

In the opinion of Co-Bond Counsel, under existing statutes and regulations, as presently construed, and assuming continuing compliance by the Authority with certain covenants of the Indenture, interest on the Bonds is excluded from gross income for federal income tax purposes. Interest on the Bonds is not an item of tax preference for purposes of the federal individual and corporate alternative minimum taxes. For information regarding continuing requirements as to such tax exemption and other tax consequences to the owners of the Bonds, see "TAX EXEMPTION" herein. The Bonds are exempt from taxation within the Commonwealth of Pennsylvania except for gift, estate, succession or inheritance taxes or any other taxes not levied or assessed directly on the Bonds, the transfer thereof, the income therefrom or the realization of profits on the sale thereof.

NEW ISSUE — Book Entry Only

RATINGS: See "Ratings of the Bonds" herein

The Pittsburgh Water and Sewer Authority

\$278,970,000

**Water and Sewer System Revenue Refunding Bonds,
Series A of 1993**

\$10,785,000

**Water and Sewer System Revenue Bonds,
Series B of 1993**

Dated: October 15, 1993

**Due: September 1, as shown on
inside front cover**

The Water and Sewer System Revenue Refunding Bonds, Series A of 1993 (the "1993 Series A Bonds") and the Water and Sewer System Revenue Bonds, Series B of 1993 (the "1993 Series B Bonds", and together with the 1993 Series A Bonds, the "Bonds") will be special limited obligations of The Pittsburgh Water and Sewer Authority (the "Authority"). The Bonds will be issued under a Trust Indenture, dated as of October 15, 1993, between the Authority and PNC Bank, National Association, as Trustee (the "Indenture"). The Indenture provides that the Bonds shall be secured by a pledge of the receipts and revenues of the Authority, after deduction of the proper expenses of the operation, maintenance and repair of the water supply and distribution and the wastewater collection systems of the Authority (the "Water and Sewer System"), and reserves therefor as provided in the Indenture.

The Bonds will be the only bonded indebtedness of the Authority outstanding under the Indenture having a lien on the Receipts and Revenues of the Water and Sewer System, although parity bonds may be issued in accordance with the Indenture.

Payment of the principal of, and interest on, the Bonds when due is insured under a Municipal Bond New Issue Insurance Policy issued by Financial Guaranty Insurance Company.

**FGIC. Financial Guaranty Insurance
Company**

FGIC is a registered service mark used by Financial Guaranty Insurance Company, a private company not affiliated with any U.S. Government agency.

The Bonds are issuable only as fully registered bonds initially registered in the name of Cede & Co., as nominee for The Depository Trust Company ("DTC"), New York, New York which will act as securities depository for the Bonds. Purchasers will not receive certificates representing their ownership interest in the Bonds purchased. So long as Cede & Co. is the registered owner, or nominee of DTC, references herein to "Owners" or "registered owners" shall mean Cede & Co., as aforesaid and shall not mean the Beneficial Owners of the Bonds. Beneficial ownership of the Bonds may be acquired in denominations of \$5,000, principal amount, and any integral multiple thereof.

Principal and interest on the Bonds will be paid by PNC Bank, National Association, Pittsburgh, Pennsylvania, as trustee (the "Trustee"). So long as DTC or its nominee, Cede & Co., is the registered owner, such payments will be made directly to Cede & Co. Disbursement of such payments to the DTC Participants is the responsibility of DTC and disbursement of such payments to the Beneficial Owners is the responsibility of the DTC Participants and the Indirect Participants, as more fully described herein. Interest will be payable on the Bonds on March 1 and September 1, commencing March 1, 1994 to the registered owners of the Bonds as of the close of business on the fifteenth day of the month preceding the relevant Interest Payment Date. Certain Bonds are subject to optional and mandatory redemption as described under heading "Redemption of the Bonds" herein.

NEITHER THE CITY OF PITTSBURGH NOR THE COMMONWEALTH OF PENNSYLVANIA NOR ANY POLITICAL SUBDIVISION THEREOF IS OBLIGATED TO PAY THE PRINCIPAL, REDEMPTION PRICE OF, OR INTEREST ON, THE BONDS, AND NEITHER THE FAITH, CREDIT NOR TAXING POWER OF THE CITY OF PITTSBURGH OR THE COMMONWEALTH OF PENNSYLVANIA OR ANY OTHER POLITICAL SUBDIVISION THEREOF IS PLEDGED TO SUCH PAYMENT. THE AUTHORITY HAS NO TAXING POWER.

The Bonds are offered when, as and if issued by the Authority and received by the Underwriters, subject to the approval of the legality of Eckert Seamans Cherin & Mellott and King, Abrams & Burney, Co-Bond Counsel. Certain legal matters will be passed upon for the Authority by its General Counsel, Dawn A. Botsford, Esquire, and for the Underwriters by their Counsel, Klett Lieber Rooney & Schorling, a Professional Corporation. The Authority expects that delivery of the Bonds in definitive form will be made in New York, New York, on or about November 16, 1993.

PaineWebber Incorporated

Alex. Brown & Sons, Inc.

Smith Barney Shearson

J.P. Morgan Securities Inc.

WR Lazard, Laidlaw & Mead, Inc.

The Pittsburgh Water and Sewer Authority

\$278,970,000
Water and Sewer System Revenue Refunding Bonds,
Series A of 1993

Maturities, Principal Amounts, Interest Rates and Prices/Yields

\$171,560,000 Serial Bonds

<u>(9/1)</u> <u>Maturity</u>	<u>Principal</u> <u>Amount</u>	<u>Interest</u> <u>Rate</u>	<u>Yields</u>
1994	\$8,495,000	3.50%	2.70%
1995	4,355,000	3.40	3.40
1996	5,945,000	3.50	3.60
1997	6,865,000	3.75	3.80
1998	8,550,000	3.90	4.00
1999	8,885,000	4.00	4.20
2000	9,245,000	4.25	4.40
2001	9,635,000	4.40	4.50
2002	10,065,000	4.50	4.60
2003	10,505,000	4.60	4.70
2004	11,000,000	4.70	4.80
2005	11,515,000	4.75	4.85
2006	12,060,000	4.80	4.95
2007	12,640,000	4.90	5.05
2008	13,260,000	5.00	5.15
2009	13,920,000	5.00	5.20
2010	14,620,000	5.00	5.25

\$49,105,000 6.50% Term Bond Due September 1, 2013, Price to Yield 5.25%
\$58,305,000 4.75% Term Bond Due September 1, 2016, Price to Yield 5.35%

\$10,785,000
Water and Sewer System Revenue Bonds,
Series B of 1993

\$10,785,000 5.00% Term Bond Due September 1, 2023, Price to Yield 5.40%

THE PITTSBURGH WATER AND SEWER AUTHORITY

David M. Matter, Chairman
Joseph Preston, Jr., Vice-Chairman
D'Ann Swanson, Treasurer
Lewis H. Borman, Secretary
Eugene Ricciardi, Member
Ann J. Davis, Member

AUTHORITY GENERAL COUNSEL

Dawn A. Botsford, Esquire

TRUSTEE

PNC Bank, National Association

FINANCIAL ADVISOR

Public Financial Management, Inc.

PAYING AGENT

PNC Bank, National Association

CO-BOND COUNSEL

Eckert Seamans Cherin & Mellott;
King, Abrams & Burney

UNDERWRITERS' COUNSEL

Klett Lieber Rooney & Schorling,
A Professional Corporation

No dealer, broker, salesperson or other person has been authorized by the Authority or the Underwriters to give any information or to make any representation in connection with the Bonds or the matters described herein, other than those contained in this Official Statement, and, if given or made, such other information or representation must not be relied upon as having been authorized by any of the foregoing. 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.

All quotations from and summaries and explanations of provisions of laws herein do not purport to be complete and reference is made to said laws for full and complete statements of their provisions.

This Official Statement is not to be construed as a contract or agreement between the Authority and the purchasers or holders of any of the Bonds. Any statements made in this Official Statement involving matters of opinion, whether or not expressly so stated, are intended merely as opinion and not as representations of fact. The information contained herein is subject to change without notice and neither the 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 Authority.

The order and placement of materials in this Official Statement, including the Appendices, 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.

THE BONDS HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, NOR HAS THE INDENTURE BEEN QUALIFIED UNDER THE TRUST INDENTURE ACT OF 1939, IN RELIANCE UPON EXEMPTIONS CONTAINED IN SUCH ACTS. THE REGISTRATION OR QUALIFICATION OF THE BONDS IN ACCORDANCE WITH APPLICABLE PROVISIONS OF THE SECURITIES LAWS OF THE STATES, IF ANY, IN WHICH THE BONDS HAVE BEEN REGISTERED OR QUALIFIED AND THE EXEMPTION FROM REGISTRATION OR QUALIFICATION IN CERTAIN OTHER STATES CANNOT BE REGARDED AS A RECOMMENDATION THEREOF. NEITHER THESE STATES NOR ANY OF THEIR AGENCIES HAVE PASSED UPON THE MERITS OF THE BONDS OR THE ACCURACY OR COMPLETENESS OF THIS OFFICIAL STATEMENT. ANY REPRESENTATION TO THE CONTRARY MAY BE A CRIMINAL OFFENSE.

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SUMMARY INFORMATION

THIS SUMMARY STATEMENT IS SUBJECT IN ALL RESPECTS TO THE MORE COMPLETE INFORMATION CONTAINED IN THIS OFFICIAL STATEMENT, AND OFFERING OF THE 1993 BONDS TO THE POTENTIAL PURCHASERS IS MADE ONLY BY MEANS OF THIS OFFICIAL STATEMENT.

<i>Offering</i>	\$278,970,000 The Pittsburgh Water and Sewer Authority, Water and Sewer System Revenue Refunding Bonds, Series A of 1993 and \$10,785,000 Water and Sewer System Revenue Bonds, Series B of 1993
<i>Date of Issue</i>	October 15, 1993.
<i>Denomination</i>	\$5,000 or multiples thereof.
<i>Maturity</i>	September 1 on the dates specified on the front inside cover hereof.
<i>Interest</i>	Payable on March 1 and September 1 of each year commencing March 1, 1994.
<i>Security</i>	The Receipts and Revenues of the Authority after payment of the Authority's Current Expenses, together with funds held by the Trustee under the Indenture. The timely payment of principal of and interest on the Bonds is insured under a bond insurance policy issued by Financial Guaranty Insurance Corporation. See "SECURITY FOR THE BONDS" and "MUNICIPAL BOND INSURANCE" herein.
<i>Use of Proceeds</i>	The 1993 Series A Bonds will be used (a) to advance refund all of the Authority's outstanding Water and Sewer System Revenue Refunding Bonds, Series A of 1991; and (b) to pay all of the costs of issuance, including the bond insurance premium. The 1993 Series B Bonds will be used (a) to pay for improvements to the Authority's Water and Sewer System; and (b) to pay all of the costs of issuance, including the bond insurance premium.
<i>Redemption</i>	Certain of the 1993 Bonds are subject to optional, mandatory sinking fund and extraordinary optional redemption prior to maturity. See "REDEMPTION OF THE BONDS" herein.
<i>Bond Rating</i>	Moody's Investors Corporation "Aaa" Standard & Poor's Corporation "AAA"
<i>Trustee & Paying Agent</i>	PNC Bank, National Association, Pittsburgh, Pennsylvania

THE PITTSBURGH WATER AND SEWER AUTHORITY

\$278,970,000
Water and Sewer System Revenue Refunding Bonds,
Series A of 1993

\$10,785,000
Water and Sewer System Revenue Bonds,
Series B of 1993

INTRODUCTION

The purpose of this Official Statement, which includes this introductory statement, the cover page and appendices hereto, is to set forth certain information pertaining to The Pittsburgh Water and Sewer Authority (the "Authority"), a body corporate and politic duly created and existing under the Pennsylvania Municipality Authorities Act of 1945 (P.L. 382), as amended, 53 P.S. § 301 et seq. (the "Act"), and to the issuance by the Authority of \$278,970,000 aggregate principal amount, Water and Sewer System Revenue Refunding Bonds, Series A of 1993 (the "1993 Series A Bonds") and \$10,785,000 aggregate principal amount, Water and Sewer System Revenue Bonds, Series B of 1993 (the "1993 Series B Bonds", and together with the 1993 Series A Bonds, the "Bonds"). The Bonds are being issued pursuant to a Trust Indenture between the Authority and PNC Bank, National Association, as trustee (the "Trustee"), dated as of October 15, 1993 (the "Indenture") in order to carry out the refunding program as described herein (see "History of Financing and Refunding Program" herein) and to pay for capital improvements to the Authority's Water and Sewer System (see "The Water and Sewer System" and "The Capital Improvement Program" herein).

The Authority was established in February 1984 by the City of Pittsburgh (the "City") for the purpose of assuming responsibility for the operation of the City's water supply, distribution and wastewater collection systems (the "Water and Sewer System"). On May 1, 1984, the Authority assumed responsibility for establishing and collecting user fees and charges and for maintaining and improving the Water and Sewer System. Pursuant to a lease and management agreement (the "Lease and Management Agreement") between the Authority and the City, the Water and Sewer System is operated and maintained by the City under the general supervision and control of the Authority. The Lease and Management Agreement also requires the City to collect user fees and charges imposed by the Authority and to implement a program of capital improvements on behalf of the Authority. The Water and Sewer System provides water to approximately 84,000 customers and sewage service to approximately 100,000 customers. The Water and Sewer System does not include wastewater treatment facilities.

Rates and charges established by the Authority are not subject to the approval of any department, board or agency of the Commonwealth of Pennsylvania or the City.

There follow in this Official Statement brief descriptions of the Authority and other information concerning the terms of the Bonds, the Indenture, the Lease and Management Agreement, the Water and Sewer System and the Municipal Bond Insurance Policy. All references herein to the Indenture and the Lease and Management Agreement are qualified in their entirety by references to such documents. The form of the Indenture is attached hereto as Appendix A. Copies of the Lease and Management Agreement are available from the Authority. All references to the Bonds are qualified in their entirety by reference to the definitive form thereof and the information with

respect thereto contained in the Indenture. All capitalized terms used herein are used with the meaning set forth in the Indenture unless otherwise so specified.

THE AUTHORITY

The Pittsburgh Water and Sewer Authority is a body corporate and politic organized and existing under the Act pursuant to Resolution No. 36 of the Council of the City of Pittsburgh, duly enacted on February 6, 1984, approved by the Mayor on February 8, 1984, and effective February 14, 1984. The Secretary of the Commonwealth of Pennsylvania approved the Authority's Articles of Incorporation and issued a Certificate of Incorporation on February 17, 1984. Articles of Amendment were approved and a Certificate of Amendment issued by the Department of State on December 11, 1989 to include the power to finance projects and to include among authorized projects low head dams and facilities for generating surplus electric power.

Under the Act, the Authority is specifically authorized to acquire, hold, construct, finance, improve, maintain, operate, own and lease, either as lessor or lessee, projects of the following kinds and character: sewers, sewer systems or parts thereof, waterworks, water supply works, and water distribution systems, low head dams and facilities for generating surplus power.

Effective May 1, 1984, the City leased the Water and Sewer System to the Authority for a term of fifty years with renewal provisions. The Authority is authorized to operate and maintain the Water and Sewer System, construct all necessary improvements, establish and collect rates and charges for its services, and finance its operations and improvements through revenue collections and the sale of bonds and notes payable solely from the Authority's revenues. Pursuant to the terms of the Lease and Management Agreement, the Authority has appointed and designated the City as the Authority's agent to manage, operate and maintain the Water and Sewer System for the term of the lease, subject to the general supervision, direction and control of the Authority. Various departments of the City, including the City's Department of Water (the "Department of Water") and the City's Department of Public Works (the "Department of Public Works") carry out such responsibilities.

Membership

The Board of the Authority consists of seven (7) members appointed by the Mayor of the City and the City Council of the City. The City's Director of Finance is an *ex officio* member of the Board. The position of the City's Director of Finance is currently vacant, resulting in a vacancy on the Board of the Authority. The terms of office of the members commence on the date of appointment, and the members serve staggered terms for one year through five years from the first Monday in January next succeeding the date of appointment or until appointment of a successor, whichever is later. The present members of the Board and officers of the Authority, their terms and their principal private affiliations are as follows:

<u>Member</u>	<u>Occupation</u>	<u>Term Expires (First Monday of January)</u>
David M. Matter Chairman	President Oxford Development Corp.	1995
Joseph L. Preston, Jr. Vice-Chairman	Member, Pennsylvania General Assembly	1996
D'Ann Swanson Treasurer	City Treasurer, City of Pittsburgh	1998
Lewis H. Borman, Secretary	Asst. Executive Secretary City of Pittsburgh	1996
Ann J. Davis	Community Leader	1992*
Eugene Ricciardi	Member, City Council, City of Pittsburgh	1994

* Although Mrs. Davis' term expired in 1992, she continues to serve until such time as a reappointment or new appointment is made.

The Board of the Authority holds monthly meetings to discuss policy and to act on resolutions. The day to day operation of the Authority is the responsibility of its Executive Director. Glenn M. Cannon was appointed by the Board as the Executive Director of the Authority effective June 1, 1992. Mr. Cannon has a Bachelor of Science Degree from Indiana University of Pennsylvania, a Master of Public Administration Degree from Carnegie Mellon University and a Juris Doctor Degree from the Duquesne University School of Law. Prior to his appointment as Executive Director he was the Director of the City of Pittsburgh Public Safety Department, one of several positions that he held within that department.

Dawn A. Botsford was appointed by the Board as the General Counsel effective June 1, 1992. Ms. Botsford has a Bachelor of Arts degree and a Master of Public Administration degree, each from West Virginia University and a Juris Doctor degree from the Duquesne University School of Law. Prior to her appointment as General Counsel, she was the Executive Director of the Authority. Ms. Botsford has also been employed by the City of Pittsburgh since 1982 as the Director of the Water Department, a Senior Budget Analyst and as Director of the Department of General Services.

HISTORY OF FINANCING AND REFUNDING PROGRAM

History

The Authority was established by the City of Pittsburgh in February of 1984. In conjunction therewith the City entered into the Lease and Management Agreement with the Authority whereby the City leased the Water and Sewer System to the Authority and whereby the Authority became responsible for the operation and maintenance of the Water and Sewer System. Pursuant to such responsibility, in April of 1984 the Authority adopted an initial Capital Improvement Program (the "Program") for the purpose of maintaining a satisfactory level of service to the Water and Sewer System's existing users and to address future user requirements. In order to implement the first phase

of the Program, the Authority issued its Daily Adjustable Demand Water and Sewer System Revenue Bonds, Series of 1984 (the "1984 Bonds"). Thereafter the Authority issued its Water and Sewer System Adjustable Rate Tender Revenue Bonds, Series of 1985 (the "1985 Bonds") to provide for the refunding and the redemption on April 1, 1987 of the 1984 Bonds.

The Authority subsequently issued \$134,700,000 of its Water and Sewer System Adjustable Rate Tender Revenue Bonds, Series of 1986 (the "1986 Program Bonds"), in order to implement the second phase of the Program.

Refunding Program

The 1993 Series A Bonds are being issued to refund the Authority's \$248,329,024.10, principal amount, Water and Sewer System Revenue Refunding Bonds, Series A of 1991 (the "1991 Refunding Bonds"), which were issued to current refund all of the then outstanding 1985 Bonds and 1986 Program Bonds. A portion of the proceeds of the 1993 Series A Bonds will be deposited with PNC Bank, National Association, as escrow agent (in such capacity, the "Escrow Agent"), pursuant to an Escrow Deposit Agreement dated as of October 15, 1993 (the "Escrow Agreement") between the Authority and the Escrow Agent. The Escrow Agent will use such proceeds to acquire direct obligations of the United States Treasury which will be sufficient in amount, as verified by KPMG Peat Marwick, certified public accountants, to (a) pay maturing principal of, premium, if any, and interest on the 1991 Refunding Bonds which are current interest bonds through their redemption in whole on September 1, 2001 and (b) pay the maturity amount of the 1991 Refunding Bonds which are capital appreciation bonds through their final maturity on September 1, 2008. For further information, see "EXAMINATION OF YIELDS AND ESCROW SUFFICIENCY" herein.

Following the issuance of the Bonds, the Authority will have no other bonds outstanding which are payable from the Receipts and Revenues of the Authority. The Authority has covenanted in the Indenture that it will permit no other indebtedness to have a lien on the Receipts and Revenues which is prior to the Bonds. Parity and subordinated debt may be issued by the Authority in accordance with the provisions of the Indenture. See "SECURITY FOR BONDS - Additional Bonds" herein and APPENDIX A hereto for the provisions of the Indenture governing the incurrence of additional indebtedness by the Authority.

THE BONDS

Description of the Bonds

The Bonds will be issued as fully registered bonds in book-entry form in the principal amounts set forth on the inside of the cover of this Official Statement. The Bonds will be issued in denominations of \$5,000, principal amount, or any integral multiple thereof, and will bear interest at the rates and will mature on the dates and in the amounts set forth on the inside of the cover of this Official Statement. Principal and interest shall be paid in such coin or currency of the United States of America as at the time of payment is legal tender for the payment of public and private debts. Interest on the Bonds will be computed on the basis of a 360-day year of twelve 30-day months.

Interest shall be payable on the Bonds on March 1 or September 1 of each year commencing March 1, 1994 (each an "Interest Payment Date"). Each Bond will be initially dated October 15, 1993, and thereafter will be dated as of its date of authentication and will bear interest from the March 1 or September 1, as the case may be, next preceding the date of such Bond to which interest has been paid unless the date of such Bond is an Interest Payment Date on which interest has been paid,

in which event it shall bear interest as of such Interest Payment Date or, if dated prior to the first Record Date, which is February 15, 1994, in which event it shall bear interest from October 15, 1993.

The Bonds are payable as to principal at the principal corporate trust office of PNC Bank, National Association, as paying agent or any successor paying agent. Payment of interest on the Bonds shall be made to the Bondholders of record on the registration books of the paying agent as of the close of business on the fifteenth day of the month (whether or not such day is a business day) next preceding the Interest Payment Date (the "Record Date") by check mailed to such owner at the address shown on the registration books or in any other manner as may be mutually acceptable to the owner and the Trustee. Defaulted interest with respect to any Bond shall cease to be payable to the holder thereof on the relevant Record Date and shall be payable instead to the registered Bondholder as of the close of business on a Special Record Date for the payment of such defaulted interest established by the Trustee in accordance with the Indenture.

Payment of interest on any Bond shall be made to any owner of \$1,000,000 or more in aggregate principal amount of Bonds by wire transfer to such owner on any Interest Payment Date upon written notice from such owner received by the Paying Agent not later than the Business Day preceding the Record Date for the applicable Interest Payment Date, such notice to contain the wire transfer address within the continental United States to which such owner wishes to have such wire directed.

The Bonds are subject to mandatory and optional redemption as described herein under the captions "Optional Redemption," "Mandatory Sinking Fund Redemption," and "Extraordinary Optional Redemption."

Book-Entry Only System

The Depository Trust Company ("DTC"), New York, NY, will act as securities depository for the Bonds. The Bonds will be issued as fully-registered bonds registered in the name of Cede & Co. (DTC's partnership nominee). One fully-registered bond will be issued for each issue of the Bonds, each in the aggregate principal amount of such issue, and will be deposited with DTC. If, however, the aggregate principal amount of any issue exceeds \$150 million, one certificate will be issued with respect to each \$150 million of principal amount and an additional certificate will be issued with respect to any remaining principal amount of such issue.

DTC 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 securities that its participants ("Participants") deposit with DTC. DTC also facilitates the settlement among Participants of securities transactions, such as transfers and pledges, in deposited securities through electronic computerized book-entry changes in Participants' accounts, thereby eliminating the need for physical movement of securities certificates. Direct Participants include securities brokers and dealers, banks, trust companies, clearing corporations, and certain other organizations. DTC is owned by a number of its Direct Participants and by the New York Stock Exchange, Inc., the American Stock Exchange, Inc., and the National Association of Securities Dealers, Inc. Access to the DTC system is also available to others such as securities brokers and dealers, banks, and trust companies that clear through or maintain a custodial relationship with a Direct Participant, either directly or indirectly ("Indirect Participants"). The Rules applicable to DTC and its Participants are on file with the Securities and Exchange Commission.

Purchases of 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, but Beneficial Owners are 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 Participants acting on behalf of Beneficial Owners. Beneficial Owners will not receive certificates representing their ownership interests in 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 Participants with DTC are registered in the name of DTC's partnership nominee, Cede & Co. The deposit of Bonds with DTC and their registration in the name of Cede & Co. effect no 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 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 Cede & Co. If less than all of the Bonds within an issue are being redeemed, DTC's practice is to determine by lot the amount of the interest of each Direct Participant in such issue to be redeemed.

Neither DTC nor Cede & Co. will consent or vote with respect to the Bonds. Under its usual procedures, DTC mails an Omnibus Proxy to the Authority 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 DTC. DTC's practice is to credit Direct Participants' accounts on payable date in accordance with their respective holdings shown on DTC's records unless DTC has reason to believe that it will not receive payment on payable date. 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 Paying Agent, or the Authority, subject to any statutory or regulatory requirements as may be in effect from time to time. Payment of principal and interest to DTC is the responsibility of the Authority or the Paying Agent, disbursement of such payments to Direct Participants shall be the responsibility of DTC, and disbursement of such payments to the Beneficial Owners shall be the responsibility of Direct and Indirect Participants.

DTC may discontinue providing its services as securities depository with respect to the Bonds at any time by giving reasonable notice to the Authority or the Paying Agent. Under such circumstances, in the event that a successor securities depository is not obtained, bond certificates are required to be printed and delivered.

The Authority may decide to discontinue use of the system of book-entry transfers through DTC (or a successor securities depository). In that event, bond certificates will be printed and delivered.

The information in this section concerning DTC and DTC's book-entry system has been obtained from sources that the Authority believes to be reliable, but the Authority takes no responsibility for the accuracy thereof.

In the event that the book-entry only system is discontinued, the following provisions would apply: Bonds may be exchanged for an equal aggregate principal amount of Bonds in other authorized denominations, upon surrender thereof at the principal corporate trust office of the Trustee. The transfer of Bonds may be registered on the books maintained by the Trustee for such purpose only upon the surrender thereof to the Trustee with a duly executed assignment in form satisfactory to the Authority and the Trustee. For every exchange or registration or transfer of Bonds, the Trustee may make a charge sufficient to reimburse it for any tax or other governmental charge required to be paid with respect to such exchange or registration or transfer of the Bonds. The Trustee shall not be required to register the transfer or exchange of any Bond (i) during a period beginning at the opening of business fifteen (15) days before the day of the mailing of notice of redemption of the Bonds and ending at the close of business on the day of such mailing, (ii) at any time following the selection of such Bond, in whole or in part, for redemption, or (iii) during the period commencing on a Record Date and ending on the corresponding Interest Payment Date.

In the event that the book-entry only system is discontinued, principal and redemption price will be payable upon surrender of the Bonds at the corporate trust office of the Trustee.

REDEMPTION OF THE BONDS

Optional Redemption

The 1993 Bonds maturing on or after September 1, 2004, (except the 1993 Series A Bonds maturing on September 1, 2013, which are not subject to optional redemption) are subject to optional redemption on or after September 1, 2003, in whole at any time, or in part on any Interest Payment Date. Any such redemption will be made at a redemption price equal to the following percentages of the principal amount thereof determined in accordance with the following schedule plus accrued interest to the redemption date:

Redemption Periods (Both dates inclusive)	Price
September 1, 2003 through August 31, 2004	102%
September 1, 2004 through August 31, 2005	101
September 1, 2005 and thereafter	100

The 1993 Series A Bonds maturing on September 1 of the years 1994 through 2003 and the 1993 Series A Bonds maturing on September 1, 2013 are not subject to optional redemption.

Mandatory Sinking Fund Redemption

(a) **1993 Series A Bonds.** The 1993 Series A Bonds maturing on September 1, 2013 and September 1, 2016 are subject to mandatory sinking fund redemption, by lot, at a redemption price equal to 100% of the principal amount thereof plus accrued interest to the redemption date, on the dates and in the principal amounts as follows:

September 1, 2013 Maturity		September 1, 2016 Maturity	
<u>Year (September 1)</u>	<u>Principal Amount</u>	<u>Year (September 1)</u>	<u>Principal Amount</u>
2011	\$15,350,000	2014	\$18,540,000
2012	16,345,000	2015	19,425,000
2013*	17,410,000	2016*	20,340,000

* Final Maturity

(b) **1993 Series B Bonds.** The 1993 Series B Bonds maturing on September 1, 2023 are subject to mandatory sinking fund redemption, by lot, at a redemption price equal to 100% of the principal amount thereof plus accrued interest to the redemption date, on the dates and in the principal amounts as follows:

<u>Year (September 1)</u>	<u>Principal Amount</u>
2017	\$1,325,000
2018	1,390,000
2019	1,460,000
2020	1,535,000
2021	1,610,000
2022	1,690,000
2023*	1,775,000

* Final Maturity

Extraordinary Optional Redemption

The 1993 Bonds are subject to extraordinary redemption prior to maturity at the option of the Authority in whole or in part at any time, in the event of condemnation, damage or destruction of the Water and Sewer System, from moneys deposited with or held by the Trustee for such purpose, upon payment of 100% of the principal amount thereof being redeemed, together with interest accrued to the date fixed for redemption.

The redemption of the Bonds shall be made in the manner and upon the terms and conditions set forth in the Indenture. In the event that less than all of the 1993 Bonds of any series or maturity are to be redeemed as provided above, they shall be redeemed at random in any reasonable manner determined by the Trustee, unless otherwise directed by the Authority, and shall be selected for redemption by the Trustee in blocks of \$5,000, principal amount, provided that no such redemption shall cause any holder of 1993 Bonds to hold less than \$5,000, principal amount,

of Bonds after such redemption. Any redemption of the 1993 Bonds shall be upon at least fifteen (15) days but not more than thirty (30) days prior written, telegraphic or telexed notice to the Bondholder of the 1993 Bonds so called for redemption.

MUNICIPAL BOND INSURANCE

Concurrently with the issuance of the Bonds, Financial Guaranty Insurance Company ("Financial Guaranty") will issue its Municipal Bond New Issue Insurance Policy for the Bonds (the "Policy"). The Policy unconditionally guarantees the payment of that portion of the principal of and interest on the Bonds which has become due for payment, but shall be unpaid by reason of nonpayment by the Authority. Financial Guaranty will make such payments to State Street bank & Trust Company, N.A., or its successor as its agent (the "Fiscal Agent"), on the later of the date on which such principal and interest is due or on the business day next following the day on which Financial Guaranty shall have received telephonic or telegraphic notice, subsequently confirmed in writing, or written notice by registered or certified mail, from an owner of Bonds or the Paying Agent of the nonpayment of such amount by the Authority. The Fiscal Agent will disburse such amount due on any Bond to its owner upon receipt by the Fiscal Agent of evidence satisfactory to the Fiscal Agent of the owner's right to receive payment of the principal and interest due for payment and evidence, including any appropriate instruments of assignment, that all of such owner's rights to payment of such principal and interest shall be vested in Financial Guaranty. The term "nonpayment" in respect of a Bond includes any payment of principal or interest made to an owner of a Bond which has been recovered from such owner pursuant to the United States Bankruptcy Code by a trustee in bankruptcy in accordance with a final, nonappealable order of a court having competent jurisdiction.

The Policy is non-cancelable and the premium will be fully paid at the time of delivery of the Bonds. The Policy covers failure to pay principal of the Bonds on their respective stated maturity dates or dates on which the same shall have been duly called for mandatory sinking fund redemption, and not on any other date on which the Bonds may have been otherwise called for redemption, accelerated or advanced in maturity, and covers the failure to pay an installment of interest on the stated date for its payment.

Generally, in connection with its insurance of an issue of municipal securities, Financial Guaranty requires, among other things, (i) that it be granted the power to exercise any rights granted to the holders of such securities upon the occurrence of an event of default, without the consent of such holders, and that such holders may not exercise such rights without Financial Guaranty's consent, in each case so long as Financial Guaranty has not failed to comply with its payment obligations under its insurance policy; and (ii) that any amendment or supplement to or other modification of the principal legal documents be subject to Financial Guaranty's consent. The specific rights, if any, granted to Financial Guaranty in connection with its insurance of the Bonds are set forth in the description of the principal legal documents appearing elsewhere in this Official Statement. Reference should be made as well to such description for a discussion of the circumstances, if any, under which the Authority is required to provide additional or substitute credit enhancement, and related matters.

This Official Statement contains a section regarding the ratings assigned to the Bonds and references should be made to such section for a discussion of such ratings and the basis for their assignment to the Bonds. Reference should be made to the description of the Authority for a discussion of the ratings, if any, assigned to such entity's outstanding parity debt that is not secured by credit enhancement.

Financial Guaranty is a wholly-owned subsidiary of FGIC Corporation (the "Corporation"), a Delaware holding company. The Corporation is a subsidiary of General Electric Capital Corporation ("GE Capital"). Neither the Corporation nor GE Capital is obligated to pay the debts of or the claims against Financial Guaranty. Financial Guaranty is a monoline financial guaranty insurer domiciled in the State of New York and subject to regulation by the State of New York Insurance Department. As of June 30, 1993, the total capital and surplus of Financial Guaranty was approximately \$686,140,000. Financial Guaranty prepares financial statements on the basis of both statutory accounting principles and generally accepted accounting principles. Copies of such financial statements may be obtained by writing to Financial Guaranty at 115 Broadway, New York, New York 10006, Attention: Communications Department (telephone number: (212) 312-3000) or to the New York State Insurance Department at 160 West Broadway, 18th Floor, New York, New York 10013, Attention: Property Companies Bureau (telephone number: (212) 602-0389).

SOURCES AND USES OF FUNDS

Sources:

Proceeds of the sale of the Bonds	\$289,755,000
Transfer of Funds from Prior Indenture ¹	2,009,523
Net Premium	409,282
Accrued Interest	<u>1,223,954</u>
TOTAL	<u>\$293,397,059</u>

Uses:

Deposit to Escrow for 1991 Refunding Bonds	\$276,612,747
Deposit to Construction Fund	12,000,000
Deposit to Debt Service Fund	1,223,954
Costs of Issuance ²	<u>3,561,058</u>
TOTAL	<u>\$293,397,059</u>

¹ Transfer of balance in the Renewal and Replacement Fund

² Includes: Underwriters' discount, bond insurance premium, debt service reserve surety bond premium, fees of the Trustee, Escrow Agent, Co-Bond Counsel, Underwriters' Counsel and Financial Advisor, printing costs and miscellaneous fees and expenses.

DEBT SERVICE REQUIREMENTS

Year Sept 1.	Principal	Mandatory Redemption	Interest	Total
1994	\$8,495,000.00		\$12,469,298.56	\$20,964,298.56
1995	4,355,000.00		13,908,205.00	18,263,205.00
1996	5,945,000.00		13,760,135.00	19,705,135.00
1997	6,865,000.00		13,552,060.00	20,417,060.00
1998	8,550,000.00		13,294,622.50	21,844,622.50
1999	8,885,000.00		12,961,172.50	21,846,172.50
2000	9,245,000.00		12,605,772.50	21,850,772.50
2001	9,635,000.00		12,212,860.00	21,847,860.00
2002	10,065,000.00		11,788,920.00	21,853,920.00
2003	10,505,000.00		11,335,995.00	21,840,995.00
2004	11,000,000.00		10,852,765.00	21,852,765.00
2005	11,515,000.00		10,335,765.00	21,850,765.00
2006	12,060,000.00		9,788,802.50	21,848,802.50
2007	12,640,000.00		9,209,922.50	21,849,922.50
2008	13,260,000.00		8,590,562.50	21,850,562.50
2009	13,920,000.00		7,927,562.50	21,847,562.50
2010	14,620,000.00		7,231,562.50	21,851,562.50
2011		\$15,350,000.00	6,500,562.50	21,850,562.50
2012		16,345,000.00	5,502,812.50	21,847,812.50
2013	17,410,000.00		4,440,387.50	21,850,387.50
2014		18,540,000.00	3,308,737.50	21,848,737.50
2015		19,425,000.00	2,428,087.50	21,853,087.50
2016	20,340,000.00		1,505,400.00	21,845,400.00
2017		1,325,000.00	539,250.00	1,864,250.00
2018		1,390,000.00	473,000.00	1,863,000.00
2019		1,460,000.00	403,500.00	1,863,500.00
2020		1,535,000.00	330,500.00	1,865,500.00
2021		1,610,000.00	253,750.00	1,863,750.00
2022		1,690,000.00	173,250.00	1,863,250.00
2023	<u>1,775,000.00</u>	<u>.</u>	<u>88,750.00</u>	<u>1,863,750.00</u>
	<u>\$211,085,000.00</u>	<u>\$78,670,000.00</u>	<u>\$217,773,971.06</u>	<u>\$507,528,971.06</u>

SECURITY FOR BONDS

The Bonds are limited obligations of the Authority and are payable only out of the sources set forth in the Indenture. The Indenture provides that the Bonds shall be secured by a pledge of the Receipts and Revenues of the Authority, after payment of Current Expenses of the Water and Sewer System and trust moneys pledged, as provided in the Indenture, including funds on deposit in the Debt Service Reserve Fund in an amount equal to the Maximum Annual Debt Service on the Bonds. The timely payment of principal of and interest on the Bonds when due will be additionally secured by the Policy to be issued by the Bond Insurer on the date of issuance and delivery of the Bonds.

Debt Service Reserve Fund

As additional security for the repayment of the Bonds, the Indenture requires that a Debt Service Reserve Fund be created and funded in an amount equal to the Maximum Annual Debt Service Requirements on the Bonds. The Debt Service Reserve Fund will be funded with a surety bond issued by the Bond Insurer (described in the immediately following section) in the required amount equal to the Maximum Annual Debt Service Requirements on the Bonds. In the event of a deficiency in the amounts required to be held by the Trustee in the Debt Service Fund on any payment date, the Trustee shall draw moneys upon the surety bond in an amount equal to such deficiency and deposit such moneys to the Debt Service Fund on the payment date.

Debt Service Reserve Fund Policy

Concurrently with the issuance of the Bonds, Financial Guaranty will issue its Municipal Bond Debt Service Reserve Fund Policy (the "Reserve Policy"). The Reserve Policy unconditionally guarantees the payment of that portion of the principal of and interest on the Bonds which has become due for payment, but shall be unpaid by reason of nonpayment by the Issuer, provided that the aggregate amount paid under the Reserve Policy may not exceed the maximum amount set forth in the Reserve Policy, which maximum amount represents Maximum Annual Debt Service Requirement on the Bonds. Financial Guaranty will make such payments to the paying agent (the "Paying Agent") for the Bonds on the later of the date on which such principal and interest is due or on the business day next following the day on which Financial Guaranty shall have received telephonic or telegraphic notice subsequently confirmed in writing or written notice by registered or certified mail from the Paying Agent of the nonpayment of such amount by the Issuer. The term "nonpayment" in respect of a Bond includes any payment of principal or interest made to an owner of a Bond which has been recovered from such owner pursuant to the United States Bankruptcy Code by a trustee in bankruptcy in accordance with a final nonappealable order of a court having competent jurisdiction.

The Reserve Policy is non-cancelable and the premium will be fully paid at the time of delivery of the Bonds. The Reserve Policy covers failure to pay principal of the Bonds on their respective stated maturity dates, or dates on which the same shall have been called for mandatory sinking fund redemption, and not on any other date on which the Bonds may have been accelerated, and covers the failure to pay an installment of interest on the stated date for its payment. The Reserve Policy shall terminate on the earlier of the final maturity date of the Bonds and the date on which Bonds are no longer outstanding under the Trust Indenture.

Generally, in connection with its issuance of a Reserve Policy, Financial Guaranty requires, among other things, (i) that, so long as it has not failed to comply with its payment obligations under the Reserve Policy, it be granted the power to exercise any remedies available at law or under the authorizing document other than (A) acceleration of the Bonds or (B) remedies which would

adversely affect holders in the event that the issuer fails to reimburse Financial Guaranty for any draws on the Reserve Policy; and (ii) that any amendment or supplement to or other modification of the principal legal documents be subject to Financial Guaranty's consent. The specific rights, if any, granted to Financial Guaranty in connection with its issuance of the Reserve Policy are set forth in the description of the principal legal documents appearing elsewhere in this Official Statement. Reference should be made as well to such description for a discussion of the circumstances, if any, under which the Authority is required to provide additional or substitute credit enhancement, and related matters.

This Official Statement contains a section regarding the ratings assigned to the Bonds and references should be made to such section for a discussion of such ratings and the basis for their assignment to the Bonds. Reference should be made to the description of the Authority for a discussion of the ratings, if any, assigned to such entity's outstanding parity debt that is not secured by credit enhancement.

The Reserve Policy is not covered by the Property/Casualty Insurance Security Fund specified in Article 76 of the New York Insurance Law.

Financial Guaranty is a wholly-owned subsidiary of FGIC Corporation (the "Corporation"), a Delaware holding company. The Corporation is a subsidiary of General Electric Capital Corporation ("GE Capital"). Neither the Corporation nor GE Capital is obligated to pay debts of or the claims against Financial Guaranty. Financial Guaranty is a monoline financial guaranty insurer domiciled in the State of New York and subject to regulation by the State of New York Insurance Department. As of September 30, 1993, the total capital and surplus of Financial Guaranty was approximately \$744,722,000. Financial Guaranty prepares financial statements on the basis of both statutory accounting principles and generally accepted accounting principles. Copies of such financial statements may be obtained by writing to Financial Guaranty at 115 Broadway, New York, New York 10006, Attention: Communications Department (telephone number: (212) 312-3000) or to the New York State Insurance Department at 160 West Broadway, 18th Floor, New York, New York 10013, Attention: Property Companies Bureau (telephone number: (212) 602-0389).

Authority Rate Covenant

The Indenture provides for the fixing and charging by the Authority of rates, rents and charges for the water and sewer service furnished by its Water and Sewer System in accordance with the following Authority Rate Covenant. Under the Indenture, the Authority has covenanted with the owners of the Bonds to adopt rates complying with either of the following in each Fiscal Year:

(1) The Authority will maintain, charge and collect, so long as any of the Bonds shall remain outstanding, reasonable rates, rentals and other charges for the use of the facilities of the Water and Sewer System which (after making due and reasonable allowances for contingencies and a margin of error in the estimates), together with other Receipts and Revenues, including any unrestricted cash and investments accumulated in the Revenue Fund at the beginning of each Fiscal Year, shall be at all times at least sufficient to provide annually:

- (a) Funds to pay all of the Current Expenses of the Authority;

- (b) An amount equal to 120% of the Debt Service Requirements with respect to the Bonds during the then current Fiscal Year of the Authority; and
- (c) Funds to pay all Indirect Expenses and the Additional Payment; or

(2) The Authority will maintain, charge and collect, so long as any of the Bonds shall remain outstanding, reasonable rates, rentals and other charges for the use of the facilities of the Water and Sewer System which (after making due and reasonable allowances for contingencies and a margin of error in the estimates), together with other Receipts and Revenues, for the then current Fiscal Year (exclusive of interest income earned by the Authority on funds other than the Debt Service Reserve Fund; provided, however, that earnings on the Construction Fund may also be included during any construction period, but only to the extent such earnings are expressly required to be either retained in the Construction Fund or applied directly to payment of debt service of Bonds) shall be at all times at least sufficient to provide annually:

- (a) Funds to pay all of the Current Expenses of the Authority;
- (b) An amount equal to 100% of the Debt Service Requirements with respect to the Bonds during the then current Fiscal Year of the Authority; and
- (c) Funds to pay all Indirect Expenses and the Additional Payment.

Calculation of compliance with the covenant shall be made on the following basis: (a) operating revenue, Construction Fund income, earnings on the Debt Service Reserve Fund, Indirect Expenses and direct expenses, including required deposits to replenish any withdrawals from the Debt Service Reserve Fund and the Renewal and Replacement Fund which have not been capitalized shall be accounted for on the accrual basis; (b) costs of issuance of the Bonds may be treated as if such amounts are amortized over the life of the Bonds irrespective of any shorter period over which such costs are actually amortized; and (c) depreciation is specifically excluded from the calculation.

If at any time the revenues collected shall not be sufficient to enable the Authority to comply with the rate covenant described in either (1) or (2) above, it will promptly revise its water or sewer rates, rents and other charges so that the Authority will be in compliance with such covenant and any deficiencies in transfers of funds required to be made pursuant to the Indenture will be remedied before the end of the next ensuing Fiscal Year.

Additional Bonds

The Indenture permits the issuance of Additional Bonds for the purpose of:

- (a) financing the cost of completing the Construction Project or acquiring or constructing Capital Additions to the Water and Sewer System as are necessary to preserve, develop or improve the Water and Sewer System; and
- (b) refunding outstanding Bonds.

Prior to the issuance of Additional Bonds, the Indenture requires, among other things, that the following test be satisfied:

An Independent Auditor or the Consulting Engineer shall certify that the Authority's Adjusted Gross Revenues, for twelve (12) consecutive months out of the eighteen (18) months prior to issuance of such Additional Bonds, would be sufficient for the Authority to comply with its rate covenant (the Debt Service Requirement for this test, however, must be based on the Maximum Annual Debt Service, including debt service on the proposed Additional Bonds). For purposes of this test, "Adjusted Gross Revenues" shall mean, for any twelve (12) month period under consideration, the Gross Revenues of the Authority for such twelve (12) month period, adjusted for the following:

- (1) any increase in rates or charges reasonably projected by the Authority on the date of calculation of Adjusted Gross Revenues;
- (2) customers added to the Water and Sewer System subsequent to the start of such twelve (12) month period but prior to the date of issuance of such Additional Bonds;
- (3) the estimated change in Gross Revenues which will result from the connection of existing residences or businesses to the Water and Sewer System within one year following completion of any project to be funded or system to be acquired from the proceeds of such Additional Bonds;
- (4) the estimated change of Gross Revenues (up to a maximum of 10% of the Gross Revenues of the Authority at the time the contract is entered into) which will result from services provided under any take-or-pay contract entered into subsequent to the start of the twelve (12) month period but prior to the date of issuance of such Additional Bonds; and
- (5) any adjustment that is approved in writing by the Bond Insurer and of which any rating agency then rating the Bonds has received not less than five (5) days prior written notice.

For the purposes of issuing Additional Bonds for the purpose of refunding a series of bonds, the above test need not be met if Maximum Annual Debt Service on the refunding bonds does not exceed Maximum Annual Debt Service on the refunded bonds, and if the final maturity of the refunding bonds is not longer than the final maturity of the refunded bonds.

In addition to the foregoing, the Authority may incur or assume additional debt provided that, among other things, the security for such debt is subordinate to the lien of and security interests granted by the Indenture.

THE WATER AND SEWER SYSTEM

The Water Supply and Distribution System

The water supply and distribution system (the "Water System") consists of a 120 million gallon per day rapid sand type treatment plant which was placed in service in 1969, 1,200 miles of mains

and service lines, 30,000 valves, 8,000 fire hydrants, nine pumping stations, five reservoirs, and eleven storage tanks. The total storage capacity of the reservoirs and tanks is approximately 455 million gallons. Based on the average usage over the past several years, this capacity is sufficient to provide storage equivalent to approximately three to five days of normal water usage. In the opinion of the Authority's Consulting Engineer, The Chester Engineers, the Water System's treated water quality exceeds all the current standards and levels of the Safe Drinking Water Act and the Pennsylvania Department of Environmental Resources ("DER").

The sole source of water for the Water System is the Allegheny River. The DER issued the Authority a Water Allocation Permit in March 1989. This permit is for 100 million gallons per day; however, DER has advised that they would reevaluate this allocation in the future in the event the Authority's demand increases as a result of growth within the City or through the sale of water to surrounding municipalities. The current average withdrawal of water from the Allegheny River is approximately 65 million gallons per day, and the maximum withdrawal made on any one day was approximately 90 million gallons during the past year. The Authority's Consulting Engineer is of the opinion that the Allegheny River's water is of good quality, and that there is ample quantity to meet foreseeable demands.

The Water System currently provides approximately 84,000 residential, commercial, industrial and public customers with potable water and water for fire protection within the geographic boundaries of the City. This represents approximately 84 percent of the total customers within the City with the balance served by three independent water purveyors.

In 1992, the total amount of water supplied by the Authority was approximately 24 billion gallons, an average of 65 million gallons per day. Approximately two billion gallons, or nearly five million gallons per day, were sold to several adjacent municipalities for resale to customers within their service areas. In September 1986, the Authority entered into an agreement with the Pennsylvania-American Water Company for the Authority to supply up to twelve million gallons of water per day to the Pennsylvania-American Water Company for their use and resale to their customers. The Pennsylvania-American Water Company is currently buying four million gallons per day. No major changes in customers or water usage are anticipated in the foreseeable future; however, the Authority is attempting to market its excess supply of water. See "Prospective Water Sales" infra.

The Authority's Consulting Engineer is of the opinion that the Water System is in adequate operating condition and has adequate capacity to meet demands in the foreseeable future, provided the Authority continues the rehabilitation and replacement program initiated under its Capital Improvement program in 1984.

The Sewer System

The wastewater collection system (the "Sewer System") is part of a regional system which provides service to about 550,000 people, of which nearly 370,000 live within the City. The total drainage area served by the regional system is approximately 80 square miles of which the City comprises about 55 square miles, or nearly 70 percent of the total. The Sewer System is primarily a combined system designed to carry both storm and sanitary flows. The Sewer System is comprised of an extensive network of approximately 1,100 miles of sewer lines and four wastewater pumping stations. The average age of the sewer lines is between 60 and 70 years old, with some portions reaching nearly 150 years in age.

The Sewer System conveys wastewater generated within the City boundaries to Allegheny County Sanitary Authority ("ALCOSAN") interceptors along the rivers of the City for conveyance to ALCOSAN's wastewater treatment facility for processing prior to discharge into the Ohio River. The ALCOSAN treatment facility is operating in compliance with the National Pollutant Discharge Elimination System ("NPDES") under Permit No. 0025984.

The Sewer System also is utilized by 24 suburban municipalities pursuant to agreements with the City to convey their wastewater to the ALCOSAN treatment facility. Many of the agreements with the suburban municipalities do not provide for the sharing of maintenance or reconstruction costs of the Sewer System.

The Sewer System is designed so that during wet weather, a portion of the collected storm water and diluted wastewater is discharged to natural water courses by diversion chambers located throughout the Sewer System and at connection to the ALCOSAN interceptors. The Sewer System is in satisfactory operating condition and has adequate capacity for the dry weather wastewater flows; however, in the past during wet weather, the Sewer System has often been taxed beyond its capacity and has resulted in overflow, bypassing and flooding. Many of these conditions have been or will be eliminated by the completion of the Capital Improvement Program initiated by the Authority in 1984.

The Authority's Consulting Engineer is of the opinion that the Sewer System is in adequate operating condition but is in need of an ongoing Capital Improvement Program in order to correct existing deficiencies and maintain and upgrade the system. With the continuation of the Capital Improvement Program, the Sewer System will be sufficient to meet foreseeable future demands and provide uninterrupted service to its users.

Description of Area

A description of the area served by the Water and Sewer System and selected demographics of the service area are set forth in Appendix D.

Water and Sewer Rates

During 1985, the Authority engaged KMG/Main Hurdman to conduct a cost of service/water rate study. On July 12, 1985 the Authority adopted the rate structure proposed in the study which establishes charges to Authority customers based upon their classification and consumption. The study was conducted in conjunction with the Consulting Engineers and followed the American Public Works Association M-1 methodology. Effective January 1, 1993 the Authority's rate schedule was increased by approximately 3.5% to result in the current rate schedule for the Authority.

The following tables present the Authority's Water and Sewer Rates and certain data with respect thereto. The data have been derived from the books and records of the Authority and the Department of Water.

Water and Sewer Rates*

	Residential		Commercial		Industrial		Wholesale (Up to 500,000 gallons)	
	\$	%**	\$	%**	\$	%**	\$	%**
1986 Rate	1.64	14	1.62	14	1.51	14	1.41	41
1987 Rate	1.95	19	1.93	19	1.80	19	1.68	19
1988 Rate	2.30	18	2.28	18	2.12	18	1.99	18
1989 Rate	2.42	5	2.39	5	2.23	5	2.09	5
1990 Rate	2.54	5	2.51	5	2.34	5	1.71	-18
1991 Rate	2.67	5	2.64	5	2.46	5	1.80	5
1992 Rate	2.90	8.5	2.85	8.5	2.67	8.5	1.95	8.5
1993 Rate	3.00	3.5	2.96	3.5	2.46	3.5	2.15	3.5

* Rate per 1,000 gallons over minimum use per quarter.

** The % columns represent the percentage increase over the previous year's rate.

1992 Water Consumption by Customer Classification*

<u>Classification</u>	<u>Customers</u>	<u>Percentage of Usage</u>
Residential	76,781	51%
Commercial	6,664	24
Industrial	201	5
Wholesale	21	12
Pennsylvania Amer- ican Water	_____	8
TOTAL	83,667	100%

* Excludes customers of other water purveyors

Residential customers are the Water System's major block of customers. The "Commercial" category includes water usage by schools, hospitals and various units of government.

A detailed analysis of historical water consumption prepared by the Authority indicates that consumption in any one quarter differed by no more than 3% from the mean consumption level.

Therefore, seasonal variability is not a significant factor in water consumption nor in the water and sewer systems revenue stream.

WATER RATE SURVEY OF MAJOR AREA SUPPLIERS*

	<u>Rate 1,000 Gal.</u>	<u>Water Minimum Charge</u>	<u>Water Minimum Gallons</u>	<u>Water 20,000 Gal. Average Customer</u>
1. Moon Township Water Authority	1.80	\$16.20	9,000	36.00
2. Shaler Township Water Authority	2.25	6.75	3,000	45.00
3. Oakmont Boro Municipal Authority - Basic	1.75	21.42	3,000	51.17
4. Wilkinsburg-Penn Joint Water Authority**	1.93	21.23	1,100	52.11
5. Plum Borough**	1.78	19.20	750	54.80
6. Sharpsburg Water Works	2.70	8.00	2,500	56.60
7. Etna Borough	3.00	18.00	6,000	60.00
8. Monroeville Water Authority	3.10	18.60	6,000	62.00
9. Oakmont Boro Municipal Authority - Repump	2.31	23.52	3,000	62.79
10. Aspinwall Borough	3.50	3.50	1,000	70.00
11. PITTSBURGH WATER AND SEWER AUTHORITY	3.00	22.32	4,000	70.32
12. Millvale Water Works	3.65	18.25	5,000	73.00
13. West View Municipal Authority**	2.38	10.35***	0	74.61
14. Reserve Township	3.95	15.80	4,000	79.00
15. Harmar Water Authority	4.00	14.00	2,000	86.00
16. Pennsylvania American Water Company**	3.50	25.20***	0	95.12
17. Blawnox Borough	4.70	14.10	0	108.10
18. Fox Chapel Water Authority	5.50	10.00	1,000	110.00
19. McKeesport Municipal Water Authority	5.48	12.24	2,000	110.88
20. Westmoreland Authority	5.48	36.72	6,000	113.44

* Water rates decline as the usage rises for West View and Oakmont.

** Rate per 100 cubic foot.

*** Service charge; no minimum.

10 Largest Users

1. Housing Authority of Pittsburgh
2. LTV Steel
3. University of Pittsburgh
4. H.J. Heinz Company
5. Carnegie-Mellon University
6. Pittsburgh Brewing Co.
7. ALCOSAN
8. Veteran's Affairs Hospital
9. Allegheny General Hospital
10. Oxford Development

Prospective Water Sales

The Authority has current excess delivery capacity of approximately 35 million gallons of potable water per day and the Authority is aggressively attempting to market the same. The Authority is currently holding discussions with communities in the northern tier of Allegheny County and the southern tier of Butler County in an attempt to explore the possibilities of meeting future water demands in those areas. In addition, the Authority recently formalized a long term agreement for the sale of water to the Borough of Millvale.

Expenses of Operation

In 1993, the Department of Water has personnel budgeted as follows: 20 positions in billing, 22 in administrative and other accounting positions, 65 positions in purification and pumping, 146 in distribution and 7 in engineering. Salaries constitute the largest budget category, representing approximately 35% of the budget. Utilities, primarily electricity for the treatment plant and pumping stations, is the second largest budget category at approximately 21%. The third largest category (approximately 14%) consists of payments to other water suppliers, primarily the Western Pennsylvania Water Company, in order to subsidize the difference between their rates for customers in areas of the City not served by the Water System.

The Department of Public Works bills the Authority approximately \$3,000,000 per year for routine maintenance and repair of the Sewer System. Such amount is expected to increase or decrease in relation to wage increases or decreases. The Authority estimates this expense will continue to increase at an average rate of 5% per year.

Financial Operations

The following table prepared by the Authority sets forth the results of financial operations and coverage ratios for the years 1988 through 1992. Audited financial statements for the years 1991 and 1992 are attached hereto as Appendix "C".

FIVE-YEAR FINANCIAL HISTORY
(000's Omitted)

	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>
Water Rate Increases:	18%	5%	5%	5%	8.5%
Operating Revenues:					
Metered and flat water sales, and other misc. operating revenues	\$33,579	\$35,081	\$37,952	\$40,165	\$43,035
Sales to Pa. American Water Co.	<u>1,546</u>	<u>2,304</u>	<u>2,464</u>	<u>2,602</u>	<u>2,824</u>
	\$35,125	\$37,385	\$40,416	\$42,767	\$45,859
Operating Expenses:					
City reimbursement (1)	\$28,703	\$28,266	(2) \$47,301	\$33,906	\$34,601
Depreciation	995	1,288	1,936	2,571	3,166
Authority general & administrative	<u>544</u>	<u>475</u>	<u>537</u>	<u>745</u>	<u>659</u>
	\$30,242	\$30,029	\$49,774	\$37,222	\$38,426
Operating income (loss)	4,883	7,356	(9,358)	5,545	7,433
Other Income (3)	6,774	9,245	12,409	9,327	2,177
Other Expense (4)	<u>8,932</u>	<u>11,059</u>	<u>15,048</u>	<u>15,868</u>	<u>11,513</u>
	\$ 2,725	\$ 5,542	(\$11,997)	(\$996)	(\$1,903)
Extraordinary Gain (5)	--	--	--	<u>2,972</u>	--
Net income (loss)	<u>\$ 2,725</u>	<u>\$ 5,542</u>	<u>(\$11,997)</u>	<u>\$ 1,976</u>	<u>(\$1,903)</u>
<u>Debt Service Coverage Ratio:</u>					
Total Revenue (6)	\$48,299	\$50,437	\$52,339	\$50,272	\$49,636
Less: Direct Operating and Maintenance Expenses (7)	<u>19,373</u>	<u>18,456</u>	<u>20,798</u>	<u>22,541</u>	<u>22,765</u>
Net Revenue Available for Debt Service	<u>\$28,926</u>	<u>\$31,981</u>	<u>\$31,541</u>	<u>\$27,731</u>	<u>\$26,871</u>
Interest Requirement (8)	\$12,895	\$13,534	\$13,495	\$15,120	\$15,958
Principal Requirement (8)	<u>700</u>	<u>800</u>	<u>900</u>	----	----
Total Annual Debt Service Requirement	<u>\$13,595</u>	<u>\$14,334</u>	<u>\$14,395</u>	<u>\$15,120</u>	<u>\$15,958</u>
Annual Debt Coverage Ratio	2.13	2.23	2.19	1.83	1.68
Maximum Annual Debt Service Coverage Ratio (9)	1.36	1.50	1.48	1.30	1.26

- (1) Includes reimbursement for direct and indirect expenses incurred by the City in operating and maintaining the system, payment to non-City water agencies, City financing charge, and additional payment to the City.
- (2) Includes an accrued \$14,350 charge from the City for employee benefits not previously charged to the Authority for the years ended 1985 through 1989.
- (3) Interest income on funds restricted for construction or to service related debt is capitalized. Amounts capitalized were \$26,166, \$23,525, \$18,991, \$12,225, and \$2,415 in 1988, 1989, 1990, 1991, and 1992 respectively.
- (4) Interest expense on funds restricted for construction or to service related debt is capitalized. Amounts capitalized were \$25,232, \$23,992, \$19,923, \$15,418 and \$6,693 in 1988, 1989, 1990, 1991, and 1992 respectively.
- (5) Gain recognized on defeasance of bonds from the 1991 refunding.
- (6) Includes operating revenues and interest earnings, exclusive of restricted earnings and earnings on the 1986 Refunding Bonds escrow fund (prior to the 1991 refunding).
- (7) Includes all direct operation and maintenance expenses reimbursed to the City, payments to non-City water agencies, and general and administrative expenses incurred by the Authority. Excludes reimbursement to the City for indirect expenses, City financing charge, and additional payment, which are subordinated to debt service.
- (8) Exclusive of debt service funded through the 1986 Refunding Bonds escrow fund (prior to the 1991 refunding).
- (9) Based on maximum annual debt service of \$21,316.50.

Billings and Collections

Pursuant to the terms of the Lease and Management Agreement, water customers are billed by the City Department of Water based upon meter readings, estimated readings, or on a flat rate basis, and revenues are collected by the City's Department of Finance.

Historically, the City has collected approximately 93% to 95% of water billings. The Authority has established a collection policy which provides for the filing of liens, the termination of services, and the taking of real property in the case of delinquent accounts.

In August of 1988, installation of a new billing system was completed and all water billings were converted to the new system. This new billing system has enhanced the Authority's ability to manage accounts in the following areas: account aging, selection of delinquent accounts for terminations and collections, meter inventories, revenue forecasting and service work order processing.

Employee Relations and Retirement System

The majority of employees in the Department of Water and the Department of Public Works are represented by a labor organization under Act 195 of the State of Pennsylvania. Blue collar employees are represented by the Pittsburgh Joint Collective Bargaining Committee and white collar employees are represented by the American Federation of State, County and Municipal Employees, Local No. 2719. Act 195 requires that bargaining start at least six months prior to the date on which the City's budget must be adopted by City Council and that mediation be used if an impasse is reached. Since the time they were certified, the City has concluded numerous negotiations with these bargaining units without any labor stoppages. Four year agreements with each unit, effective January 1, 1991 were reached in 1991 with average salary increases of between 3.5 - 4.5% in each of the four years.

Employees in the Departments of Water and Public Works are covered under the Municipal Pension Fund. In 1990, it was determined by the City's actuary, Mercer, Meideinger, Inc. that the City's Municipal Pension Fund had achieved acceptable actuarial funding status in that it was in a funding plan that amortized its unfunded liability over a thirty-year period.

THE CAPITAL IMPROVEMENT PROGRAM

The Authority initiated a major Capital Improvement Program (the "Program") in 1984 funded through the issuance of Revenue Bonds Series of 1984 and 1986 which provided \$200,777,000 for such improvements. The Program was designed to address future user requirements and to maintain a satisfactory level of service to the Water and Sewer System current users.

As of October 1, 1993, 419 individual contracts have been completed having a value of approximately \$126,860,000. Current active contracts as of this date are valued at approximately \$48,115,000. Thus, as of October 1, 1993, the total value of completed and/or active contracts under the Program was approximately \$174,875,000 or 87.1 percent of the total Program. As of this date, the total funds expended are \$167,385,000 or 83.4 percent of the funds available.

It is anticipated the Authority will be awarding new contracts valued at approximately \$20,000,000 by the end of the year. Therefore, by the end of 1993 approximately \$195,000,000 of the \$200,777,000 available for the system improvements will have been expended or encumbered.

The primary objectives of the Program were to insure uninterrupted service to customers and to enhance the system's capabilities. The Program was designed to maintain a satisfactory level of service to the Water and Sewer System users, to improve operating efficiency of the System and to address future user requirements.

In order to assure the continuation of satisfying these primary objectives and to comply with current drinking water regulations promulgated by the Pennsylvania Safe Drinking Water Act (35 P.S. 721.4), additional funds are required for identified additional capital improvements. The Safe Drinking Water Act requires the covering of all finished water storage reservoirs to prevent recontamination of water before consumption by the public. This Act requires such open reservoirs to be covered by December 31, 1995. The Authority's water system includes four open, finished water reservoirs as follows:

	<u>Reservoir</u>	<u>Capacity</u>
1.	Highland No. 1	130 Millon Gallons
2.	Highland No. 2	125 Millon Gallons
3.	Lanpher	154 Millon Gallons
4.	Herron Hill	11.5 Millon Gallons

Current plans provide for the replacement of the Herron Hill reservoir with two concrete tanks in 1994. This project will be funded from unexpended proceeds of a prior bond issue. Lanpher is also scheduled to be covered in 1994 and Highland No. 1 to be covered in 1995. Highland No. 2 will be taken out of service by December 31, 1995 and covered in 1996, thus complying with the State mandate.

It is estimated that an additional \$12,000,000 is required to fund the covering of the Lanpher Reservoir and to implement other improvements and/or repairs to the Authority's Water and Sewer System in 1994. The recommended improvements are set forth in the Report of Chester Environmental, dated October 1, 1993, entitled "Status Report of Current Capital Improvement Program and Additional Funding Requirements."

The Consulting Engineer for the Authority estimates that the initial Capital Improvement Program, which commenced in 1984, will be completed in early 1995, and the proposed new \$12,000,000 program by the end of 1995. See APPENDIX F hereto for a further description of the Capital Projects.

FUTURE INDEBTEDNESS

The Authority will require future funding in order to achieve complete compliance with current drinking water regulations, promulgated by the Pennsylvania Safe Drinking Act (35 P.S. 721.4). The Authority's current plans provide for covering Highland No. 1 Reservoir in 1995 and Highland No. 2 Reservoir in 1996. Funding of these two projects, as well as other future mandated water quality standards and continuation of repairs and improvements to the water and sewer systems, could require the issuance, in the aggregate, of approximately \$100,000,000 of additional bonds at various times between the years 1994 and 2000.

THE LEASE AND MANAGEMENT AGREEMENT

The City's Water and Sewer System is operated and maintained under a Lease and Management Agreement between the City and the Authority for a term of fifty (50) years, with renewal provisions. Subject to the general supervision, direction and control of the Authority in the exercise and discharge of its public duties under the Act and other applicable laws and regulations, the City operates and maintains the Water and Sewer System as the Authority's agent pursuant to the terms of the Lease and Management Agreement. The Authority shall fully compensate the City for all Direct and Indirect Expenses actually incurred and expended by the City in maintaining and operating the Water and Sewer System. A summary of the Lease and Management Agreement follows.

Operation and Maintenance

As the Authority's agent, the City operates and maintains the Water and Sewer System primarily through its Department of Water and its Department of Public Works. Direct Expenses, as defined below, incurred and expended by the City's Water Department and Public Works Department in the operation and maintenance of the Water and Sewer System shall be reimbursed by the Authority to the City. All capital expenditures shall be paid for by the Authority.

Direct Expenses

Direct Expenses are defined as all expenses incurred by the City's Water Department and Public Works Department in the operation and maintenance of the Water and Sewer System.

Indirect Expenses

Indirect Expenses are defined as all expenditures made by the City in carrying out its obligations under the Lease and Management Agreement which are not included in the Direct Expenses definition. Such Indirect Expenses include but are not limited to the City's General Obligation Debt payments attributable to the Water and Sewer System, Pennsylvania American Water Company equalization payments and all overhead costs of the City incurred pursuant to the Lease and Management Agreement including, but not limited to fringe benefits, pension and retirement benefits, space rental, data processing and administrative salaries. These expenses shall be determined solely by the City and shall be paid on an annual basis in accordance with the Lease and Management Agreement.

Additional Payment

After the Authority has met requirements as to funding amounts to be paid into the Debt Service Fund, the Debt Service Reserve Fund, the Operating Reserve Account, and the Renewal and Replacement Fund, the Authority is required to pay to the City an amount equal to the Additional Payment as that item is defined in the Indenture.

Budget

The Authority is required to submit a proposed City Water Department operating budget to the City on the first Monday of October of each year. That budget must include all Direct Expenses reasonably expected to be incurred by the City in performing its obligation under the Lease and Management Agreement, and the City must include that budget in an unchanged form in its budget for the next calendar year. The Authority is similarly required to submit a proposed budget

for Direct Expenses for Sewer System operation and maintenance, and the City must include funds therefor in its budget for the next calendar year. The City shall submit to the Authority by the second Monday in January of each year, the amount which the Authority will be required to reimburse for Indirect Expenses and the Additional Payment. So long as the rates charged by the Authority are sufficient to meet all of its outstanding liabilities and to reimburse the City for the Authority budget and all costs billed from the City to the Authority, the City must, in good faith, use its best efforts to expend all of the money appropriated for the use of the City Water Department.

Rates

The Authority is required to establish rates pursuant to the covenants contained in the Indenture securing the Authority's debt obligations, at a level sufficient to allow the Authority to meet its obligations under the Indenture, and to cover the City's Direct Expenses and all requested funds for Indirect Expenses, the Additional Payment and reasonable contingencies.

Indemnification and Insurance

The City is responsible for all claims arising out of the operation and maintenance of the Water and Sewer System prior to the effective date of the Lease and Management Agreement, and has also assumed the responsibility and has indemnified the Authority fully, for any liability resulting from the operation and maintenance of the Water and Sewer System on or after the effective date of the Lease and Management Agreement. That agreement permits the Authority and the City to purchase excess limits insurance applicable to water and sewer operations and maintenance. The City also indemnifies the Authority from any claims based upon alleged improper expenditures made by the City in violation of federal, state or local law or in violation of any indenture or similar agreement securing Authority indebtedness.

Termination

The City has the right to terminate the Lease and Management Agreement upon ninety (90) days written notice to the Authority, provided that any such termination will be subject to the City providing for the payment in full of all existing liabilities, contingent and otherwise, of the Authority, including all bonds then outstanding.

LITIGATION

There is no litigation pending or threatened seeking to enjoin the issuance, sale or delivery of the Bonds or affecting the security pledged therefor.

There are no pending claims or actions against the Authority arising from the operation and maintenance of the Water and Sewer System which, in the opinion of the Authority's General Counsel, would have a material adverse effect on the Authority's financial position. Neither are there any pending claims or actions against the City which, in the opinion of the City Solicitor, will have a substantial impact on the City's ability to operate and maintain the Water and Sewer System pursuant to the Lease and Management Agreement.

FINANCIAL STATEMENTS

The audited financial statements of the Authority have been included in Appendix C of this Official Statement for the period indicated in the report appearing in Appendix C, which report has not been updated since the period indicated therein.

EXAMINATION OF YIELDS AND ESCROW SUFFICIENCY

The arithmetical accuracy of certain computations included in the schedules provided by PaineWebber on behalf of the Authority relating to (a) computation of forecasted receipts of principal and interest on the United States Treasury investments deposited in the Escrow Fund established under the Escrow Agreement to (i) pay maturing principal of, premium, if any, and interest on the 1991 Refunding Bonds which are current interest bonds through their redemption in whole on September 1, 2001 and (ii) pay the maturity amount of the 1991 Refunding Bonds which are capital appreciation bonds through their final maturity on September 1, 2008, and (b) computation of the yields on the Bonds and the United States Treasury investments was examined by KPMG Peat Marwick, certified public accountants. Such computations were based solely upon assumptions and information provided by PaineWebber on behalf of the Authority. KPMG Peat Marwick has restricted its procedures to examining arithmetical accuracy of certain computations and has not made any study or evaluation of the assumptions and information upon which the computations are based and, accordingly, has not expressed an opinion on the data used, the reasonableness of the assumptions, or the achievability of the forecasted outcome.

TAX EXEMPTION

In the opinion of Eckert Seamans Cherin & Mellott and King, Abrams & Burney, Co-Bond Counsel (the form of which is set forth in APPENDIX B hereto), based on existing laws, regulations, rulings, and court decisions, interest on the Bonds is excluded from gross income for federal income tax purposes pursuant to Section 103 of the Internal Revenue Code of 1986, as amended (the "Code"), and the Bonds are exempt from taxation within the Commonwealth of Pennsylvania except for gift, estate, succession or inheritance taxes or any other taxes not levied or assessed directly on the Bonds, the transfer thereof, the income therefrom or the realization of profits on the sale thereof.

Co-Bond Counsel is further of the opinion that interest on the Bonds is not an item of tax preference under Section 57 of the Code for purposes of the federal individual or corporate alternative minimum taxes. Such interest, however, will be included in the adjusted current earnings of a corporation for purposes of the alternative minimum tax imposed on corporations.

The Code imposes various restrictions, conditions, and requirements relating to the exclusions from gross income for federal tax purposes of interest on obligations such as the Bonds. The Authority has covenanted to comply with certain guidelines designed to assure that interest on the Bonds will not become includable in federal gross income. Failure to comply with these covenants may result in interest on the Bonds being included in federal gross income, possibly from the date of issuance of the Bonds. The opinion of Co-Bond Counsel assumes compliance with these covenants. Co-Bond Counsel has not undertaken to determine (or to inform any person) whether any actions taken (or not taken) or events occurring after the date of issuance of the Bonds may affect the tax status of interest on the Bonds.

Although Co-Bond Counsel has rendered an opinion that interest on the Bonds is excluded from gross income for federal income tax purposes, the accrual or receipt of interest on the Bonds may otherwise affect the federal income tax liability of the recipient. The nature and extent of these other tax consequences will depend upon the recipient's particular tax status or other items of income or deductions. Co-Bond Counsel expresses no opinion regarding any such consequences.

LEGALITY FOR INVESTMENT

Under the Probate, Estates and Fiduciaries Code, the Bonds are authorized investments for fiduciaries and personal representatives (as defined in that Code) in the Commonwealth and, in the opinion of Eckert Seamans Cherin & Mellott and King, Abrams & Burney, Co-Bond Counsel, the Bonds are legal investments for Commonwealth banks and trust companies, savings banks and insurance companies and are acceptable security for deposits of the funds of the Commonwealth.

THE TRUSTEE

The obligations and duties of the Trustee are described in the Indenture and the Trustee has undertaken only those obligations and duties which are expressly set out in the Indenture. The Trustee has not independently passed upon the validity of the Bonds, the security therefor, the adequacy of the provisions for payment thereof or the tax-exempt status of the interest on the Bonds. The Trustee has relied upon the opinion of Co-Bond Counsel for the validity and tax-exempt status of the interest on the Bonds. The Indenture expressly provides that the Trustee shall not be responsible for any loss or damage resulting from any action or inaction taken in good faith in reliance upon an opinion of counsel.

Under the terms of the Indenture, the Trustee is liable only for those damages caused by its gross negligence or willful misconduct. Under the Indenture, the Trustee is not required to take notice or be deemed to have notice of any default under the Indenture, except failure by the Authority to cause to be made any of the payments required to be made for payment of principal of the Bonds, when due at maturity or earlier redemption, or interest on the Bonds, or failure by the Authority to file with the Trustee any document required by the Indenture or unless the Trustee has been specifically notified in writing of such default by the Authority or the owners of at least 25% in aggregate principal amount of the Outstanding Bonds affected by such default. All notices or other instruments required by the Indenture to be delivered to the Trustee must be delivered at the principal corporate trust office of the Trustee. In the absence of any such notice, the Trustee may conclusively assume no Event of Default (as defined in the Indenture) exists, except as expressly stated above and in the Indenture. The summary of the Trustee's rights, duties, obligations and immunities contained herein is not intended to be a complete summary and reference is made to the Indenture for a complete statement of the Trustee's rights, duties, obligations and immunities.

FINANCIAL ADVISOR

Public Financial Management, Inc., of Philadelphia, Pennsylvania, served as financial advisor to the Authority in respect to the sale of the Bonds. The financial advisor assisted the Authority in the preparation of the Official Statement, and in other matters relating to the planning, structuring and issuance of the Bonds, and provided other advice. Public Financial Management, Inc. is a financial

advisory and consulting organization and is not engaged in the business of underwriting, marketing or trading of municipal securities or any other negotiable instruments.

LEGAL OPINIONS

Purchase of the Bonds by the Underwriters is subject to the receipt of the approving legal opinion of Eckert Seamans Cherin & Mellott and King, Abrams & Burney, both of Pittsburgh, Pennsylvania, Co-Bond Counsel. The unqualified approving opinion of Co-Bond Counsel will be printed on the Bonds in substantially the form attached to this Official Statement as Appendix B. Certain legal matters for the Authority will be passed upon by its General Counsel, Dawn A. Botsford, Esquire, Pittsburgh, Pennsylvania. Certain legal matters will be passed upon for the Underwriters by their counsel, Klett Lieber Rooney & Schorling, a Professional Corporation, Pittsburgh, Pennsylvania.

RATINGS OF THE BONDS

Standard & Poor's Corporation and Moody's Investors Service, Inc. have assigned their municipal bond ratings of "AAA" and "Aaa", respectively, to the Bonds with the understanding that upon delivery of the Bonds, a policy insuring the payment when due of the principal of and interest on the Bonds will be issued by Financial Guaranty Insurance Company.

Such ratings reflect only the view of such rating agencies and are not recommendations to buy, sell or hold the Bonds. An explanation of the significance of such ratings may be obtained from the rating agencies furnishing the same.

Generally, rating agencies base their ratings on the information and materials furnished to them and on investigations, studies and assumptions by the rating agencies. There is no assurance that a particular rating will continue for any given period of time or that they will not be revised downward or withdrawn entirely if, in the judgment of the agency originally establishing the rating, circumstances so warrant. Any such downward revision or withdrawal could have an adverse effect on the market price of the Bonds.

UNDERWRITING

The Bonds are being purchased for reoffering by PaineWebber Incorporated; Alex . Brown & Sons, Inc.; J.P. Morgan Securities Inc.; Smith Barney Shearson; and WR Lazard, Laidlaw & Mead, Inc. at an aggregate purchase price of \$288,195,214, plus accrued interest (the face amount of the Bonds plus \$409,282 net premium, less \$1,969,068 Underwriters' discount), plus accrued interest thereon from the dated date of the Bonds to the date of Closing. The initial offering prices for the Bonds are set forth on the inside of the Cover Page. The Bond Purchase Agreement provides that the Underwriters' obligations are subject to certain conditions precedent and that the Underwriters will purchase all of the Bonds if any are purchased. The Underwriters may offer and sell Bonds to certain dealers and others at prices lower than the offering prices stated on the inside of the Cover Page. The offering prices may be changed from time to time by the Underwriters.

MISCELLANEOUS

The references, excerpts and summaries of all documents referred to herein do not purport to be complete statements of the provisions of such documents, and reference is made to all such documents for full and complete statements of all matters of fact relating to the Bonds, the security for the payment of the Bonds and the rights of the owners thereof.

The information contained in this Official Statement has been compiled from official and other sources deemed to be reliable and, while not guaranteed as to completeness or accuracy, is believed to be correct as of its date.

Any statement made in this Official Statement involving matters of opinion or of estimates, whether or not expressly so stated, are set forth as such and not as representations of fact, and no representation is made that any of the estimates will be realized. The information and expressions of opinion herein are subject to change without notice and neither the 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 Authority since the date hereof.

The Authority deems this Preliminary Official Statement to be substantially final as of its date for purposes of Securities Exchange Commission Rule 15c2-12 and the Authority has agreed to comply with all applicable provisions of such rule.

This Official Statement has been duly executed and delivered on behalf of the Authority by its Chairman.

THE PITTSBURGH WATER AND SEWER AUTHORITY

By: /s/ David M. Matter
Chairman

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APPENDIX "A"
FORM OF INDENTURE

TRUST INDENTURE

Dated as of October 15, 1993

BETWEEN

THE PITTSBURGH WATER AND SEWER AUTHORITY

and

PNC BANK, NATIONAL ASSOCIATION,
as Trustee

\$278,970,000
WATER AND SEWER SYSTEM
REVENUE REFUNDING BONDS, SERIES A OF 1993

\$10,785,000
WATER AND SEWER SYSTEM
REVENUE BONDS, SERIES B OF 1993

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TRUST INDENTURE

THIS TRUST INDENTURE dated as of the 15th day of October, 1993, is by and between THE PITTSBURGH WATER AND SEWER AUTHORITY, a body corporate and politic organized and existing under the laws of the Commonwealth of Pennsylvania, having its principal office in the City of Pittsburgh, Allegheny County, Pennsylvania (the "Authority"), and PNC BANK, NATIONAL ASSOCIATION, a national banking corporation organized and existing under and by virtue of the laws of the United States, having power and authority to accept and execute trusts and having its principal corporate trust office in the City of Pittsburgh, Allegheny County, Pennsylvania (the "Trustee"), as trustee.

WHEREAS, the Authority is a public body corporate and politic duly organized and validly existing under the provisions of the Municipality Authorities Act of 1945 of the Commonwealth of Pennsylvania, approved May 2, 1945, P.L. 382, as amended (the "Act"), having been duly organized by the City of Pittsburgh, Allegheny County, Pennsylvania (the "City"); and

WHEREAS, the City has heretofore leased the Water and Sewer System (as hereinafter defined) to the Authority pursuant to a Lease and Management Agreement dated March 29, 1984 and effective May 1, 1984 (the "Agreement"); and

WHEREAS, the Authority has heretofore designated the City as its agent to operate and maintain the Water and Sewer System pursuant to the Agreement; and

WHEREAS, in order to promote the health, safety and welfare of those it serves, the Authority determined to make certain capital improvements to the Water and Sewer System; and

WHEREAS, the Authority, for the purpose of paying for said capital improvements, issued \$93,600,000 aggregate principal amount of its Daily Adjustable Water and Sewer System Revenue Bonds, Series of 1984 (the "1984 Revenue Bonds"); and

WHEREAS, the 1984 Revenue Bonds were issued under and secured by a Trust Indenture dated as of July 1, 1984 by and among the Authority, Equibank, as trustee, and The Bank of New York, as paying agent (the "1984 Indenture"); and

WHEREAS, the Authority has heretofore issued \$100,000,000 aggregate principal amount of its Water and Sewer System Adjustable Rate Tender Revenue Bonds, Series of 1985 (the "1985 Revenue Bonds") in order to provide funds (i) which, together with moneys earned from the investment thereof, were sufficient to redeem all outstanding 1984 Revenue Bonds on April 1, 1987 and to pay all interest on the 1985 Revenue Bonds to and including April 1, 1987, (ii) to pay certain amounts due to the City allocable to the City's outstanding indebtedness for the Water and Sewer System, (iii) to make certain required payments into the Renewal and Replacement Fund established under the 1984 Indenture for the 1985 calendar year, (iv) to deposit an amount in the Debt Service Reserve Fund which was required to be maintained for the 1985 Revenue Bonds, and (v) to pay all

with other available funds and investment earnings thereon, will be used to retire the 1986 Refunding Bonds as and when the same shall become due; and

WHEREAS, the Authority has determined that it is in the best financial interest of the Authority to issue (a) \$278,970,000 aggregate principal amount of its Water and Sewer System Revenue Refunding Bonds, Series A of 1993 (the "1993 Series A Bonds") in order to provide funds which will be used (i) to advance refund all of the outstanding 1991 Refunding Bonds and (ii) to pay all fees and expenses incurred in connection with the issuance of the 1993 Series A Bonds, including certain insurance premiums and (b) \$10,785,000 aggregate principal amount of its Water and Sewer System Revenue Bonds, Series B of 1993 (the "1993 Series B Bonds", and, together with the 1993 Series A Bonds, the "1993 Bonds") in order to provide funds which will be used (i) to pay for capital improvements to the Authority's Water and Sewer System and (ii) to pay all fees and expenses incurred in connection with the issuance of the 1993 Series B Bonds, including certain insurance premiums; and

WHEREAS, the 1993 Bonds will be issued under this Trust Indenture (herein, the "Indenture"); and

WHEREAS, definitive 1993 Bonds and the certificate of authentication shall be substantially in the following forms with necessary or appropriate insertions, omissions and variations as required or permitted by the Indenture:

[FORM OF 1993 SERIES A BOND]

THE PITTSBURGH WATER AND SEWER AUTHORITY
Commonwealth of Pennsylvania

WATER AND SEWER SYSTEM
REVENUE REFUNDING BOND, SERIES A OF 1993

No. _____
Registered Owner: _____
Maturity Date: _____
Interest Rate: _____
Principal Sum: _____
CUSIP No. _____
\$ _____

The Pittsburgh Water and Sewer Authority (the "Authority"), a body corporate and politic duly organized and existing under the laws of the Commonwealth of Pennsylvania (the "Commonwealth"), for value received, promises to pay, solely from the receipts and revenues and other moneys hereinafter mentioned, to the Registered Owner (named above) or registered assigns, on the Maturity Date (stated above), upon surrender hereof, the Principal Sum (stated above) and to pay interest thereon from the date hereof until maturity or, if this Bond shall have been duly called for earlier redemption and payment of the redemption price

fees and expenses incurred in connection with the issuance of the 1985 Revenue Bonds, including certain insurance premiums and bank fees; and

WHEREAS, the 1985 Revenue Bonds were issued under and secured by a Trust Indenture dated as of April 1, 1985 by and between the Authority and Pittsburgh National Bank, as trustee (the "Original 1985 Indenture"); and

WHEREAS, the Authority has heretofore issued \$134,700,000 aggregate principal amount of its Water and Sewer System Adjustable Rate Tender Revenue Bonds, Series of 1986 (the "1986 Revenue Bonds") in order to provide funds (i) to complete Phase II of the Construction Project, (ii) to deposit an amount in the Debt Service Reserve Fund created under the 1985 Indenture which was required to be maintained therein for the 1986 Revenue Bonds, and (iii) to pay all fees and expenses incurred in connection with the issuance of the 1986 Revenue Bonds, including certain insurance premiums and bank fees; and

WHEREAS, the 1986 Revenue Bonds were issued under and secured by a First Supplemental Trust Indenture dated as of June 1, 1986 (which, together with the Original 1985 Indenture is hereinafter referred to as the "1985 Indenture"); and

WHEREAS, the Authority has heretofore issued \$264,090,000 aggregate principal amount of its Water and Sewer System Revenue Refunding Bonds, Series of 1986 Bonds (the "1986 Refunding Bonds") in order to provide funds (i) which, together with moneys earned from the investment thereof, were sufficient to redeem all outstanding 1985 Revenue Bonds and 1986 Revenue Bonds on September 1, 1991 and to pay all interest on the 1986 Refunding Bonds to September 1, 1991, and (ii) to pay all fees and expenses incurred in connection with the issuance of the 1986 Refunding Bonds, including certain insurance premiums; and

WHEREAS, the 1986 Refunding Bonds were issued under and secured by a Trust Indenture dated as of July 1, 1986 by and between the Authority and Pittsburgh National Bank, as Trustee (the "1986 Indenture"); and

WHEREAS, the Authority has also issued \$248,329,024.10 aggregate principal amount of its Water and Sewer System Revenue Refunding Bonds, Series A of 1991 (the "1991 Refunding Bonds") in order to provide funds which were used (i) to refund all of the outstanding 1985 Revenue Bonds and 1986 Revenue Bonds on September 1, 1991 and (ii) to pay all fees and expenses incurred in connection with the issuance of the 1991 Refunding Bonds, including certain insurance premiums; and

WHEREAS, the 1991 Refunding Bonds were issued under and secured by a Trust Indenture dated as of June 15, 1991 by and between the Authority and Pittsburgh National Bank, as Trustee (the "1991 Indenture"); and

WHEREAS, as a result of the refunding of the Refunding Bonds by the issuance of the 1991 Refunding Bonds, the proceeds of the 1986 Refunding Bonds, together

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shall have been made or provided for, until the date fixed for redemption hereof, at the Interest Rate (stated above) per annum, computed on the basis of a 360-day year of twelve thirty-day months, payable semi-annually on the first day of March and September of each year, commencing March 1, 1994 (each an "Interest Payment Date") or if any Interest Payment Date shall not be a business day (as hereinafter defined), then on the next following business day. Should this Bond be presented for payment at maturity and payment not be made in accordance with the terms hereof, the principal sum hereof shall thereafter (without prejudice to the rights of the owner hereof to pursue any other remedy available at law or equity) bear interest until paid at the rate of interest set forth above or at such lesser maximum rate of interest as is permitted by law.

Principal and interest will be payable in such coin or currency of the United States of America as, at the respective times of payment, shall be legal tender for the payment of public and private debts. Principal shall be payable at the principal corporate trust office of PNC Bank, National Association, as Trustee and Paying Agent (the "Trustee") in the City of Pittsburgh, Pennsylvania (the "City") or at the principal office of any successor trustee or paying agent appointed under the Indenture hereinafter mentioned. Interest is payable to the Registered Owner hereof as shown on the registration books as of the close of business on the fifteenth day of the month (whether or not such day is a business day) next preceding the Interest Payment Date (the "Record Date"). Payment shall be made by check mailed to such owner at the address shown on the registration books, by wire transfer to an owner of \$1,000,000 or more of aggregate principal amount of 1993 Bonds (upon receipt by the Trustee of written notice not less than one business day prior to the Record Date for the applicable Interest Payment Date, such notice to contain the wire transfer address within the continental United States to which such owner desires to have such wire transfer directed), or in any other manner as may be mutually acceptable to the owner and the Trustee.

This Bond shall initially be dated October 15, 1993, and thereafter will be dated as of the date of its authentication. This Bond shall bear interest from the most recent Interest Payment Date preceding the date of such Bond to which interest has been paid, unless the date of such Bond is an Interest Payment Date on which interest has been paid, in which event it shall bear interest as of such Interest Payment Date, or, if dated prior to February 15, 1994, in which event it shall bear interest from October 15, 1993.

This Bond is one of a duly authorized issue of bonds (the "Bonds") of the Authority, which issue of bonds consists or may consist of several series of varying denominations, dates, maturities and tenors, all issued and to be issued under and pursuant to a Trust Indenture dated as of October 15, 1993 (which Indenture, together with all indentures supplemental thereto, is herein called the "Indenture") duly executed and delivered by the Authority to the Trustee, an executed counterpart of which is on file at the principal corporate trust office of the Trustee, all equally and ratably secured by the Indenture, except as hereinafter provided. This Bond is one of a series entitled "The Pittsburgh Water and Sewer Authority, Water and Sewer System Revenue Refunding Bonds, Series A of 1993" (the "1993 Series A Bonds"), in the aggregate principal amount of \$278,970,000 issued for the purpose of providing moneys which will be sufficient to redeem the Authority's Water and Sewer System Revenue Refunding Bonds, Series of 1991. The 1993 Series A Bonds are

Optional Redemption

being issued simultaneously with, and on a parity with, the Authority's Water and Sewer System Revenue Bonds, Series B of 1993 (the "1993 Series B Bonds" and, together with the 1993 Series A Bonds, the "1993 Bonds") in the aggregate principal amount of \$10,785,000 for the purpose of funding certain capital improvements to the Authority's Water and Sewer System. The 1993 Series A Bonds are issued in registered form in the denomination of \$5,000 principal amount or any integral multiple thereof.

It is expressly agreed and understood that the Indenture and the obligations thereby secured, including this Bond, are corporate obligations of the Authority, and that the Bonds are payable only out of the sources set forth in the Indenture. The payment of principal of and interest on the 1993 Bonds through maturity is secured by an insurance policy issued by Financial Guaranty Insurance Company. In addition, the Indenture provides that the Bonds shall be secured by a pledge of the receipts and revenues of the Authority, after deduction of the proper expenses of the operation, maintenance and repair of the Water and Sewer System and reserves therefor as provided in the Indenture. The Indenture provides for the fixing and charging by the Authority of rates, rents and charges for the water and sewer service furnished by its Water and Sewer System at least sufficient in the aggregate to provide, together with other receipts and revenues derived by the Authority, funds for paying the cost of operating, maintaining and repairing the Water and Sewer System, paying the principal of and the interest on its bonds as such principal and interest shall become due, and establishing the reserves required by the Indenture.

Neither the credit nor the taxing power of the City or the Commonwealth or any political subdivision thereof is pledged for the payment of the principal of, the interest on, or the premium (if any) payable upon the redemption of, this Bond; nor shall this Bond be deemed an obligation of the City or the Commonwealth or any political subdivision thereof; nor shall the City, or the Commonwealth or any political subdivision thereof be liable for the payment of the principal of, the interest on, or the premium (if any) payable upon the redemption of this Bond, and neither the Trustee nor any receiver appointed to operate and maintain any of the facilities of the Authority and to collect revenues arising therefrom for the benefit of the bondholders shall be authorized to sell, assign, mortgage or otherwise dispose of any assets of whatever kind or character belonging to the Authority. The Authority has no taxing power.

In case an event of default, as defined in the Indenture, shall occur, the principal of all the Bonds at any such time outstanding under the Indenture may be declared to be due and payable by the Trustee or may become due and payable upon the conditions and in the manner and with the effect provided in the Indenture. The owner of this Bond shall have no right to enforce the provisions of the Indenture or to institute action to enforce the covenants thereof or to take any action with regard to any event of default under the Indenture, or to institute, appear in or defend any suit or other proceeding with respect thereto, except as provided in the Indenture or by the Act (as hereinafter defined).

the Authority, and shall be selected for redemption by the Trustee in blocks of \$5,000, principal amount, provided that no such redemption shall cause any holder of 1993 Series A Bonds to hold less than \$5,000, principal amount, of Bonds after such redemption. Any redemption of the Bonds shall be upon at least fifteen (15) days but not more than thirty (30) days prior written, telegraphic or telexed notice to the owner of the 1993 Series A Bonds so called for redemption.

If the Authority shall have duly sent notice of redemption and shall have provided funds for the payment of the principal of the Bonds so called for redemption and interest thereon to the date of redemption, interest on such Bonds shall cease to accrue from and after said redemption date.

Certain modifications and alterations of the Indenture not adversely affecting rights of owners of the Bonds outstanding thereunder may be made without consent of owners of said Bonds in the manner and upon the terms and conditions provided in the Indenture. Any other modification or alteration of the Indenture and or rights and obligations of the Authority and of owners of the Bonds outstanding thereunder may be made only in the manner and upon the terms and conditions provided in the Indenture. Any consent by the owner of this Bond, when required by the Indenture (unless revoked as provided in the Indenture), shall be conclusive and binding upon such owner and all future owners of this Bond, irrespective of whether any notation of such consent is made upon this Bond.

The Authority and the Trustee may treat the person in whose name this Bond is registered as the absolute owner hereof whether or not this Bond or any installment of interest shall be overdue, for the purpose of receiving payment thereof and for all other purposes whatsoever, and shall not be affected by any notice to the contrary.

The owner of this Bond shall have no right to enforce provisions of this Bond or the Indenture, except as provided in the Indenture.

No recourse shall be had for the payment of the principal of, or the interest or premium, if any, on, this Bond or for any claim based hereon or on the Indenture or on any indenture supplemental thereto, against any member, officer, or employee, past, present or future, of the Authority, or of any successor body, either directly or through the Authority or any such successor body, whether by virtue of any constitutional provision, statute or rule of law, or by the enforcement of any assessment or penalty, or otherwise, all such liability of such members, officers or employees being released as a condition of and as consideration for the execution of the Indenture and the issuance of this Bond.

This Bond will be transferred or exchanged for an equal aggregate principal amount or maturity amount, as applicable, of Bonds of similar term and tenor in any authorized denomination, only by presentation and surrender of this Bond to the Trustee, together with an assignment duly executed by the Owner hereof or by his attorney-in-fact or legal representative. As a precondition to the transfer of this Bond, the Authority or the

The 1993 Series A Bonds maturing on or after September 1, 2004 (except the 1993 Series A Bonds maturing on September 1, 2013 which are not subject to optional redemption) are subject to optional redemption on or after September 1, 2003, in whole at any time, or in part on any Interest Payment Date. Any such redemption will be made at a redemption price equal to the following percentages of the principal amount thereof determined in accordance with the following schedule plus accrued interest to the redemption date:

Redemption Periods (Both dates inclusive)	Price
September 1, 2003 through August 31, 2004	102%
September 1, 2004 through August 31, 2005	101
September 1, 2005 and thereafter	100

Mandatory Sinking Fund Redemption

The 1993 Series A Bonds maturing on September 1, 2013 are subject to mandatory sinking fund redemption, by lot, on September 1, 2011 in the principal amount of \$15,350,000 and on September 1, 2012, in the principal amount of \$16,345,000 at a redemption price equal to 100% of the principal amount thereof plus accrued interest to the redemption date.

The 1993 Series A Bonds maturing on September 1, 2016 are subject to mandatory sinking fund redemption, by lot, on September 1, 2014 in the principal amount of \$18,540,000 and on September 1, 2015 in the principal amount of \$19,425,000 at a redemption price equal to 100% of the principal amount thereof plus accrued interest to the redemption date.

Extraordinary Optional Redemption

The 1993 Series A Bonds are subject to extraordinary redemption prior to maturity at the option of the Authority in whole or in part at any time, in the event of condemnation, damage or destruction of the Water and Sewer System, out of moneys deposited with or held by the Trustee for such purpose, upon payment of 100% of the principal amount thereof being redeemed, plus interest accrued to the date fixed for redemption.

Optional redemption and mandatory redemption shall be made in the manner and upon the terms and conditions set forth in the Indenture. In the event that less than all of the 1993 Series A Bonds are to be redeemed as provided above, they shall be redeemed at random in any reasonable manner determined by the Trustee, unless otherwise directed by

Trustee may charge the owner hereof for any tax, fee or governmental charge required to be paid with respect to such transfer.

The Trustee shall not be required to register the transfer or exchange of any Bond (i) during a period beginning at the opening of business fifteen (15) days before the day of the mailing of notice of redemption of the Bonds and ending at the close of business on the date of such mailing, (ii) at any time following the selection of such Bonds, in whole or in part, for redemption, or (iii) during the period commencing on a Record Date and ending on the corresponding Interest Payment Date.

It is hereby certified, recited and declared that all acts, conditions and things required by the Constitution and laws of the Commonwealth to exist, to have happened or be performed precedent to and in the issuance of this Bond and the execution and delivery of the Indenture exist, have happened and have been performed as so required. This Bond is issued and the Indenture was made and entered into under and pursuant to the Municipality Authorities Act of 1945, P.L. 382, approved May 2, 1945, as amended (the "Act"), and under and pursuant to resolutions duly adopted by the Authority.

This Bond shall not be valid or become obligatory for any purpose until this Bond shall have been authenticated by the execution by the Trustee of the Certificate of Authentication endorsed hereon.

IN WITNESS WHEREOF, The Pittsburgh Water and Sewer Authority has caused this Bond to be executed in its name and on its behalf by the manual or facsimile signature of its Chairman or Vice Chairman, and its corporate seal or a facsimile thereof to be hereunto affixed, duly attested by the manual or facsimile signature of its Secretary or Assistant Secretary.

THE PITTSBURGH WATER AND SEWER AUTHORITY

By _____
Chairman

ATTEST:

Secretary

[SEAL]

DATED:

Certificate of Authentication

This Bond is one of the Water and Sewer System Revenue Refunding Bonds, Series A of 1993 described in the within-mentioned Indenture.

Printed on the reverse side hereof is a complete text of the opinion of Eckert Seamans Cherin & Mellott and King, Abrams & Burney, Co-Bond Counsel, both of Pittsburgh, Pennsylvania, an executed original of which, dated the date of original delivery of and payment for the series of bonds of which this Bond is one, is on file at the principal corporate trust office of the Trustee.

PNC BANK, NATIONAL ASSOCIATION, as Trustee

By _____
Authorized Officer

[FORM OF ASSIGNMENT]
ASSIGNMENT

FOR VALUE RECEIVED the undersigned sells, assigns and transfers unto

_____ the within bond issued by THE PITTSBURGH WATER AND SEWER AUTHORITY and hereby irrevocably constitutes and appoints _____ Attorney to transfer said bond on the books of the Authority with full power of substitution in the premises.

Dated: _____
(Sign here exactly as name(s) is (are) shown on the fact of this bond without any change or alteration whatever.)

SIGNATURE(S) GUARANTEED:

Notice: Signature(s) must be guaranteed by a member of an approved signature Guarantee Medallion Program.

[FORM OF 1993 SERIES B BOND]

THE PITTSBURGH WATER AND SEWER AUTHORITY
Commonwealth of Pennsylvania

WATER AND SEWER SYSTEM
REVENUE BOND, SERIES B OF 1993

No. _____ CUSIP No. _____
Registered Owner: \$ _____
Maturity Date: _____
Interest Rate: _____
Principal Sum: _____

The Pittsburgh Water and Sewer Authority (the "Authority"), a body corporate and politic duly organized and existing under the laws of the Commonwealth of Pennsylvania (the "Commonwealth"), for value received, promises to pay, solely from the receipts and revenues and other moneys hereinafter mentioned, to the Registered Owner (named above) or registered assigns, on the Maturity Date (stated above), upon surrender hereof, the Principal Sum (stated above) and to pay interest thereon from the date hereof until maturity or, if this Bond shall have been duly called for earlier redemption and payment of the redemption price shall have been made or provided for, until the date fixed for redemption hereof, at the Interest Rate (stated above) per annum, computed on the basis of a 360-day year of twelve thirty-day months, payable semi-annually on the first day of March and September of each year, commencing March 1, 1994 (each an "Interest Payment Date") or if any Interest Payment Date shall not be a business day (as hereinafter defined), then on the next following business day. Should this Bond be presented for payment at maturity and payment not be made in accordance with the terms hereof, the principal sum hereof shall thereafter (without prejudice to the rights of the owner hereof to pursue any other remedy available at law or equity) bear interest until paid at the rate of interest set forth above or at such lesser maximum rate of interest as is permitted by law.

Principal and interest will be payable in such coin or currency of the United States of America as, at the respective times of payment, shall be legal tender for the payment of public and private debts. Principal shall be payable at the principal corporate trust office of PNC Bank, National Association, as Trustee and Paying Agent (the "Trustee") in the City of Pittsburgh, Pennsylvania (the "City") or at the principal office of any successor trustee or paying agent appointed under the Indenture hereinafter mentioned. Interest is payable to the Registered Owner hereof as shown on the registration books as of the close of business on the fifteenth day of the month (whether or not such day is a business day) next preceding the Interest Payment Date (the "Record Date"). Payment shall be made by check mailed to such owner at the address shown on the registration books, by wire transfer to an owner of \$1,000,000 or more of aggregate principal amount of 1993 Bonds (upon receipt by the Trustee of written notice not less than one business day prior to the Record Date for the

[TEXT OF OPINION OF ECKERT SEAMANS CHERIN & MELLOTT AND KING, ABRAMS & BURNLEY, CO-BOND COUNSEL, BOTH OF PITTSBURGH, PENNSYLVANIA, ISSUED IN RESPECT OF \$278,970,000, PRINCIPAL AMOUNT, OF THE PITTSBURGH WATER AND SEWER AUTHORITY, WATER AND SEWER SYSTEM REVENUE REFUNDING BONDS, SERIES A OF 1993].

[STATEMENT OF MUNICIPAL BOND INSURANCE]

Financial Guaranty Insurance Company ("Financial Guaranty") has issued a policy containing the following provisions with respect to The Pittsburgh Water and Sewer Authority Water and Sewer System Revenue Refunding Bonds, Series A of 1993 (the "Bonds"), such policy being on file at the principal office of the Paying Agent:

Financial Guaranty hereby unconditionally and irrevocably agrees to pay for disbursement to the Bondholders that portion of the principal of and interest on the Bonds which is then due for payment and which the issuer of the Bonds (the "Issuer") shall have failed to provide. Due for payment mean, with respect to the principal, the stated maturity date thereof, or the date on which the same shall have been duly called for mandatory sinking fund redemption and does not refer to any earlier date on which the payment of principal of the Bonds is due by reason of call for redemption (other than mandatory sinking fund redemption), acceleration or other advancement of maturity, and with respect to interest, the stated date for payment of such interest.

Upon receipt of telephonic or telegraphic notice, subsequently confirmed in writing, or written notice by registered or certified mail, from a Bondholder or the Paying Agent to Financial Guaranty that the required payment of principal or interest has not been made by the Issuer to the Paying Agent, Financial Guaranty on the due date of such payment or within one business day after receipt of notice of such nonpayment, whichever is later, will make a deposit of funds, in an account with State Street Bank and Trust Company, N.A., or its successor as its agent (the "Fiscal Agent"), sufficient to make the portion of such payment not paid by the Issuer. Upon presentation to the Fiscal Agent of evidence satisfactory to it of the Bondholder's right to receive such payment and any appropriate instruments of assignment required to vest all of such Bondholder's right to such payment in Financial Guaranty, the Fiscal Agent will disburse such amount to the Bondholder.

As used herein the term "Bondholder" means the person other than the Issuer who at the time of nonpayment of a Bond is entitled under the terms of such Bond to payment thereof.

The policy is non-cancellable for any reason.

FINANCIAL GUARANTY INSURANCE COMPANY

applicable Interest Payment Date, such notice to contain the wire transfer address within the continental United States to which such owner desires to have such wire transfer directed), or in any other manner as may be mutually acceptable to the owner and the Trustee.

This Bond shall initially be dated October 15, 1993, and thereafter will be dated as of the date of its authentication. This Bond shall bear interest from the most recent Interest Payment Date preceding the date of such Bond to which interest has been paid, unless the date of such Bond is an Interest Payment Date on which interest has been paid, in which event it shall bear interest as of such Interest Payment Date, or, if dated prior to February 15, 1994, in which event it shall bear interest from October 15, 1993.

This Bond is one of a duly authorized issue of bonds (the "Bonds") of the Authority, which issue of bonds consists or may consist of several series of varying denominations, dates, maturities and tenors, all issued and to be issued under and pursuant to a Trust Indenture dated as of October 15, 1993 (which Indenture, together with all indentures supplemental thereto, is herein called the "Indenture") duly executed and delivered by the Authority to the Trustee, an executed counterpart of which is on file at the principal corporate trust office of the Trustee, all equally and ratably secured by the Indenture, except as hereinafter provided. This Bond is one of a series entitled "The Pittsburgh Water and Sewer Authority, Water and Sewer System Revenue Bonds, Series B of 1993" (the "1993 Series B Bonds"), in the aggregate principal amount of \$10,785,000 issued for the purpose of funding certain capital improvements to the Authority's Water and Sewer System. The 1993 Series B Bonds are being issued simultaneously with, and on a parity with, the Authority's Water and Sewer System Revenue Refunding Bonds, Series A of 1993 (the "1993 Series A Bonds" and, together with the 1993 Series B Bonds, the "1993 Bonds") in the aggregate principal amount of \$278,970,000 for the purpose of providing moneys which will be sufficient to redeem the Authority's Water and Sewer System Revenue Refunding Bonds, Series of 1991. The 1993 Series B Bonds are issued in registered form in the denomination of \$5,000 principal amount or any integral multiple thereof.

It is expressly agreed and understood that the Indenture and the obligations thereby secured, including this Bond, are corporate obligations of the Authority, and that the Bonds are payable only out of the sources set forth in the Indenture. The payment of principal of and interest on the 1993 Bonds through maturity is secured by an insurance policy issued by Financial Guaranty Insurance Company. In addition, the Indenture provides that the Bonds shall be secured by a pledge of the receipts and revenues of the Authority, after deduction of the proper expenses of the operation, maintenance and repair of the Water and Sewer System and reserves therefor as provided in the Indenture. The Indenture provides for the fixing and charging by the Authority of rates, rents and charges for the water and sewer service furnished by its Water and Sewer System at least sufficient in the aggregate to provide, together with other receipts and revenues derived by the Authority, funds for paying the cost of operating, maintaining and repairing the Water and Sewer System, paying the principal of and the interest on its bonds as such principal and interest shall become due, and establishing the reserves required by the Indenture.

Neither the credit nor the taxing power of the City or the Commonwealth or any political subdivision thereof is pledged for the payment of the principal of, the interest on, or the premium (if any) payable upon the redemption of, this Bond; nor shall this Bond be deemed an obligation of the City or the Commonwealth or any political subdivision thereof; nor shall the City, or the Commonwealth or any political subdivision thereof be liable for the payment of the principal of, the interest on, or the premium (if any) payable upon the redemption of this Bond, and neither the Trustee nor any receiver appointed to operate and maintain any of the facilities of the Authority and to collect revenues arising therefrom for the benefit of the bondholders shall be authorized to sell, assign, mortgage or otherwise dispose of any assets of whatever kind or character belonging to the Authority. The Authority has no taxing power.

In case an event of default, as defined in the Indenture, shall occur, the principal of all the Bonds at any such time outstanding under the Indenture may be declared to be due and payable by the Trustee or may become due and payable upon the conditions and in the manner and with the effect provided in the Indenture. The owner of this Bond shall have no right to enforce the provisions of the Indenture or to institute action to enforce the covenants thereof or to take any action with regard to any event of default under the Indenture, or to institute, appear in or defend any suit or other proceeding with respect thereto, except as provided in the Indenture or by the Act (as hereinafter defined).

Optional Redemption

The 1993 Series B Bonds are subject to optional redemption on or after September 1, 2003, in whole at any time, or in part on any Interest Payment Date. Any such redemption will be made at a redemption price equal to the following percentages of the principal amount thereof determined in accordance with the following schedule plus accrued interest to the redemption date:

Redemption Periods (Both dates inclusive)	Price
September 1, 2003 through August 31, 2004	102%
September 1, 2004 through August 31, 2005	101
September 1, 2005 and thereafter	100

Mandatory Sinking Fund Redemption

The 1993 Series B Bonds maturing on September 1, 2023 are subject to mandatory sinking fund redemption, by lot, at a redemption price equal to 100% of the principal amount thereof plus accrued interest to the redemption date, on the dates and in the principal amounts as follows:

The Authority and the Trustee may treat the person in whose name this Bond is registered as the absolute owner hereof whether or not this Bond or any installment of interest shall be overdue, for the purpose of receiving payment thereof and for all other purposes whatsoever, and shall not be affected by any notice to the contrary.

The owner of this Bond shall have no right to enforce provisions of this Bond or the Indenture, except as provided in the Indenture.

No recourse shall be had for the payment of the principal of, or the interest or premium, if any, on, this Bond or for any claim based hereon or on the Indenture or on any indenture supplemental thereto, against any member, officer, or employee, past, present or future, of the Authority, or of any successor body, either directly or through the Authority or any such successor body, whether by virtue of any constitutional provision, statute or rule of law, or by the enforcement of any assessment or penalty, or otherwise, all such liability of such members, officers or employees being released as a condition of and as consideration for the execution of the Indenture and the issuance of this Bond.

This Bond will be transferred or exchanged for an equal aggregate principal amount or maturity amount, as applicable, of Bonds of similar term and tenor in any authorized denomination, only by presentation and surrender of this Bond to the Trustee, together with an assignment duly executed by the Owner hereof or by his attorney-in-fact or legal representative. As a precondition to the transfer of this Bond, the Authority or the Trustee may charge the owner hereof for any tax, fee or governmental charge required to be paid with respect to such transfer.

The Trustee shall not be required to register the transfer or exchange of any Bond (i) during a period beginning at the opening of business fifteen (15) days before the day of the mailing of notice of redemption of the Bonds and ending at the close of business on the date of such mailing, (ii) at any time following the selection of such Bonds, in whole or in part, for redemption, or (iii) during the period commencing on a Record Date and ending on the corresponding Interest Payment Date.

It is hereby certified, recited and declared that all acts, conditions and things required by the Constitution and laws of the Commonwealth to exist, to have happened or be performed precedent to and in the issuance of this Bond and the execution and delivery of the Indenture exist, have happened and have been performed as so required. This Bond is issued and the Indenture was made and entered into under and pursuant to the Municipality Authorities Act of 1945, P.L. 382, approved May 2, 1945, as amended (the "Act"), and under and pursuant to resolutions duly adopted by the Authority.

This Bond shall not be valid or become obligatory for any purpose until this Bond shall have been authenticated by the execution by the Trustee of the Certificate of Authentication endorsed hereon.

IN WITNESS WHEREOF, The Pittsburgh Water and Sewer Authority has caused this Bond to be executed in its name and on its behalf by the manual or facsimile

Year (September 1)	Principal Amount	Year (September 1)	Principal Amount
2017	\$1,325,000	2020	\$1,535,000
2018	1,390,000	2021	1,610,000
2019	1,460,000	2022	1,690,000
		2023*	1,775,000

* Final Maturity

Extraordinary Optional Redemption

The 1993 Series B Bonds are subject to extraordinary redemption prior to maturity at the option of the Authority in whole or in part at any time, in the event of condemnation, damage or destruction of the Water and Sewer System, out of moneys deposited with or held by the Trustee for such purpose, upon payment of 100% of the principal amount thereof being redeemed, plus interest accrued to the date fixed for redemption.

Optional redemption and mandatory redemption shall be made in the manner and upon the terms and conditions set forth in the Indenture. In the event that less than all of the 1993 Series B Bonds are to be redeemed as provided above, they shall be redeemed at random in any reasonable manner determined by the Trustee, unless otherwise directed by the Authority, and shall be selected for redemption by the Trustee in blocks of \$5,000, principal amount, provided that no such redemption shall cause any holder of 1993 Series B Bonds to hold less than \$5,000, principal amount, of Bonds after such redemption. Any redemption of the Bonds shall be upon at least fifteen (15) days but not more than thirty (30) days prior written, telegraphic or telexed notice to the owner of the 1993 Series B Bonds so called for redemption.

If the Authority shall have duly sent notice of redemption and shall have provided funds for the payment of the principal of the Bonds so called for redemption and interest thereon to the date of redemption, interest on such Bonds shall cease to accrue from and after said redemption date.

Certain modifications and alterations of the Indenture not adversely affecting rights of owners of the Bonds outstanding thereunder may be made without consent of owners of said Bonds in the manner and upon the terms and conditions provided in the Indenture. Any other modification or alteration of the Indenture and or rights and obligations of the Authority and of owners of the Bonds outstanding thereunder may be made only in the manner and upon the terms and conditions provided in the Indenture. Any consent by the owner of this Bond, when required by the Indenture (unless revoked as provided in the Indenture), shall be conclusive and binding upon such owner and all future owners of this Bond, irrespective of whether any notation of such consent is made upon this Bond.

signature of its Chairman or Vice Chairman, and its corporate seal or a facsimile thereof to be hereunto affixed, duly attested by the manual or facsimile signature of its Secretary or Assistant Secretary.

THE PITTSBURGH WATER AND SEWER
AUTHORITY

By _____
Chairman

ATTEST:

Secretary

[SEAL]

DATED:

Certificate of Authentication

This Bond is one of the Water and Sewer System Revenue Bonds, Series B of 1993 described in the within-mentioned Indenture.

Printed on the reverse side hereof is a complete text of the opinion of Eckert Seamans Cherin & Mellott and King, Abrams & Burney, Co-Bond Counsel, both of Pittsburgh, Pennsylvania, an executed original of which, dated the date of original delivery of and payment for the series of bonds of which this Bond is one, is on file at the principal corporate trust office of the Trustee.

PNC BANK, NATIONAL ASSOCIATION, as Trustee

By _____
Authorized Officer

[FORM OF ASSIGNMENT]
ASSIGNMENT

FOR VALUE RECEIVED the undersigned sells, assigns and transfers unto _____ the within bond issued by THE PITTSBURGH WATER AND SEWER AUTHORITY and hereby irrevocably constitutes and appoints _____ Attorney to transfer said bond on the books of the Authority with full power of substitution in the premises.

Dated: _____

(Sign here exactly as name(s) is (are) shown on the fact of this bond without any change or alteration whatever.)

SIGNATURE(S) GUARANTEED:

Notice: Signature(s) must be guaranteed by a member of an approved signature Guarantee Medallion Program.

[TEXT OF OPINION OF ECKERT SEAMANS CHERIN & MELLOTT AND KING, ABRAMS & BURNEY, CO-BOND COUNSEL, BOTH OF PITTSBURGH, PENNSYLVANIA, ISSUED IN RESPECT OF \$10,785,000, PRINCIPAL AMOUNT, OF THE PITTSBURGH WATER AND SEWER AUTHORITY, WATER AND SEWER SYSTEM REVENUE BONDS, SERIES B OF 1993].

[STATEMENT OF MUNICIPAL BOND INSURANCE]

Financial Guaranty Insurance Company ("Financial Guaranty") has issued a policy containing the following provisions with respect to The Pittsburgh Water and Sewer Authority Water and Sewer System Revenue Bonds, Series B of 1993 (the "Bonds"), such policy being on file at the principal office of the Paying Agent:

Financial Guaranty hereby unconditionally and irrevocably agrees to pay for disbursement to the Bondholders that portion of the principal of and interest on the Bonds which is then due for payment and which the issuer of the Bonds (the "Issuer") shall have failed to provide. Due for payment mean, with respect to the principal, the stated maturity date thereof, or the date on which the same shall have been duly called for mandatory sinking fund redemption and does not refer to any earlier date on which the payment of

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after payment of the Authority's Current Expenses (as defined in this Indenture), together with all cash and investments from time to time held in any fund (other than the Rebate Fund) by the Trustee hereunder.

TO HAVE AND TO HOLD the same unto the Trustee, its successors and assigns in trust, forever, IN TRUST, NEVERTHELESS, upon the terms and trusts herein set forth, to secure the payment of all Bonds issued hereunder and the interest thereon and the observance and performance of all the terms, provisions and conditions of this Indenture, and for the equal and ratable benefit and security of all and singular the present and future holders of the Bonds, without preference, priority or distinction as to lien or otherwise, except as otherwise hereinafter provided, of any one Bond over any other Bond by reason of priority in the issue, sale or authentication thereof or otherwise, provided, however, that the Insurance Policy issued with respect to the 1993 Bonds is for the sole benefit and security of the 1993 Bonds; and it is hereby covenanted and agreed by and between the parties hereto that the terms and conditions upon which the Bonds are to be issued, authenticated, delivered, secured and accepted by all persons who shall from time to time be or become holders thereof, and the trusts and conditions upon which the pledged receipts and revenues are to be held and disposed of, are as follows:

ARTICLE I
DEFINITIONS

The terms defined in this Article I shall, for all purposes of this Indenture and of all indentures supplemental hereto now or hereafter entered into in accordance with the provisions hereof, have the meanings herein specified, unless the context clearly otherwise requires:

Additional Bonds

The term "Additional Bonds" means Bonds authenticated and delivered hereunder of any series other than the 1993 Bonds.

Additional Payment

The term "Additional Payment" shall mean the amount billed by the City to the Authority pursuant to the Lease and Management Agreement, such amount not to exceed, for the Authority's 1991 Fiscal Year the sum of \$4,228,200, which amount shall increase for each Fiscal Year thereafter by an amount equal to the percentage increase of the "Consumer Price Index for all Urban Consumers" (1982-1984 = 100) as published by the U.S. Department of Commerce, or if not published, a similar index. In addition, the Additional Payment shall include the receipt by the City of up to 600 million gallons of water each year, provided, however, that the City shall not be entitled to a credit for any water not so used.

Annual Budget

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principal of the Bonds is due by reason of call for redemption (other than mandatory sinking fund redemption), acceleration or other advancement of maturity, and with respect to interest, the stated date for payment of such interest.

Upon receipt of telephonic or telegraphic notice, subsequently confirmed in writing, or written notice by registered or certified mail, from a Bondholder or the Paying Agent to Financial Guaranty that the required payment of principal or interest has not been made by the Issuer to the Paying Agent, Financial Guaranty on the due date of such payment or within one business day after receipt of notice of such nonpayment, whichever is later, will make a deposit of funds, in an account with State Street Bank and Trust Company, N.A., or its successor as its agent (the "Fiscal Agent"), sufficient to make the portion of such payment not paid by the Issuer. Upon presentation to the Fiscal Agent of evidence satisfactory to it of the Bondholder's right to receive such payment and any appropriate instruments of assignment required to vest all of such Bondholder's right to such payment in Financial Guaranty, the Fiscal Agent will disburse such amount to the Bondholder.

As used herein the term "Bondholder" means the person other than the Issuer who at the time of nonpayment of a Bond is entitled under the terms of such Bond to payment thereof.

The policy is non-cancellable for any reason.

FINANCIAL GUARANTY INSURANCE COMPANY

AND WHEREAS, the execution and delivery of the 1993 Bonds and of this Indenture have been duly authorized by resolution of the Authority, and all things necessary to make the 1993 Bonds, when executed by the Authority, authenticated by the Trustee and issued by the Authority, the valid, binding and legal obligations of the Authority, and to constitute these presents a valid and binding pledge of the security hereinafter provided, have been duly done and performed,

NOW, THEREFORE, THIS INDENTURE WITNESSETH: that in consideration of the premises and of the acceptance by the Trustee of the trusts hereby created, and of the purchase and acceptance of the Bonds by the holders thereof, and for the purpose of fixing and declaring the terms and conditions upon which the Bonds are or may be issued, authenticated, delivered, secured and accepted by all persons who shall from time to time be or become holders thereof, and to declare the terms and conditions upon which the Bonds are secured, and to secure the payment of the principal of, and interest and premium (if any) on all Bonds at any time issued and outstanding hereunder, according to their tenor, purport and effect and to secure the performance and observance of all of the covenants, agreements and conditions therein and herein contained, the Authority, intending to be legally bound, has executed and delivered this Indenture and by these presents does hereby sell, assign, transfer, set over, grant a security interest in and pledge unto PNC Bank, National Association, as Trustee, its successors in the trust and its assigns forever, to the extent provided in this Indenture, the Receipts and Revenues (as defined in this Indenture).

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The term "Annual Budget" shall mean the budget required by Section 7.12 herein.

Authority

The term "Authority" shall mean The Pittsburgh Water and Sewer Authority, a body corporate and politic existing and operating under the Municipality Authorities Act.

Authorized Depository

The term "Authorized Depository" shall mean any incorporated bank or trust company doing business in the Commonwealth of Pennsylvania, which is insured by the Federal Deposit Insurance Corporation or by any other agency of the United States of America performing functions similar to the Federal Deposit Insurance Corporation (provided such an agency shall be in existence), which has a combined capital and surplus of not less than One Million Dollars (\$1,000,000), and which is not unsatisfactory to the Trustee, and shall include the Trustee; provided that the Authority may deposit funds in any bank or trust company doing business in the Commonwealth of Pennsylvania to the extent that such funds are insured by the Federal Deposit Insurance Corporation or by any other agency of the United States of America performing similar functions to the Federal Deposit Insurance Corporation.

Board

The term "Board" shall mean the governing body of the Authority.

Bond or Bonds

The term "Bond" or "Bonds" shall mean any bond or all the bonds, as the case may be, authenticated and delivered under this Indenture.

Bond Insurer

The term "Bond Insurer" shall mean, with respect to the 1993 Bonds, Financial Guaranty Insurance Company, a New York stock insurance company, or any successor thereto and, with respect to any series of Additional Bonds, the insurance company or bank, if any, guaranteeing the payment of principal and interest on such Additional Bonds when due.

Business Day

The term "Business Day" shall mean a day on which banks located in each of the cities in which the principal offices of the Trustee and the Paying Agent are located are not required or authorized to remain closed and on which the New York Stock Exchange is not closed.

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Capital Additions

The term "Capital Additions" shall mean all new or additional property, which the Authority has authority to, or is required to, construct or acquire (including, without limiting the generality of the foregoing, lands, rights of way, easements and similar interests in real property and all buildings, improvements, standpipes, reservoirs, wells, flumes, sluices, canals, basins, cribs, machinery, mains, conduits, hydrants, pipes, pipe lines, service pipes, water and sewer plants and systems, dams, tanks, shops, structures, purification systems, pumping stations, fixtures, engines, boilers, pumps, meters, facilities for cogeneration and transportation and other equipment) and any and all permanent improvements, replacements, additions, extensions and betterments to real or fixed property of the Authority, which new or additional property and permanent improvements, replacements, additions, extensions and betterments shall be hereafter constructed or otherwise acquired by the Authority, but shall not include the Construction Project.

City

The term "City" shall mean the City of Pittsburgh, Pennsylvania.

Consulting Engineer

The term "Consulting Engineer" shall mean a person who is a registered professional engineer under the laws of the Commonwealth of Pennsylvania qualified to pass on engineering questions relating to the operation and maintenance of water and sewer systems, who is appointed by the Board, who is in fact independent (although such person may be regularly retained by the Authority) and who is not unsatisfactory to the Trustee. If such person be an individual, such person shall not be a member of the Board or an officer or employee of the Authority or the City. If such person be a partnership or corporation, such person shall not have a partner, director, officer or substantial stockholder who is a member of the Board or an officer or employee of the Authority or the City. The Consulting Engineering may perform similar services for the City.

Construction Project

The term "Construction Project" shall mean the program of acquisition, construction and improvement to the Water and Sewer System described in (a) the report of Green International, Inc. dated December 9, 1983, (b) the report of The Chester Engineers, Inc. dated May 16, 1986, and (c) the Report of the Chester Environmental, Inc. dated October 1, 1993, as the same may be amended from time to time.

Cost

The term "Cost", when used with reference to the Construction Project or with reference to Capital Additions, shall mean the amounts required to be paid to complete the Construction Project or to construct or otherwise acquire such Capital Additions, and shall include, in addition to such other items as are included within any proper definition of cost,

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Debt Service Reserve Fund Policy

The term "Debt Service Reserve Fund Policy" shall mean the Municipal Bond Debt Service Reserve Fund Policy issued by the Bond Insurer on the date of issuance of the 1993 Bonds and deposited into the Debt Service Reserve Fund.

Fiscal Year

The term "Fiscal Year" shall mean the period of twelve months beginning on January 1 of each year or such other twelve month period as may be designated by the Authority.

Government Obligations

The term "Government Obligations" shall mean (a) non callable direct obligations of, or obligations the principal of and interest on which are unconditionally guaranteed by, the United States of America and that are not redeemable prior to their maturity other than at the option of the holder thereof, or (b) tax exempt obligations of any state or any instrumentality, agency or political subdivision thereof which are fully secured as to principal and interest by obligations described in (a) and that are not redeemable prior to their maturity other than at the option of the holder thereof.

Gross Revenues

The term "Gross Revenues", when used with respect to any period, shall mean the aggregate gross operating revenues consisting of all moneys received by the Authority from the rates and charges for the sale of services by the Authority, and other non-operating revenues for such period, including, but not limited to, interest earnings, if any, on the Debt Service Reserve Fund, all as determined in accordance with generally accepted accounting principles, after reasonable provision for uncollectible accounts, if any. Said term shall not include any gains from the sale or other disposition of or from any increase in the value of capital assets (including investments purchased by the Trustee pursuant to the provisions of this Indenture) or any fee or charge established, levied and collected by the Authority from persons for the privilege of making connections to the Water and Sewer System to the extent such fees or charges are pledged in accordance with the Act as a refund to such person who has paid for the construction of any extension of the Water and Sewer System or assessment revenues which are subject to the lien of assessment bonds then outstanding.

Holder of Bonds

The term "Holder of Bonds" or "Bondholder" or "Holder" or any similar term shall mean any registered owner of any Bond.

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allowances or charges for interest during construction and for a reasonable period thereafter, which is not otherwise provided for, taxes, engineering, legal, fiscal and superintendence expenses and premiums for casualty and other insurance and all expenses incurred by the Authority in connection with the preparation, issue and sale of the Bonds including discounts (if any) incurred on the sale of the Bonds.

Counsel

The term "Counsel" shall mean legal counsel admitted to practice before the Supreme Court of the Commonwealth of Pennsylvania, who may but need not be counsel regularly retained by the Authority, appointed by the Board and not unsatisfactory to the Trustee.

Current Expenses

The term "Current Expenses" shall mean the reasonable, proper and necessary costs of operation, maintenance and repair of the Water and Sewer System and Capital Additions and shall include, but without limiting the generality of the foregoing, administrative, engineering, legal, auditing and insurance expenses, liquidity facility fees and expenses, fees and expenses of the Trustee, any Paying Agent, and authorized depositories, an allowance for depreciation, any payments to pension or retirement funds and taxes, and the direct expenses payable by the Authority to the City under the Lease Agreement but it shall not include the Additional Payment or Indirect Expenses.

Debt Service Requirements

The term "Debt Service Requirements" shall mean, in respect of any Fiscal Year, the sum of the amount required to be paid in such Fiscal Year by the Authority in respect of the interest on and the principal of the Bonds outstanding or to be outstanding, as the case may be, and the amounts required to be paid to any sinking, purchase or analogous fund established for such Bonds; provided, however, that the Debt Service Requirements in respect of any Fiscal Year for a series of Bonds for which there shall have been established a sinking, purchase or analogous fund shall be determined after projecting the operation of such fund to the retirement of Bonds by redemption and giving effect to the reduction in the payments to be made in such Fiscal Year in respect of the principal of and interest on such Bonds by reason of such redemption. To the extent any Bonds under consideration bear interest at a variable rate, the Debt Service Requirements for such Bonds shall be assumed to bear interest at the highest of: (i) the actual rate on the date of calculation, or if the indebtedness is not yet outstanding, the initial rate (if established and binding), (ii) if the indebtedness has been outstanding for at least twelve months, the average rate over the twelve months immediately preceding the date of calculation, and (iii) (1) if interest on the indebtedness is excludable from gross income under the applicable provisions of the Internal Revenue Code of 1986, as amended, the most recently published Bond Buyer 25 Bond Revenue Index (or comparable index if no longer published) plus fifty (50) basis points, or (2) if interest is not so excludable, the interest rate on direct U.S. Treasury Obligations with comparable maturities plus fifty (50) basis points.

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Indenture

The term "Indenture" or "this Indenture" shall mean this instrument and all indentures supplemental hereto.

Independent Auditor

The term "Independent Auditor" shall mean a person who is engaged in the accounting profession, who is a nationally recognized certified public accountant under the laws of the Commonwealth of Pennsylvania, who is in fact independent (although such person may be regularly retained by the Authority) who is appointed by the Board and who is not unsatisfactory to the Trustee. If such person be an individual, such person shall not be a member of the Board, or an officer or employee of the Authority. If such person be a partnership or corporation, such person shall not have a partner, director, officer or substantial stockholder who is a member of the Board or an officer or employee of the Authority.

Indirect Expenses

The term "Indirect Expenses" shall mean those indirect expenses incurred by the City pursuant to the Lease Agreement as more fully defined therein.

Insurance Policy

The term "Insurance Policy" or "Bond Insurance Policy" shall mean the municipal bond new issue insurance policy issued by the Bond Insurer that guarantees payment of principal of and interest on the 1993 Bonds.

Interest Payment Date

The term "Interest Payment Date" shall mean any date on which principal and/or interest is due on the Bonds and for the 1993 Bonds shall specifically mean March 1 and September 1 of each year.

Lease Agreement

The term "Lease Agreement" shall mean the Lease and Management Agreement dated March 29, 1984, and effective May 1, 1984 between the City and the Authority as thereafter amended from time to time.

Maximum Annual Debt Service Requirements

The term "Maximum Annual Debt Service Requirements" shall mean the highest Debt Service Requirements required to be paid in any Fiscal Year. To the extent any Bonds under consideration bear interest at a variable rate, the Maximum Annual Debt Service Requirements for such Bonds shall be assumed to bear interest at the highest of: (i)

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the actual rate on the date of calculation, or if the indebtedness is not yet outstanding, the initial rate (if established and binding), (ii) if the indebtedness has been outstanding for at least twelve months, the average rate over the twelve months immediately preceding the date of calculation, and (iii) (1) if interest on the indebtedness is excludable from gross income under the applicable provisions of the Internal Revenue Code of 1986, as amended, the most recently published Bond Buyer 25 Bond Revenue Index (or comparable index if no longer published) plus fifty (50) basis points, or (2) if interest is not so excludable, the interest rate on direct U.S. Treasury Obligations with comparable maturities plus fifty (50) basis points.

Moody's

The term "Moody's" shall mean Moody's Investors Service, its successors and assigns, and, if such corporation shall be dissolved or liquidated or shall no longer perform the functions of a securities rating agency, "Moody's" shall be deemed to refer to any other nationally recognized securities rating agency designated by the Authority, by notice to the Trustee.

Municipality Authorities Act

The term "Municipality Authorities Act" or "Act" shall mean the Municipality Authorities Act of 1945 of the Commonwealth of Pennsylvania, approved May 2, 1945, P.L. 382, as heretofore and hereafter amended and supplemented.

Net Revenues

The term "Net Revenues", when used with reference to any period, shall mean the Gross Revenues of the Authority for such period, less all Current Expenses for such period. In case the Authority shall have acquired any property constituting part of the Water and Sewer System within or after the period for which any calculation of Net Revenues is made there shall be included in ascertaining the Net Revenues for such period, the net earnings or net losses, as the case may be, of such property for the whole of such period to the extent the same may not have been otherwise included. The net earnings or net losses, as the case may be, of such property for the period preceding its acquisition by the Authority shall be computed as if such property had been operated by the Authority during such period. If within or after the period for which any such calculation is made, the Authority shall have disposed of any property constituting part of the Water and Sewer System, then the net earnings or net losses, as the case may be, of such property for the whole of such period shall be excluded, to the extent the same may not have been otherwise excluded, in ascertaining the Net Revenues for such period. If the rates, rents and charges during all or any part of the period for which any such calculation is made shall be different from the rates, rents and charges which are in effect at the time such calculation is made, there shall be added to or deducted from the Net Revenues so calculated, any increase or decrease of the Gross Revenues for such period which would result from the computation of such Gross Revenues on the basis of the rates, rents and charges in effect at the date of said calculation, rather than the rates, rents and charges which were actually in effect during that period.

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(i) the lien of taxes, assessments or other governmental charges not at the time delinquent and the lien of taxes, assessments and other governmental charges which are delinquent but the validity of which is being contested in good faith by appropriate proceedings diligently conducted unless and until foreclosure, restraint, sale or other similar proceedings shall have been commenced, and with respect to which such reserves or other appropriate provisions, if any, as shall be required by generally accepted accounting principles shall have been made;

(ii) liens securing indebtedness which has neither been assumed by the Authority nor upon which it customarily pays interest and existing solely upon real property or rights in relation thereto, which real property or rights were acquired for right-of-way purposes;

(iii) in the case of real estate acquired by eminent domain proceedings, any deficiency of title which necessarily results from such method of acquisition and which, while it may impair the marketability of the Authority's title to such real estate, does not, in the opinion of counsel, affect the Authority's right to use such real estate for the purposes intended;

(iv) any other liens, encumbrances, exceptions, reservations and defects of title which do not, in the opinion of counsel, have a materially adverse effect on the Authority's right to use the affected real estate for the purposes intended; and

(v) the right of any public utility from whom the Authority shall have acquired any easement, right-of-way or interest in land for right-of-way purposes to require any adjustment in or relocation of the facilities of the Authority which would not prevent the continued satisfactory operation thereof.

Person

The term "Person" shall mean an individual, a corporation, a partnership, an association, a joint stock company, a trust, any unincorporated organization, an authority or similar body or a governmental or political subdivision thereof.

Policy Costs

The term "Policy Costs" shall mean, collectively, the repayment of any draws under the Debt Service Reserve Fund Policy and related reasonable expenses incurred by the Bond Insurer (together with interest thereon at a rate equal to the lower of (i) the prime rate of Morgan Guaranty Trust Company of New York in effect from time to time plus 2% per annum, and (ii) the highest rate permitted by law).

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Officers' Certificate

The term "Officers' Certificate" shall mean a certificate signed by the Chairman or Vice Chairman or the Executive Director and the Treasurer or an Assistant Treasurer or Secretary or an Assistant Secretary of the Authority. If such Officers' Certificate shall include a statement with respect to the existence or non-existence of an event of default hereunder or any condition, event, act or omission which, with the giving of notice or lapse of time or both, would constitute an event of default, such Officers' Certificate may state that such statement is based upon the best knowledge, information and belief of the signers of such certificate, provided that such certificate also states that, in the opinion of the signers of such certificate, they have made such examination or investigation as they deemed reasonably appropriate to enable them to make such statement.

Outstanding

The term "Outstanding under this Indenture" or "Outstanding hereunder" or "Outstanding", when used with reference to Bonds, shall mean, at any date as of which the amount of Outstanding Bonds is to be determined, the aggregate of all Bonds authenticated and delivered under this Indenture, except

(i) Bonds cancelled at or prior to such date;

(ii) Bonds for the payment of which funds shall have been theretofore deposited in trust with the Trustee and which shall have matured by their terms but shall not have been surrendered for payment;

(iii) Bonds for the redemption or payment of which funds in the full amount required, either alone or together with the interest to be earned thereon, but without the need to reinvest interest or principal, shall then be irrevocably held in trust by the Trustee, provided that notice of such redemption shall have been provided as set forth in Article IV or provisions satisfactory to the Trustee shall have been made for providing such notice;

(iv) Bonds deemed to be paid pursuant to the provisions of Article XII hereof.

Paying Agent

The term "Paying Agent" shall initially mean, with respect to the 1993 Bonds, PNC Bank, National Association, and any successor paying agent or co-paying agent appointed by the Authority with respect to the 1993 Bonds.

Permitted Liens and Title Defects

The term "Permitted Liens and Title Defects" shall mean:

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Prime Rate

The term "Prime Rate" means the rate of interest announced, from time to time, by the Trustee as its prime rate.

Receipts and Revenues

The term "Receipts and Revenues" shall mean any and all rates, fees, rents and charges established or to be established, levied and collected in connection with, and all other payments, receipts and revenues of whatever kind or character arising from, the operation or ownership of any property of the Authority or any part thereof (except tap or connection fees and charges to the extent such fees or charges are pledged in accordance with the Act as a refund to such person who has paid for the construction of any extension of the Water and Sewer System or assessment revenues which are subject to the lien of assessment bonds then outstanding), any income earned on the moneys or investments on deposit in the Debt Service Fund, Debt Service Reserve Fund, Construction Fund, Revenue Fund, Operation and Maintenance Fund and any sinking, purchase or analogous fund created hereunder.

Record Date

The term "Record Date" shall mean the fifteenth day of the calendar month (whether or not such day is a Business Day) immediately preceding any Interest Payment Date.

Resolution of the Board

The term "Resolution of the Board" shall mean a resolution certified by the Secretary or Assistant Secretary-Treasurer of the Authority, under its corporate seal, to have been duly adopted by the Board and to be in full force and effect on the date of such certification.

Sewer System

The term "Sewer System" shall mean and include, as of any particular time, (i) all tangible property, fixed or moveable, then owned or operated by the Authority and used in the rendering of sewer service by the Authority, (ii) all Capital Additions then constructed or otherwise acquired relating to sewer service, and (iii) all franchises used or useful to the Authority at such particular time in the rendering of sewer service by the Authority.

S&P

The term "S&P" shall mean Standard & Poor's Corporation, its successors and assigns, and, if such corporation shall be dissolved or liquidated or shall no longer perform the functions of a securities rating agency, "S&P" shall be deemed to refer to any other

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nationally recognized securities rating agency designated by the Authority, by notice to the Trustee.

Supplemental Indenture

The term "Supplemental Indenture" or "indenture supplemental hereto" shall mean any indenture now or hereafter duly authorized and entered into in accordance with the provisions of this Indenture.

Trustee

The term "Trustee" shall mean PNC Bank, National Association and its successors in the trust hereunder.

Water and Sewer System

The term "Water and Sewer System" shall mean and include as of any particular time the Sewer System, the Water System and any Capital Additions of the Authority.

Water System

The term "Water System" shall mean and include, as of any particular time, (i) all tangible property, fixed or movable, then owned or operated by the Authority and used in the rendering of water service by the Authority, (ii) all Capital Additions then constructed or otherwise acquired relating to water service, and (iii) all franchises used or useful to the Authority at such particular time in the rendering of water service by the Authority.

All terms defined in the recitals of this Indenture shall have the meanings ascribed to them therein. Except where the context otherwise requires, words importing one gender shall include all genders and words importing the singular number shall include the plural and vice versa.

ARTICLE II

DESCRIPTION, EXECUTION AND REGISTRATION OF BONDS

Section 2.01. Authorized Amount of 1993 Bonds; Denominations; Issuance and Delivery. The Bonds may, at the election of the Board, be issued in one or more series and shall be designated generally as the Water and Sewer System Revenue Bonds of the Authority.

There is hereby created for issuance hereunder two series of Bonds which shall bear the descriptive title "The Pittsburgh Water and Sewer Authority, Water and Sewer System Revenue Refunding Bonds, Series A of 1993", issuable as fully registered bonds in

2013	49,105,000	6.50
2016	58,305,000	4.75

1993 Series B Bonds

Year September 1	Principal Amount	Interest Rate
2023	\$10,785,000	5.00%

Interest payable on the 1993 Bonds will be computed on the basis of a 360-day year of twelve 30-day months.

The 1993 Bonds shall be redeemable as provided therein and in Article IV hereof.

The Bonds of any series other than the 1993 Bonds may contain such terms, conditions and covenants, not contrary to the Act or the Indenture, as may be determined by the Board and expressed in such Bonds and in a Supplemental Indenture which shall set forth the form of the Bonds of any additional series.

The principal of, premium, if any, and interest on the Bonds shall be payable in any currency of the United States of America which, at the respective dates of payment thereof, is legal tender for the payment of public and private debts, and such principal and premium, if any, shall be payable at the office of the Paying Agent, or at the office of any alternate paying agent, if any, named in any such Bond. Payment of the interest on any Bond shall be made to the person appearing on the Bond Register as the registered owner thereof as of the Record Date for such interest payment and shall be paid: (i) by check or draft of the Trustee mailed to such registered owner at such owner's address as it appears on such registration books or at such other address as is furnished to the Paying Agent in writing by such owner; (ii) by wire transfer to an owner of \$1,000,000 or more of aggregate principal amount of Bonds (upon receipt by the Trustee of written notice not less than one business day prior to the Record Date for the applicable Interest Payment Date, such notice to contain the wire transfer address within the continental United States to which such owner desires to have such wire directed); or (iii) in any other manner as may be mutually acceptable to the owner and the Trustee. If and to the extent that there shall be a default in the payment of the interest due on any Interest Payment Date, such defaulted interest shall be paid to the Bondowners in whose name any such Bonds (or any Bond issued upon transfer or exchange thereof) are registered at the close of business on a special record date for the payment of such defaulted interest established by notice mailed to the Bondowners not less than fifteen (15) days preceding such special record date. Such notice of special record date will be mailed to the person in whose name the Bonds are registered at the close of business on the fifth (5th) business day next preceding the date of mailing. Each Bond shall bear

the aggregate principal amount of \$278,970,000 and "The Pittsburgh Water and Sewer Authority, Water and Sewer System Revenue Bonds, Series B of 1993", issuable as fully registered bonds in the aggregate principal amount of \$10,785,000. The 1993 Bonds shall be substantially in the forms hereinbefore recited with appropriate insertions, omissions and variations and shall be numbered in a manner acceptable to the Trustee.

The 1993 Bonds shall initially bear interest from October 15, 1993. The 1993 Bonds shall be issued in registered form in the minimum denomination of \$5,000 principal amount and integral multiples of \$5,000 in excess thereof.

Interest on the 1993 Bonds shall be payable on March 1 and September 1 of each year, commencing March 1, 1994.

Each 1993 Bond shall initially be dated October 15, 1993, and thereafter will be dated as of the date of its authentication. Each 1993 Bond shall bear interest from the most recent Interest Payment Date preceding the date of such Bond to which interest has been paid, unless the date of such Bond is an Interest Payment Date on which interest has been paid, in which event it shall bear interest as of such Interest Payment Date, or, if dated prior to February 15, 1994, in which event it shall bear interest from October 15, 1993.

The 1993 Bonds shall bear interest at the following rates and shall mature on the following dates:

**MATURITY SCHEDULE
1993 Series A Bonds**

Year September 1	Principal Amount	Interest Rate
1994	\$8,495,000	3.50%
1995	4,355,000	3.40
1996	5,945,000	3.50
1997	6,865,000	3.75
1998	8,550,000	3.90
1999	8,885,000	4.00
2000	9,245,000	4.25
2001	9,635,000	4.40
2002	10,065,000	4.50
2003	10,505,000	4.60
2004	11,000,000	4.70
2005	11,515,000	4.75
2006	12,060,000	4.80
2007	12,640,000	4.90
2008	13,260,000	5.00
2009	13,920,000	5.00
2010	14,620,000	5.00

interest on overdue principal, premium, if any, and, to the extent permitted by law, on overdue interest at the rate per annum borne by such Bond during such interest period.

Except as otherwise provided herein, both the principal of and interest on the Bonds shall be payable only out of the Receipts and Revenues of the Authority, after payment of the Current Expenses.

Section 2.02. Registration of Bonds. The Authority shall keep or cause to be kept at the principal corporate trust offices of the Trustee books for the registration and transfer of Bonds; and the Authority will register or transfer or cause to be registered or transferred therein, as hereinafter provided and under such reasonable regulations as it may prescribe, any Bond entitled to be so registered or transferred, upon presentation for such purpose. The Trustee is hereby appointed as registrar of the Authority for the purpose of registering, transferring and exchanging the Bonds. The Bond Insurer shall, upon the occurrence of an event of default triggering an obligation to make payments under the Insurance Policy, have the right to inspect the registration books maintained pursuant to this Section 2.02.

Section 2.03. Uniform Commercial Code. The Bonds shall be securities under the Pennsylvania Uniform Commercial Code Investment Securities and shall be negotiable instruments to the extent provided therein.

Section 2.04. Transfers and Exchanges of Bonds. Upon surrender for transfer of any fully registered Bond at the principal corporate trust office of the Trustee, the Trustee shall authenticate and deliver in the name of the transferee or transferees one or more new fully registered Bonds of authorized denominations for the aggregate principal amount which the Bondowner is entitled to receive.

Any Bond shall be exchangeable for Bonds of any authorized denomination, in an aggregate principal amount equal to the principal amount of the Bond presented for exchange.

All Bonds presented for transfer or exchange shall be accompanied by a written instrument or instruments of transfer or authorization for exchange, in form satisfactory to the Trustee, duly executed by the Bondowner or by his duly authorized attorney. No transfer of any Bond shall be valid unless made on the registration books by the registered owner in person, or by his duly authorized attorney. Such registrations, exchanges and transfers shall be without expense to the holders of the Bonds, but any taxes, fees or other governmental charges required to be paid with respect to the same shall be paid by the holder requesting any such registration, exchange or transfer as a condition precedent to the exercise of such privilege. 1993 Bonds may be presented for exchange or transfer only at the principal corporate trust office of the Trustee or at the office of any Paying Agent as the Authority may hereafter appoint.

The Trustee shall not be required to register the transfer or exchange of any Bond (i) during a period beginning at the opening of business fifteen (15) days before the day

of the mailing of notice of redemption of the Bonds and ending at the close of business on the date of such mailing, (ii) at any time following the selection of such Bonds, in whole or in part, for redemption, or (iii) during the period commencing on a Record Date and ending on the corresponding Interest Payment Date.

Section 2.05. Form of Bonds; Temporary Bonds. Bonds in definitive form shall be fully engraved or printed or lithographed on steel-engraved borders, or printed or typewritten. Until Bonds in definitive form of any series are ready for delivery, the Authority may execute and upon its request in writing the Trustee shall initially authenticate and deliver in lieu of any thereof, and subject to the same provisions, limitations and conditions, one or more printed, lithographed or typewritten Bonds in temporary form, substantially of the tenor of the Bonds hereinbefore described, and with appropriate omissions, variations and insertions, with regard to the 1993 Bonds. Such Bonds or Bonds in temporary form may be for the amount of \$5,000 or any multiple or multiples thereof, as the Authority may determine. Until exchanged for Bonds in definitive form such Bonds in temporary form shall be entitled to the lien and benefit of this Indenture. The Authority shall, without unreasonable delay, prepare, execute and deliver to the Trustee, and thereupon, upon the presentation and surrender of any Bond or Bonds in temporary form, the Trustee shall authenticate and deliver, in exchange therefor, a Bond or Bonds in definitive form of the same series and same maturity for the same aggregate principal amount as the Bond or Bonds in temporary form surrendered. Such exchange shall be made by the Authority at its own expense and without making any charge therefor. Until such Bonds in definitive form are ready for delivery, the holder of one or more Bonds in temporary form may, with the consent of the Authority, exchange the same, upon the surrender thereof to the Trustee for cancellation, for Bonds in temporary form of like aggregate principal amount, of the same series and maturity, in authorized denominations.

Section 2.06. Numbering of Bonds. Any Bond may bear such numbers, letters, or other marks of identification or designation, and may be endorsed with or have incorporated in the text thereof such legends or recitals with respect to transferability or in respect of the Bond or Bonds for which it is exchangeable and may contain such provisions, specifications and descriptive words, not inconsistent with the provisions of this Indenture, as may be determined by the Board and approved by the Trustee.

Section 2.07. Execution of Bonds. All the Bonds shall, from time to time, be executed on behalf of the Authority by the manual or facsimile signature of its Chairman or its Vice Chairman and its corporate seal (which may be in facsimile) shall be thereunto affixed or thereon imprinted and attested by the manual or facsimile signature of its Secretary or its Assistant Secretary-Treasurer. If any of the officers whose signature shall be upon the Bonds shall cease to be such officers of the Authority before the Bonds so signed and sealed shall have been actually authenticated by the Trustee or delivered by the Authority, such Bonds nevertheless may be authenticated, issued, and delivered with the same force and effect as though the person or persons whose signature shall be upon such Bonds had not ceased to be such officer or officers of the Authority; and also any such Bond may be signed and sealed on behalf of the Authority by the signature of such persons as at the actual date of

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So long as the 1993 Bonds or any portion thereof are registered in the name of DTC or any nominee thereof, all payments of the principal or redemption price of or interest on such 1993 Bonds shall be made to DTC or its nominee in New York Clearing House or equivalent next day funds on the dates provided for such payments under this Indenture. Each such payment to DTC or its nominee shall be valid and effective to fully discharge all liability of the Authority or the Trustee with respect to the principal or redemption price of or interest on the 1993 Bonds to the extent of the sum or sums so paid. In the event of the redemption of less than all of the 1993 Bonds Outstanding, the Trustee shall not require surrender by DTC or its nominee of the 1993 Bonds so redeemed, but DTC or its nominee may retain such 1993 Bonds and make an appropriate notation on the 1993 Bond certificate as to the amount of such partial redemption; provided that, in each case the Trustee shall request, and DTC shall deliver to the Trustee, a written confirmation of such partial redemption and thereafter the records maintained by the Trustee shall be conclusive as to the amount of the Bonds which have been redeemed.

The Authority and the Trustee may treat DTC or its nominee as the sole and exclusive owner of the 1993 Bonds registered in its name for the purposes of payment of the principal or redemption price of or interest on the 1993 Bonds, selecting the 1993 Bonds or portions thereof to be redeemed, giving any notice permitted or required to be given to Bondholders under this Indenture, registering the transfer of 1993 Bonds, obtaining any consent or other action to be taken by Bondholders and for all other purposes whatsoever; and neither the Authority nor the Trustee shall be affected by any notice to the contrary. Neither the Authority nor the Trustee shall have any responsibility or obligation to any participant in DTC, any person claiming a beneficial ownership interest in the 1993 Bonds under or through DTC or any such participant, or any other person which is not shown on the registration books of the Trustee as being a Bondholder, with respect to either: (i) the 1993 Bonds; or (ii) the accuracy of any records maintained by DTC or any such participant; or (iii) the payment by DTC or any such participant of any amount in respect of the principal or redemption price of or interest on the 1993 Bonds; or (iv) any notice which is permitted or required to be given to Bondholders under this Indenture; or (v) the selection by DTC or any such participant of any person to receive payment in the event of a partial redemption of the 1993 Bonds; or (vi) any consent given or other action taken by DTC as Bondholder.

So long as the 1993 Bonds or any portion thereof are registered in the name of DTC or any nominee thereof, all notices required or permitted to be given to the Bondholders under this Indenture shall be given to DTC as provided in the Representation Letter, in such form as is acceptable to the Trustee, the Authority and DTC.

In connection with any notice or other communication to be provided to Bondholders pursuant to this Indenture by the Authority or the Trustee with respect to any consent or other action to be taken by Bondholders, DTC shall consider the date of receipt of notice requesting such consent or other action as the record date for such consent or other action, provided that the Authority or the Trustee may establish a special record date for such consent or other action. The Authority or the Trustee shall give DTC notice of such Special Record Date not fewer than fifteen (15) calendar days in advance of such Special Record Date to the extent possible.

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the execution of such Bond shall be the proper officers of the Authority, although at the nominal date of such Bond any such person shall not have been such officer of the Authority.

Section 2.08. Mutilated, Lost, Stolen or Destroyed Bonds. Upon receipt by the Authority and the Trustee of evidence satisfactory to all of them that any Outstanding Bond has been mutilated, destroyed, lost or stolen, and of indemnity satisfactory to all of them, the Authority, in its discretion, may execute and thereupon the Trustee shall authenticate and deliver, a new Bond of the same series and same maturity and of like tenor in exchange and substitution for, and upon surrender and cancellation of, the mutilated Bond or in lieu of and in substitution for the Bond so destroyed, lost or stolen. The Authority may, for each new Bond authenticated and delivered under the provisions of this Section, require the payment of the expenses, including counsel fees, which may be incurred by the Trustee in the premises. Any Bond issued under the provisions of this Section in lieu of a Bond alleged to be destroyed, lost or stolen, shall constitute an original additional contractual obligation on the part of the Authority whether or not the Bond so alleged to be destroyed, lost or stolen be at any time enforceable by anyone; and shall be equally and proportionately entitled to the benefits of this Indenture with all other Bonds issued under this Indenture.

Section 2.09. Certificate of Authentication. Subject to the qualifications hereinbefore set forth, the Bonds to be secured hereby shall be substantially of the tenor and effect hereinbefore recited, and no Bonds shall be secured hereby or entitled to the benefit hereof, or shall be or become valid or obligatory for any purpose, unless there shall be endorsed thereon a certificate of authentication, substantially in the form hereinbefore recited, executed by the Trustee; and such certificate on any Bond issued by the Authority shall be conclusive evidence and the only competent evidence that it has been duly authenticated and delivered hereunder. The 1993 Bonds shall be authenticated by the Trustee.

Section 2.10. Book-Entry Only Bonds. The 1993 Bonds shall be initially issued in book-entry only form. In the event that any provision of this Section 2.10 is inconsistent with other provisions of this Indenture, so long as the 1993 Bonds shall be in book-entry only form, the provisions of this Section 2.10 shall govern. The Depository Trust Company ("DTC") will act as securities depository for the 1993 Bonds. The ownership of one fully registered 1993 Bond for each maturity set forth in this Indenture, each in the aggregate principal amount of such maturity, will be registered in the name of CEDE & Co., as nominee for DTC; provided that if DTC shall request that the 1993 Bonds be registered in the name of a different nominee, the Trustee shall exchange all or any portion of the 1993 Bonds for an equal aggregate principal amount of 1993 Bonds registered in the name of such nominee or nominees of DTC. No person other than DTC or its nominee shall be entitled to receive from the Authority or the Trustee either a 1993 Bond or any other evidence of ownership of the 1993 Bonds, or any right to receive any payment in respect thereof unless DTC or its nominee shall transfer record ownership of all or any portion of the 1993 Bonds on the registration books maintained by the Trustee, in connection with discontinuing the book entry system or otherwise.

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At or prior to the issuance of the 1993 Bonds, the Authority and the Trustee shall execute or signify their approval of the Representation Letter. Any successor Trustee shall, in its written acceptance of its duties under this Indenture, agree to take any actions necessary from time to time to comply with the requirements of the Representation Letter.

The book-entry system for registration of the ownership of the 1993 Bonds may be discontinued at any time if either: (i) DTC determines to resign as securities depository for the 1993 Bonds; or (ii) the Authority provides thirty (30) days' notice of such discontinuation to the Trustee and DTC (that continuation of the system of book-entry transfers through DTC (or through a successor securities depository) is not in the best interests of the Authority. Upon occurrence of either such event, the Authority may attempt to establish a securities depository book-entry relationship with another securities depository. If the Authority does not do so, or is unable to do so, and after the Authority has notified DTC and upon surrender to the Trustee of the 1993 Bonds held by DTC, the Authority will issue and the Trustee will authenticate and deliver the Bonds in registered certificate form in denominations of \$5,000 and integral multiples thereof, at the expense of the Authority, to such persons, and in such maturities and principal amounts, as may be designated by DTC, but without any liability on the part of the Authority or the Trustee for the accuracy of such designation. Whenever DTC requests the Authority or the Trustee to do so, the Authority or the Trustee shall cooperate with DTC in taking appropriate action after reasonable notice to arrange for another securities depository to maintain custody of certificates evidencing the 1993 Bonds.

ARTICLE III

AUTHENTICATION AND DELIVERY OF BONDS

Section 3.01. Delivery of 1993 Bonds for Authentication. The 1993 Bonds shall be executed in the form and manner hereinabove recited and delivered to the Trustee for initial authentication and the Trustee shall initially authenticate and deliver said principal amount of 1993 Bonds, but only upon receipt by the Trustee of the following:

(1) A certificate, signed by the Chairman or a Vice Chairman and Secretary or Assistant Secretary-Treasurer of the Authority, directing the authentication of the 1993 Bonds and the delivery thereof to the Treasurer or Assistant Treasurer of the Authority or to a designated purchaser of the 1993 Bonds;

(2) A copy of a resolution of the Authority certified by its Secretary or Assistant Secretary, authorizing the execution and delivery of this Indenture, the issuance and authentication of the 1993 Bonds, and the sale and delivery of the 1993 Bonds to specified purchasers at a specified price;

(3) An Officer's Certificate setting forth (i) the amount of proceeds to be received by the Authority from the sale of the 1993 Bonds, including any accrued interest payable as part thereof, which shall be separately stated and deposited into the Debt Service Fund by the Trustee solely for the purpose of paying interest on the

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1993 Bonds on March 1, 1994; (ii) the amount of 1993 Series A Bond proceeds to be deposited into the Escrow Fund established pursuant to the Escrow Agreement, which amount shall be equal to that set forth in a verification report required to be furnished pursuant to paragraph (5) of this Section; (iii) the amount of 1993 Series B Bond proceeds to be deposited into the 1993 Construction Fund; and (iv) the estimated amount of expenses incurred in connection with financing, including all printing costs, insurance premiums, initial legal fees and initial and first annual fees of the Trustee, and to be paid from the proceeds of the 1993 Bonds;

(4) An opinion or opinions of one or more counsel to the effect that (i) the Authority has been duly and legally incorporated and is a validly existing authority in good standing under the laws of the Commonwealth of Pennsylvania; (ii) the Authority holds leasehold title to the Water and Sewer System, free and clear of liens, encumbrances and defects of title, other than Permitted Liens and Title Defects; (iii) the proceedings authorizing the execution and delivery of the Indenture and the execution, authentication and delivery of the 1993 Bonds and the sale thereof to the purchasers are valid and legally sufficient; (iv) all conditions precedent and concurrent provided herein to the authentication and delivery of the 1993 Bonds by the Trustee have been complied with; (v) the Indenture is the legal, binding and enforceable instrument in accordance with its terms (except to the extent that the remedies provided for herein may be limited by bankruptcy laws or the Municipality Authorities Act); and (vi) the 1993 Bonds are legal and binding obligations of the Authority entitled to the benefit and security of the Indenture;

(5) A verification report stating that the proceeds of the 1993 Series A Bonds deposited into the Escrow Fund, together with certain earnings from the investment thereof, are sufficient to redeem in full the 1991 Bonds and to defease the 1991 Indenture.

(6) Evidence satisfactory to the Trustee of the payments of moneys required pursuant to clause (iv) of the Officers' Certificate furnished under paragraph (3) of this Section.

(7) The original Insurance Policy and Debt Service Reserve Fund Policy.

When the above-mentioned documents shall have been filed with the Trustee, the Trustee shall authenticate the 1993 Bonds as directed and deliver them to the Treasurer or Assistant Treasurer of the Authority or to a designated purchaser of the 1993 Bonds pursuant to the order specified in paragraph (1) of this Section. The authentication of the 1993 Bonds shall be undertaken by the Trustee.

Section 3.02. Delivery of Additional Bonds for Authentication. From time to time hereafter the Authority may issue Bonds, in addition to the 1993 Bonds, for the purposes specified in Sections 3.03 and 3.04. Such Additional Bonds shall not be secured by, or afforded the benefits of, the Insurance Policy. Anything to the contrary herein notwithstanding, no Additional Bonds shall be issued if an Event of Default has occurred and

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basis that such variable rate debt is assumed to bear interest at the highest of: (i) the actual rate on the date of calculation, or if the indebtedness is not yet outstanding, the initial rate (if established and binding), (ii) if the indebtedness has been outstanding for at least twelve months, the average rate over the twelve months immediately preceding the date of calculation, and (iii) (1) if interest on the indebtedness is excludable from gross income under the applicable provisions of the Internal Revenue Code of 1986, as amended, the most recently published Bond Buyer 25 Bond Revenue Index (or comparable index if no longer published) plus fifty (50) basis points, or (2) if interest is not so excludable, the interest rate on direct U.S. Treasury Obligations with comparable maturities plus fifty (50) basis points. If the Supplemental Indenture shall provide that all or a portion of the cash to be deposited to the credit of the Debt Service Reserve Fund shall be withdrawn from moneys in the Revenue Fund, the Supplemental Indenture shall contain provisions requiring the deposits to be made over a period which shall not be in excess of two Fiscal Years beginning, in any event, with the Fiscal Year immediately following the Fiscal Year in which payments are first required to be made from the Revenue Fund to the Debt Service Fund in respect of such Additional Bonds;

(d) in case such Additional Bonds are being issued for the purpose of enabling the Authority to acquire or construct Capital Additions, a description of such Capital Additions and the creation of an additional construction fund having terms and provisions with respect to the withdrawal of cash therefrom not more favorable to the Authority than the corresponding terms and provisions contained in Section 5.01;

(e) in case such Additional Bonds are being issued for the purpose of providing the Authority with funds to effect the refunding of Bonds, the creation of a special escrow or redemption fund and the irrevocable deposit in trust with or for the benefit of the Trustee to the credit of such fund of cash or securities sufficient to effect such refunding and the designation of the Trustee as the agent of the Authority to take such action as shall be necessary in order to effect the refunding of such Bonds;

(4) An opinion or opinions of one or more counsel to the effect that (i) the Authority is a duly incorporated and validly existing Authority under the laws of the Commonwealth of Pennsylvania; (ii) the proceedings authorizing the execution, delivery and sale of such Additional Bonds and the execution and delivery of such Supplemental Indenture are valid and legally sufficient and such Supplemental Indenture is a legal, binding and enforceable instrument in accordance with its terms (except to the extent that the remedies provided for therein and in the Indenture may be limited by bankruptcy laws or the Act); (iii) the Authority has obtained from all governmental agencies having jurisdiction in the premises all necessary authorizations in connection with the construction of the Capital Additions, and the issuance of such Additional Bonds; (iv) the Authority holds leasehold title to all its property free and

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is continuing. No Bonds shall be authenticated and delivered hereunder by the Trustee under said Sections unless the Trustee shall have received prior to or at the time of the authentication thereof:

(1) An order signed by the Chairman or a Vice Chairman and Secretary or an Assistant Secretary of the Authority directing the authentication of such Additional Bonds and the delivery thereof to the Treasurer or an Assistant Treasurer of the Authority or to a designated purchaser of such Additional Bonds;

(2) A resolution of the Board authorizing the execution and requesting the authentication and delivery of such Additional Bonds, designating the series of such Bonds, authorizing the execution and delivery of a Supplemental Indenture creating such series, the sale and delivery of such Additional Bonds to specified purchasers at a specified price, the completion of the Construction Project or the acquisition or construction of specified Capital Additions or the refunding of the Bonds to be refunded as the case may be, and, in the case of the refunding of Bonds, irrevocably authorizing the Trustee to take such action as shall be necessary in order to effect such refunding;

(3) A Supplemental Indenture executed by the Authority in an appropriate number of counterparts providing the terms and provisions of such Additional Bonds and containing, in addition to such special terms and provisions not inconsistent with this Indenture, as may be necessary or proper to secure adequately such Additional Bonds, provisions for:

(a) the transfer from the Revenue Fund to the Debt Service Fund on the dates specified therein of cash, to the extent of available moneys in the Revenue Fund, for the purpose of paying the interest on and principal of such Additional Bonds as the same shall become due;

(b) if a sinking, purchase or analogous fund shall be established for such Additional Bonds, the withdrawal from the Revenue Fund and the deposit for the credit of said sinking, purchase or analogous fund on the dates specified therein of cash, to the extent of available moneys in the Revenue Fund, sufficient to enable the Authority to comply with the terms of such fund;

(c) the deposit by the Authority with the Trustee for the credit of the Debt Service Reserve Fund, either from the proceeds from the sale of such Additional Bonds or from moneys available in the Revenue Fund, or from both, of cash which, when added to the amount required to be deposited therein pursuant to the then existing provisions of the Indenture shall equal the Maximum Annual Debt Service Requirements on all Bonds which shall be Outstanding immediately after the issuance of such Additional Bonds. For purposes of funding the Debt Service Reserve Fund, the Maximum Annual Debt Service Requirements for any variable rate debt shall be calculated on the

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clear of all liens and title defects other than Permitted Liens and Title Defects; (v) all conditions precedent provided for in this Indenture relating to the authentication and delivery of such Additional Bonds have been complied with and the Authority is duly authorized and entitled to authentication and delivery of such Additional Bonds; and (vi) such Additional Bonds are, or upon the issue thereof, will be the valid and binding obligations of the Authority entitled to the benefits and security of this Indenture.

(5) The Authority shall deliver to the Bond Insurer an official statement, if any, prepared in connection with the issuance of additional debt, whether or not it is on a parity with the 1993 Bonds, within thirty (30) days of the bond sale.

(6) In the event that any Policy Costs are due and owing at the time of issuance of the Additional Bonds, for the purpose of the debt tests required by Section 3.03(3) and 3.04(3) hereof, Gross Revenues of the Authority shall be reduced by the amount of any Policy Costs then due and owing.

(7) No Additional Bonds may be issued without the prior written consent of the Bond Insurer if any Policy Costs are past due and owing to the Bond Insurer.

Section 3.03. Additional Bonds to Complete Construction Project or Capital Additions. From time to time hereafter the Authority may execute and deliver to the Trustee, and the Trustee shall thereupon authenticate and deliver in addition to the Bonds authorized to be issued pursuant to the other provisions of this Article, Additional Bonds for the purpose of financing the cost of completing the Construction Project or acquiring or constructing Capital Additions, for such aggregate principal amount as will enable the Authority to comply with the applicable provisions of this Section upon receipt by the Trustee of the following:

(1) All documents required to be delivered to the Trustee pursuant to the provisions of Section 3.02;

(2) An Officers' Certificate setting forth (i) the amount of the proceeds, including accrued interest, to be received by the Authority from the sale of such Additional Bonds, (ii) the costs and expenses incurred or to be incurred in connection with the issuance and sale of such Additional Bonds, (iii) the Maximum Annual Debt Service Requirements on such Additional Bonds, (iv) the Maximum Annual Debt Service Requirements on all Bonds which shall be Outstanding immediately after the issuance of such Additional Bonds, (v) the actual debt service on such Additional Bonds, and (vi) that no event of default and no condition, event, act or omission, which with the giving of notice or the lapse of time, or both, would constitute an event of default, has occurred and is continuing or exists;

(3) An Independent Auditor or the Consulting Engineer shall certify that the Authority's Adjusted Gross Revenues, for twelve (12) consecutive months out of the eighteen (18) months prior to issuance of such Additional Bonds, would be sufficient

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for the Authority to comply with the rate covenant set forth in Section 7.01 hereof (the debt service requirement for this test, however, must be based on the Maximum Annual Debt Service, including debt service on the proposed Additional Bonds). For purposes of this test, "Adjusted Gross Revenues" shall mean, for any twelve (12) month period under consideration, the Gross Revenues of the Authority for such twelve (12) month period, adjusted for the following:

- (a) any increase in rates or charges reasonably projected by the Authority on the date of calculation of Adjusted Gross Revenues;
- (b) customers added to the Water and Sewer System subsequent to the start of such twelve (12) month period but prior to the date of issuance of such Additional Bonds;
- (c) the estimated change in Gross Revenues which will result from the connection of existing residences or businesses to the Water and Sewer System within one year following completion of any project to be funded or system to be acquired from the proceeds of such Additional Bonds;
- (d) the estimated change in Gross Revenues (up to a maximum of 10% of the Gross Revenues of the Authority at the time the contract is entered into) which will result from services provided under any take-or-pay contract entered into subsequent to the start of the twelve (12) month period but prior to the date of issuance of such Additional Bonds; and
- (e) any adjustment that is approved in writing by the Bond Insurer and of which any rating agency then rating the Bonds has received not less than five (5) days prior written notice.

Any variable rate debt to be issued shall, for all purposes of this Section 3.03, be assumed to bear interest at the highest of: (i) the actual rate on the date of calculation, or if the indebtedness is not yet outstanding, the initial rate (if established and binding), (ii) if the indebtedness has been outstanding for at least twelve months, the average rate over the twelve months immediately preceding the date of calculation, and (iii) (1) if interest on the indebtedness is excludable from gross income under the applicable provisions of the Internal Revenue Code of 1986, as amended, the most recently published Bond Buyer 25 Bond Revenue Index (or comparable index if no longer published) plus fifty (50) basis points, or (2) if interest is not so excludable, the interest rate on direct U.S. Treasury Obligations with comparable maturities plus fifty (50) basis points;

(4) In the case of Additional Bonds issued to acquire or construct a Capital Addition, a Consulting Engineer's certificate certifying that the Capital Additions are advisable and setting forth the estimated cost of acquiring or constructing the Capital Additions.

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Auditor or the Consulting Engineer shall certify that the Authority's Adjusted Gross Revenues, for twelve (12) consecutive months out of the eighteen (18) months prior to issuance of such Additional Bonds, would be sufficient for the Authority to comply with the rate covenant set forth in Section 7.01 hereof (the debt service requirement for this test, however, must be based on the Maximum Annual Debt Service, including debt service on the proposed Additional Bonds). For purposes of this test, "Adjusted Gross Revenues" shall mean, for any twelve (12) month period under consideration, the Gross Revenues of the Authority for such twelve (12) month period, adjusted for the following:

- (a) any increase in rates or charges reasonably projected by the Authority on the date of calculation of Adjusted Gross Revenues;
- (b) customers added to the Water and Sewer System subsequent to the start of such twelve (12) month period but prior to the date of issuance of such Additional Bonds;
- (c) the estimated change in Gross Revenues which will result from the connection of existing residences or businesses to the Water and Sewer System within one year following completion of any project to be funded or system to be acquired from the proceeds of such Additional Bonds;
- (d) the estimated change in Gross Revenues (up to a maximum of 10% of the Gross Revenues of the Authority at the time the contract is entered into) which will result from services provided under any take-or-pay contract entered into subsequent to the start of the twelve (12) month period but prior to the date of issuance of such Additional Bonds; and
- (e) any adjustment that is approved in writing by the Bond Insurer and of which any rating agency then rating the Bonds has received not less than five (5) days prior written notice.

Any variable rate debt to be issued shall, for all purposes of this Section 3.04, be assumed to bear interest at the highest of: (i) the actual rate on the date of calculation, or if the indebtedness is not yet outstanding, the initial rate (if established and binding), (ii) if the indebtedness has been outstanding for at least twelve months, the average rate over the twelve months immediately preceding the date of calculation, and (iii) (1) if interest on the indebtedness is excludable from gross income under the applicable provisions of the Internal Revenue Code of 1986, as amended, the most recently published Bond Buyer 25 Bond Revenue Index (or comparable index if no longer published) plus fifty (50) basis points, or (2) if interest is not so excludable, the interest rate on direct U.S. Treasury Obligations with comparable maturities plus fifty (50) basis points;

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(5) Cash in an amount equal to the accrued interest paid in respect of such Additional Bonds, which cash shall be deposited by the Trustee to the credit of the Debt Service Fund;

(6) Cash in an amount equal to the amount, if any, required to be deposited to the credit of the Debt Service Reserve Fund from the proceeds from the sale of such Additional Bonds pursuant to the provisions of the Supplemental Indenture relating to such Additional Bonds; and

(7) Cash in an amount equal to the balance of the proceeds received in connection with the sale of such Additional Bonds, which cash shall not be less than the estimated Cost of completing the Construction Project or, in the case of Additional Bonds for the acquisition or construction of Capital Additions, the estimated cost set forth in the certificate of the Consulting Engineer furnished pursuant to paragraph (4) of this Section of acquiring or constructing the Capital Additions and the amount of costs and expenses set forth in the officers certificate furnished pursuant to paragraph (2) of this Section, and which cash shall be deposited to the credit of the additional construction fund created by the Supplemental Indenture relating to such Additional Bonds.

Section 3.04. Additional Bonds to Refund Outstanding Bonds. From time to time hereafter the Authority may execute and deliver to the Trustee, and the Trustee shall thereupon authenticate and deliver in addition to the Bonds authorized to be issued pursuant to the other provisions of this Article, Additional Bonds for the purpose of refunding Outstanding Bonds, for such aggregate principal amount as will enable the Authority to comply with the provisions of this Section upon receipt by the Trustee of the following:

(1) All documents required to be delivered to the Trustee pursuant to the provisions of Section 3.02;

(2) An Officers' Certificate setting forth (i) the amount of the proceeds, including accrued interest, to be received by the Authority from the sale of such Additional Bonds, (ii) the costs and expenses incurred or to be incurred in connection with the refunding of the Bonds, and the issuance and sale of such Additional Bonds, (iii) the Maximum Annual Debt Service Requirements on such Additional Bonds, (iv) the Maximum Annual Debt Service Requirements on all Bonds which shall be outstanding immediately after the issuance of such Additional Bonds, (v) the actual debt service on such Additional Bonds and (vi) that no event of default and no condition, event, act or omission which, with the giving of notice or lapse of time, or both, would constitute an event of default, has occurred and is continuing or exists;

(3) If only a portion of the Outstanding Bonds are to be refunded, and if the Maximum Annual Debt Service Requirements on the Additional Bonds are in excess of the Maximum Annual Debt Service Requirements on the Bonds being refunded, and if the final maturity of the Additional Bonds is longer than the final maturity of the Bonds being refunded (otherwise this clause is not applicable), an Independent

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(4) Cash or securities (which shall be Government Obligations or such other securities as the Bond Insurer shall have approved) which (either alone or together with the interest to be earned thereon without reinvestment), shall be sufficient together with any cash or securities available under this Indenture for such purpose, to effect the refunding of the Bonds to be refunded, which cash or securities shall be deposited by the Trustee to the credit of a special escrow or redemption fund;

(5) Cash or securities in an amount equal to the amount, if any, required to be deposited to the credit of the Debt Service Reserve Fund from the proceeds from the sale of such Additional Bonds pursuant to the provisions of the Supplemental Indenture relating to such Additional Bonds;

(6) Cash in an amount equal to the accrued interest received in respect of such Additional Bonds, which cash shall be deposited by the Trustee to the credit of the Debt Service Fund; and

(7) Cash in an amount equal to the amount set forth in the above mentioned officers certificate pursuant to subdivision (ii) of paragraph (2) of this Section, and evidence that such cash is used solely for the purposes of paying the costs and expenses set forth in said Officers' Certificate pursuant to said subdivision (ii).

If after making the above-mentioned deposits any balance shall remain from the proceeds from the sale of such Additional Bonds or if the moneys to the credit of the Debt Service Reserve Fund shall be in excess of the amount required to be maintained therein, the Trustee shall deposit said balance or excess to the credit of the Debt Service Fund. If the cash referred to in Paragraph (7) of this Section shall be in excess of the amounts required to pay the items in respect of which such amounts were to be used, such excess shall be deposited to the credit of the Debt Service Fund.

Section 3.05. Subordinated Debt of Authority. In addition to the foregoing and in addition to the subordinate pledge granted by the Authority to the Bond Insurer pursuant to the Debt Service Reserve Fund Policy Agreement with respect to the issuance of the Debt Service Reserve Fund Policy, the Authority may incur or assume additional debt provided that:

(1) the security for such debt is subordinate to the lien of and security interests granted by this Indenture; and

(2) any agreement for the repayment of such subordinate debt and any instrument evidencing or securing such subordinate debt shall provide: (i) that an event of default thereunder may be an event of default under this Indenture, and (ii) that, notwithstanding the occurrence of any event of default in respect of any subordinate debt, the lender shall not be entitled to exercise any rights or remedies with respect to the Receipts and Revenues until and unless the Trustee shall have instituted proceedings to exercise its rights pursuant to Article VIII hereof.

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Section 3.06. Covenant as to Prior Lien Debt. The Authority will not incur or assume any debt which will be secured by a lien on the Receipts and Revenues which will be prior to the lien granted by the terms of this Indenture.

Section 3.07. Deposit of 1993 Bond Proceeds. Upon receipt of the proceeds of the 1993 Bonds, such moneys shall be deposited to a Clearing Fund for the 1993 Bonds and shall be disbursed for the purposes and in the amounts set forth in the closing certificate of the Authority executed on the date of issuance of the 1993 Bonds. To the extent it is determined on or before February 1, 1994 that any remaining moneys in such fund will not be necessary to pay costs of issuance, such moneys shall be transferred to the 1993 Construction Fund.

ARTICLE IV

REDEMPTION OF BONDS

Section 4.01. Optional and Mandatory Redemption of 1993 Bonds.

The 1993 Series A Bonds maturing on or after September 1, 2004 (except the 1993 Series A Bonds maturing on September 1, 2013 which are not subject to optional redemption) are subject to optional redemption on or after September 1, 2003, in whole at any time, or in part on any Interest Payment Date. Any such redemption will be made at a redemption price equal to the following percentages of the principal amount thereof determined in accordance with the following schedule plus accrued interest to the redemption date:

Redemption Periods (Both dates inclusive)	Price
September 1, 2003 through August 31, 2004	102%
September 1, 2004 through August 31, 2005	101
September 1, 2005 and thereafter	100

The 1993 Series A Bonds maturing on September 1, 2013 are subject to mandatory sinking fund redemption, by lot, on September 1, 2011 in the principal amount of \$15,350,000 and on September 1, 2012, in the principal amount of \$16,345,000 at a redemption price equal to 100% of the principal amount thereof plus accrued interest to the redemption date.

The 1993 Series A Bonds maturing on September 1, 2016 are subject to mandatory sinking fund redemption, by lot, on September 1, 2014 in the principal amount of \$18,540,000 and on September 1, 2015 in the principal amount of \$19,425,000 at a redemption price equal to 100% of the principal amount thereof plus accrued interest to the redemption date.

The 1993 Series B Bonds are subject to optional redemption on or after September 1, 2003, in whole at any time, or in part on any Interest Payment Date. Any such redemption will be made at a redemption price equal to the following percentages of the principal amount thereof determined in accordance with the following schedule plus accrued interest to the redemption date:

Redemption Periods (Both dates inclusive)	Price
September 1, 2003 through August 31, 2004	102%
September 1, 2004 through August 31, 2005	101
September 1, 2005 and thereafter	100

The 1993 Series B Bonds maturing on September 1, 2023 are subject to mandatory sinking fund redemption, by lot, at a redemption price equal to 100% of the principal amount thereof plus accrued interest to the redemption date, on the dates and in the principal amounts as follows:

Year (September 1)	Principal Amount	Year (September 1)	Principal Amount
2017	\$1,325,000	2020	\$1,535,000
2018	1,390,000	2021	1,610,000
2019	1,460,000	2022	1,690,000
		2023*	1,775,000

* Final Maturity

(c) In accordance with the provisions of Section 7.10 hereof, the 1993 Bonds are subject to extraordinary redemption prior to maturity at the option of the Authority, in whole or in part at any time, in the event of condemnation, damage or destruction of the Water and Sewer System, out of moneys deposited with or held by the Trustee for such purpose, upon payment of 100% of the principal amount, being redeemed, plus interest accrued to the date fixed for redemption.

If less than all 1993 Bonds within a series are to be redeemed at a particular time, the 1993 Bonds within such series so to be called for redemption shall be redeemed at random in any reasonable manner determined by the Trustee, unless otherwise directed by the Authority.

Section 4.02. Notice of Redemption. Notice of the redemption of Bonds, other than mandatory sinking fund redemption and excepting any notice that refers to Bonds that are the subject of an advance refunding, shall be sent only if sufficient funds have been deposited with the Trustee to pay the redemption price of the Bonds to be redeemed. Whenever the Authority shall redeem all or part of the Bonds, it shall cause a written.

telegraphic or telexed notice of intention to redeem, signed in the name of the Authority by its Secretary or Assistant Secretary to be sent, by the Trustee to each registered owner of the Bonds to be redeemed at the last address of said registered owner appearing upon the registration books not less than fifteen (15) days or more than thirty (30) days before the redemption date. Failure to mail any such notice shall not affect the validity of the proceeding for redemption. Such notice shall specify the maturities and the numbers of the Bonds so to be redeemed, if less than all Bonds of a maturity are to be redeemed, the date fixed for redemption, the redemption price and the place of payment, and shall further state that, from and after such redemption date, interest thereon will cease to accrue. Simultaneously with the mailing of notice to Bondholders, the Trustee shall notify the Bond Insurer of any redemption, other than mandatory sinking fund redemption, of the 1993 Bonds, which notice shall include the principal amount, maturities and CUSIP numbers thereof.

Section 4.03. Nonpresentation of Bonds. Notice having been given in the manner hereinbefore provided in this Article and irrevocable instructions having been given to the Trustee to pay said Bonds or portions thereof and cash equal to the redemption price of said Bonds and the interest accrued thereon to the date of redemption having been deposited in trust with the Trustee on or prior to the date set for redemption, the Bonds so called for redemption shall become due and payable on the redemption date so designated, and interest on such Bonds shall cease to accrue from such redemption date, whether such Bonds are presented for redemption or not. The principal amount of all Bonds so called for redemption, together with the premium, if any, and accrued interest thereon, shall be paid by the Trustee, upon presentation and surrender thereof.

Section 4.04. CUSIP Numbers. The Trustee shall use the "CUSIP" numbers assigned to the Bonds, if then generally in use, in notices of redemption of Bonds as a convenience to Bondholders; provided that any such notice shall state that no representation is made as to the correctness of such numbers either as printed on the Bonds or as contained in any notice of redemption and that reliance may only be placed on the identification numbers established under the Indenture.

ARTICLE V

CONSTRUCTION FUND

Section 5.01. Construction Funds. There are hereby created two Construction Funds named the "Prior Bonds Construction Fund" and the "1993 Bonds Construction Fund" (herein collectively called the "Construction Fund"). On the date of issuance of the 1993 Bonds, any moneys remaining in the Construction Fund, as well as all moneys in the Renewal and Replacement Fund, established under the 1991 Indenture shall be deposited into the Prior Bonds Construction Fund and the moneys directed by the Authority to be transferred from the Clearing Fund shall be deposited into the 1993 Construction Fund. All moneys on deposit in the Construction Fund shall be held in trust by the Trustee as security

under this Indenture and disbursed by the Trustee pursuant to this Section 5.01 in payment of the Costs of the Construction Project. Before each such withdrawal and payment of the Costs of the Construction Project from the Construction Fund by the Trustee, the Authority shall deliver to the Trustee the following:

(a) A requisition, signed by the Chairman or a Vice Chairman or the Executive Director and the Treasurer or Secretary or Assistant Secretary-Treasurer of the Authority, stating in respect of each payment to be made:

- (1) the item number of the payment;
- (2) the name and address of the person to whom payment is due;
- (3) the amount to be paid and the Construction Fund from which payment is to be made;
- (4) the purpose for which the obligation was incurred;
- (5) that obligations in the stated amount have been incurred by the Authority and that each item thereof is a proper part of the Cost of the Construction Project and has not been paid;
- (6) that there has not been filed with or served upon the Authority notice of any lien, right to lien or attachment upon, or claim affecting the right to receive payment of any of the moneys payable to any persons named in such requisition;
- (7) that such requisition contains no items representing payment on account of any retained percentage which the Authority is on the date of such certificate entitled to retain;
- (8) that neither the Authority nor any of its officers or members has received any discount, rebate, commission, fee, proceeds from insurance or other abatement which is not reflected on the requisition in connection with any such expenditures or indebtedness; and
- (9) that no part of any such item has been included in any previous requisition for the withdrawal of moneys from the Construction Fund or the Construction Fund established under the 1984 Indenture, the 1985 Indenture, the 1986 Indenture or the 1991 Indenture;

(b) Except to the extent to which a requisition relates to financing costs, a certificate signed by the Consulting Engineer approving such requisition and certifying that each item to be paid as set forth in such requisition constitutes an obligation which has been properly incurred as part of the Cost of the Construction Project and is then due and unpaid;

(c) If any such requisition contains any item for the payment of the purchase price or costs of any lands, franchises, easements, rights-of-way, or rights or interests in or relating to lands, except payments for options or partial payments upon contracts not exceeding in the aggregate 10% of the purchase price or cost of such lands, franchises, easements, rights-of-way or rights or interests in or relating to lands, covered by such options or contracts, an opinion of counsel for the Authority to the effect that the Authority either has or will immediately upon such payment have (by reason of the prior or simultaneous delivery of proper instruments of conveyance or transfer mentioned in such opinion) leasehold title thereto, or other interests therein, sufficient for the ownership, maintenance and operation for a period of not less than the maturity of the Bonds of the portion of the Water and Sewer System located or to be located thereon, except Permitted Liens and Title Defects.

Upon the receipt of each such requisition and the accompanying certificates and opinions, the Trustee shall pay to the persons named in such requisition, the respective amounts stated therein to be due to such persons.

Investment earnings on the amounts on deposit in the Construction Fund shall be transferred by the Trustee to the Debt Service Fund unless the Authority directs the Trustee to retain such earnings in the Construction Fund.

Any moneys remaining in the Construction Fund after all amounts due in respect of the Construction Project shall have been paid, which fact shall be evidenced to the Trustee by delivery of an Officers' Certificate to that effect, shall be transferred by the Trustee to the Renewal and Replacement Fund to the extent of any deficiency therein and thereafter to the Debt Service Fund. If an Event of Default pursuant to Section 8.01(a) or (b) occurs, and only to the extent that no other available moneys are held under this Indenture, the Trustee shall transfer moneys from the Construction Fund to the Debt Service Fund to pay principal and interest on the Bonds.

Section 5.02. Amendment of Construction Project. The Authority may from time to time amend or revise the Construction Project with the approval of the Consulting Engineer, but only if the Authority shall have first delivered to the Trustee (i) a statement describing the proposed amendments and revisions, (ii) a resolution of the Board approving the proposed amendments and revisions and (iii) a certificate signed by the Consulting Engineer setting forth the general effect of such proposed amendments and revisions and certifying in his opinion that such proposed amendments and revisions are in the best interests of the Authority and will not have a materially adverse effect on the interests of the Bondholders.

Section 5.03. Assessment Projects. Whenever the Authority has determined to charge the cost of construction of any future project against the properties benefited, improved or accommodated thereby, the Authority shall promptly file with the Trustee certified resolutions imposing assessments and, if the assessment is to be according to the front foot rule, a certified copy of the resolution or ordinance of the municipality or municipalities in which the project is located approving the estimated cost, and shall keep

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Notwithstanding the pledge of all Receipts and Revenues hereunder, on the date of issuance of the 1993 Bonds and on or before the first day of each month thereafter, the Authority shall transfer from the Revenue Fund to the Operation and Maintenance Fund an amount equal to the amount budgeted by the Authority for that month for payment of the Current Expenses as the same become due.

After making the foregoing transfer, if required, (i) on or before each Interest Payment Date, the Authority shall transfer from the Revenue Fund to the Trustee for deposit to the Debt Service Fund an amount equal to the amount of interest that has actually accrued and is payable on the 1993 Bonds to such date (after taking into account any deposits to be made into the Debt Service Fund from the Construction Fund); and (ii) on or before December 1, 1993 and on or before the first day of each month thereafter, the Authority shall transfer from the Revenue Fund to the Trustee for deposit to the Debt Service Fund an amount equal to one-tenth of the principal due on the 1993 Bonds on September 1, 1994; and (iii) on or before September 1, 1994 and on or before the first day of each month thereafter, the Authority shall transfer from the Revenue Fund to the Trustee for deposit to the Debt Service Fund an amount equal to one-twelfth of the principal (whether due at maturity or by mandatory redemption) due on the 1993 Bonds on the next following September 1.

If the Trustee shall have withdrawn moneys from the Debt Service Reserve Fund or the Operating Reserve Account (or if there is a deficiency in the amount on deposit in the Debt Service Reserve Fund as a result of a decline in market value), the Authority shall, on the first day of the month after such withdrawal has been made (or such deficiency has been determined), and only after the foregoing required transfers from the Revenue Fund have been made, transfer from the Revenue Fund to the Trustee for deposit to the Debt Service Reserve Fund and/or the Operating Reserve Account, as the case may be, such amounts as are specified in Section 6.03 and 6.04 hereof in order to restore the amounts in the Debt Service Reserve Fund or the Operating Reserve Account to the amounts required to be maintained therein.

The Authority's obligation to repay any Policy Costs to the Bond Insurer shall have the same priority and be paid in the same manner from the Revenue Fund as the obligation to maintain and refill the Debt Service Reserve Fund. Repayment of Policy Costs shall commence in the first month following each draw on the Debt Service Reserve Fund Policy, and each such monthly payment shall be in an amount at least equal to one-twelfth of the aggregate of the Policy Costs related to such draw.

After the foregoing transfers have been made, on the date(s) specified in the Consulting Engineer's report required by Section 7.11 hereof, the Authority shall transfer from the Revenue Fund to the Trustee for deposit to the Renewal and Replacement Fund such amount as is specified in the Consulting Engineer's report.

The Authority, after making the foregoing transfers, shall transfer from the Revenue Fund all payments due on any subordinated debt incurred pursuant to Section 3.05 hereof and thereafter into the Supplemental Costs Fund an amount equal to the Additional

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available for inspection by the Trustee a schedule of assessments made and liens filed thereunder.

Section 5.04. Payment of Assessments. The Authority may, in its discretion, permit payment of assessments in equal quarterly, semi-annual or annual installments with interest at such rate as the Authority may determine, subject to applicable law, but in no event shall the last installment become due more than five years after notice of assessment. If any assessment is not paid in full within 60 days following the assessment, the Authority shall cause its claim therefor to be filed as a lien against the property assessed with reasonable promptness and in any event no later than the last day permitted by law. If any assessment or installment thereof is not paid when due, the Authority shall take such action for the enforcement of such liens as may be necessary to collect the amounts due together with costs and interest and, at the discretion of the Authority, penalties thereon.

Section 5.05. Deposit of Assessment Revenues. The Authority shall deposit assessment revenues in the Revenue Fund unless a Supplemental Indenture under which assessment bonds are issued provides for other disposition of assessment revenues.

Section 5.06. Contract Security. All contracts which provide for the furnishing of material or the doing of work with regard to the Construction Project shall be in compliance with all federal and state statutes, rules and regulations and shall be subject to the approval of the Consulting Engineer. The Authority will require each person with whom it may contract for construction to furnish a performance security and a labor and material-men's security each for not less than 100% of the full amount of the contract entered into with such person or such greater or lesser amount as may be required by applicable law, and to carry such insurance as may be required by law and as may be recommended by the Consulting Engineer. The proceeds of any such performance security shall forthwith, upon the receipt thereof by the Authority, be deposited to the credit of the applicable Construction Fund and applied toward the completion of the construction covered by the contract in connection with which such performance security shall have been furnished except that any such proceeds as shall constitute liquidated damages for delay shall be deposited to the credit of the Revenue Fund.

ARTICLE VI

REVENUES, FUNDS AND INVESTMENTS

Section 6.01. Revenue Fund; Depreciation Reserve Account. The Authority hereby agrees to establish with one or more Authorized Depositories a fund to be known as and referred to herein as the "Revenue Fund" into which all Receipts and Revenues and all other amounts received by the Authority from any source (except as otherwise provided herein) shall be deposited. On the date of issuance of the 1993 Bonds all amounts in the Revenue Fund created under the 1991 Indenture shall be transferred to the Revenue Fund created hereunder.

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Payment and the Indirect Expenses due the City pursuant to the Agreement for such Fiscal Year, to be used in accordance with Section 6.07 hereof.

The Authority additionally agrees to establish within the Revenue Fund a Depreciation Reserve Account. On December 1 of each year after making the foregoing transfers, the Authority shall transfer to the Depreciation Reserve Account an amount equal to the excess of the depreciation on the Water and Sewer System during such year over the principal payments on the Bonds outstanding during such year and the amount of Capital Additions funded from the Authority's Gross Revenues during such year. Moneys in the Depreciation Reserve Account may be applied by the Authority to the payment of (i) principal on the Bonds of the Authority; (ii) Capital Additions; and (iii) the Construction Project.

In addition to the transfers and payments required above, the Authority shall also make such transfers and payments as may be required by any Supplemental Indenture executed and delivered in connection with the issuance of Additional Bonds.

Section 6.02. Operation and Maintenance Fund. The Authority hereby agrees to establish with an Authorized Depository a fund to be known and referred to herein as the "Operation and Maintenance Fund" into which the Authority shall deposit the funds specified in Section 6.01 hereof for payment of the Authority's Current Expenses. On the date of issuance of the 1993 Bonds, all moneys in the Operation and Maintenance Fund created under the 1991 Indenture shall be transferred to the Operation and Maintenance Fund created hereunder.

The Authority shall promptly pay out of the Operation and Maintenance Fund its Current Expenses as the same shall become due. All withdrawals or payments from the Operation and Maintenance Fund shall be made in accordance with the By-laws of the Authority.

There is hereby created and designated a special account within the Operation and Maintenance Fund called the "Operating Reserve Account" which shall be held in trust by the Trustee separate from the Operation and Maintenance Fund, until applied to as hereinafter provided. On the date of issuance of the 1993 Bonds all moneys in the Operating Reserve Account established under the 1991 Indenture shall be transferred to the Operating Reserve Account created hereunder. Thereafter there shall be maintained in the Operating Reserve Account one-sixth of the amount equal to Authority's budgeted Current Expenses for the current Fiscal Year. Amounts in the Operating Reserve Account shall be applied by the Trustee upon written request of the Authority to pay the Current Expenses of the Authority to the extent that the amounts on deposit in the Operation and Maintenance Fund are insufficient. If a deficiency exists in the Operating Reserve Account, on the dates specified in Section 6.01 above, the Authority shall withdraw from the Revenue Fund such amounts as will be sufficient to repair any deficiencies in the Operating Reserve Account in not more than twelve (12) equal monthly payments. All earnings on the investment of amounts in the Operating Reserve Account shall be transferred by the Trustee to the Authority for deposit in the Revenue Fund.

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Section 6.03. Debt Service Fund. There is hereby created and designated a special fund called the "Debt Service Fund" which shall be held in trust by the Trustee until applied as hereinafter directed. The Trustee shall on each March 1 and September 1 transfer from the Revenue Fund to the Debt Service Fund the amount necessary for payment of principal and/or interest on the 1993 Bonds.

Upon receipt of moneys on the dates and in the amounts specified in Section 6.01, the Trustee shall deposit such moneys into the Debt Service Fund which amounts shall be applied by the Trustee on each Interest Payment Date for the purpose of paying principal and/or interest due on the 1993 Bonds on such Interest Payment Date.

On the dates specified in a Supplemental Indenture or Indentures relating to Additional Bonds, the Authority shall deposit and the Trustee shall apply the amounts required to be deposited on said dates pursuant to the provisions of such Supplemental Indenture or Indentures for the purpose of paying the interest on and principal of such Additional Bonds.

In addition to the payment of principal on the 1993 Bonds as the same mature, the 1993 Bonds shall be subject to mandatory redemption.

The Authority may deposit into the Debt Service Fund such additional funds as the Authority shall determine which shall be applied by the Trustee at the request of the Authority to the purchase of 1993 Bonds and such moneys shall be withdrawn by the Trustee and deposited in the Redemption Fund and applied to the payment of the purchase price of such 1993 Bonds which the Authority or the Trustee may agree to purchase; provided, however, that the Authority shall not purchase, and the Trustee shall not apply moneys in the Debt Service Fund to the purchase of such 1993 Bonds at a price in excess of 100% of the principal amount thereof, plus accrued interest thereon to the date of purchase. At any time that the Trustee shall be requested to apply such moneys in the Debt Service Fund to purchase such 1993 Bonds, the Authority shall furnish to the Trustee not later than sixty (60) days prior to the next mandatory redemption date of any applicable year an Officers' Certificate specifying the 1993 Bonds which it has agreed to purchase, the purchase price thereof, the names of the sellers and the expenses involved in connection with such purchase.

Section 6.04. Debt Service Reserve Fund. There is hereby created and designated a special fund called the "Debt Service Reserve Fund" which shall be held in trust by the Trustee until applied as hereinafter provided. On the date of issuance of the 1993 Bonds there shall be deposited into the Debt Service Reserve Fund, the Debt Service Reserve Fund Policy in the amount of \$23,180,170, which is equal to the Maximum Annual Debt Service Requirements on the 1993 Bonds. There shall be maintained in the Debt Service Reserve Fund an amount equal to the Maximum Annual Debt Service Requirements on the Bonds (but in no event shall such amount be required to be in excess of 10% of the proceeds of the Bonds or such larger amount as may be permitted by federal tax laws). For purposes of funding the Debt Service Reserve Fund, Maximum Annual Debt Service Requirements for any variable rate debt shall be calculated on the basis that such variable rate debt is assumed to bear interest at the highest of: (i) the actual rate on the date of calculation, or if the indebtedness is not yet

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after applying all cash available in the Debt Service Reserve Fund and prior to replenishment of any such cash draws, respectively.

If the Authority shall fail to pay any Policy Costs in accordance with the provisions of this Indenture, the Bond Insurer shall be entitled to exercise any and all remedies under this Indenture other than (i) acceleration of the maturity of the Bonds, or (ii) remedies which would adversely affect Bondholders.

The Trustee shall notify the Bond Insurer of any withdrawal from the Debt Service Reserve Fund due to a deficiency in any other fund or of any deficiency in the Debt Service Reserve Fund due to market fluctuation of the investments held therein.

Section 6.05. Redemption Fund. There is hereby created and designated a special fund to be known as the "Redemption Fund" which shall be held in trust by the Trustee until applied as hereinafter provided. The Authority may transfer to the Trustee for deposit to the credit of the Redemption Fund such amounts as it may elect for the purchase of Bonds or redemption of Bonds at the option of the Authority and the Trustee shall apply such moneys to the redemption of Bonds in the amounts directed by the Authority. Upon any such purchase or redemption, the Trustee shall transfer from the Debt Service Fund to the Redemption Fund any amount deposited in the Debt Service Fund with respect to interest on the Bonds being redeemed and shall pay the interest due on the redemption date out of such moneys.

Section 6.06. Renewal and Replacement Fund. There is hereby created and designated a special fund to be known as the "Renewal and Replacement Fund" which shall be held in trust by the Trustee until applied as hereinafter provided.

The moneys at any time on deposit to the credit of the Renewal and Replacement Fund may be used by the Authority for extraordinary maintenance and repair of the Water and Sewer System or to pay the cost of Capital Additions, or, to the extent that moneys are not available in the Construction Fund, to pay the cost of the Construction Project. In addition, the Trustee shall, without any direction from the Authority, transfer moneys from the Renewal and Replacement Fund to the Debt Service Fund or to any sinking, purchase or analogous fund to the extent that the moneys in the Debt Service Fund, the Debt Service Reserve Fund or any sinking, purchase or analogous fund may on any Interest Payment Date be insufficient to make the payment for which the Debt Service Fund, the Debt Service Reserve Fund or any sinking, purchase or analogous fund was established as the same shall become due.

So long as the amount on deposit in the Renewal and Replacement Fund is not less than the amount set forth in the Consulting Engineer's report required by Section 7.11 hereof, the Authority is not required to make any deposits into the Renewal and Replacement Fund. If, upon receipt of the Consulting Engineer's report, the amount on deposit in the Renewal and Replacement Fund is less than the amount set forth in the Consulting Engineer's report required by Section 7.11 hereof, the Authority shall, on the date(s) specified in such report, transfer to the Trustee from the Revenue Fund to the Renewal and Replacement Fund an amount equal to the amount necessary to fully fund the Renewal and Replacement Fund to the amount required by the Consulting Engineer's report.

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outstanding, the initial rate (if established and binding), (ii) if the indebtedness has been outstanding for at least twelve months, the average rate over the twelve months immediately preceding the date of calculation, and (iii) (1) if interest on the indebtedness is excludable from gross income under the applicable provisions of the Internal Revenue Code of 1986, as amended, the most recently published Bond Buyer 25 Bond Revenue Index (or comparable index if no longer published) plus fifty (50) basis points, or (2) if interest is not so excludable, the interest rate on direct U.S. Treasury Obligations with comparable maturities plus fifty (50) basis points. In addition to the Debt Service Reserve Fund Policy, any amount required to be maintained in the Debt Service Reserve Fund may be in the form of cash, a letter of credit or other credit instrument, a surety bond or a combination thereof and shall conform to the requirements set forth in Exhibit "A" hereto and incorporated herein, unless specifically waived or amended in writing by the Bond Insurer.

After making the deposits required pursuant to Section 6.02 and 6.03 hereof, the Authority shall withdraw from the Revenue Fund and deposit into the Debt Service Reserve Fund:

(a) on the dates specified in any Supplemental Indenture or Indentures relating to Additional Bonds, the amounts required to be deposited on such dates to the credit of the Debt Service Reserve Fund pursuant to the provisions of such Supplemental Indenture or Indentures; and

(b) if a deficiency exists in the Debt Service Reserve Fund, on the dates specified in Section 6.01 above, such amounts as will be sufficient to repair any deficiencies in the Debt Service Reserve Fund in not more than twelve equal monthly payments.

The Trustee shall ascertain the necessity for a claim upon the Debt Service Reserve Fund Policy and provide notice to the Bond Insurer of any such claim in accordance with the Debt Service Reserve Fund Policy at least two Business Days prior to each Interest Payment Date. The Trustee shall without any direction from the Authority, transfer moneys from the Debt Service Reserve Fund to the Debt Service Fund or to any sinking, purchase or analogous fund to the extent that the moneys in the Debt Service Fund or any sinking, purchase or analogous fund may on any Interest Payment Date be insufficient to make the payments for which the Debt Service Fund or any sinking, purchase or analogous fund was established as the same shall become due. If and to the extent that cash has been deposited into the Debt Service Reserve Fund in addition to the Debt Service Reserve Fund Policy, all such cash shall be used (or investments purchased with such cash shall be liquidated and the proceeds applied as required) prior to any drawing under the Debt Service Reserve Fund Policy, and repayment of any Policy Costs shall be made prior to replenishment of any such cash amounts.

If, in addition to the Debt Service Reserve Fund Policy, any other reserve fund substitute instrument ("Additional Reserve Fund Policy") is provided, drawings on the Debt Service Reserve Fund Policy and any such Additional Reserve Fund Policy, and of repayment of Policy Costs and reimbursement of amounts due under the Additional Reserve Policy, shall be made on a pro rata basis (calculated by reference to maximum amounts available thereunder)

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Section 6.07. Supplemental Costs Fund. The Authority agrees to establish with an Authorized Depository a fund to be known and referred to herein as the "Supplemental Costs Fund" into which the Authority shall deposit the funds specified in Section 6.01 hereof. On the date of issuance of the 1993 Bonds all amounts in the Supplemental Costs Fund established under the 1991 Indenture shall be transferred to the Supplemental Costs Fund. Moneys in this fund shall be applied by the Authority for the payment of the Additional Payment and Indirect Expenses. Any moneys remaining in the Supplemental Cost Fund after payment of the Additional Payment and Indirect Expenses on or after October 1 of each year shall thereafter be transferred to the Revenue Fund.

Section 6.08. Rebate Fund. A. There is hereby created and established with the Trustee separate and apart from the pledge of this Indenture a fund designated as "The Pittsburgh Water and Sewer Authority Rebate Fund (the "Rebate Fund"). Within the Rebate Fund there is hereby created and established a 1993 Bonds Rebate Account. Within 30 days after the end of each Bond Year, the Trustee shall furnish to the Authority a report setting forth for each Fund and account created under this Indenture the total amount invested in each of the Funds and accounts during the preceding year, the investments made with the moneys in the Funds and accounts and the investments earnings and losses resulting from such investments, together with such additional information concerning such investments as the Authority shall reasonably request; provided, however, that the Authority shall only be required to make a rebate calculation at the end of every fifth "Bond Year". With respect to the 1993 Bonds, each Bond Year shall end on November 16. The Trustee shall make deposits to and disbursements from the Rebate Fund upon directions furnished by the Authority and in accordance with the provisions of Clauses B. and C. below, shall invest the Rebate Fund pursuant to instructions given to it by the Authority and shall deposit income from such investments immediately upon receipt thereof in the 1993 Rebate Account. Anything herein to the contrary notwithstanding, the immediately preceding sentence of this Section and Clauses B. and C. below may be superseded or amended by new instructions delivered by the Authority and accompanied by an Opinion of Counsel from an individual or firm nationally recognized as bond counsel, addressed to the Trustee to the effect that the use of such new instructions will not adversely affect the tax exemption of the 1993 Bonds. If the Authority has not provided directions as to rebate withdrawals, deposits or disbursements in a timely manner, the Trustee may at the Authority's expense hire a consultant to perform the necessary and appropriate calculations.

B. If a withdrawal from the 1993 Rebate Account is permitted as a result of a computation made by the Authority, the amount withdrawn shall be deposited in the Debt Service Fund for the benefit of the Authority. Records of the determinations required by this Section shall be retained by the Trustee until six years after the 1993 Bonds are no longer Outstanding.

C. Not later than 60 days after the end of every fifth bond year, the Trustee shall pay to the United States Internal Revenue Service from moneys on deposit in the appropriate account of the Rebate Fund or from other available funds under the Indenture the rebate amount, if any, as set forth in the Authority's report. Every payment required to be made pursuant to this Section shall be filed with the Internal Revenue Service Center, Philadelphia, Pennsylvania 19255 and shall be accompanied by a copy of the Form 8038-T.

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Section 6.09 Authorized Investments. At the direction of the Authority, signed by any two of its Chairman or Vice Chairman or Executive Director or Secretary or Assistant Secretary-Treasurer or Treasurer, or signed by such other person or persons who is or are authorized to do so pursuant to a resolution of the Board, a certified copy of which shall be on file with the Trustee, moneys to the credit of the following Funds shall be invested by the Trustee in the following securities:

(a) Direct obligations of the United States of America and securities fully and unconditionally guaranteed as to the timely payment of principal and interest by the United States of America, provided, that the full faith and credit of the United States of America must be pledged to any such direct obligation or guarantee ("Direct Obligations").

(b) Direct obligations and fully guaranteed certificates of beneficial interest of the Export-Import Bank of the United States; consolidated debt obligations and letter of credit-backed issues of the Federal Home Loan Banks; participation certificates and senior debt obligations of the Federal Home Loan Mortgage Corporation ("FHLMCs"); debentures of the Federal Housing Administration; mortgage-backed securities (except stripped mortgage securities which are valued greater than par on the portion of unpaid principal) and senior debt obligations of the Federal National Mortgage Association ("FNMA's"); participation certificates of the General Services Administration; guaranteed mortgage-backed securities and guaranteed participation certificates of the Government National Mortgage Association ("GNMA's"); guaranteed participation certificates and guaranteed pool certificates of the Small Business Administration; debt obligations and letter of credit-backed issues of the Student Loan Marketing Association; local authority bonds of the U.S. Department of Housing & Urban Development; guaranteed Title XI financings of the U.S. Maritime Administration; guaranteed transit bonds of the Washington Metropolitan Area Transit Authority; Resolution Funding Corporation securities.

(c) Direct obligations of any state of the United States of America or any subdivision or agency thereof whose unsecured, uninsured and unguaranteed general obligation debt is rated, at the time of purchase, "A" or better by Moody's and "A" or better by S&P, or any obligation fully and unconditionally guaranteed by any state, subdivision or agency whose unsecured, uninsured and unguaranteed general obligation debt is rated, at the time of purchase, "A" or better by Moody's and "A" or better by S&P.

(d) Commercial paper (having original maturities of not more than 270 days) rated, at the time of purchase, "P-1" by Moody's and "A-1" or better by S&P.

(e) Federal funds, unsecured certificates of deposit, time deposits or bankers acceptances (in each case having maturities of not more than 365 days) of any domestic bank including a branch office of a foreign bank which branch office is located in the United States, provided legal opinions are received to the effect that full and timely payment of such deposit or similar obligation is enforceable against the principal office or any branch of such bank, which, at the time of purchase, has a short-term "Bank Deposit" rating of "P-1" by Moody's and a "Short-Term CD" rating of "A-1" or better by S&P.

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(f) Deposits of any bank or savings and loan association which has combined capital, surplus and undivided profits of not less than \$3 million, provided such deposits are continuously and fully insured by the Bank Insurance Fund or the Savings Association Insurance Fund of the Federal Deposit Insurance Corporation ("FDIC").

(g) Investments in money-market funds rated "AAAm" or "AAAm-G" by S&P.

(h) Repurchase agreements collateralized by Direct Obligations, GNMA's, FNMA's or FHLMC's with any registered broker/dealer subject to the Securities Investors' Protection Corporation jurisdiction or any commercial bank insured by the FDIC, if such broker/dealer or bank has an unsecured, unsecured and unguaranteed obligation rated "P-1" or "A3" or better by Moody's and "A-1" or "A-" or better by S&P, provided:

- (i) a master repurchase agreement or specific written repurchase agreement governs the transactions; and
- (ii) the securities are held free and clear of any lien by the Trustee or an independent third party acting solely as agent ("Agent") for the Trustee, and such third party is (i) a Federal Reserve Bank, (ii) a bank which is a member of the Federal Deposit Insurance Corporation and which has combined capital, surplus and undivided profits of not less than \$50 million, or (iii) a bank approved in writing for such purpose by the Bond Insurer, and the Trustee shall have received written confirmation from such third party that it holds such securities, free and clear of any lien, as agent for the Trustee; and
- (iii) a perfected first security interest under the Uniform Commercial Code, or book entry procedures prescribed at 31 C.F.R. 306.1 et seq. or 31 C.F.R. 350.0 et seq. in such securities is created for the benefit of the Trustee; and
- (iv) the repurchase agreement has a term of 180 days or less, and the Trustee or the Agent will value the collateral securities no less frequently than weekly and will liquidate the collateral securities if any deficiency in the required collateral percentage is not restored within two Business Days of such valuation; and
- (vi) the fair market value of the securities in relation to the amount of the repurchase obligation, including principal and interest, is equal to at least 103%.

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All investments shall mature or shall be subject to withdrawal, as the case may be, not later than the date required for the operation of such Fund and in no event later than the date or the number of months or years after the date of such investment or deposit as specified in the following columns:

<u>Fund</u>	<u>Period of Investment</u>
Debt Service Fund	Not later than one day prior to the next interest or principal payment date.
Debt Service Reserve Fund	Not later than 5 years from the date of investment, or such longer period as may be approved by the Bond Insurer.
Redemption Fund	Not later than the day prior to the redemption date with respect to which such deposit has been made.
Construction Fund	Such dates as may be specified by the Authority to permit it to meet its obligations to be paid therefrom.
Renewal and Replacement Fund	Not later than 2 years from the date of investment.
Operating Reserve Account	Not later than 1 year from the date of investment.

In any such case, the full purchase price (including accrued interest and premiums, if any) of obligations, shall be paid out of the Fund for which the investment was made. Upon a like direction by the Authority, or whenever the moneys in said Funds are to be applied and paid out pursuant to any provisions of this Indenture, or, whenever the Trustee shall deem such action to be advisable, the Trustee shall sell all or any part of the obligations in which the moneys in one or more such Funds shall be invested or withdraw moneys from such accounts or certificates of deposit, and the proceeds of such sale or the amount of such withdrawal shall be deposited to the credit of the respective Fund or Funds. Interest and income derived from any such investments or deposits shall be held and transferred as follows, unless otherwise directed by the Authority:

- (a) Construction Fund - to Debt Service Fund;
- (b) Debt Service Fund - remain in that Fund;
- (c) Debt Service Reserve Fund remain in that fund to make up any deficiency therein; otherwise, transferred to Revenue Fund;
- (d) Redemption Fund - transferred to Revenue Fund;

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(e) Renewal and Replacement Fund - remain in that fund to make up any deficiency therein; otherwise, transferred to Revenue Fund.

(f) Operating Reserve Account - remain in that account to make up any deficiency therein; otherwise, transferred to Revenue Fund.

Any loss resulting from any such investment shall be charged to the respective Fund or Funds, for which such investment was made. Obligations purchased as an investment of any of said Funds shall be deemed at all times to be a part of such Fund. The Trustee shall not be liable or responsible for any loss resulting from any investment made in accordance with the provisions of this Section or resulting from any sale by the Trustee of such investment made in accordance with instructions from the Authority.

Cash in each of the Funds and accounts therein and all certificates of deposit, repurchase agreements and investment agreements all as referred to in this Article, to the extent that the same is not insured or guaranteed by the Federal Deposit Insurance Corporation or other Federal agency, shall be continuously secured by a pledge of securities described in (a) and/or (b) of Section 6.09 hereof having an aggregate market value, exclusive of accrued interest in the case of certificates of deposit and including accrued interest in the case of repurchase agreements or other investment agreements, at all times at least equal to 100% (or 103% in the case of repurchase agreements or investment agreements) of the balance on deposit (including interest earned in the case of repurchase agreements or investment agreements) in such Fund or account. Such securities shall be held by a trustee or agent satisfactory to the Authority and to the Trustee. In the event that the market value of such security is determined by the Trustee to be less than the required amount, the Trustee shall promptly obtain additional security.

All Authorized Investments (except investment agreements) shall be valued by the Trustee as frequently as deemed necessary by the Bond Insurer, but not less often than annually, at the market value thereof, exclusive of accrued interest.

No later than 20 days before each Interest Payment Date, the Trustee shall advise the Authority of the amount of interest credited and to be credited to the Debt Service Fund prior to the next Interest Payment Date to enable the Authority to determine the amount to be transferred from the Revenue Fund on such Interest Payment Date.

ARTICLE VII

RATE COVENANT AND PARTICULAR COVENANTS

Section 7.01. Authority Rate Covenant. The Authority covenants with the holders of the Bonds that it will comply with either (1) or (2) below in any Fiscal Year as follows:

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(1) The Authority will maintain, charge and collect, so long as any of the Bonds shall remain outstanding, reasonable rates, rentals and other charges for the use of the facilities of the Water and Sewer System which (after making due and reasonable allowances for contingencies and a margin of error in the estimates) together with other Receipts and Revenues, including any unrestricted cash and investments accumulated in the Revenue Fund at the beginning of each Fiscal Year, shall be at all times at least sufficient to provide annually:

- (a) Funds to pay all of the Current Expenses of the Authority; and
- (b) An amount equal to 120% of the Debt Service Requirements with respect to the Bonds during the then current Fiscal Year of the Authority.
- (c) Funds to pay the Indirect Expenses and the Additional Payment.

(2) The Authority will maintain, charge and collect, so long as any of the Bonds shall remain outstanding, reasonable rates, rentals and other charges for the use of the facilities of the Water and Sewer System which (after making due and reasonable allowances for contingencies and a margin of error in the estimates), together with other Receipts and Revenues, for the then current Fiscal Year (exclusive of interest income earned by the Authority on funds other than the Debt Service Reserve Fund; provided, however, that earnings on the Construction Fund may also be included during any construction period, but only to the extent such earnings are expressly required to be either retained in the Construction Fund and may be used to pay debt service on Bonds or are applied directly to payment of debt service on Bonds), shall be at all times at least sufficient to provide annually:

- (a) Funds to pay all of the Current Expenses of the Authority;
- (b) An amount equal to 100% of the Debt Service Requirements with respect to the Bonds during the then current Fiscal Year of the Authority; and
- (c) Funds to pay all Indirect Expenses and the Additional Payment.

Calculation of compliance with the covenant shall be made on the following basis: (a) operating revenue, Construction Fund income, earnings on the Debt Service Reserve Fund, Indirect Expenses and direct expenses, including required deposits to replenish any withdrawals from the Debt Service Reserve Fund and the Renewal and Replacement Fund which have not been capitalized shall be accounted for on the accrual basis; (b) costs of issuance of the Bonds may be treated as if such amounts are amortized over the life of the Bonds irrespective of any shorter period over which such costs are actually amortized; and (c) depreciation is specifically excluded from the calculation. In the event that any Policy Costs are due and owing at the time of the calculation of the rate covenant, Gross Revenues of the Authority shall be reduced by the amount of any Policy Costs then due and owing.

The Authority also covenants with the holders of the Bonds that if at any time the revenues collected shall not be sufficient to enable the Authority to comply with the provisions of this Section 7.01, it will promptly revise its water or sewer rates, rents and other charges so

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supplements, and it will take such actions and proceedings as may be required, from time to time, to preserve its corporate existence, rights and franchises.

Section 7.07. Liens; Sale of Assets. So long as any of the Bonds secured hereby are Outstanding, none of the Receipts and Revenues shall be used for any purpose other than as provided in this Indenture, and no contract or contracts will be entered into or any action taken by which the rights of the Trustee or of the Bondholders might be impaired or diminished.

The Authority will not voluntarily create or permit to be created any debt, lien or charge on a parity with or having priority over the lien of this Indenture upon any of the Receipts and Revenues pledged hereby or any other receipts and revenues or other amounts at any time pledged for the payment of the Bonds. The Authority will not sell or otherwise dispose of or encumber the Water and Sewer System or any part thereof except as herein otherwise provided. No sale or other disposition of fixed properties having a value in excess of One Million Dollars (\$1,000,000) shall be made unless the Consulting Engineer shall first have filed his certificate with the Authority and the Trustee recommending such sale or other disposition of said fixed properties and shall have stated in such certificate that the sale or other disposition of said properties is in the best interests of the Authority and will not impair the security of the Bonds and the retention of said properties is not necessary for the efficient operation of the Water and Sewer System. If, after receiving the certificate of the Consulting Engineer, the Authority determines to sell or otherwise dispose of said fixed properties, it shall by resolution adopted by a majority vote of a quorum of the Board, authorize such sale or other disposition and shall file a certified copy of such resolution with the Trustee.

The proceeds from such sale or other disposition of any such fixed properties shall be deposited in the Revenue Fund.

The Authority may from time to time sell or otherwise dispose of property other than fixed property included in the Water and Sewer System if the Authority shall determine that the sale or other disposition of such property is in the best interests of the Authority and will not impair the security of the Bonds and the retention of said properties is not necessary for the efficient operation of the Water and Sewer System. The proceeds from the sale or other disposition of such property shall be deposited in the Revenue Fund.

Section 7.08. Payment of Taxes and other Governmental Charges. The Authority will pay all taxes, assessments and other governmental charges lawfully imposed upon its properties or the Receipts and Revenues when the same shall become due as well as all lawful claims for labor, material and supplies, which, if unpaid, might by law become a lien or charge on the Water and Sewer System or the Receipts and Revenues or any part thereof prior to or on a parity with the lien hereof, or which might impair the security of this Indenture, so that the priority and security of this Indenture shall be preserved, provided that nothing in this Section contained shall require the Authority to pay and discharge any such tax, assessment, charge or claim so long as the validity thereof shall be contested in good faith by appropriate proceedings diligently conducted (unless and until foreclosure, distraint, sale or other similar proceedings shall have been commenced) and if such reserves or other appropriate provisions, if

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that the Authority will be in compliance with this Section 7.01 and so that any deficiencies in transfers of funds required to be made pursuant to this Indenture will be remedied before the end of the next ensuing Fiscal Year. Upon the adoption of any schedule of water or sewer rates, rents or other charges, or any revision thereof, the Authority shall cause certified copies thereof to be filed with the Trustee.

Section 7.02. Principal and Interest; Cancellation. The Authority will punctually pay the principal of (and premium, if any) and interest on each of the Bonds issued hereunder and secured hereby on the dates, at the places and in the manner specified herein and in said Bonds. All Bonds paid, redeemed or purchased, shall be cancelled by the Trustee. All such Bonds so cancelled may at any time be destroyed by the Trustee and an appropriate certificate of destruction shall be prepared and executed by the Trustee.

Section 7.03. No Extension of Payment. The Authority will not directly or indirectly extend or assent to the extension of the time of payment of any claim for interest upon any of the Bonds by purchasing or funding such claim or by any other arrangement, and, in case the time for payment of any such claim for interest shall be extended, such claim shall not be entitled, in case of any default hereunder, to the benefits of this Indenture, or to any payment out of the assets of the Authority, except subject to the prior payment of the principal of all Bonds issued and Outstanding hereunder, and of such portion of the accrued interest thereon as shall not be represented by such extended claims.

Section 7.04. Appointment of Trustee. The Authority hereby irrevocably appoints the Trustee as its agent to maintain an office or agency at its corporate trust office in the City, where Bonds may be presented for registration and transfer and where notices, presentations and demands in respect to the Bonds, or of this Indenture, may be served. The Trustee shall not be under any liability to the Authority or to any other corporation or person in respect of any such presentation, demand or notice. The Authority shall have the right to appoint a Paying Agent to perform any of the Trustee's duties hereunder with respect to the authentication, transfer, exchange or payment of the Bonds hereunder.

Section 7.05. Corporate Existence. The Authority is duly authorized under its certificate of incorporation and all applicable laws to issue the Bonds and execute and deliver this Indenture and to pledge the Receipts and Revenues pledged hereby, and all corporate action on its part to that end has been duly and validly taken; this Indenture is and will be a legal, binding and enforceable instrument in accordance with its terms except to the extent that the enforcement of the remedies provided for herein may be limited by bankruptcy laws or the Municipality Authorities Act; and the Bonds are and will be valid and binding obligations of the Authority entitled to the benefits and security of the Indenture. The Authority will at all times preserve and protect the security of the Bonds and the rights of the Trustee and the Bondholders hereunder.

Section 7.06. Compliance with Act; Maintenance of Existence. The Authority will at all times comply with the laws of the Commonwealth of Pennsylvania applicable to the Authority, particularly the Municipality Authorities Act of 1945 and its amendments and

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any, as shall be required by generally accepted accounting principles shall have been made therefor.

Section 7.09. Insurance of Water and Sewer System. The Authority will at all times cause all the property of the Water and Sewer System which is of a character usually insured by persons operating properties of a similar nature to be properly insured and kept insured by a reputable insurance company or companies against loss or damage by fire or other hazards to the extent that such properties are usually insured by persons operating properties of a similar nature in the same or similar localities. All policies shall be so written that the Trustee will be notified of cancellation or amendment at least fifteen (15) days prior to the effective date of such cancellation or amendment. In case the Trustee shall at any time notify the Authority in writing that it disapproves of any insurance company issuing a policy of insurance covering any one or more such risks, the Authority will forthwith effect other insurance with companies satisfactory to the Trustee.

All such policies shall be for the benefit of the Trustee and the Authority as their interests may appear. All policies shall provide that claims in excess of \$500,000 shall be made payable to the Trustee and shall be deposited with the Trustee and the Trustee shall have the sole right to receive the proceeds of such policies and to collect and receipt for claims in excess of \$500,000 thereunder. The Trustee may accept as conclusive the adjustment of any loss or losses by the Authority and any insurance company. The proceeds of all such policies paid to the Trustee shall be held by it as additional security hereunder until paid out by it as herein provided. All claims of \$500,000 or less shall be paid to the Authority.

The Authority will maintain public liability and property damage insurance in such amounts, containing such terms and provisions, as are usually maintained by persons operating similar facilities, provided, however, that the Authority may insure itself against such risks by a program of self insurance.

Section 7.10. Damage, Destruction or Condemnation of Water and Sewer System; Application of Proceeds. In the event of any damage to the Water and Sewer System covered by insurance or condemnation or taking by eminent domain of any part of the Water and Sewer System for which the cost of repair or replacement shall exceed \$500,000, the Authority shall promptly notify the Trustee and file with the Trustee a Consulting Engineer's certificate stating whether, in the signer's opinion, it is practicable and advantageous to repair or replace the damaged or condemned property. If the certificate states that repair or replacement is practicable and advantageous, the Consulting Engineer shall, if appropriate, prepare and file with the Trustee plans and specifications therefor with an estimate of the cost thereof, and the insurance or condemnation proceeds, if any, shall be applied thereto. If the proceeds are \$500,000 or more, the Trustee shall transfer any such proceeds to the Construction Fund. If the proceeds are less than \$500,000, the Trustee shall pay them to or upon the order of the Authority, which shall use them only to pay the costs of the repair or replacement. Any balance not so used shall be deposited by the Authority in the Revenue Fund or, at the option of the Authority, in a special fund with the Trustee for the extraordinary redemption of Bonds as hereinafter provided.

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If any insurance or condemnation proceeds are not so applied within 12 months after receipt by the Trustee, or if the Authority fails to file a Consulting Engineer's certificate with respect to any damage to the Water and Sewer System covered by insurance or condemnation or taking by eminent domain of any part of the Water and Sewer System for which the cost of repair or replacement shall exceed \$500,000, within three months after the occurrence of the damage or condemnation, or if the certificate which is filed states that the repair or replacement is not practical or advantageous, any such proceeds shall be deposited in the Revenue Fund or, at the option of the Authority, in the Redemption Fund for the extraordinary redemption of Bonds as hereinafter provided.

The 1993 Bonds are subject to redemption without premium at any time, in whole or in part, within a maturity by lot, by the Authority upon the occurrence of any condemnation or taking or damage or injury of the nature set forth in this Article, from the proceeds collected as a result of such damage, injury or taking. In all cases of redemption under this Section, including redemptions resulting from the damage, destruction or condemnation of equipment, the Authority shall cause to be filed with the Trustee the certificate of the Consulting Engineer referred to above, determining that repair, reconstruction or replacement is not practicable, desirable or financially feasible. In the event that less than all of the Bonds outstanding are to be redeemed, the Authority shall furnish to the Trustee a Consulting Engineer's Certificate stating (i) that the property forming a part of the Water and Sewer System that was damaged or injured or taken by such condemnation proceedings is not essential to the operation of the Water and Sewer System and that the continued operation of the remaining Water and Sewer System will not, in the signer's opinion, adversely affect the security of the Bonds remaining outstanding after such redemption, or (ii) that the Water and Sewer System has been restored to a condition substantially equivalent to its condition prior to the occurrence of such damage, injury or condemnation, and that continued operation of the Water and Sewer System will not, in the signer's opinion, adversely affect the security of the Bonds remaining outstanding after such redemption. For purposes of this Section 7.10, the term Consulting Engineer shall also include an employee of the City or the Authority who is otherwise qualified to act as Consulting Engineer under this Indenture.

Section 7.11. Employment of Consulting Engineer; Reports. The Authority will employ a Consulting Engineer to perform such duties as are imposed on the Consulting Engineer by the provisions of this Indenture.

It shall be the duty of the Consulting Engineer, in addition to the other duties prescribed elsewhere in this Indenture, to prepare and file with the Authority and with the Trustee on or before October 1, 1994, and on or before ninety days prior to the beginning of each Fiscal Year thereafter, a report setting forth the following:

- (a) His advice and recommendations as to the proper maintenance, repair and operation of the Water and Sewer System during the next Fiscal Year;
- (b) His advice and recommendations as to the Capital Additions that should be made during the next Fiscal Year, and his estimate of the amounts of money that should

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shall include therein for the year in question a statement as to whether the schedule of rates then in effect complies with the covenants contained in Section 7.01. Simultaneously with the delivery of the annual audited financial statements to the Bond Insurer, the Authority shall also provide: (A) the number of Water and Sewer System users as of the end of the Fiscal Year, (B) notification of the withdrawal of any Water and Sewer System user comprising 4% or more of system sales measured in terms of revenue dollars since the last reporting date, and (C) any significant plant retirements or expansions planned or undertaken since the last reporting date.

Section 7.15. Non-Arbitrage Covenant. The Authority covenants that it will not direct or make any use of the proceeds of the Bonds which would cause the Bonds to be arbitrage Bonds within the meaning of Section 148 of the Internal Revenue Code of 1986, as amended, and the regulations promulgated and proposed thereunder.

Section 7.16. Advances by Trustee. If the Authority shall fail to perform any of the covenants contained in this Article, the Trustee or any Bondholder through the Trustee may make advances to perform the same on behalf of the Authority, but shall be under no duty so to do; and all sums so advanced shall be at once repayable by the Authority and shall bear interest at the Prime Rate until paid, and shall be secured hereby, having the benefit of a lien hereby created on a parity with the Bonds, but no such advances shall be deemed to relieve the Authority from any default hereunder.

Section 7.17. Further Assurances. The Authority shall execute and deliver such further instruments and do such further acts as may be necessary or proper to carry out more effectually the purposes of this Indenture and the transfer to any new trustee of the estate, powers, instruments or funds held in trust hereunder. The Authority shall, on an ongoing basis, execute and deliver all documents and make or cause to be made all filings and recordings necessary or desirable in order to perfect, preserve and protect the interest of the Trustee in the Trust Estate to the extent possible under applicable law. Not earlier than 180 days nor later than 30 days prior to each fifth anniversary of the closing for the Bonds, the Authority shall deliver an opinion of Pennsylvania counsel to the Trustee and the Bond Insurer indicating that all filings and recordings have been made and all other actions have been taken so as to perfect, preserve and protect such interests under applicable law.

Section 7.18. Construction of Construction Project; Operation of Water and Sewer System. The Authority covenants that it will construct the Construction Project in an economical and efficient manner and that upon the completion of the Construction Project it will operate and maintain the same as a part of the Water and Sewer System.

The Authority further covenants that it will operate the Water and Sewer System in an efficient and economical manner, that it will at all times maintain the Water and Sewer System in good repair and in sound operating condition and will make all necessary repairs, renewals and replacements thereto.

Section 7.19. Covenant Against Encumbrances. The Authority further covenants that it will duly observe and comply with all valid requirements of any governmental authority relative to the Water and Sewer System, that it will not create or suffer to be created any lien or

be expended for Current Expenses and his estimate of the amounts of money necessary for such purposes;

(c) His advice and recommendations as to the amount, if any, to be maintained in the Renewal and Replacement Fund for extraordinary maintenance and repair of the Water and Sewer System, and the amount, if any, to be deposited therein during the next Fiscal Year; and

(d) His finding whether the properties of the Water and Sewer System have been maintained in good repair and sound operating condition and his estimate of the amount, if any, required to place such properties in such condition and the details of such expenditures and the approximate time required therefor.

Section 7.12. Adoption of Annual Budget. The Authority covenants that it will on or before the second Friday in December, commencing in December, 1993, prior to the beginning of each Fiscal Year thereafter, prepare and adopt a budget of Current Expenses for the next Fiscal Year, which budget shall contain an estimate of the Gross Revenues to be derived for the period covered by such budget, and a copy of such budget shall be promptly filed with the Trustee and the Bond Insurer. Any budget may be amended from time to time by the Authority and such amended budget shall be promptly filed with the Trustee and the Bond Insurer.

Until the adoption of the annual budget of Current Expenses for a particular Fiscal Year, the budget for the preceding Fiscal Year shall be deemed to be in force for such particular Fiscal Year.

Section 7.13. Maintenance of Water and Sewer System. The Authority will at all times maintain or cause to be maintained the Water and Sewer System and every part thereof in good repair, working order and condition, will continuously operate the same and will, from time to time, make or cause to be made all needful and proper repairs, renewals and replacements so that the aggregate efficiency and capacity of the Water and Sewer System shall at no time be unreasonably impaired or reduced.

Section 7.14. Employment of Independent Accountant; Annual Financial Report. Authority covenants that it has employed and will continue to employ an Independent Auditor to perform such duties as are imposed on the Independent Auditor by this Indenture.

The Authority has caused an accurate system of accounts to be installed as recommended by its Independent Auditor. The Authority will keep proper books of record and accounts in which complete and correct entries shall be made of all its dealings and transactions in accordance with generally accepted accounting principles, consistently applied. On or before May 1 of each year, beginning with May 1, 1994 the Authority will furnish to the Trustee and the Bond Insurer, and to any holder of any of the Bonds, at the written request of such holder, a copy of its audit report for the preceding Fiscal Year. Said audit report shall, in each instance, have been prepared by an Independent Auditor after having made an audit of the Authority's books and accounts pertaining to the Water and Sewer System for such year and

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charge upon the Water and Sewer System or any part thereof, other than as provided in this Indenture, and that it will pay or cause to be discharged, or will make adequate provision to satisfy and discharge all lawful claims and demands for labor, materials, supplies or other objects which, if unpaid, might by law become a lien upon the Water and Sewer System or any part thereof or the Receipts and Revenues; provided, however, that nothing contained in this Section shall require the Authority to pay or cause to be discharged, or make provisions for, any such lien or charge so long as the validity thereof shall be contested in good faith and by appropriate legal proceedings.

Section 7.20. Use of Receipts and Revenues. The Authority covenants and agrees that, so long as any of the Bonds secured hereby shall be Outstanding, none of the Receipts and Revenues will be used for any purpose other than as provided in this Indenture, and that no contract or contracts will be entered into or any action taken to impair or diminish the rights of holders of the Bonds.

Section 7.21. No Free Service. Except as provided in Section 7.01 hereof, the Authority will not render or cause to be rendered any free services of any nature by the facilities of the Water and Sewer System nor will any preferential rates be established for users of the same class, excluding the rates, fees or charges for services rendered to the City including its departments, agencies and instrumentalities (up to 600 million gallons of water each year).

Section 7.22. Failure to Pay for Services. Upon failure of any customer to pay for services rendered within thirty (30) days, after receipt of a billing for such services the Authority, to the extent permitted by law, shall initiate and diligently pursue proceedings to shut off the connection of such customer to the Water and Sewer System and to not furnish the customer or permit the customer to receive further service until all obligations owed by the customer to the Authority on account of services shall have been paid in full or arrangements for payment satisfactory to the Authority shall have been made. This covenant shall not, however, prevent the Authority from causing any connection to be shut off sooner.

Section 7.23. Enforcement of Collections. The Authority will diligently enforce and collect the rates, fees and other charges for the services of the Water and Sewer System; will take all steps, actions and proceedings for the enforcement and collections of such rates, fees and charges as shall become delinquent to the full extent permitted or authorized by law; and will maintain accurate records with respect thereto. All such rates, fees, charges and revenues herein pledged shall, as collected, be held in trust to be applied as provided in this Indenture and not otherwise.

Section 7.24. Additional Information to Bond Insurer. In addition to any other

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audits and reports required to be provided by the Authority to the Bond Insurer, the Authority shall provide the Bond Insurer with the following information:

- (i) Within 150 days after the end of each of the Issuer's Fiscal Years, budget for the new year, a statement of the amount on deposit in the Debt Service Reserve Fund as of the last valuation, and, if not presented in the audited financial statements, a statement of the Net Revenues pledged to payment of Bonds in each such Fiscal Year;
- (ii) Official statement or other disclosure, if any, prepared in connection with the issuance of additional debt, whether or not it is on parity with the Bonds within 30 days after the sale thereof;
- (iii) Notice of any draw upon or deficiency due to market fluctuation in the amount, if any, on deposit in the Debt Service Reserve Fund;
- (iv) Notice of the redemption, other than mandatory sinking fund redemption, of any of the 1993 Bonds, including the principal amount, maturities and CUSIP numbers thereof; and
- (v) Such additional information as the Bond Insurer may reasonably request from time to time.

ARTICLE VIII

REMEDIES

Section 8.01. Events of Default. Each of the following events is hereby declared an "Event of Default" for any Bond issued hereunder:

- (a) failure by the Authority to pay the principal of, or the premium (if any) payable upon the redemption of, any Bond when due and payable either at maturity, declaration, or by proceedings for redemption, or otherwise (no effect being given to payments made under the Bond Insurance Policy); or
- (b) failure by the Authority to pay any installment of interest on any Bond when due and payable (no effect being given to payments made under the Bond Insurance Policy); or
- (c) the entry of an order or decree appointing a receiver or receivers of the Water and Sewer System or of the Receipts and Revenues with the consent or acquiescence of the Authority, or, if such order or decree shall have been entered without the acquiescence or consent of the Authority, the failure of the Authority to cause such order or decree to be vacated or discharged or stayed on appeal within ninety (90) days after entry; or

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Bond Insurer of any other Event of Default known to the Trustee within thirty (30) days of the Trustee's knowledge thereof.

Section 8.02. Acceleration of Principal. Upon the occurrence and continuance of any Event of Default described in Section 8.01, the Trustee may, and at the written request of Bondholders of not less than 25% in principal amount of the Bonds then Outstanding shall by written notice to the Authority, declare the Bonds to be immediately due and payable, whereupon they shall, without further action, become and be immediately due and payable, anything in this Indenture or in the Bonds to the contrary notwithstanding, and the Trustee shall give notice thereof to the Authority and shall give notice thereof by certified mail to all holders of Outstanding Bonds. In addition, the Trustee shall be entitled to exercise any or all of the remedies granted to a trustee or under the Insurance Policy or the Municipality Authorities Act. In no event, so long as the Insurance Policy is in effect and the Bond Insurer is not in default thereunder, shall the Trustee accelerate the payment of the Bonds without the written consent of the Bond Insurer.

The above provision, however, is subject to the condition that if, after the principal of said Bonds shall have been so declared to be due and payable, all arrears of interest, if any, upon the Bonds and interest on overdue installments of interest at the rate of interest specified therein, and the principal of all Bonds which have matured other than by reason of such declaration, shall have been paid by the Authority, and the Authority shall also have performed all other things in respect to which it may have been in default hereunder, and shall have paid the reasonable charges of the Trustee and its counsel and of the holders of said Bonds, including reasonable attorneys' fees paid or incurred, then, and in every such case, the holders of not less than a majority in aggregate principal amount of the Bonds then outstanding, by written notice to the Authority and to the Trustee, may waive such default and its consequences and such waiver shall be binding upon the Trustee and upon all holders of Bonds issued hereunder; but no such waiver shall extend to or affect any subsequent default or impair any rights or remedy consequent thereon. In no event, so long as the Insurance Policy is in effect and the Bond Insurer is not in default thereunder, shall the Trustee waive a default without the prior written consent of the Bond Insurer.

Section 8.03. Remedies of Trustee and Bondholders; Rights of Entry. Subject to Section 8.02, upon the happening and during the continuance of any event of default specified in Section 8.01, then and in every such case, the Trustee may and, upon written request of the holders of not less than twenty-five per centum (25%) in aggregate principal amount of the Bonds then Outstanding, shall enter into and upon and take possession of the Water and Sewer System and each and every part thereof as for a condition broken and may exclude the Authority, its agents and employees and all persons claiming under them wholly therefrom and have, hold, use, operate, manage and control the same and each and every part thereof, and in the name of the Authority or otherwise as the Trustee shall deem best, conduct the business thereof and exercise all the rights and powers of the Authority with respect to the Water and Sewer System and use all its then existing property, assets and franchises for that purpose and out of the Receipts and Revenues, maintain, restore, insure and keep insured, the Water and Sewer System against such hazards as are ordinarily insured against by a person operating a water and sewer system similar to the Water and Sewer System and from time to time may

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(d) the institution of any proceeding with the consent or acquiescence of the Authority for the purpose of effecting a composition between the Authority and its creditors, or for the purpose of adjusting the claims of such creditors pursuant to any Federal or State statute now or hereafter enacted, if the claims of such creditors are under any circumstances payable out of the Receipts and Revenues, or if such proceeding shall have been instituted without the consent or acquiescence of the Authority, the failure of the Authority to have such proceeding withdrawn, or any order entered therein vacated or discharged, within ninety (90) days after the institution of such proceeding or the entry of such order; or

(e) the entry of a final judgment against the Authority, which judgment constitutes or could result in a lien or charge upon the Water and Sewer System or the Receipts and Revenues, or which materially and adversely affects the ownership, control or operation of the Water and Sewer System, if such judgment shall not be discharged within ninety (90) days from the entry thereof, or if an appeal shall not be taken therefrom, or from the order, decree or process upon which or pursuant to which such judgment was granted or entered, in such manner as to conclusively set aside the execution or levy under such judgment, order, decree or process, or the enforcement thereof; or

(f) the failure of the Authority to repair or replace, with reasonable dispatch, any part of the Water and Sewer System necessary for its efficient operation which shall have been destroyed or damaged (whether such failure promptly to repair or replace the same be due to the impracticability of such repair or replacement or the lack of funds therefor or for any other reason); or

(g) the failure or refusal of the Authority to comply with any provisions of the Municipality Authorities Act, as amended and supplemented, or the rendering of the Authority, for any reason, incapable of fulfilling its obligations hereunder or thereunder; or

(h) the failure of the Authority to observe any other covenant, condition or agreement of the Authority contained in the Bonds or in the Indenture and the continuation of such failure for a period of sixty (60) days after written notice of such failure from the Trustee, which may give such notice in its discretion and shall give such notice at the written request of the holders of not less than twenty-five per centum (25%) in aggregate principal amount of the Bonds then outstanding, provided that, the failure of the Authority to meet the rate covenant set forth in Section 7.01 hereof shall not constitute an Event of Default hereunder, and provided further that if such failure is not capable of being remedied within 60 days after such notice, no Event of Default shall exist if the Authority commences the actions necessary for the cure of such failure within such 60 day period and diligently pursues such actions thereafter.

The Trustee shall (i) provide immediate notice to the Bond Insurer of the occurrence of an Event of Default under clause (a) or (b) above and (ii) provide notice to the

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make all such necessary or proper repairs as to it may seem expedient, and establish, levy, maintain and collect such rates, rents and charges in connection with the Water and Sewer System as it may deem necessary, proper, desirable and reasonable, and collect and receive all Receipts and Revenues, and after deducting therefrom the expenses of operation, maintenance and repair and all expenses incurred hereunder and all other proper outlays herein authorized and all such payments which may be made for insurance and other proper charges, including just and reasonable compensation for its own services, and for the services of such attorneys, agents and employees as it may, in the exercise of its discretion, employ for any of the purposes aforesaid, the Trustee shall apply the rest and residue of the moneys received by it, as well as all cash and investments held by the Trustee in any fund hereunder, subject to the provisions hereof with respect to claims for principal and interest, to the payment of the principal of and interest on the Bonds. Whenever all that is due upon such Bonds and installments of interest and under any of the terms of this Indenture shall have been paid or deposited with the Trustee and all defaults made good, the Trustee in possession shall surrender possession to the Authority, its successors or assigns. However, the same right of entry shall exist upon any subsequent default or defaults. For purposes of this section, the Bond Insurer shall, so long as no default has occurred under its Insurance Policy, be deemed to be the owner of the 1993 Bonds.

Section 8.04. Judicial Action. In case of the breach of any of the covenants or conditions of this Indenture, the Trustee shall have the right and power to take appropriate judicial proceedings for the enforcement of its rights and the rights of the Bondholders hereunder. Upon the happening of an event of default hereunder, the Trustee may either after entry, or without entry, proceed by suit or suits, actions or special proceedings at law or in equity to enforce its rights and the rights of the Bondholders hereunder, and it shall be obligatory upon the Trustee to take action to that end, either by such proceedings or by the exercise of its powers with respect to entry or otherwise, as it may determine, upon being requested to do so by the holders of twenty-five per centum (25%) in aggregate principal amount of the Bonds then Outstanding hereunder and upon being indemnified as hereinafter provided. For purposes of this section, the Bond Insurer shall, so long as no event of default has occurred under its Insurance Policy, be deemed to be the owner of the 1993 Bonds.

No remedy by the terms of this Indenture conferred upon or reserved to the Trustee or to the Bondholders is intended to be exclusive of any other remedy, but each and every such remedy shall be cumulative and shall be in addition to any other remedy given hereunder or now or hereafter existing at law or in equity or by statute.

The holders of a majority in aggregate principal amount of the Bonds then Outstanding hereunder, at any time, by an instrument in writing executed and delivered to the Trustee, may reasonably direct the method and place of conducting all proceedings to be taken for the enforcement of any of the rights of the Bondholders; provided that such direction shall not be otherwise than in accordance with the provisions of law or of this Indenture.

So long as the Insurance Policy is in effect and the Bond Insurer is not in default thereunder, the Bond Insurer may direct the Trustee with respect to the taking of each remedy

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provided in this Section and the Trustee shall not take any action directed by the Bondholders without the prior written consent of the Bond Insurer.

Section 8.05. Payments by Authority. The Authority covenants that if any default shall be made in the payment of the principal or of interest on any Bond hereby secured when the same shall become payable, the Authority will pay to the Trustee, upon demand, for the benefit of the holders of the Bonds so in default, the whole amount then due and payable for principal and interest, with interest upon the overdue principal and upon the overdue installments of interest at the rate of interest specified in the Bonds from the date of default to the date of payment; and in case the Authority shall fail to pay the same forthwith upon such demand, the Trustee in its own name and as trustee of an express trust shall be entitled to sue for and to recover judgment for the whole amount so due and unpaid.

So long as the Insurance Policy is in effect and the Bond Insurer is not in default thereunder, the Bond Insurer may direct the Trustee with respect to the taking of each remedy provided in this Section and the Trustee shall not take any action directed by the Bondholders without the prior written consent of the Bond Insurer.

Section 8.06. Application of Moneys. Any moneys received by the Trustee or by any receiver from the operation of said Water and Sewer System, shall, after payment of the costs and expenses of the operation thereof, be applied,

First: to the payment of the fees, counsel fees and expenses of the Trustee and of the receivers, if any, and all costs and disbursements allowed by the court, if there be any court action.

Second: to the payment of the whole amount of principal and interest which shall then be owing or unpaid upon the Bonds, and in case such amounts shall be insufficient to pay in full the whole sum so due and unpaid, then to the payment of such principal and interest ratably, without preference or priority of principal over interest or of interest over principal or of any installment of interest over any other installment of interest, except as provided in Section 7.03.

Third: to the payment of the surplus, if any, to the Authority, or to whoever is lawfully entitled to receive the same or as a court of competent jurisdiction may direct.

Section 8.07. Trustee's Rights. Any right of action under this Indenture, or under any of the Bonds, may be enforced by the Trustee without the possession of any of the Bonds or the production thereof on any trial or other proceedings relative thereto and any such suit or proceeding instituted by the Trustee shall be brought in its name as Trustee and any recovery of judgment shall be for the equal benefit of the holders and registered owners of the Bonds in respect of which such judgment shall have been recovered, subject to the provisions hereof with respect to extended claims for interest.

Section 8.08. Limitations on Bondholders. No holder of any Bonds shall have any right to institute any suit, action, or proceeding in equity or at law for the enforcement of

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In case the Trustee shall have proceeded to enforce any right under this Indenture by entry or otherwise, and such proceedings shall have been discontinued or abandoned for any reason, or shall have been determined adversely to the Trustee, then and in every such case the Authority and the Trustee shall be restored to their former positions and rights hereunder with respect to the pledged revenues, and all rights, remedies and powers of the Trustee shall continue as if no such proceedings had been taken.

Section 8.11. Appointment of Receiver. Subject to Section 8.02, as provided by the Municipality Authorities Act, as amended, the Trustee shall be entitled as a matter of right to the appointment of a receiver, and the Trustee, the Bondholders and any receiver so appointed shall have all such rights and powers and shall be subject to such limitations and restrictions as are contained in said Act.

Section 8.12. Limitation on Rights to Mortgage. It is expressly understood and agreed that nothing in the provisions of the Bonds or in this Indenture shall be taken to authorize the Trustee, or any receiver appointed hereunder to operate and maintain the Water and Sewer System, to sell, assign, mortgage or otherwise dispose of any of the assets of whatever kind and character belonging to the Authority.

Section 8.13. Issuer of Insurance Policy as Subrogee of Holders of Bonds. Any Bond delivered to the Bond Insurer pursuant to the Insurance Policy shall be deemed to continue to be Outstanding under and secured by this Indenture.

ARTICLE IX

CONCERNING THE TRUSTEE

Section 9.01. Acceptance of Trust. The Trustee accepts and agrees to execute the trusts hereby created but only upon the additional terms and conditions set forth in this Article, to all of which the parties hereto and the respective registered owners of the Bonds agree.

Section 9.02. Responsibility for Statements in Indenture or Bonds. The recitals of fact herein and in the Bonds contained, except only the Trustee's certificate of authentication upon the Bonds, shall be taken as the statements of the Authority and the Trustee assumes no responsibility for the correctness of the same. The Trustee makes no representations as to the validity or sufficiency of this Indenture or the due execution or acknowledgment thereof on the part of the Authority or in respect of the Bonds issued hereunder, and the Trustee shall incur no responsibility in respect of such matter.

Section 9.03. Maintenance of Insurance. The Trustee shall be under no obligation to effect or maintain insurance or to renew any policies of insurance or to inquire as to the adequacy of any insurance or for responsibility of insurers, or to report, make or file claims or proofs of loss for any loss or damage insured against or which may occur or to keep

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this Indenture or for the execution of any trust hereof or for the appointment of a receiver or to exercise any other remedy hereunder, unless such holder shall have previously given to the Trustee written notice of an event of default and of the continuance thereof as hereinbefore provided nor unless also the holders of at least twenty-five per centum (25%) in aggregate principal amount of the Bonds then Outstanding hereunder shall have made written request of the Trustee and shall have offered it reasonable opportunity either to proceed to exercise the powers hereinbefore granted or to institute such action, suit or proceeding in its own name nor unless also they shall have offered to the Trustee adequate security and indemnity against the costs, expenses and liability to be incurred therein or thereby; and such notification, request and offer of indemnity are hereby declared in every such case at the option of the Trustee to be conditions precedent to the execution of the powers and trusts of this Indenture or for the appointment of a receiver or for any other remedy hereunder; it being understood and intended that no one or more holders or registered owners of the Bonds shall have any right in any manner whatsoever to affect, disturb or prejudice the lien of this Indenture by his own or their action or to enforce any right hereunder except in the manner herein provided, and that all such proceedings at law or in equity shall be instituted, had and maintained in the manner herein provided and for the benefit of all holders of outstanding Bonds, subject to the provisions hereof with respect to claims for interest.

Subject to the following paragraph, nothing in this Article shall, however, affect or impair the right of any Bondholder which is absolute and unconditional, to enforce the payment of the principal and interest of his Bonds, or the obligation of the Authority which is also absolute and unconditional, to pay the principal of and interest on each of the Bonds issued hereunder to the respective holders or registered owners thereof at the time and place in said Bonds expressed.

So long as the Insurance Policy is in effect and the Bond Insurer is not in default thereunder, the Bond Insurer may direct the Trustee with respect to the taking of each remedy provided in this Section and the Trustee shall not take any action directed by the Bondholders without the prior written consent of the Bond Insurer.

Section 8.09. Waiver by Authority. The Authority may waive any period of grace provided for in this Article.

Section 8.10. Waiver of Default, Delay or Omission of Trustee. No waiver of any default hereunder, whether by the Trustee, the Bond Insurer or the Bondholders shall extend to or shall affect any subsequent default or shall impair any rights or remedies consequent thereon. No delay or omission of the Trustee, the Bond Insurer or of any holders of Bonds hereby secured 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 acquiescence therein; and every right, power and remedy given by this Indenture to the Trustee, the Bond Insurer or to the Bondholders may be exercised from time to time and as often as may be deemed expedient by the Trustee, the Bond Insurer or in an appropriate case, by the Bondholders.

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itself advised or informed as to the payment of any insurance premiums, taxes or assessments or to see to or require such payment to be made nor shall the Trustee be under any liability for the failure of the Authority to effect or renew any insurance; but the Trustee may, in its discretion, do any or all of the matters and things in this Section set forth, or require the same to be done.

Section 9.04. Disposition of Bonds and Proceeds. The Trustee shall be under no responsibility or duty with respect to the disposition of the Bonds authenticated and delivered hereunder or the application of the proceeds of any of the Bonds or of any other moneys deposited with it and withdrawn in the manner provided in this Indenture.

Section 9.05. Agents of Trustee; Responsibility for Default of Agents. The Trustee may execute any of the trusts or powers hereof and perform any duty hereunder by or through its attorneys or agents, and it shall not be answerable or accountable for any act, default, neglect or misconduct of any such attorney or agent, if reasonable care has been exercised in his appointment and retention, nor shall the Trustee be otherwise answerable or accountable under any circumstances whatever in connection with the trust, except for its own gross negligence or willful misconduct.

Section 9.06. Indemnity; No Duty to Notice Default. The Trustee shall be under no obligation or duty to perform any act which would involve it in expense or liability or to institute or defend any suit in respect hereof unless properly indemnified against such expense or liability to its satisfaction. The Trustee shall not be required to take notice, or be deemed to have knowledge, of any default of the Authority hereunder, except a default pursuant to Section 8.01(a) or (b), and may conclusively assume that there has been no such default unless and until it shall have been specifically notified in writing of such default by the Authority or the holders of not less than twenty-five per centum (25%) in aggregate principal amount of the Bonds then Outstanding hereunder. The Trustee shall provide the Bond Insurer with immediate notice of a default pursuant to Section 8.01(a) or (b) and, within thirty (30) days of the Trustee's knowledge thereof, any other default known to the Trustee. The Trustee shall not be under any obligation to take any action in respect of any default or otherwise, or to institute, appear in or defend any suit or other proceeding in connection therewith or to ascertain or inquire as to the performance of any of the covenants or agreements herein contained on the part of the Authority, unless requested in writing so to do by the Bond Insurer or, with the consent of the Bond Insurer, the holders of not less than twenty-five per centum (25%) in aggregate principal amount of the Bonds then Outstanding hereunder and indemnified to its satisfaction but this provision shall not affect any discretionary power herein given to the Trustee. The Trustee shall, however, take actions pursuant to Section 13.02 hereof, as required therein.

The foregoing provisions are intended only for the protection of the Trustee, and shall not affect any discretion or power given by any provision of this Indenture to the Trustee to take action in respect to any default without such notice or request from the Bondholders or without such security or indemnity. The Trustee may, at any time in its discretion, require of the Authority full information and advice as to the performance of any of the covenants, conditions and agreements, and may further make or cause to be made independent investigations at the expense of the Authority, concerning the affairs of the Authority insofar as such affairs are related to the Water and Sewer System.

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Section 9.07. Right to Rely Upon Documents and Telephonic Notice. The Trustee shall be protected and shall incur no liability in relying, acting or proceeding in good faith upon any notice, resolution, request, consent, order, certificate, report, opinion, Bond, telegram, telephonic notice, teletype or other facsimile transmission, waiver, statement, affidavit, voucher, appraisal, application or other paper or document believed by it to be genuine and to have been signed, passed or presented by the proper person or Board, or to have been prepared and furnished pursuant to the provisions of this Indenture, and before acting upon any of the same the Trustee shall not be bound to make any investigation into the matters stated therein.

The Trustee may consult with legal counsel to be selected and employed by it and the opinion of such counsel shall be full and complete authorization and protection in respect of any action taken or suffered by it hereunder in good faith and in accordance with the opinion of such counsel.

The Trustee shall not be bound to recognize any person as the holder of a Bond Outstanding hereunder unless and until his Bond is submitted to the Trustee for inspection, if required, and his title thereto satisfactorily established, if disputed.

Section 9.08. Trustee Compensation; Indemnification of Trustee. The Authority shall, out of the Receipts and Revenues, pay to the Trustee, from time to time, reasonable compensation for all services rendered hereunder, and shall also reimburse the Trustee for all of its reasonable expenses, charges and other disbursements and those of its attorneys, agents and employees, incurred in and about the administration and execution of the trusts hereby created, and the performance of its powers and duties hereunder, and the Trustee shall have a lien on the Receipts and Revenues therefor, prior and superior to the lien of the Bonds issued hereunder. The Authority further agrees to indemnify and save the Trustee harmless against any liabilities which it may incur in the exercise and performance of its powers and duties hereunder and not due to its gross negligence or willful misconduct.

Section 9.09. Trustee's Right to Make Advances. If the Authority shall fail to perform any of the covenants or agreements contained in this Indenture, the Trustee may, in its discretion and without notice to the Bondholders, at any time and from time to time, make advances to effect performance of the same on behalf of the Authority, but the Trustee shall be under no obligation so to do; and any and all moneys paid or advanced by the Trustee for any such purpose, together with interest thereon at the rate equal to 102% of the Prime Rate in effect at the time of such advance, shall be a lien in favor of the Trustee upon the Receipts and Revenues prior and superior to the lien of the Bonds issued hereunder; but no such advance shall operate to relieve the Authority from any default hereunder.

Section 9.10. Right to Own and Deal in Bonds. The Trustee may become the owner of Bonds issued hereunder and secured hereby, with the same rights it would have if it were not Trustee. The Trustee may also engage in, or be interested in any financial or other transaction with the Authority and may act as depository for and permit any of its officers or directors to act as a member of, or in any other capacity with respect to, any committee formed to protect the rights of Bondholders or to effect or aid any reorganization growing out of the

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any retiring trustee may apply to any court of competent jurisdiction to appoint a successor trustee. Said court may thereupon after such notice, if any, as such court may deem proper and prescribe, appoint a successor trustee. Any trustee appointed under the provisions of this Section in succession to the Trustee shall be a bank or trust company organized under the law of the United States of America or of the Commonwealth of Pennsylvania, having an office in the County of Allegheny, Pennsylvania, and authorized under such laws to exercise corporate trust powers shall then be in good standing and have a combined capital and surplus aggregating at least \$50,000,000 if there be such an institution willing, qualified and able to accept the trust upon reasonable or customary terms and shall be approved in writing by the Bond Insurer.

Section 9.15. Acceptance and Transfer of Trust Estate. Every successor trustee appointed hereunder shall execute, acknowledge and deliver to its predecessor trustee, and also to the Authority, an instrument accepting such appointment hereunder and thereupon such successor trustee, without any further act, deed or conveyance, shall become fully vested with all the estates, properties, rights, immunities, powers, trusts, duties and obligations of its predecessor with like effect as if originally named trustee herein; but the trustee ceasing to act, shall nevertheless, on the written request of the Authority, or of the successor trustee, execute, acknowledge and deliver such instruments of conveyance and further assurance and so such other things as may reasonably be required for more fully and certainly vesting and confirming in such successor trustee all the rights, title and interest of the Trustee in and to the pledged receipts and revenues and such rights, powers, trusts, duties and obligations; and the trustee ceasing to act shall also, upon like request, pay over, assign and deliver to the successor trustee any money or other property subject to the lien of this Indenture. Should any deed, conveyance or instrument in writing from the Authority be required by the new trustee for more fully and certainly vesting in and confirming to such new trustee such estates, rights, powers and duties, any and all such deeds, conveyances and instruments in writing shall, on request, be executed, acknowledged and delivered by the Authority.

Section 9.16. Successor Trustee by Merger. Any bank or trust company having power to execute the trusts of this Indenture and otherwise qualified to act as Trustee hereunder, with or into which the Trustee may be merged or consolidated or any such bank or trust company resulting from any merger or consolidation to which the Trustee shall be a party, shall be the successor trustee under this Indenture, without the execution or filing of any paper or the performance of any further act on the part of any other parties hereto, anything herein to the contrary notwithstanding.

Section 9.17. Appointment of Paying Agent. The Authority may appoint a successor Paying Agent or a co-paying agent at any time upon written notice to the Bond Insurer and the Trustee.

Any successor paying agent or co-paying agent appointed under the provisions of this Section shall be a bank or trust company organized under the law of the United States of America or of the State of New York, having an office in the City of New York, New York.

Section 9.18. Trustee to Notify S&P and Moody's. The Trustee hereby agrees to notify S&P and Moody's of (i) any change of the Trustee, (ii) any change in the Insurance

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enforcement of the Bonds or this Indenture, whether or not any such committee shall represent the holders of a majority in principal amount of the Bonds Outstanding hereunder.

Section 9.11. Construction of Provisions of Indenture. The Trustee may construe any of the provisions of this Indenture insofar as the same may appear to be ambiguous or inconsistent with any other provisions hereof; and any construction of any such provisions hereof by the Trustee in good faith shall be binding upon the Bondholders.

Section 9.12. Right to Resign. The Trustee may at any time resign and be discharged of the trusts hereby created by giving not less than sixty (60) days written notice to the Authority and the registered Owners of the Bonds specifying the date when such resignation shall take effect, the mailing of such notice to be made not less than twenty-one days prior to the resignation date specified in said notice unless previously a successor trustee shall have been appointed by the Bondholders or the Authority as hereinafter provided, in which event such resignation shall take effect immediately on the appointment of such successor trustee. No such resignation, however, shall be effective until a successor Trustee has been appointed.

Section 9.13. Removal of Trustee. The Trustee may be removed at any time by an instrument or concurrent instruments in writing signed by the holders of not less than a majority in aggregate principal amount of the Bonds then Outstanding hereunder and filed with the Authority. A photostatic copy of each such instrument shall be promptly delivered by the Authority to the Trustee. No such removal, however, shall become effective until a successor Trustee has been appointed and accepted the duties of Trustee.

Section 9.14. Appointment of Successor Trustee; Qualifications. In case at any time the Trustee shall resign or shall be removed or dissolved or shall become incapable of acting or shall be adjudged a bankrupt or insolvent, or if a receiver, liquidator or conservator of the Trustee or of its property shall be appointed, or if any public officer shall take charge or control of the Trustee or of its property or affairs, the position of the Trustee shall ipso facto be vacant. If the position of Trustee shall become vacant for any of the foregoing reasons or for any other reason, a successor may be appointed by the holders of not less than a majority in aggregate principal amount of the Bonds then Outstanding hereunder, by an instrument or concurrent instruments in writing signed by such Bondholders or by their attorneys in fact duly authorized and filed with the Authority, photostatic copies of each such instrument shall be promptly delivered to such new trustee and predecessor trustee; provided, nevertheless, that until a new trustee shall be appointed by the Bondholders as aforesaid, the Authority, by instrument executed by order of its Board and duly acknowledged by its proper officers and delivered to the new trustee and predecessor trustee, shall appoint a trustee to fill such vacancy until a new trustee shall be appointed by the Authority shall immediately and without further act be superseded by the trustee appointed by the Bondholders. The Bond Insurer shall be informed promptly in writing of the resignation or removal of the Trustee or Paying Agent and appointment of a successor Trustee or Paying Agent pursuant to Sections 9.12, 9.13, 9.14 or 9.17 hereof.

If in a proper case no appointment of a successor trustee shall be made pursuant to the foregoing provisions of this Section, the holder of any Bond Outstanding hereunder or

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Policy, and (iii) any mandatory redemption of Bonds other than mandatory sinking fund redemption. Notices shall be sent to Moody's Investors Service, 99 Church Street, New York, New York 10007, Attention: Municipal Department/Structured Finance Group.

ARTICLE X

CONCERNING THE HOLDERS OF THE BONDS

Section 10.01. Execution of Instruments. Whenever in this Indenture it is provided that the holders of a specified percentage or a majority of the Bonds Outstanding hereunder may take any action (including the making of any demand or request, the giving of any notice, consent or waiver or the taking of any other action) the fact that at the time of taking any such action the holders of such specified percentage or majority have joined therein may be evidenced by any instrument or any number of instruments of similar tenor executed by Bondholders in person or by agent or proxy appointed in writing.

Section 10.02. Proof of Ownership. Subject to the provisions of Article IX, proof of the execution of any instrument by a Bondholder or his agent or proxy and proof of the holding by any persons of any of the Bonds shall be sufficient if made in the following manner:

(1) The fact and date of the execution by any such persons of any instrument may be proved by the certificate of any notary public or other officer authorized to take acknowledgments of deeds to be recorded in any State within the United States, that the person executing such instrument acknowledged to him the execution thereof, or by an affidavit of a witness to such execution sworn to before any such notary or other such officer; and

(2) The ownership of Bonds may be proved by the registration books for such Bonds maintained by the Authority at the principal corporate trust office of the Trustee.

The Trustee and any Paying Agent may require such additional proof of any matter referred to in this Section as it shall deem necessary or may accept such other proof as it may deem appropriate.

ARTICLE XI AMENDMENTS AND MODIFICATIONS

Section 11.01. Waivers and Supplemental Indentures Not Requiring Consent of Bondholders. In addition to any Supplemental Indenture otherwise authorized by this Indenture, the Authority (with the prior written consent of the Bond Insurer), and the Trustee may, from time to time and at any time, enter into such indentures or agreements supplemental hereto as shall not be inconsistent with the terms and provisions hereof and which shall not adversely affect the rights of the holders of the Bonds Outstanding hereunder (which supplemental indentures or agreements shall thereafter form a part thereof) for the following purposes:

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(a) to cure any ambiguity, formal defect or omission in this Indenture or any Supplemental Indenture;

(b) to grant or confer upon the Trustee for the benefit of the Bondholders any additional rights, remedies, powers, authority or security that may lawfully be granted to or conferred upon the Bondholders, or the Trustee;

(c) to add to the covenants and agreements of the Authority in this Indenture contained, other covenants and agreements thereafter to be observed, or to surrender any right or power herein reserved to or conferred upon the Authority;

(d) to modify any of the provisions of this Indenture or to relieve the Authority of any of the obligations, conditions or restrictions contained in this Indenture, provided that such modification or relief shall not, by the express terms of the particular Supplemental Indenture, become effective until all Bonds Outstanding on the date of the execution and delivery of such Supplemental Indenture shall no longer be Outstanding;

(e) to make such provision in regard to matters or questions arising under the Indenture as may be necessary or desirable and not inconsistent with the Indenture; or

(f) to close the Indenture against, or to restrict, in addition to the limitations and restrictions herein contained, the issue of Additional Bonds hereunder, by imposing additional conditions and restrictions to be thereafter observed, whether applicable in respect to all Bonds issued and to be issued hereunder or in respect of one or more series of Bonds, or otherwise.

Section 11.02. Supplemental Indentures Requiring Consent of Bondholders.

With the consent, evidenced as provided in Section 10.01, of the holders of not less than sixty-six and two-thirds per centum (66-2/3%) in aggregate principal amount of the Bonds then Outstanding or, in the case one or more but less than all of the series of the Bonds then Outstanding are affected, then, in addition, with the consent of the holders of not less than sixty-six and two thirds per centum (66-2/3%) of the principal amount of the Bonds of each series so affected then Outstanding, and with the consent of any guarantor of principal and interest of any series of Bonds issued under a supplemental indenture, the Authority and the Trustee may from time to time and at any time enter into an Indenture or Indentures Supplemental hereto for the purpose of eliminating any of the provisions of this Indenture or of any Supplemental Indenture or of modifying in any manner the rights of the holders of the Bonds so affected; provided, however, that no such supplemental indenture shall (i) extend the fixed maturity date of any Bond, or reduce the principal amount thereof, or reduce the rate or extend the time of payment of interest thereon, or reduce any premium payable upon the redemption thereof, without the consent of the holder of each Bond so affected, or (ii) permit the creation by the Authority of any lien prior to the lien of this Indenture upon any part of the Receipts and Revenues, or reduce the aforesaid percentage of Bonds, the holders of which are required to consent to any such Supplemental Indenture, without the consent of the holders of all Bonds then Outstanding; provided, however, that in no event shall the provisions of Section 6.09 of this Indenture be amended. It shall not be necessary for the consent of the Bondholders

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DISCHARGE OF INDENTURE

Section 12.01. Release of Indenture. If the Authority, its successors or assigns, shall pay or cause to be paid into the holders of all Bonds Outstanding hereunder the principal and interest to become due thereon and the premium thereon, if any, at the times and in the manner stipulated therein, then this Indenture and the estate and rights hereby granted shall cease, determine and be void, and thereupon the Trustee shall, upon the request of the Authority, deliver to the Authority such instruments as shall be requisite to satisfy the lien hereof, and reconvey to the Authority the estate and title hereby conveyed, and assign and deliver to the Authority any property at the time subject to the lien of this Indenture which may then be in the possession of the Trustee; but the Trustee shall take any such action only upon the receipt of an officer's certificate and an opinion of counsel, each stating in substance that in the opinion of the respective signers all conditions precedent provided for in this Indenture relating to such release, cancellation and discharge have been complied with. In addition, this Indenture shall not be discharged until all Policy Costs owing to the Bond Insurer shall have been paid in full.

Bonds for the payment or redemption of which there shall have been deposited with the Trustee cash or Defeasance Obligations (which shall mean direct non-callable obligations of the United States of America and securities fully and unconditionally guaranteed as to the timely payment of principal and interest by the United States of America, to which direct obligation or guarantee the full faith and credit of the United States of America has been pledged, Refcorp interest strips, CATS, TIGRS, STRPS, or defeased municipal bonds rated "AAA" by S&P or "Aaa" by Moody's, any combination thereof or any other security approved by the Bond Insurer), the principal and interest on which when due, will, without reinvestment of principal or interest, provide sufficient moneys to pay the Bonds in full at maturity or the date fixed for redemption, shall be deemed to be paid within the meaning of this Article. In the event of an advance refunding, the Authority shall cause to be delivered a verification report of an independent nationally recognized certified public accountant.

The release, cancellation and discharge of this Indenture, however, shall be without prejudice to the right of the Trustee to be paid any compensation then due to them hereunder and to be protected and saved harmless by the Authority from any and all losses, liabilities, costs and expenses, including counsel fees, at any time incurred by the Trustee hereunder or connected with any Bond issued hereunder, of and from which, if this Indenture had not been released, cancelled and discharged, the Authority would have been obligated by the terms of this Indenture to protect and save the Trustee harmless, and the Authority hereby covenants to protect and save the Trustee harmless of and from such losses, liabilities, costs and expenses.

If any Bond shall not be presented for payment when the principal thereof shall become due, either at maturity or otherwise, or at the date fixed for the redemption thereof, and if the Authority shall have deposited with the Trustee, for the purpose, or left with it in trust if previously so deposited, funds sufficient to pay the principal of such Bond (and the premium, if any payable upon the redemption thereof), together with all interest due thereon, to the date of maturity thereof or to the date fixed for redemption thereof, for the benefit of the holder or

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under this section to approve the particular form of any proposed Supplemental Indenture, but it shall be sufficient if such consent shall approve the substance thereof. Nothing herein contained, however, shall be construed as making necessary the approval by the Bondholders of the execution of any Supplemental Indenture or agreement as authorized in Section 11.01. No Supplemental Indenture shall be effective under this Section unless it has been consented to in writing by the Bond Insurer.

Section 11.03. Authorization to Trustee; Opinion of Counsel. The Trustee shall join with the Authority in the execution of any Supplemental Indenture which the Authority is authorized to execute under the provisions of Section 11.01 or Section 11.02 upon the delivery by the Authority to the Trustee of the following:

(a) A certified copy of a resolution of the Board authorizing such Supplemental Indenture and requesting the execution thereof by the Trustee;

(b) An opinion of counsel (i) to the effect that the Authority and the Trustee are authorized to enter into such Supplemental Indenture by the provisions of Section 11.01 or (ii) to the effect that the Authority and the Trustee are authorized to enter into such Supplemental Indenture by the provisions of Section 11.02 and that the consent of the Bondholders required has been secured and is evidenced by specified documents meeting the requirements of Section 10.01; and

(c) If the opinion of counsel shall state that the Authority and the Trustee are authorized to enter into such Supplemental Indenture by the provisions of Section 11.02, the documents evidencing the consent of the Bondholders as specified in said opinion;

provided, however, that the Trustee shall not be obligated to join in any such Supplemental Indenture which, in its opinion, adversely affects its own duties, rights or immunities under the Indenture.

Section 11.04. Effectiveness of Amendments, Modifications. Upon the execution of any Supplemental Indenture pursuant to the provisions of this Article, the Indenture shall be and be deemed to be modified and amended in accordance therewith and the respective rights, limitations of rights, obligations, duties and immunities under the Indenture of the Trustee, the Authority and the holders of Bonds shall thereafter be determined, exercised and enforced hereunder subject in all respect to such modifications and amendments, and all the terms and conditions of any such Supplemental Indenture shall be and be deemed to be part of the terms and conditions of the Indenture for any and all purposes. The Authority shall provide the Bond Insurer with a full transcript of all proceedings relating to the execution of any supplement or amendment to this Indenture. The Authority shall provide Moody's and S&P with a notice of each amendment to this Indenture and a copy thereof at least fifteen (15) days in advance of its execution.

ARTICLE XII

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holders thereof, respectively, all liability of the Authority to the holder of such Bond for the payment of the principal thereof, the interest thereon, and the premium, if any, shall forthwith cease, determine and be completely discharged, and thereupon it shall be the duty of the Trustee, to hold said fund or funds, without liability for interest thereon, for the benefit of the holder of such Bond who shall thereafter be restricted exclusively to said fund or funds for any claim of whatsoever nature on his part under this Indenture or on, or with respect to, said Bond.

Any moneys deposited with the Trustee, by the Authority, pursuant to the terms of this Indenture, for the payment or redemption of Bonds which remain unclaimed by the holders of the Bonds for five (5) years after the date of maturity or the date fixed for redemption, as the case may be, shall upon the written request of the Authority if the Authority is not at that time, to the knowledge of the Trustee, in default hereunder be paid to the Authority. Thereafter, such holders of the Bonds shall thereafter look only to the Authority for payment and then only to the extent of the amounts so received without interest thereon; provided, however, that before being required to make any such repayment, the Trustee, may at the expense of the Authority cause to be published a notice in a newspaper of general circulation in the City to the effect that said moneys remain unclaimed and that after a date named therein said moneys will be returned to the Authority.

ARTICLE XIII

MISCELLANEOUS

Section 13.01. Limitation of Rights, Remedy or Claim. Nothing in this Indenture, expressed or implied, is intended or shall be construed to confer upon, or to give to, any person or corporation, other than the parties hereto and the holders of the Bonds outstanding hereunder, any rights, remedy or claim under or by reason of this Indenture or any covenant, condition or stipulation hereof; and all the covenants, stipulations, promises and agreements in this Indenture contained by and on behalf of the Authority shall be for the sole and exclusive benefit of the parties hereto, and of the holders of the Bonds Outstanding hereunder.

Section 13.02. Provisions Relating to Bond Insurer.

A. If, on the third day preceding any interest payment date for the 1993 Bonds there is not on deposit with the Trustee sufficient moneys available to pay all principal of and interest on the 1993 Bonds due on such date, the Trustee shall immediately notify the Bond Insurer and State Street Bank and Trust Company, N.A., New York, New York or its successor as its Fiscal Agent (the "Fiscal Agent") of the amount of such deficiency. If, by said interest payment date, the Authority has not provided the amount of such deficiency, the Trustee shall simultaneously make available to the Bond Insurer and to the Fiscal Agent the registration books for the Bonds maintained by the Trustee. In addition:

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1. The Trustee shall provide the Bond Insurer with a list of the Bondholders entitled to receive principal or interest payments from the Bond Insurer under the terms of the Bond Insurance Policy and shall make arrangements for the Bond Insurer and its Fiscal Agent (1) to mail checks or drafts to Bondholders entitled to receive full or partial interest payments from the Bond Insurer, and (2) to pay principal of the Bonds surrendered to the Fiscal Agent by the Bondholders entitled to receive full or partial payments from the Bond Insurer; and

2. The Trustee shall, at the time it makes the registration books available to the Bond Insurer pursuant to (1) above, notify Bondholders entitled to receive the payment of principal of or interest on the Bonds from the Bond Insurer (a) as to the fact of such entitlement, (b) that the Bond Insurer will remit to them all or part of the interest payments coming due, (c) that, except as provided in paragraph (B) below, in the event that any Bondholder is entitled to receive full payment of principal from the Bond Insurer, such Bondholder must tender his Bond with the instrument of transfer in the form provided on the Bond executed in the name of the Bond Insurer, and (d) that, except as provided in paragraph (B) below, in the event that such Bondholder is entitled to receive partial payment of principal from the Bond Insurer, such Bondholder must tender his Bond for payment first to the Trustee, which shall note on such Bond the portion of principal paid by the Trustee, and then, with the form of transfer executed in the name of the Bond Insurer, to the Fiscal Agent, which will then pay the unpaid portion of principal to the Bondholder.

B. In the event that the Trustee has notice that any payment of principal of or interest on a Bond has been recovered from a Bondholder pursuant to the United States Bankruptcy Code by a trustee in bankruptcy in accordance with the final, nonappealable order of a court having competent jurisdiction, the Trustee shall, at the time it provides notice to the Bond Insurer, notify all Bondholders that in the event that any Bondholder's payment is so recovered, such Bondholder will be entitled to payment from the Bond Insurer to the extent of such recovery, and the Trustee shall furnish to the Bond Insurer its records evidencing the payments of principal of and interest on the Bonds which have been made by the Trustee and subsequently recovered from Bondholders, and the dates on which such payments were made.

C. The Bond Insurer shall, to the extent it makes payment of principal of or interest on the Bonds, become subrogated to the rights of the recipients of such payments in accordance with the terms of the Bond Insurance Policy and, to evidence such subrogation, (i) in the case of subrogation as to claims for past due interest, the Trustee shall note the Bond Insurer's rights as subrogee on the registration books maintained by the Trustee upon receipt from the Bond Insurer of proof of the payment of interest thereon to the Bondholders of such Bonds, and (ii) in the case of subrogation as to claims for past due principal, the Trustee shall note the Bond Insurer's rights as subrogee on the registration books for the Bonds maintained by the Trustee upon receipt of proof of the payment of principal thereof to the Bondholders of such Bonds. Notwithstanding anything in this Indenture to the contrary, the Trustee shall make payment of such past due interest and past due principal directly to the Bond Insurer to the extent that the Bond Insurer is a subrogee with respect thereto.

Any notice to or demand upon the Trustee may be served, presented, or made at the corporate trust office of the Trustee at 23rd Floor, One Oliver Plaza, Pittsburgh, Pennsylvania 15265, Attention: Vice President - Corporate Trust. Any notice to or demand upon the Authority shall be deemed to have been sufficiently given or served by the Trustee for all purposes, by being sent by certified or registered United States mail, postage prepaid, to the Authority at 1010 Allegheny Building, 429 Forbes Avenue, Pittsburgh, Pennsylvania 15219, Attention: Executive Director or at such other address as may be filed in writing by the Authority with the Trustee. Any notice to the Bond Insurer may be served, presented or made to Financial Guaranty Insurance Company, 115 Broadway, New York, New York 10006, Attention: Managing Counsel, and to the Fiscal Agent at State Street Bank and Trust Company, N.A., 61 Broadway, New York, New York 10006, Attention: Corporate Trust Department.

Section 13.09. Binding Effect of Covenants. All the covenants, promises and agreements in this Indenture contained by or on behalf of the Authority, or by or on behalf of the Trustee shall bind and inure to the benefit of their respective successors and assigns, whether so expressed or not.

IN WITNESS WHEREOF, The Pittsburgh Water and Sewer Authority, party of the first part, has caused this Indenture to be executed by its Chairman or one of its Vice Chairmen and its corporate seal to be hereunto impressed and attested by its Secretary or one of its Assistant Secretaries, and PNC Bank, National Association, party of the second part, in evidence of its acceptance of the trusts hereby created, has caused this Indenture to be executed by one of its Vice Presidents and its corporate seal to be hereunto impressed and attested by one of its Authorized Officers.

ATTEST: THE PITTSBURGH WATER AND SEWER AUTHORITY

Secretary By Chairman

[SEAL]

ATTEST: PNC BANK, NATIONAL ASSOCIATION, as Trustee

Authorized Officer By Vice President

[SEAL]

D. The Trustee shall not take the Bond Insurance Policy into account in determining whether the rights of bondholders are adversely affected by actions taken pursuant to the terms and provisions of the Indenture.

E. The Bond Insurer shall be included as a party in interest and as a party entitled to (i) notify the Trustee of an event of default, and (ii) request the Trustee to intervene in judicial proceedings that affect the 1993 Bonds or the security therefor. The Trustee shall accept notice of default from the Bond Insurer.

Section 13.03. Invalidity of Provisions. If any one or more of the covenants or agreements provided in this Indenture on the part of the Authority or the Trustee to be performed should be finally determined by a court of competent jurisdiction to be contrary to law, then such covenant or covenants or agreement or agreements shall be null and void and shall be deemed separable from the remaining covenants and agreements, and shall in no way affect the validity of the Indenture.

Section 13.04. Governing Law. This Indenture shall be deemed to be and shall be construed as a Pennsylvania contract and wherever enforced shall be construed in accordance with the laws of the Commonwealth of Pennsylvania.

Section 13.05. Limitation of Liability. No covenant or agreement contained in the Bonds or in this Indenture shall be deemed to be the covenant or agreement of any member, agent or employee of the Authority in his individual capacity and neither the members of the Board of the Authority nor any official executing the Bonds shall be liable personally on the Bonds or be subject to any personal liability or accountability by reason of the issuance thereof.

Section 13.06. Execution in Counterparts. This Indenture may be executed in multiple counterparts, each of which shall be regarded for all purposes as an original; but such counterparts shall constitute but one and the same instrument.

Section 13.07. Payment on Saturday, Sunday or Legal Holiday. If any case where the date of maturity of interest on or principal of any Bond or the date fixed for redemption or tender of any Bond shall be a Saturday, Sunday or a legal holiday or a day on which banking institutions in the Commonwealth of Pennsylvania or the State of New York are authorized by law to close, then payment of such interest or principal and premium, if any, need not be made on such date but may be made on the next succeeding Business Day not a Saturday, Sunday nor a legal holiday nor a day upon which banking institutions are authorized by law to close, with the same force and effect as if made on the date of maturity or the date fixed for redemption, and no interest shall accrue for the period after such date.

Section 13.08. Notices. Except as otherwise expressly provided in this Indenture, or in any indenture supplemental hereto, any request, opinion, consent, demand, notice, order, appointment, or other direction required or permitted to be made or given by the Authority, shall be deemed to have been sufficiently made or given if executed on behalf of the Authority by its Chairman or a Vice Chairman and its Secretary or an Assistant Secretary or its Treasurer or an Assistant Treasurer, or by officers performing similar function.

COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF ALLEGHENY)

On this the ___th day of November, 1993, before me the undersigned notary public, personally appeared DAVID M. MATTER, who acknowledged himself to be the Chairman of The Pittsburgh Water and Sewer Authority, a body corporate and politic, and that he as such officer, being authorized to do so, executed the foregoing instrument for the purposes therein contained by signing the name of said Authority, by himself as such officer.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

[N.P. Seal] _____
Notary Public

My Commission Expires:

COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF ALLEGHENY)

On this the ___ day of November, 1993, before me, the undersigned notary public, personally appeared FRED J. DERAMO, who acknowledged himself to be a Vice President of Pittsburgh National Bank, a national banking corporation, and that he as such officer, being authorize to do so, executed the foregoing instrument for the purposes therein contained by signing the name of the corporation by himself as such officer.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

[N.P. Seal] _____
Notary Public

[N.P. Seal]

My Commission Expires:

RESERVE FUND SURETY GUIDELINES

The Issuer may satisfy the requirement (the "Reserve Fund Requirement") to deposit a specified amount in the debt service reserve fund (the "Reserve Fund") by the deposit of a surety bond, insurance policy or letter of credit as set forth below. The following requirements shall be incorporated in the Trust Indenture (the "Authorizing Document") in the event the Reserve Fund Requirement is fulfilled by a deposit of a credit instrument (other than a credit instrument issued by Financial Guaranty) in lieu of cash:

1. A surety bond or insurance policy issued to the entity serving as trustee or paying agent (the "Fiduciary"), as agent of the bondholders, by a company licensed to issue an insurance policy guaranteeing the timely payment of debt service on the Bonds (a "municipal bond insurer") may be deposited in the Reserve Fund to meet the Reserve Fund Requirement if the claims paying ability of the issuer thereof shall be rated "AAA" or "Aaa" by S&P or Moody's, respectively.
2. A surety bond or insurance policy issued to the Fiduciary, as agent of the bondholders, by an entity other than a municipal bond insurer may be deposited in the Reserve Fund to meet the Reserve Fund Requirement if the form and substance of such instrument and the issuer thereof shall be approved by Financial Guaranty.
3. An unconditional irrevocable letter of credit issued to the Fiduciary, as agent of the bondholders, by a bank may be deposited in the Reserve Fund to meet the Reserve Fund Requirement if the issuer thereof is rated at least "AA" by S&P. The letter of credit shall be payable in one or more draws upon presentation by the beneficiary of a sight draft accompanied by its certificate that it then holds insufficient funds to make a required payment of principal or interest on the bonds. The draws shall be payable within two days of presentation of the sight draft. The letter of credit shall be for a term of not less than three years. The issuer of the letter of credit shall be required to notify the Issuer and the Fiduciary, not later than 30 months prior to the stated expiration date of the letter of credit, as to whether such expiration date shall be extended, and if so, shall indicate the new expiration date.

If such notice indicates that the expiration date shall not be extended, the Issuer shall deposit in the Reserve Fund an amount sufficient to cause the cash or permitted investments on deposit in the Reserve Fund together with any other qualifying credit instruments, to equal the Reserve Fund Requirement on all outstanding Bonds, such deposit to be paid in equal installments on at least a semi-annual basis over the remaining term of the letter of credit, unless the Reserve Fund credit instrument is replaced by a Reserve Fund credit instrument meeting the requirements in any of 1-3 above. The letter of credit shall permit a draw in full not less than two weeks prior to the expiration or termination of such letter of credit if the letter of credit has not been replaced or renewed. The Authorizing Document shall, in turn, direct the Fiduciary to draw upon the letter of credit prior to its expiration or termination unless an acceptable replacement is in place or the Reserve Fund is fully funded in its required amount.

4. The use of any Reserve Fund credit instrument pursuant to this Paragraph shall be subject to receipt of an opinion of counsel acceptable to Financial Guaranty and in form and substance satisfactory to Financial Guaranty as to the due authorization, execution, delivery and enforceability of such instrument in accordance with its terms, subject to applicable laws affecting creditors' rights generally, and, in the event the issuer of such credit instrument is not a domestic entity, an opinion of foreign counsel in form and substance satisfactory to Financial Guaranty. In addition, the use of an irrevocable letter of credit shall be subject to receipt of an opinion of counsel acceptable to Financial Guaranty and in form and substance satisfactory to Financial Guaranty to the effect that payments under such letter of credit would not constitute avoidable preferences under Section 547 of the U.S. Bankruptcy Code or similar state laws with avoidable preference provisions in the event of the filing of a petition for relief under the U.S. Bankruptcy Code or similar state laws by or against the issuer of the bonds (or any other account party under the letter of credit).
5. The obligation to reimburse the issuer of a Reserve Fund credit instrument for any fees, expenses, claims or draws upon such Reserve Fund credit instrument shall be subordinate to the payment of debt service on the bonds. The right of the issuer of a Reserve Fund credit instrument to payment or reimbursement of its fees and expenses shall be subordinated to cash replenishment of the Reserve Fund, and, subject to the second succeeding

sentence, its right to reimbursement for claims or draws shall be on a parity with the cash replenishment of the Reserve Fund. The Reserve Fund credit instrument shall provide for a revolving feature under which the amount available thereunder will be reinstated to the extent of any reimbursement of draws or claims paid. If the revolving feature is suspended or terminated for any reason, the right of the issuer of the Reserve Fund credit instrument to reimbursement will be further subordinated to cash replenishment of the Reserve Fund to an amount equal to the difference between the full original amount available under the Reserve Fund credit instrument and the amount then available for further draws or claims. If (a) the issuer of a Reserve Fund credit instrument becomes insolvent or (b) the issuer of a Reserve Fund credit instrument defaults in its payment obligations thereunder or (c) the claims-paying ability of the issuer of the insurance policy or surety bond falls below a S&P "AAA" or a Moody's "Aaa" or (d) the rating of the issuer of the letter of credit falls below a S&P "AA", the obligation to reimburse the issuer of the Reserve Fund credit instrument shall be subordinate to the cash replenishment of the Reserve Fund.

6. If (a) the revolving reinstatement feature described in the preceding paragraph is suspended or terminated or (b) the rating of the claims paying ability of the issuer of the surety bond or insurance policy falls below a S&P "AAA" or a Moody's "Aaa" or (c) the rating of the issuer of the letter of credit falls below a S&P "AA", the Issuer shall either (i) deposit into the Reserve Fund an amount sufficient to cause the cash or permitted investments on deposit in the Reserve Fund to equal the Reserve Fund Requirement on all outstanding Bonds, such amount to be paid over the ensuing five years in equal installments deposited at least semi-annually or (ii) replace such instrument with a surety bond, insurance policy or letter of credit meeting the requirements in any of 1-3 above within six months of such occurrence. In the event (a) the rating of the claims-paying ability of the issuer of the surety bond or insurance policy falls below "A" or (b) the rating of the issuer of the letter of credit falls below "A" or (c) the issuer of the Reserve Fund credit instrument defaults in its payment obligations or (d) the issuer of the Reserve Fund credit instrument becomes insolvent, the Issuer shall either (i) deposit into the Reserve Fund an amount sufficient to cause the cash or permitted investments on deposit in the Reserve Fund to equal to Reserve Fund Requirement on all outstanding Bonds, such amount to be paid over the ensuing year in equal installments on at least a monthly

basis or (ii) replace such instrument with a surety bond, insurance policy or letter of credit meeting the requirements in any of 1-3 above within six months of such occurrence.

7. Where applicable, the amount available for draws or claims under the Reserve Fund credit instrument may be reduced by the amount of cash or permitted investments deposited in the Reserve Fund pursuant to clause (i) of the preceding subparagraph 6.
8. If the Issuer chooses the above described alternatives to a cash-funded Reserve Fund, any amounts owed by the Issuer to the issuer of such credit instrument as a result of a draw thereon or a claim thereunder, as appropriate, shall be included in any calculation of debt service requirements required to be made pursuant to the Authorizing Document for any purpose, e.g., rate covenant or additional bonds test.
9. The Authorizing Document shall require the Fiduciary to ascertain the necessity for a claim or draw upon the Reserve Fund credit instrument and to provide notice to the issuer of the Reserve Fund credit instrument in accordance with its terms not later than three days (or such longer period as may be necessary depending on the permitted time period for honoring a draw under the Reserve Fund credit instrument) prior to each interest payment date.
10. Cash on deposit in the Reserve Fund shall be used (or investments purchased with such cash shall be liquidated and the proceeds applied as required) prior to any drawing on any Reserve Fund credit instrument. If and to the extent that more than one Reserve Fund credit instrument is deposited in the Reserve Fund, drawings thereunder and repayments of costs associated therewith shall be made on a pro rata basis, calculated by reference to the maximum amounts available thereunder.

APPENDIX "B"

FORM OF CO-BOND COUNSEL OPINION

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ECKERT SEAMANS CHERIN & MELLOTT
42nd Floor, USX Tower
600 Grant Street
Pittsburgh, PA 15219
(412) 566-6000

KING, ABRAMS & BURNEY
1002 Fifth Avenue
Pittsburgh, PA 15219
(412) 471-4420

November 16, 1993

THE PITTSBURGH WATER AND SEWER AUTHORITY
\$278,970,000
Water and Sewer System
Revenue Refunding Bonds,
Series A of 1993

THE PITTSBURGH WATER AND SEWER AUTHORITY
\$10,785,000
Water and Sewer System
Revenue Bonds,
Series B of 1993

To the Purchasers of the
Above-Described Bonds:

Ladies and Gentlemen:

We have acted as Co-Bond Counsel in connection with the issuance and sale of \$278,970,000, aggregate principal amount, of Water and Sewer System Revenue Refunding Bonds, Series A of 1993 (the "Series A Bonds") and \$10,785,000, aggregate principal amount, of Water and Sewer System Revenue Bonds, Series B of 1993 (the "Series B Bonds") (the Series A Bonds and the Series B Bonds collectively referred to as the "Bonds") by The Pittsburgh Water and Sewer Authority (the "Authority"), under a Trust Indenture dated as of October 15, 1993 (the "Indenture") between the Authority and PNC Bank, National Association, as Trustee (the "Trustee").

The Bonds are in fully registered form. The Series A Bonds have been issued in order to provide funds which will be used (i) to advance refund all of the Authority's outstanding Water and Sewer System Revenue Refunding Bonds, Series A of 1991, and (ii) to pay all fees and expenses incurred in connection with the issuance of the Series A Bonds, including certain insurance premiums. The Series B Bonds have been issued in order to provide funds which will be used (i) to pay for capital improvements to the Authority's

Water and Sewer System, and (ii) to pay all fees and expenses incurred in connection with the issuance of the Series B Bonds, including certain insurance premiums.

The Bonds are not obligations of the City of Pittsburgh, the Commonwealth of Pennsylvania (the "Commonwealth"), or of any political subdivision thereof, but, and to the extent provided in the Indenture, are payable solely out of the receipts and revenues of the Authority derived from the operation of its Water and Sewer System and from certain other moneys of the Authority, as further described in the Indenture.

As Co-Bond Counsel, we have examined the Indenture, certified copies of all of the proceedings relating to the issuance of the Bonds, including the certification of the Authority that the Authority does not expect that the proceeds of the Bonds will be used in a manner which would cause the Bonds to be arbitrage bonds within the meaning of Section 148 of the Internal Revenue Code of 1986, as amended (the "Code"), specimens of the forms of the Bonds, the Municipality Authorities Act of 1945, P.L. 382, as amended (the "Act"), the constitution of the Commonwealth, and such other public records and documents and matters of law as we deemed appropriate in order to render the opinions set forth herein.

Based upon the foregoing, it is our opinion, as of the date hereof and under existing law, that:

1. The Authority is a public instrumentality and body corporate and politic duly organized pursuant to the Act and is validly existing and in good standing under the Act.

2. The Authority has full legal right, power and authority to enter into the Indenture, to issue, sell and deliver the Bonds and to carry out and consummate all other transactions to be carried out and consummated by it as contemplated by the Indenture.

3. The Indenture has been duly authorized, executed and delivered by the Authority and constitutes a legal, valid and binding obligation of the Authority, enforceable in accordance with its terms.

4. The Bonds have been duly authorized, executed, authenticated, issued and delivered, and constitute legal, valid and binding obligations of the Authority in accordance with their terms, and are entitled to the benefit and security of the Indenture.

5. The interest on the Bonds (a) is excluded from gross income for federal tax purposes and (b) is not an item of tax preference (within the meaning of Section 57(a)(5) of the Code for purposes of the federal alternative minimum tax imposed on individuals and corporations; however, it should be noted that with respect to corporations (as defined for federal income tax purposes), such interest is taken into account in determining adjusted current earnings for the purposes of (i) computing the alternative minimum tax imposed on such corporations by Section 55 of the Code, and (ii) computing the environmental tax

imposed by Section 59A of the Code. The opinion set forth above in this paragraph is subject to the condition that the Authority comply with all requirements of the Code that must be satisfied subsequent to the issuance of the Bonds in order that interest thereon be (or continue to be) excluded from gross income for federal tax purposes. Failure to comply with such requirements could cause interest on the Bonds to be included in gross income retroactively to the date of issuance of the Bonds. We express no opinion regarding other federal tax consequences arising with respect to the Bonds.

6. The Bonds are exempt from taxation within the Commonwealth of Pennsylvania except for gift, estate, succession or inheritance taxes or any other taxes not levied or assessed directly on the Bonds, the transfer thereof, the income therefrom, or the realization of profits on the sale thereof.

7. The Bonds are exempt from registration under the provisions of the Securities Act of 1933, as amended and the Indenture is not required to be qualified under the Trust Indenture Act of 1939, as amended.

It is to be understood that the rights of the owners of the Bonds and the enforceability of the Bonds and the Indenture may be subject to bankruptcy, insolvency, reorganization, moratorium and other similar laws of general application affecting creditors' rights heretofore or hereafter enacted to the extent constitutionally applicable and that their enforcement may also be subject to the exercise of judicial discretion in appropriate cases.

Very truly yours,

ECKERT, SEAMANS, CHERIN & MELLOTT

KING, ABRAMS & BURNEY

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APPENDIX "C"

AUTHORITY FINANCIAL STATEMENTS FOR
YEARS 1991 AND 1992

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Audited Financial Statements
and Other Financial Information

PITTSBURGH WATER AND SEWER AUTHORITY

Years ended December 31, 1992 and 1991
with Report of Independent Auditors

PITTSBURGH WATER AND SEWER AUTHORITY

Audited Financial Statements and Other Financial Information

Years ended December 31, 1992 and 1991

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Report of Independent Auditors

Board of Directors
Pittsburgh Water and Sewer Authority

We have audited the accompanying balance sheets of the Pittsburgh Water and Sewer Authority as of December 31, 1992 and 1991, and the related statements of income (loss) and Authority accumulated deficit and cash flows for the years then ended. These financial statements are the responsibility of the Authority's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

As more fully discussed in Note 3 to the financial statements, the Authority has material transactions with related parties.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Pittsburgh Water and Sewer Authority at December 31, 1992 and 1991, and the results of its operations and its cash flows for the years then ended in conformity with generally accepted accounting principles.

Our audits have been made primarily for the purpose of expressing an opinion on the basic financial statements taken as a whole. The accompanying other financial information is presented for purposes of additional analysis and is not a required part of the basic financial statements. Such other financial information has been subjected to the procedures applied in the audits of the basic financial statements and, in our opinion, is fairly stated in all material respects in relation to the basic financial statements taken as a whole.



March 12, 1993

PITTSBURGH WATER AND SEWER AUTHORITY

Balance Sheets

	December 31	
	1992	1991
	(In Thousands)	
Assets		
Current assets:		
Nontrusted funds:		
Cash and cash equivalents	\$ 5,159	\$ 17,959
Accrued interest	-	7
	<u>5,159</u>	<u>17,966</u>
Net customer accounts receivable (Note 3):		
Billed	3,859	3,446
Unbilled	7,227	7,062
Other current assets	7	7
Total current assets	<u>16,252</u>	<u>28,481</u>
Trusteed and restricted funds (Note 2):		
Accrued interest receivable	308	531
Accrued interest payable	(7,594)	(8,428)
Cash and cash equivalents	52,194	58,051
Investments	21,150	23,197
	<u>66,058</u>	<u>73,351</u>
Property, plant and equipment, at cost (Note 2):		
Utility plant, net of accumulated depreciation of \$9,144 in 1992 and \$6,433 in 1991	105,748	84,791
Nonutility plant, net of accumulated depreciation of \$1,357 in 1992 and \$913 in 1991	3,490	2,868
Construction in progress, including deferred interest expense of \$5,948 in 1992 and \$2,850 in 1991	37,536	45,643
Total property, plant and equipment	<u>146,774</u>	<u>133,302</u>
Bond issue costs, net of accumulated amortization of \$291 in 1992 and \$102 in 1991	2,310	2,465
Deferred hydroelectric division expenses (Note 7)	-	1,223
	<u>\$231,394</u>	<u>\$238,822</u>

	December 31	
	1992	1991
	<u>(In Thousands)</u>	
Liabilities and Authority accumulated deficit		
Current liabilities:		
Nontrusted funds:		
Accounts payable	\$ 120	\$ 100
Due to City of Pittsburgh	4,877	6,883
Total current liabilities	<u>4,997</u>	<u>6,983</u>
Accounts payable—trusted funds	1,402	2,064
Due to City of Pittsburgh	-	3,350
Bonds payable (Notes 1 and 2):		
Revenue bonds, Series 1991	248,329	248,329
Less: bond discount	(9,628)	(10,101)
Total bonds payable	<u>238,701</u>	<u>238,228</u>
Commitments and contingencies (Note 4)	-	-
Total liabilities	<u>245,100</u>	<u>250,625</u>
Authority accumulated deficit:		
Contributed capital	5,277	5,277
Accumulated deficit	(18,983)	(17,080)
Total Authority accumulated deficit	<u>(13,706)</u>	<u>(11,803)</u>
	<u>\$231,394</u>	<u>\$238,822</u>

See accompanying notes.

PITTSBURGH WATER AND SEWER AUTHORITY

Statements of Income (Loss) and Authority Accumulated Deficit

	Year ended December 31	
	1992	1991
	(In Thousands)	
Operating revenue, principally water sales (Note 6)	\$45,859	\$ 42,767
Operating expenses (Note 3):		
City water department—direct expenses	15,015	14,630
Sewer direct and indirect expenses	4,272	4,251
Allocation of City indirect costs	4,827	4,544
Payments to non-City water agencies	2,819	2,915
City financing charge	3,228	3,338
Additional payment	4,440	4,228
Depreciation	3,166	2,571
Authority general and administrative	659	745
Total operating expenses	<u>38,426</u>	<u>37,222</u>
Total operating income	7,433	5,545
Other income (expense):		
Interest income	1,372	8,961
Interest expense	(9,863)	(14,812)
Amortization of bond issue costs	(155)	(1,056)
Net gain on investment sales	331	366
Write-off of hydroelectric division costs (Note 7)	(1,495)	—
Other	474	—
Total other income (expense)	<u>(9,336)</u>	<u>(6,541)</u>
Loss before extraordinary item	(1,903)	(996)
Extraordinary item (Note 2):		
Gain on extinguishment of bonds	—	2,972
Net income (loss)	<u>(1,903)</u>	<u>1,976</u>
Authority accumulated deficit at beginning of year	<u>(17,080)</u>	<u>(19,056)</u>
Authority accumulated deficit at end of year	<u><u>\$(18,983)</u></u>	<u><u>\$(17,080)</u></u>

See accompanying notes.

PITTSBURGH WATER AND SEWER AUTHORITY

Statements of Cash Flows

Increase (Decrease) in Cash and Cash Equivalents

	Year ended December 31	
	1992	1991
	(In Thousands)	
Operating activities		
Operating income	\$ 7,433	\$ 5,545
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation	3,166	2,571
(Increase) decrease in customer accounts receivable	(578)	591
Decrease in other current assets	-	11
Increase (decrease) in accounts payable	20	(132)
Decrease in amount due to City of Pittsburgh	(5,356)	(3,513)
Total adjustments	(2,748)	(472)
Net cash provided by operating activities	4,685	5,073
Noncapital financing activities		
Proceeds from issuance of revenue bonds related to noncapital funds, net of underwriter's discount	-	8,489
Accrued interest received on bonds issued related to noncapital funds	-	36
Principal paid on revenue bonds related to noncapital funds	-	(15,699)
Interest payments related to noncapital funds	(3,229)	(2,500)
Insurance premiums paid for revenue bonds related to noncapital funds	-	(56)
Bond issue costs related to noncapital funds	-	(11)
Proceeds from short-term loan	-	128,410
Repayment of short-term loan	-	(128,410)
Net cash used for noncapital financing activities	(3,229)	(9,741)
Capital financing activities		
Proceeds from issuance of revenue bonds related to capital funds, net of underwriter's discount	-	227,322
Accrued interest received on bonds issued related to capital funds	-	965
Principal paid on revenue bonds related to capital funds	-	(455,675)
Interest payments related to capital funds	(13,564)	(29,151)
Insurance premiums paid for revenue bonds related to capital funds	-	(1,513)
Bond issue costs related to capital funds	-	(306)
Acquisition and construction of capital assets	(13,153)	(22,250)
Net cash used for capital financing activities	(26,717)	(280,608)

Statements of Cash Flows

	Year ended December 31	
	1992	1991
	(In Thousands)	
Investing activities		
Purchase of investment securities	(12,131)	(265,237)
Proceeds from sale and maturities of investment securities	14,331	528,189
Interest earnings	4,201	54,578
Other income	475	-
Hydroelectric division expenses	(272)	(471)
Net cash provided by investing activities	6,604	317,059
Net (decrease) increase in cash and cash equivalents	(18,657)	31,783
Cash and cash equivalents at beginning of period	76,010	44,227
Cash and cash equivalents at end of period	\$57,353	\$ 76,010

See accompanying notes.

PITTSBURGH WATER AND SEWER AUTHORITY

Notes to Financial Statements

December 31, 1992

1. Summary of Significant Accounting Policies

Organization

The Pittsburgh Water and Sewer Authority (the Authority) was incorporated in February 1984 under the Municipality Authorities Act of 1945 of the Commonwealth of Pennsylvania pursuant to Resolution No. 36 of the Council of the City of Pittsburgh (City). Effective May 1, 1984, the Authority assumed responsibility for the operation and rehabilitation of the water and sewer system of the City of Pittsburgh, and a seven-year capital improvement program was adopted. At that date, the net amount of uncollected water billings of \$5,277,000 on the City's records was transferred to the Authority as a contribution to capital. The Authority's financial position and results of operations are an integral part of the financial statements of the City.

The significant accounting policies of the Authority are as follows:

Cash and Cash Equivalents

Cash and cash equivalents include all highly liquid investments, including trusteed and restricted assets, with a maturity of three months or less.

Investments

Investments in nontrusteed and trusteed funds are recorded at cost or amortized cost. The fair value of investments is based on quoted market prices.

Deferred Interest

Municipal Bond New Issue Insurance premiums paid reduce the otherwise higher interest rates on new bond issues. Therefore, these costs are deferred and amortized over the life of the related bonds using the effective interest method. The unamortized portion is included in deferred interest expense.

Interest earned on funds restricted for the purpose of capital improvements, net of related interest expense, is deferred and allocated to the cost of capital assets. For the year ended December 31, 1992, the Authority deferred interest earnings of \$2,415,000 (\$12,225,000 for the year ended December 31, 1991) less interest expense of \$6,693,000 (\$15,418,000 for the year ended December 31, 1991), exclusive of insurance premiums.

Bond Issue Costs

Bond issue costs, including remarketing fees, are deferred and amortized over the life of the related bonds using the effective interest method.

Bond Discounts

Bond discounts are amortized over the life of the related bonds using the effective interest method of amortization. The unamortized portion is reflected on the balance sheet as a reduction from the related bonds payable.

Revenue Recognition

Revenues from water sales are recognized when earned (when consumed) irrespective of when they are actually billed or collected. Water charges are billed to customers quarterly based on actual or estimated meter readings.

Property, Plant and Equipment

Depreciation of fixed assets is provided on the straight-line method based on the estimated useful lives of the various classes of assets. Utility assets have an estimated useful life of 30 to 40 years. Maintenance and repairs are charged to expense as incurred; major renewals and betterments are capitalized and depreciated over their estimated useful lives.

2. Revenue Bonds

In order to finance the first phase of its seven-year capital improvement program, the Authority issued \$93,600,000 Daily Adjustable Demand Water and Sewer System Revenue Bonds, Series of 1984 (1984 Bonds). In 1985, the Authority issued \$100,000,000 Adjustable Rate Tender Revenue Bonds, Series of 1985 (1985 Bonds), of which \$88,604,000 of the proceeds were placed in an escrow fund which was used to redeem the 1984 Bonds on April 1, 1987, and to pay interest due on the 1985 Bonds during the escrow period.

In June 1986, the Authority issued \$134,700,000 Adjustable Rate Tender Revenue Bonds, Series of 1986 (June 1986 Bonds) in order to fund the second phase of the capital improvement program. In July 1986, the Authority issued \$264,090,000 Revenue Refunding Bonds, Series of 1986 (July 1986 Bonds), with the intention of refunding the 1985 and June 1986 Bonds on September 1, 1991 or sometime thereafter. Proceeds of \$241,411,000 from the issuance were placed in an escrow fund (July 1986 escrow fund) to provide for the refunding.

During 1991, current interest rates made it beneficial for the Authority to refinance the then outstanding bonds with a new bond issuance, rather than implement the intended refunding of the July 1986 Bonds. In July 1991, the Authority issued \$248,329,024 Water and Sewer System Revenue Refunding Bonds, Series A of 1991 (1991 Bonds), the proceeds of which were placed in an escrow fund (1991 escrow fund). The escrowed proceeds, together with the earnings thereon and approximately \$870,000 of excess Authority funds, were used to redeem the 1985 and June 1986 Bonds on September 1, 1991. On July 11, 1991, the Authority used the July 1986 escrow fund, and debt service funds accumulated for principal and interest payments on the refunded bonds, to place sufficient funds in escrow in order to meet all future debt service requirements and legally defease the July 1986 Bonds. The accounting gain on the extinguishment of the 1985, June 1986, and July 1986 Bonds, net of unamortized bond issue costs and insurance premiums related to the bonds, is recognized as an extraordinary item in 1991.

The 1991 Bonds are comprised of \$220,140,000 of current interest bonds and \$28,189,024 of capital appreciation bonds. The current interest bonds have a fixed rate of interest which ranges from 5.25% to 6.6%, and pay interest semiannually at March 1 and September 1 commencing March 1, 1992. The capital appreciation bonds are scheduled to mature in 2003 through 2008 and accrete interest, which is payable at their stated maturity date. Yields on the capital appreciation bonds range from 6.9% to 7.2%. The average effective interest rate on the 1991 Bonds, including amortization of original issue discount, is 6.6% for 1992 (6.4% in 1991). The bonds are insured under a Municipal Bond New Issue Insurance Policy issued by FGIC. Fair value of the 1991 Bonds at December 31, 1992, based on quoted market prices, is approximately \$264,997,000.

Scheduled maturities (in thousands) of the 1991 Bonds are as follows:

1993	\$ 4,445
1994	5,685
1995	7,990
1996	8,455
1997	8,950
Later years	<u>212,804</u>
	<u>\$248,329</u>

The current interest bonds are subject to optional and mandatory redemption in various face amounts beginning September 1, 2001. The capital appreciation bonds are not callable prior to their respective maturity dates.

Interest incurred for the years ended December 31, 1992 and 1991 on bonds payable, exclusive of letter-of-credit fees and the amortization of deferred interest, was as follows (in thousands):

	<u>1992</u>	<u>1991</u>
1985 Bonds	\$ --	\$3,314
June 1986 Bonds	--	5,657
July 1986 Bonds	--	9,821
1991 Bonds	15,958	7,497

Insurance premiums of \$2,355,000, \$6,480,000, and \$2,623,000 were recorded as deferred interest in 1991, 1986, and 1985, respectively. The unamortized 1986 and 1985 premiums were written off when the related bonds were refunded in July and September of 1991. Amortization of the deferred interest plus letter-of-credit fees paid on the 1985 and June 1986 Bonds amounted to \$143,000 and \$919,000 for the years ended December 31, 1992 and 1991, respectively, and are included in interest cost.

In accordance with the provisions of the trust indenture for the bonds payable, the Authority has established both trustee and non-trustee funds with assets, principally short-term investments, which are restricted for specific purposes. A summary of the balances in these funds at December 31, 1992 and 1991 is as follows (in thousands):

	<u>1992</u>	<u>1991</u>
Trustee funds:		
Construction fund	\$38,315	\$51,188
Debt service fund	(131)	(5,719)
Renewal and replacement fund	2,298	2,297
Debt service reserve fund	21,688	21,725
Operating reserve account	<u>3,321</u>	<u>3,321</u>
	65,491	72,812
Self-insured escrow fund (Note 4)	<u>567</u>	<u>539</u>
Total trustee and restricted funds	<u>\$66,058</u>	<u>\$73,351</u>

In addition, the trust indenture requires that all revenues be deposited in a Revenue Fund. Amounts in the Revenue Fund are to be first disbursed to other funds as provided for in the indentures.

Under the trust indenture of the 1991 Bonds, the Authority has made certain covenants which essentially provide for rates to be set at levels sufficient to meet debt service requirements under one of two formulas. Under the first formula, revenues, as defined, must be sufficient to provide annually:

- (a) Funds to pay all of the current expenses of the Authority;
- (b) An amount equal to 100% of the debt service requirements with respect to the bonds during the then current fiscal year of the Authority; and
- (c) Funds to pay indirect expenses billed by the City and the "additional payment" (Note 3).

The second formula varies from the above in that any unrestricted cash and investments in the Revenue Fund at the beginning of the year may be included with revenues in the determination, but 120% of the debt service requirements must be met.

3. Transactions with the City of Pittsburgh

The Authority entered into a lease and management agreement effective May 1, 1984 (agreement) with the City. The agreement provides for the Authority to lease the water and sewer system (system) from the City and then contract the City to operate and maintain the system for a 50-year period. Under the agreement, the Authority reimburses the City for the direct operating costs of, and indirect costs allocated to, the water and sewer system; debt service on existing City debt related to the system prior to the effective date of the lease and management agreement; and an "additional payment" in consideration of the lease which is determined by the City each year. The "additional payment" is limited to a maximum of \$4,228,200 in 1991 increased by a specified price index thereafter. The "additional payment" also includes up to 600 million gallons of water to be provided to the City annually at no charge. The agreement also requires the Authority to reimburse the City for payments to other non-City water agencies representing the differences in rates between the City and those agencies related to water provided to City residents who are customers of non-City water agencies. Payments under the agreement, with the exception of direct costs, are subordinated to the Authority's obligations under its trust indenture.

The Authority accounts for the lease as an operating lease. Costs related to the management agreement and the lease are recognized as operating expenses by the Authority based upon billings and accrued expenses reported by the City. Future obligations of the Authority, in consideration of the lease, are the payment of the City's debt and the "additional payment." The "additional payment" can vary annually based on the City's discretion subject to certain limitations discussed above. For 1993, the "additional payment" has been budgeted at \$4,590,557. Debt service obligations of the City, which are to be funded by the Authority, as a City financing charge, are as follows (in thousands):

Year Ended December 31:	
1993	\$ 3,145
1994	3,051
1995	2,611
1996	2,609
1997	2,421
Later years	<u>26,410</u>
Total minimum future lease payments	<u><u>\$40,247</u></u>

The City is responsible for the billings and collections of the Authority's water charges. The Authority has adopted a collection policy which includes termination of service, filing of liens, accounts being turned over to collection agencies, and the sale of real property for delinquent accounts. At December 31, 1992 and 1991, the reserve for uncollectible accounts was \$19,354,000 and \$18,282,000, respectively.

The City is also responsible to hold the Authority harmless against any claims or judgments against the City or the Authority related to the operation and maintenance of the water and sewer system.

Authority employees are eligible for retirement benefits under the City's Municipal Retirement Plan. The Authority records benefits expense based on amounts billed by the City.

In November of 1990, the City notified the Authority that \$14,350,000 relating to employee benefits under the agreement from 1984 through 1989 is due to the City. These costs, which were recognized as an expense in November 1990, are being paid by the Authority in installments over a four-year period. As of December 31, 1992, Due to the City includes the remaining balance due for these costs, \$3,000,000.

4. Commitments and Contingencies

As of December 31, 1992, \$157 million has been spent, and an additional \$10 million has been committed for noncancelable construction contracts under the \$194 million seven-year Capital Improvements Program.

The Authority operates from leased space. Rental expense was \$151,000 and \$170,000 for the years ended December 31, 1992 and 1991, respectively. Future minimum rental commitments are as follows (in thousands):

Year ended December 31:

1993	\$176
1994	176
1995	145
1996	51
1997	34
Total	<u>\$582</u>

In 1987, the Authority elected to become self-insured for general liability coverage and established a Self-Insured Escrow Fund (General Liability) to cover potential liability claims. Through December 31, 1992, there have been no claims paid from this fund. As discussed in Note 3, the City indemnifies the Authority against claims arising from the operation and maintenance of the water and sewer system.

5. Investments and Deposits with Financial Institutions

The trust indentures authorize the Authority to invest in obligations of the U.S. Government and government-sponsored agencies, and instrumentalities; certificates of deposits, fully insured or collateralized; commercial paper of the highest rating; repurchase agreements collateralized by government obligations or securities; and highly rated bank promissory notes or investment funds or trusts. Throughout the year ended December 31, 1992, the Authority invested its funds in only one or more of the above authorized investments.

At December 31, 1992, the amount of the Authority's deposits totaled \$2,767,000 at carrying value (which equals market), all of which are demand deposits. The Authority's deposits are held in several institutions and are carried at cost plus accrued interest. The Authority's deposits which are held by PNC Bank as trustee, were entirely covered by Federal Depository Insurance or by collateral as required by the Office of the Comptroller of Currency, Regulation 9. All other deposits are entirely covered by Federal Depository Insurance or by collateral (on a pooled basis by participating financial institutions in accordance with Act 72 of the Commonwealth of Pennsylvania). The financial institutions certify that the securities pledged as collateral against public funds would be available to the Authority and other public bodies to indemnify them against any loss in the event of default by the institution. Under the provisions of GASB Statement Number 3, all of the Authority's deposits are considered to be insured or otherwise collateralized.

The Authority's investments held at December 31, 1992 are categorized below to give an indication of the level of risk assumed by the Authority. Category 1 includes investments that are insured or registered or for which securities are held by the Authority or its agent in the Authority's name. Category 2 includes uninsured and unregistered investments for which the securities are held by the broker's or dealer's trust department or agent in the Authority's name. Category 3 includes uninsured and unregistered investments for which the securities are held by the broker or dealer, or by its trust department or agent but not in the Authority's name.

(In Thousands)					
	Category			Carrying	Fair
	1	2	3	Amount	Value
Categorized investments:					
Repurchase agreements		\$ 2,529		\$ 2,529	\$ 2,529
Commercial paper		600		600	600
U.S. government securities		21,150		21,150	21,671
		<u>\$24,279</u>		24,279	24,800
Investments not categorized:					
Temporary investments				51,457	51,457
Total investments				<u>\$75,736</u>	<u>\$76,257</u>

The repurchase agreements and underlying securities, and U.S. government securities, are held in the counterparty's trust department's (bank's) name. The bank acts as trustee and custodian for the bondholders and, in its accounting records, holds the securities in the Authority's name in trust for the bondholders. U.S. government securities are held in the Federal Reserve book entry system. In accordance with GASB Statement Number 3, the repurchase agreements and U.S. government securities are properly classified as Category 2.

Temporary investments include highly liquid money market or mutual funds into which trusted cash in-flows are transferred until being subsequently disbursed or reinvested. This type of investment is not supported by identifiable securities and as such is not categorized.

6. Water Sales Agreement

In September 1986, the Authority entered into an agreement with Pennsylvania American Water Company (PAWC) (formerly Western Pennsylvania Water Company) to provide four to twelve million gallons of water per day for resale to PAWC customers at the Authority's normal bulk rates. Sales of water under this agreement commenced in April 1988 for an initial term of ten years. For the years ended December 31, 1992 and 1991, sales to PAWC amounted to \$2,824,000 and \$2,602,000, respectively.

7. Hydroelectric Division

In September of 1989, the City obtained a license from the Federal Energy Regulatory Commission for the construction of a Hydroelectric power plant, and transferred this license to a newly formed Hydroelectric Division of the Authority. From that time through the fourth quarter of 1992, the division conducted feasibility studies to determine if construction of the plant would benefit the Authority and its customers. All expenses of the Division were deferred pending a determination on whether to pursue the project. In the fourth quarter of 1992, the decision was made not to proceed with the project, and all related costs were expensed.

8. Short-Term Loan

In connection with the extinguishment of the July 1986 Bonds in July 1991 (Note 2), the Authority borrowed \$128,410,400 under a short-term loan facility with Pittsburgh National Bank. The loan was repaid in September 1991 with the proceeds from maturity of the remaining investment of the July 1986 Escrow Fund. The interest rate was 8%, and interest paid was approximately \$1,541,000 in 1991.

Other Financial Information

PITTSBURGH WATER AND SEWER AUTHORITY

Schedule of Activity in Restricted Funds
Series 1991 Bonds
(In Thousands)

Year ended December 31, 1992

	Trusteed and Restricted Funds					
	Construction Fund	Debt Service Fund	Debt Service Reserve Fund	Operating Reserve Account	Renewal and Replacement Fund	Self-Insured Escrow Fund
Receipts from:						
Interest income	\$ 1,858	\$ 123	\$ 1,242	\$ 118	\$ 83	\$ 28
Collection of water revenue	-	-	-	-	-	-
Other	-	-	331	-	-	-
Total receipts	1,858	123	1,573	118	83	28
Payments for:						
Interest expense	-	15,958	-	-	-	-
Capital projects	11,878	1,275	-	-	-	-
Operating expenses	-	-	-	-	-	-
General and administrative expenses	-	-	-	-	-	-
Total payments	11,878	17,233	-	-	-	-
Transfer (to) from other funds:						
Construction	-	2,853	-	-	-	-
Debt Service	(2,853)	-	-	-	-	-
Debt Service Reserve	-	-	-	-	-	-
Operating Reserve	-	-	-	-	-	-
Renewal and Replacement	-	-	-	-	-	-
Operations and Maintenance Revenue	-	-	-	-	-	-
Supplemental Cost	-	19,845	(1,610)	(118)	(82)	-
Total transfers	(2,853)	22,698	(1,610)	(118)	(82)	-
Net activity	(12,873)	5,588	(37)	-	1	28
Balance at December 31, 1991	51,188	(5,719)	21,725	3,321	2,297	539
Balance at December 31, 1992	\$38,315	\$ (131)	\$21,688	\$3,321	\$2,298	\$567

Nontrusteed Funds			
Operations and Maintenance Fund	Revenue Fund	Supplemental Cost Fund	Total
\$ 3	\$ 350	\$ -	\$ 3,805
-	45,281	-	45,281
-	290	-	621
3	45,921	-	49,707
-	-	-	15,958
-	-	-	13,153
30,006	-	9,724	39,730
949	-	-	949
30,955	-	9,724	69,790
-	-	-	2,853
-	(19,845)	-	(22,698)
-	1,610	-	1,610
-	118	-	118
-	82	-	82
-	(30,906)	-	(30,906)
30,906	-	9,724	58,665
-	(9,724)	-	(9,724)
30,906	(58,665)	9,724	-
(46)	(12,744)	-	(20,083)
150	17,799	-	91,300
\$ 104	\$ 5,055	\$ -	\$71,217

PITTSBURGH WATER AND SEWER AUTHORITY

Schedule of Activity in Restricted Funds
Series 1991 Bonds
(In Thousands)

Year ended December 31, 1991

	Trusteed and Restricted Funds					Self-Insured Escrow Fund
	Construction Fund	Debt Service Fund	Debt Service Reserve Fund	Operating Reserve Account	Renewal and Replacement Fund	
Receipts from:						
Bond proceeds	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Interest income	1,464	36	1,185	66	40	32
Collection of water revenue	-	-	-	-	-	-
Other	-	-	-	-	245	-
Total receipts	1,464	36	1,185	66	285	32
Payments for:						
1985 Bond Refunding	-	-	-	-	-	-
June 1986 Bond Refunding	-	-	-	-	-	-
Interest expense, 1991 Bonds	-	8,428	-	-	-	-
Interest expense, 1985 Bonds	-	-	-	-	-	-
Interest expense, June 1986 Bonds	-	-	-	-	-	-
Deferred interest cost	-	-	-	-	-	-
Bond issue costs	-	-	-	-	-	-
Capital projects	10,283	-	-	-	-	-
Operating expenses	-	-	-	-	-	-
General and administrative expenses	-	-	-	-	-	-
Other	-	-	-	-	-	-
Total payments	10,283	8,428	-	-	-	-
Transfer (to) from other funds:						
Series 1985 Revenue Bonds:						
Construction	209	-	-	-	-	-
Debt service reserve	-	-	21,379	-	-	-
Operating reserve	-	-	-	3,321	-	-
Debt service	-	22	-	-	-	-
Renewal and replacement	-	-	-	-	2,053	-
Revenue contingency	77	-	-	-	-	-
Series June 1986 Revenue Bonds:						
Construction	58,366	-	-	-	-	-
Debt service	-	282	-	-	-	-
Revenue contingency	16	-	-	-	-	-
Series July 1986 Revenue Bonds:						
Construction	2,692	-	-	-	-	-
Debt service	-	8	-	-	-	-
Escrow	-	1	-	-	-	-

Nontrusted Funds					
Escrow Fund	Operations and Maintenance Fund	Revenue Fund	Supplemental Cost Fund	Clearing Fund	Total
\$ -	\$ -	\$ -	\$ -	\$236,813	\$236,813
1,752	5	809	-	-	5,389
-	-	43,252	-	-	43,252
-	-	-	-	-	245
1,752	5	44,061	-	236,813	285,699
97,000	-	-	-	-	97,000
134,700	-	-	-	-	134,700
-	-	-	-	-	8,428
2,486	-	-	-	-	2,486
4,243	-	-	-	-	4,243
-	-	-	-	1,570	1,570
-	-	-	-	323	323
-	-	-	-	-	10,283
-	29,004	54	8,314	-	37,372
-	1,127	-	-	-	1,127
-	-	-	-	309	309
238,429	30,131	54	8,314	2,202	297,841
-	-	-	-	-	209
-	-	-	-	1,344	22,723
-	-	(476)	-	-	2,845
-	-	-	-	954	976
-	-	-	-	446	2,499
-	-	(223)	-	-	(146)
-	-	-	-	-	58,366
-	-	(3,013)	-	-	(2,731)
-	-	(86)	-	-	(70)
-	-	-	-	-	2,692
-	-	-	-	-	8
-	-	(142)	-	-	(141)

Schedule of Activity in Restricted Funds
Series 1991 Bonds

	Trusteed and Restricted Funds					Self- Insured Escrow Fund
	Construction Fund	Debt Service Fund	Debt Service Reserve Fund	Operating Reserve Account	Renewal and Replacement Fund	
Series 1991 Revenue Bonds:						
Construction	-	1,359	-	-	-	-
Debt service	(1,359)	-	-	-	-	-
Debt service reserve	-	-	-	-	-	-
Renewal and repair	-	-	-	-	-	-
Escrow	6	-	-	-	-	-
Operation and maintenance	-	-	-	-	-	-
Operating reserve	-	-	-	-	-	-
Revenue	-	-	(839)	(66)	(41)	-
Supplemental cost	-	-	-	-	-	-
Clearing	-	1,001	-	-	-	-
Total transfers	60,007	2,673	20,540	3,255	2,012	-
Net activity	51,188	(5,719)	21,725	3,321	2,297	32
Balance at December 31, 1990	-	-	-	-	-	507
Balance at December 31, 1991	\$51,188	\$(5,719)	\$21,725	\$3,321	\$2,297	\$539

Nontrusted Funds					
Escrow Fund	Operations and Maintenance Fund	Revenue Fund	Supplemental Cost Fund	Clearing Fund	Total
(6)	-	-	-	-	1,353
-	-	-	-	(1,001)	(2,360)
-	-	839	-	-	839
-	-	41	-	-	41
-	-	-	-	(236,683)	(236,677)
-	-	(30,104)	-	-	(30,104)
-	-	66	-	-	66
-	30,104	-	8,314	329	37,801
-	-	(8,314)	-	-	(8,314)
236,683	-	(329)	-	-	237,355
236,677	30,104	(41,741)	8,314	(234,611)	87,230
-	(22)	2,266	-	-	75,088
-	172	15,533	-	-	16,212
\$ -	\$ 150	\$17,799	\$ -	\$ -	\$ 91,300

PITTSBURGH WATER AND SEWER AUTHORITY

Schedule of Activity in Restricted Funds
 Series July 1986 Refunding Bonds
 (In Thousands)

Year ended December 31, 1991

	Trusteed Funds			Total
	Escrow Fund	Debt Service Fund	Construction Fund	
Receipts from:				
Interest income	\$ 11,517	\$ -	\$ 96	\$ 11,613
Gain on sale of investments	347	-	-	347
Loan proceeds	128,410	-	-	128,410
Total receipts	140,274	-	96	140,370
Payments for:				
Interest expense, bonds	3,101	-	-	3,101
Interest expense, loans	1,542	-	-	1,542
Loan repayment	128,410	-	-	128,410
Defeasance of July 1986 Bonds	238,964	-	-	238,964
Total payments	372,017	-	-	372,017
Transfers (to) from other funds:				
Series 1991 Revenue Bonds:				
Revenue	142	-	-	142
Debt Service	(1)	(8)	-	(9)
Construction	-	-	(2,692)	(2,692)
Total transfers	141	(8)	(2,692)	(2,559)
Net activity	(231,602)	(8)	(2,596)	(234,206)
Balance, December 31, 1990	231,602	8	2,596	234,206
Balance, December 31, 1991	\$ -0-	\$ -0-	\$ -0-	\$ -0-

PITTSBURGH WATER AND SEWER AUTHORITY

Schedule of Activity in Restricted Funds
 Series June 1986 Revenue Bonds
 (In Thousands)

Year ended December 31, 1991

	Trusted Funds		Nontrusted	Total
	Debt Service Fund	Construction Fund	Funds Revenue Contingency Account	
Receipts from:				
Interest income	\$ 72	\$ 2,759	\$ 93	\$ 2,924
Total receipts	72	2,759	93	2,924
Payments for:				
Capital projects	-	11,748	-	11,748
Interest expense	1,414	-	-	1,414
Defeasance of July 1986 Bonds	3,973	-	1,367	5,340
Other	-	75	259	334
Total payments	5,387	11,823	1,626	18,836
Transfer (to) from Series 1991 funds:				
Series June 1986 Bonds:				
Debt service	-	(4,280)	(3,697)	(7,977)
Construction	4,280	-	-	4,280
Revenue contingency	3,697	-	-	3,697
Series 1991 Revenue Bonds:				
Construction	-	(58,366)	(16)	(58,382)
Debt service	(282)	-	-	(282)
Revenue	-	-	86	86
Total transfers	7,695	(62,646)	(3,627)	(58,578)
Net activity	2,380	(71,710)	(5,160)	(74,490)
Balance, December 31, 1990	(2,380)	71,710	5,160	74,490
Balance, December 31, 1991	\$ -0-	\$ -0-	\$ -0-	\$ -0-

PITTSBURGH WATER AND SEWER AUTHORITY

Schedule of Activity in Restricted Funds
Series 1985 Bonds
(In Thousands)

Year ended December 31, 1991

	Trusted and Restricted Funds				
	Construction Fund	Debt Service Fund	Debt Service Reserve Fund	Operating Reserve Account	Renewal and Replacement Fund
Receipts from:					
Interest income	\$ 10	\$ 23	\$ 629	\$ 120	\$ 97
Gain (loss) on sale of investments	-	-	(29)	24	24
Other	-	-	-	-	-
Total receipts	10	23	600	144	121
Payments for:					
Interest expense	-	828	-	-	-
Capital projects	219	-	-	-	-
Defeasance of July 1986 Bonds	-	-	2,090	-	-
Other	-	-	-	-	-
Total payments	219	828	2,090	-	-
Transfer (to) from other funds:					
Series 1985 Bonds:					
Construction	-	9	-	-	-
Debt service	(9)	-	-	(104)	-
Operating reserve	-	104	-	-	-
Series 1991 Revenue Bonds:					
Clearing	-	(954)	(1,344)	-	(446)
Construction	(209)	-	-	-	-
Debt service	-	(22)	-	-	-
Debt service reserve	-	-	(21,379)	-	-
Operating reserve	-	-	-	(3,321)	-
Revenue	-	3,013	-	476	-
Renewal and replacement	-	-	-	-	(2,053)
Total transfers	(218)	2,150	(22,723)	(2,949)	(2,499)
Net activity	(427)	1,345	(24,213)	(2,805)	(2,378)
Balance, December 31, 1990	427	(1,345)	24,213	2,805	2,378
Balance, December 31, 1991	\$ -0-	\$ -0-	\$ -0-	\$ -0-	\$ -0-

Nontrusteed
Funds

Revenue Contingency	
Account	Total
\$ 1	\$ 880
-	19
-	-
1	899
-	828
-	219
-	2,090
148	148
148	3,285
-	9
-	(113)
-	104
-	(2,744)
(77)	(286)
-	(22)
-	(21,379)
-	(3,321)
223	3,712
-	(2,053)
146	(26,093)
(1)	(28,479)
1	28,479
\$ -0-	\$ -0-

PITTSBURGH WATER AND SEWER AUTHORITY

Schedule of Assets in Restricted Funds

December 31, 1992

	Carry Value	Market Value
	(In Thousands)	
<u>CONSTRUCTION FUND – Series 1991 Bonds</u>		
Accrued interest receivable	\$ 96	\$ 96
Dreyfus Treasury Cash Management Fund	37,619	37,619
Ford Motor Credit Corp., 3.5% interest, due February 9, 1993	600	600
	<u>\$38,315</u>	<u>\$38,315</u>
<u>DEBT SERVICE FUND – Series 1991 Bonds</u>		
Accrued Interest Payable	\$(7,594)	\$(7,594)
Dreyfus Treasury Cash Management Fund	7,463	7,463
	<u>\$ (131)</u>	<u>\$ (131)</u>
<u>DEBT SERVICE RESERVE FUND – Series 1991 Bonds</u>		
Accrued interest receivable	\$ 212	\$ 212
Dreyfus Treasury Cash Management Fund	756	756
U.S. Treasury Notes, 8.5% interest, due September 30, 1994	5,079	5,348
U.S. Treasury Notes, 8.5% interest, due November 15, 1995	532	567
U.S. Treasury Notes, 7.5% interest, due February 29, 1996	2,978	3,192
U.S. Treasury Notes, 7.5% interest, due December 31, 1996	4,066	4,065
U.S. Treasury Notes, 6.375% interest, due June 30, 1996	4,069	4,069
U.S. Treasury Notes, 6.0% interest, due November 30, 1997	3,996	3,994
	<u>\$21,688</u>	<u>\$22,203</u>

Schedule of Assets in Restricted Funds

December 31, 1992

	Carry Value	Market Value
	(In Thousands)	
<u>OPERATING RESERVE FUND – Series 1991 Bonds</u>		
Dreyfus Treasury Cash Management Fund	\$3,321	\$3,321
<u>RENEWAL AND REPLACEMENT FUND – Series 1991 Bonds</u>		
Dreyfus Treasury Cash Management Fund	\$2,298	\$2,298
<u>SELF-INSURED ESCROW FUND – Series 1991 Bonds</u>		
Cash	\$ 137	\$ 137
U.S. Treasury Notes, 6.75% interest, maturing May 31, 1993	430	436
	\$ 567	\$ 573
<u>OPERATIONS AND MAINTENANCE FUND – Series 1991 Bonds</u>		
Cash	\$ 104	\$ 104
<u>REVENUE FUND – Series 1991 Bonds</u>		
Cash	\$2,526	\$2,526
Equibank, Repurchase Agreement, 2.65% interest, due January 4, 1993	2,212	2,212
Pittsburgh National Bank, Repurchase Agreement, 2.5% interest, due January 4, 1993	317	317
	\$5,055	\$5,055

PITTSBURGH WATER AND SEWER AUTHORITY

Schedule of Assets in Restricted Funds

December 31, 1991

	Carry Value	Market Value
	(In Thousands)	
<u>CONSTRUCTION FUND – Series 1991 Bonds</u>		
Accrued interest receivable	\$ 118	\$ 118
Dreyfus Treasury Cash Management Fund	46,060	46,060
Federal National Mortgage Association, Debenture, Series 1989, 8.2% interest, due November 10, 1992	5,010	5,161
	<u>\$51,188</u>	<u>\$51,339</u>
<u>DEBT SERVICE FUND – Series 1991 Bonds</u>		
Accrued interest payable	\$(8,428)	\$(8,428)
Dreyfus Treasury Cash Management Fund	2,709	2,709
	<u>\$(5,719)</u>	<u>\$(5,719)</u>
<u>DEBT SERVICE RESERVE FUND – Series 1991 Bonds</u>		
Accrued interest receivable	\$ 412	\$ 412
Dreyfus Treasury Cash Management Fund	3,556	3,556
U.S. Treasury Notes, 8.5% interest, due February 29, 1992	4,000	4,030
U.S. Treasury Notes, 8.5% interest, due December 31, 1994	10,245	10,844
U.S. Treasury Notes, 8.5% interest, due November 15, 1995	537	570
U.S. Treasury Notes, 7.5% interest, due February 29, 1996	2,975	3,187
	<u>\$21,725</u>	<u>\$22,599</u>
<u>OPERATING RESERVE FUND – Series 1991 Bonds</u>		
Dreyfus Treasury Cash Management Fund	<u>\$ 3,321</u>	<u>\$ 3,321</u>

Schedule of Assets in Restricted Funds

December 31, 1991

	Carry Value	Market Value
	(In Thousands)	
<u>RENEWAL AND REPLACEMENT FUND – Series 1991 Bonds</u>		
Dreyfus Treasury Cash Management Fund	\$ 2,297	\$ 2,297
<u>SELF-INSURED ESCROW FUND – Series 1991 Bonds</u>		
Accrued interest receivable	\$ 1	\$ 1
Cash	108	108
U.S. Treasury Notes, 6.75% interest, maturing May 31, 1993	430	443
	<u>\$ 539</u>	<u>\$ 552</u>
<u>OPERATIONS AND MAINTENANCE FUND – Series 1991 Bonds</u>		
Cash	\$ 150	\$ 150
<u>REVENUE FUND – Series 1991 Bonds</u>		
Accrued interest receivable	\$ 7	\$ 7
Cash	376	376
Equibank, Repurchase Agreement, 4% interest, due January 2, 1992	9,740	9,740
Pittsburgh National Bank, Repurchase Agreement, 3.75% interest, due January 2, 1992	2,676	2,676
Equibank, Certificates of Deposit, 4.2% interest, due January 27, 1992	5,000	5,000
	<u>\$17,799</u>	<u>\$17,799</u>

PITTSBURGH WATER AND SEWER AUTHORITY

Schedule of Operating Expenses
(In Thousands)

Year ended December 31, 1992

	<u>Annual Budget</u>	<u>Actual</u>
Water expenses:		
Administrative salaries	\$ 1,126	\$ 1,123
Premium pay	402	414
Workmen's compensation	600	617
Education and training	15	12
Miscellaneous service	1,332	1,367
Utilities	3,928	3,451
Supplies	185	180
Repairs	665	542
Equipment	155	90
Refunds	200	209
Materials	869	895
Chemicals	950	1,128
Engineering salaries	173	172
Purification and pumping salaries	1,569	1,559
Distribution division salaries	3,267	3,255
Water departmental indirect cost	4,827	4,828
	<u>20,263</u>	<u>19,842</u>
Sewer expenses:		
Direct and indirect	4,282	4,272
General obligation debt repayment	3,228	3,228
Payments to non-City water agencies	3,355	2,819
Additional payment	4,440	4,440
Total city expenses	<u>35,568</u>	<u>34,601</u>
Authority general and administrative	765	659
Depreciation	<u>2,500</u>	<u>3,166</u>
Total operating expenses	<u><u>\$38,833</u></u>	<u><u>\$38,426</u></u>

PITTSBURGH WATER AND SEWER AUTHORITY

Schedule of Operating Expenses
(In Thousands)

Year ended December 31, 1991

	<u>Annual Budget</u>	<u>Actual</u>
Water expenses:		
Administrative salaries	\$ 1,118	\$ 1,170
Premium pay	417	441
Workmen's compensation	581	580
Education and training	13	13
Miscellaneous service	1,266	1,281
Utilities	3,784	3,858
Supplies	129	114
Repairs	289	312
Equipment	145	174
Refunds	341	294
Materials	691	716
Chemicals	838	881
Engineering salaries	178	188
Purification and pumping salaries	1,488	1,562
Distribution division salaries	2,905	3,046
Water departmental indirect cost	4,086	4,544
	<u>18,269</u>	<u>19,174</u>
Sewer expenses:		
Direct and indirect	3,296	4,251
General obligation debt repayment	3,338	3,338
Payments to non-City water agencies	2,462	2,915
Additional payment	4,228	4,228
Total city expenses	<u>31,593</u>	<u>33,906</u>
Authority general and administrative	795	745
Depreciation	2,500	2,571
Total operating expenses	<u><u>\$34,888</u></u>	<u><u>\$37,222</u></u>

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APPENDIX "D"

DESCRIPTION OF SERVICE AREA

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INTRODUCTION

The City of Pittsburgh is located in southwestern Pennsylvania at the point where the Allegheny and Monongahela Rivers merge to form the Ohio River. The City, which is the largest of 130 municipalities in Allegheny County and which serves as the County seat, covers an area of 55.5 square miles and has a 1990 Census population of 369,879.

The City is the hub of the Pittsburgh Standard Metropolitan Statistical Area (the "SMSA") which is composed of Allegheny, Beaver, Fayette, Washington and Westmoreland Counties. Mining and manufacturing were the region's original economic base. The City's location, however, has encouraged the region to diversify into products and services that serve the nation's major market areas. Transportation, distribution, finance, health care, education and research have become as essential to the City as its traditional mining and manufacturing economies. The award to Carnegie-Mellon University of the Defense Department's Software Engineering Institute firmly establishes Pittsburgh among the leading areas in the nation for advanced technology research and development.

Pittsburgh has developed as the regional center of southwestern Pennsylvania, eastern Ohio and northern West Virginia. Services provided in the City for the region include: health care, financial services and produce and goods distribution. It is the major government and communication center for the tri-state area.

The City's status as a major industrial center is attributable in part to the river system which allows for access to markets and expedites the movement of raw materials and finished goods. The abundant coal reserves in southwestern Pennsylvania have contributed to the City's role as a leader in the iron and steel industry. The economic vitality of the City and its region are further enhanced by a comprehensive transportation network. Excellent ground transportation is available through a well developed road system that includes Interstate Routes 70, 76 (Pennsylvania Turnpike), 79, 80, 276 and 279. The Pennsylvania Department of Transportation has begun work on completing the Interstate highway system through the City which will aid in the flow of traffic to and around Pittsburgh. The City is served by two airports: Pittsburgh International Airport, which is utilized by twenty-one certified air carriers and commuter carriers; and the Allegheny County Airport which primarily services privately owned aircraft.

ECONOMIC DEVELOPMENT

During the 1980's, Pittsburgh benefitted from a boom in downtown development. Known as Renaissance II, the development added almost 9 million square feet of new and redeveloped office space (a 40% increase over 1980). This massive effort was stimulated by \$2.3 billion in private investment and supported by municipal investment through infrastructure improvements, subsidized loans, urban renewal, and five-year building tax abatements. During this time, office occupancy rates have ranged between 82% to 90%, and rents have stayed competitive with other metropolitan cities.

The most dramatic private-sector projects include eight major new office projects (all completed and occupied) and three new hotels (two of which are in operation). These projects alone are expected to return to the City nearly \$15 million a year in real estate, occupation, earned income and business taxes. They will also create 33,600 new permanent jobs in the downtown area and have generated nearly 32,000 person-years in construction jobs.

Renaissance II has also generated almost 400,000 square feet of commercial and retail uses in various buildings including Oxford Centre, PPG Plaza, Warner Centre, and Station Square. More than 300,000

additional square feet of commercial and retail uses are proposed for planned developments including the Pittsburgh City Center.

The mid-1980's also saw the beginning of a major expansion of the institutional and office facilities in the university-hospital center in the City's Oakland area. Oakland includes the campuses of the University of Pittsburgh, Carnegie-Mellon University (CMU), and Carlow College, as well as the facilities of Presbyterian-University Hospital, Children's Hospital, Magee Women's Hospital, Montefiore Hospital, and Falk Clinic. Major projects include massive expansions of Presbyterian-University Hospital and the CMU campus, and construction of a center for university high-technology research, several office buildings, and parking garages.

New Construction

As part of Renaissance II, the City has committed, in part through its Capital Improvement Program, to upgrade the public services and amenities in the Golden Triangle, the central business district of the City, and immediately adjacent areas in order to provide a more efficient and attractive setting for business. By coordinating with the sponsors and developers of a number of major projects, major private and infrastructure development has taken place in the Golden Triangle and immediately adjacent areas in recent years, with more planned for the future. A description of these projects and their estimated cost and construction status is shown in Table D-1.

In recent years, almost 90% of new office space in the region has been constructed in the Central Business District. This is a considerably higher percentage of downtown office construction than is found in most major metropolitan areas. Office vacancy rates also are consistently lower for the Central Business District than for the suburban office supply. These factors illustrate that the Central Business District continues to be the preferred location for businesses in the region.

TABLE D-1
New Construction in
City of Pittsburgh
Central Business District, Environs and Oakland Area
December 1987 through August 1993

<u>Project</u>	<u>Type</u>	<u>Estimated Cost</u>	<u>Status</u>
1. Liberty Center	615 Room Hotel 500,000 sq. ft. Office 65,000 sq. ft. Commercial 450 Car Garage 30,000 sq. ft. Retail	\$137,000,000	Completed
2. CNG Tower	1,300,000 sq. ft. Office Tower Office Center	\$187,000,000	Completed
3. Fifth Avenue Place	680,000 sq. ft. Office 100,000 sq. ft. Retail	\$100,000,000	Completed
4. Light Rail Transit System	Corridor Services Central Business District and South Hills	\$559,000,000	Completed
5. Crosstown/East Street/ North Shore Expressway	Completion of Interstate System	\$450,000,000	Completed
6. Union Station Adaptive Re-use	275 Residential Units 70,000 sq. ft. Commercial	\$ 24,000,000	Completed
7. Grant Street and Liberty Avenue Reconstruction	Reconstruction	\$ 15,000,000	Completed
8. Civic Arena Renovation	Refurbishing of Arena Interior and Exterior	\$ 12,000,000	Completed
9. Public Open Space Improvements	Sidewalk and Square Improvements Mellon, Market Square, Fifth/Forbes	\$ 32,000,000	One Square Completed Other Improvements in Engineering. Market Square Completed
10. Pittsburgh City Center	Mixed Use Project 250 Room Hotel 300,000 sq. ft. Retail 2,100,000 sq. ft. Office	\$ 500,000,000	Planned

<u>Project</u>	<u>Type</u>	<u>Estimated Cost</u>	<u>Status</u>
11. Presbyterian University Hospital Medical Health Care Division of the University of Pittsburgh	Replacement Buildings. 400,000 sq. ft. Biomedical Science Tower 130,000 sq. ft. Diagnostic and Treatment Centers	\$ 250,000,000 \$ 14,000,000	Completed Completed
12. Robinson St. Garage and Sports facility University of Pittsburgh	1,100 Car Garage		
13. Carnegie-Mellon Univ. Phase I Master Plan East Campus Expansion	630 Car Garage, 2 Dormitories with Dining Facilities to House 260 Students New Athletic Stadium	\$ 35,000,000 \$ 25,000,000	Completed Completed
14. Pittsburgh Technology Center Phase I & II	High Technology University-related Research Center up to 1,600,000 sq. ft.; Related Public Improvements	\$ 260,000,000	Public Imp. 1st Univ. Bldg. Under Construction, 2nd to begin in Fall of 1992
15. Oakland Portal	135,000 sq. ft. Office 82,500 sq. ft. Hotel 512 Car Garage	\$ 11,000,000	Completed
16. School for Blind	62,600 sq. ft. Classrooms, Pool, Gym.	\$ 8,950,000	Completed
17. Holiday Inn	200 Room Hotel 50,000 sq. ft. Hotel 530 Car Garage	\$ 24,000,000	Completed
18. Bayard-Craig Office	Phase I 74,000 sq. ft. Office 145 Car Garage Phase II 83,000 sq. ft. Office 7,000 sq. ft. Retail 155 Car Garage	\$ 10,000,000 \$ 10,000,000	Completed Planned
19. Soldiers and Sailors Garage	950 Car Underground Garage	\$ 17,500,000	Completed
20. Independence Court	Assisted Living for Elderly	\$ 5,000,000	Completed

<u>Project</u>	<u>Type</u>	<u>Estimated Cost</u>	<u>Status</u>
21. Children's Hospital	100,000 sq. ft. Research Expansion Facility, 202 Parking Spaces	\$ 25,000,000	Completed
22. University of Pittsburgh	100,000 sq. ft. Bioscience Research Facility	\$ 23,000,000	Under Construction
23. 3501 Forbes Avenue	87,000 sq. ft. Office Building	\$ 5,750,000	Completed
24. Forbes/Craft Office	200,000 sq. ft. Office 340 Parking Spaces	\$ 30,000,000	Planned
25. University of Pittsburgh Student Residence	624 Student Dormitory	\$ 20,000,000	Under Construction
26. Childrens Hospital Expansion	200,000 sq. ft. Facility Patient Rooms, Office and Administration	\$ 60,000,000	Planned
27. Carnegie Mellon University	60,000 sq. ft. Addition to Grad School, Industrial 100,000 sq. ft. Student Union Athletic Facility	\$ 7,000,000 \$ 25,000,000	Completed Under Construction
28. Iroquois Bldg. and Addition to Univ. of Pittsburgh Medical Center	Renovations to 90,000 sq. ft. bldg.; Addition of 340,000 Office, Research and Retail, 630-Car Parking Garage	\$ 50,000,000	Renovations Under Construction; Addition Planned
29. Mercy Hospital	110,000 sq. ft. Addition for Outpatient Services	\$ 20,000,000	Planned
30. Carnegie Science Center	Science Museum, Omnimax Theater, Planetarium	\$ 30,000,000	Completed
31. Andy Warhol Museum	Art Museum	N/A	Planned
32. Down by the Riverside Boardwalk	Entertainment Complex with Floating Nightclubs, Restaurants and Marina	\$ 3,000,000	Completed
Landside Project	Four Buildings, including Hotel, Sports Bar, Corp. Entertainment Center and Hall	\$ 50,000,000	Planned
33. History Center	Museum of History of Western Pennsylvania	\$ 10,000,000	Planned

<u>Project</u>	<u>Type</u>	<u>Estimated Cost</u>	<u>Status</u>
34. Crawford Square	500 Units of mixed income Housing at edge of Downtown	\$ 50,000,000	Under Construction
35. West Penn Hospital	Nine-story Addition, Three-story Outpatient "Medical Mall," Parking	\$ 25,000,000	Planned
36. Washington's Landing	Mixed Use complex on island, including Marina, 400,000 sq. ft. office, light, industrial, 250 units housing, town center, and public park	\$ 150,000,000	Marina Completed, Public Improvements Under Construction - First Office Completed
37. Shadyside Hospital	New Patient Tower New Physicians Bldg. 800 Car Parking Garage New Office Tower	\$ 100,000,000 \$ 20,000,000	Completed Planned
38. Station Square Expansion	Mixed use development, including: Hotels, office Residential and exhibition uses with Riverfront open space.	\$ 180,000,000	Planned
39. Cultural District	Reconstruction of Penn Ave. Public Spaces Renovation of the Fulton Theater Office, Residential, and Entertainment uses	\$ 8,000,000 \$ 5,000,000 \$ 50,000,000	Under Construction Completed Planned
40. Magee Womens Hospital	Expansion of Out-Patient Services Research Functions	\$ 50,000,000	Under Construction
41. Motor Square Garden	Renovation to Hdqtrs. for AAA and Retail Space	\$ 3,000,000	Completed

Building Permits

The Table D-2 below sets forth the number and dollar value of residential and commercial building permits issued in the City in the years 1983 to 1992:

TABLE D-2
City of Pittsburgh
Number and Value of Building Permits, 1983-1992

<u>Year</u>	<u>Number of Permits Issued</u>	<u>Dollar Value</u>
1983	3,710	212,163,150
1984	3,858	140,202,824
1985	3,910	320,396,045
1986	3,599	254,222,123
1987	3,253	154,214,516
1988	3,281	213,563,663
1989	3,233	338,506,723
1990	3,099	140,748,508
1991	3,500	146,969,312
1992	3,368	213,314,419

Source: City of Pittsburgh, Bureau of Building Inspection.

ECONOMY

Employment

For more than 150 years, the City has been a center for business and industry. It ranks second in the nation in the control of invested capital, and fifth in the number of Fortune 500 corporate headquarters (See Table D-3). While the steel industry continues to be a major factor in the local economy, its relative importance as a source of employment in absolute and relative terms has been diminishing. As a result, the City's economy is becoming more diversified with increasing reliance on the health, education and financial industries.

TABLE D-3
City of Pittsburgh
Fortune 500 Companies
With Headquarters in Pittsburgh

<u>Corporations</u>	<u>Type of Industry</u>	<u>Fortune Ranking</u>	<u>Sales \$ Millions</u>	<u>Assets \$ Millions</u>	<u>Total Number of Corporation Employees</u>
<u>A. The 500 Largest U.S. Industrial Corporations</u>					
USX Corporation	Petroleum/Metal Mfg	25	16,186.0*	17,252.0	45,582
Westinghouse Electric Corp.	Electronics	35	12,100.0	10,398.0	109,050
Aluminum Co. of America	Metal Manufacturing	49	9,588.4	11,023.1	63,600
H.J. Heinz	Food	80	6,628.5	5,931.9	35,500
Miles	Chemicals	82	6,499.0	4,973.1	25,913
PPG Industries, Inc.	Building Materials	94	5,857.7	5,661.7	32,300
Allegheny Ludlum	Metal Manufacturing	352	1,036.0	871.2	5,400
Joy Technologies	Industrial Equipment	480	621.1	574.7	4,200
<u>B. The 100 Largest U.S. Commercial Banking Companies</u>					
PNC Bank Corp.	Commercial Banking	10	32,043.5 +	45,533.5	17,975
Mellon Bank, N.A.	Commercial Banking	25	22,715.0 +	28,762.0	15,400
Integra Financial Corp.	Commercial Banking	52	6,666.8 +	76,271.1	4,109
<u>C. The 100 Largest U.S. Diversified Service Companies</u>					
National Intergruop	Metal Manufacturing	34	3,169.6 **	507.6	4,697

* Does not include excise taxes.

** Includes sales from discontinued operations.

+ Deposits

Source: (A) Fortune Magazine, April 26, 1993; (B) Fortune Magazine, May 31, 1993 (C) Fortune Magazine, May 31, 1993

As set forth in Table D-4, total employment in the City has fluctuated during the past ten years from 286,800 in 1983 to 318,404 in 1992.

TABLE D-4
City of Pittsburgh
Total Number of Jobs in the City
1982-1992

1983	282,800
1984	284,000
1985	289,300
1986	282,000
1987	288,500
1988	300,700
1989	307,200
1990	319,600
1991	327,600
1992	318,404

Source: City of Pittsburgh Tax Files.

City and regional labor force and employment have stabilized since 1986 after sharp declines in the early 1980's due to the steel recession. See Tables B-5, B-6 and B-7A.

TABLE D-5
City of Pittsburgh
Resident Labor Force, Employment, Unemployment,
City, PMSA, Commonwealth, U.S.
1987-1992

	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>
Labor Force					
City of Pittsburgh	169,300	172,600	174,000	175,600	176,800
Pittsburgh PMSA	965,200	983,000	991,800	1,004,800	1,032,700
Pennsylvania	5,764,000	5,857,000	5,901,000	5,933,000	6,400,000
U.S.	121,669,000	123,869,000	124,787,000	125,303,000	127,000,000
Employment					
City of Pittsburgh	160,100	165,100	166,100	166,200	165,100
Pittsburgh PMSA	909,900	936,100	949,800	944,500	962,600
Pennsylvania	5,470,000	5,592,000	5,583,000	5,524,000	5,554,000
U.S.	114,968,000	117,342,000	117,914,000	116,877,000	117,600,000
Unemployed					
City of Pittsburgh	9,100	7,500	7,900	9,400	11,600
Pittsburgh PMSA	55,300	44,800	47,800	60,300	70,100
Pennsylvania	293,000	264,000	318,000	409,000	450,000
U.S.	6,701,000	6,528,000	6,874,000	8,426,000	9,400,000
Unemployment Rate (%)					
City of Pittsburgh	5.4%	4.4%	4.5%	5.4%	6.6%
Pittsburgh PMSA	5.7%	4.6%	4.8%	6.0%	6.8%
Pennsylvania	5.1%	4.5%	5.4%	6.9%	7.5%
U.S.	5.5%	5.3%	5.5%	6.2%	7.4%

Source: Pennsylvania Department of Labor and Industry, Bureau of Research and Statistics.

The following Table D-6 presents monthly unemployment information for 1993 for the City, the County, the Pittsburgh Metropolitan Statistical Area ("PMSA"), the Commonwealth and the United States.

TABLE D-6
Unemployment Rates, 1993
City, Allegheny County, PMSA, Commonwealth, U.S.

	City of Pittsburgh (1)	Allegheny County (1)	Pittsburgh MSA (1)	Pennsylvania (2)	U.S. (2)
January 1993	7.0%	6.6%	7.7%	7.5%	7.0%
February 1993	7.2%	6.7%	7.8%	7.0%	6.9%
March 1993	6.3%	5.9%	6.8%	6.9%	6.9%
April 1993	6.4%	5.8%	6.5%	6.6%	7.0%
May 1993	6.9%	6.3%	6.8%	7.1%	6.9%
June 1993	6.6%	6.1%	6.5%	6.9%	7.0%

Source: U.S. Bureau of Labor Statistics

(1) Data derived from local area unemployment statistics - unadjusted.

(2) Data derived from current population survey - seasonally adjusted.

Major Employers

Major employers located within the corporate limits of the City, together with total number of employees employed by each within the City, at any time during the year, according to City tax collection records in 1991, are presented in Table D-7.

TABLE D-7
City of Pittsburgh
Employment by Industry Grouping 1991

		Business Management & Service Firms	
Accounting Firms		Aspen Systems	620
Ernst & Young	325	AM American Management	461
Deloitte Touche	317	Management Science	266
Price Waterhouse	304	SMI of Pittsburgh	247
Coopers & Lybrand	277	Arcade Maintenance	221
Peat Marwick	243	Reese Brothers	205
Arthur Andersen	176	Essential Services	204
Schneider-Downs	109	Cleaning Services	169
D G Sisterson	88	Acme Building	148
Alpern Rosenthal	<u>80</u>	Vocational Rehabilitation	211
Sector Totals	1,919	Trading as Creative	129
		Hospital Linen	119
Advertising		Anderson Consulting	117
Public Interest Communications	326	Technosystems Service	116
Ketchum Communications	325	American Building	115
Patrick Media	93	Quatum Associates	112
Advertising Assoc	79	Bi-Coatal Payroll	101
Direct Mail Service	76	Servicemaster Co.	98
Direct Advertising Market	66	EWDB North America	97
Hallmark Advertising	<u>51</u>	Marc 7 Co.	94
Sector Totals	1,016	Industrial Appraisal	85
		Technology Licensing	84
Automotive Dealers & Services		Midwest Presort	83
BP Oil Co.	249	Consultants & Designers	78
McKean Oldsmobile	216	Comsource Technical	77
Petroleum Marketing Service	188	Burt Hill Kosar	74
Rohrich Cadillac	160	Fisery Pittsburgh	68
Don Allen Chevrolet	107	Key Entry Service	68
Mervis Motor	102	Serar Logistics	65
Massey Buick	102	Air Safe Maintenance	65
Exxon Corp	100	Ketchum Inc.	65
Universal Auto	78	Triangle Messenger	63
The Hertz Corp	74	Towers Perrin	63
Baum Blvd Dodge	66	Medical Data Services	62
Three Fours Ltd.	63	Marc Anthony	61
P&W Foreign Car	62	LWJ Corp.	59
Castriota Chevrolet	59	Wilbur Smith	59
Fruehauf Trailer	53	Alladdin Food Management	58
Pennzoil Products	52	Lind Buri Inc.	56
Pittsburgh Crankshaft	52	George B. Buck Consulting	55
BeckNarnly Worldparts	51	Heeter Colonel	54
Allegheny Ford	50	ELTEQ Management	58
Constantin Pontiac	<u>50</u>	T.W. Consultants	53
Sector Totals	1,934		

Business Management & Service Firms(Cont.)

Manpower Inc.	51
Authorization Systems	50
Campos Market Research	50
Associated Cleaning	13
TOD Services	<u>11</u>
Sector Totals	5,538

Construction & Contracting

Limbach Company	143
Turner Construction	139
Star Electric	108
Cost Corporation	96
SSM Industries	93
Frame Contracting	73
Classic Contractors	71
Wellington Power	70
Bridges & Co.	65
P J Dick Contracting	64
Beckman/Barnhart	64
Miller Thomass	63
Amaral & Neumeyer	63
Gerson Electric	60
Power Piping	60
Eichleay Corp.	59
Kirby Electric	58
Buncher Co.	57
Joseph J. Graciano Corp	57
Franklin Elecric	57
Louis J. Viglione Contracting	51
Pat Ionadi Corp	<u>51</u>
Sector Totals	1,622

Corporate Administrative Offices

USX	1,922
PPG Industries	1,395
ALCOA	1,210
Westinghouse Electric	1,192
Rockwell International	253
Bayer USA	<u>62</u>
Sector Totals	6,034

Departmental Stores

Kaufmann's	3,114
Joseph Horne Co.	1,559
Sears, Roebuck & Co.	923
J.C. Penney Inc.	513
Saks Fifth Avenue	153
Hills Stores	141
Service Merchandising	94
F W Woolworth	91
McCrorry Corp.	<u>73</u>
Sector Totals	6,661

Education (Higher)

University of Pittsburgh	19,655
Carnegie-Mellon University	6,524
Duquesne Univesity	1,674
Community College of Allegheny	1,313
Point Park College	883
Chatham College	253
Carlow College	<u>235</u>
Sector Totals	30,537

Entertainment & Arts

Pittsburgh Stadium Concessions	902
Carnegie Library & Museum	645
Civic Arena Corp	565
Pittsburgh Symphony Association	414
Gateway Clipper	412
Civic Light Opera	166
Pittsburgh Steelers Sports Inc.	166
Blockbuster Video	121
Pittsburgh Public Theatre	112
Pgh Pirates Athletic Co/Pgh Baseball Club	86
Club One	81
Cinemetette Corp/Cinema World	72
General Rowing	70
Pittsburgh Penguins Inc.	69
The Pgh Childrens Museum	<u>55</u>
Sector Totals	3,936

Financial Institutions

Mellon Bank N.A.	7,583
PNC Bank Corp.	4,223
Integra(Union)	1,322
Equibank	1,237
Federated Investors	974
Dollar Savings	645
Westinghouse Credit Corp	571
Parker Hunter	156
Shearson Lehman	129
PaineWebber	116
Russell Rea	78
North Side Deposit	78
First South Saving	63
Parkvale Savings	59
Prudential Bache	55
Mid Atlantic Capital	<u>55</u>
Sector Totals	17,344

Government

Board of Education	6,507
City of Pittsburgh	6,222
Allegheny County	4,220
Postal Service	3,705
Commonwealth of Penna	3,301
Veterans Administration	2,853
Pittsburgh Housing Authority	764
IRS	655
Us Army Corp of Engineers	356
Federal Reserve	348
US Administrative Office of Courts	186
Federal Home Loan Bank	176
FBI	138
UHA	135
US Dept of Labor	114
Public Auditorium Authority	87
U.S. Bureau of Census	<u>4</u>
Sector Totals	29,771

High Technology Firms

IBM	1,043
Davy Mckee	692
Elchleay Engineers	456
Fischer Scientific	427
LK Cornstock	425
Legent Corporation	409
Aristech Chemical	275
Rust International	248
American Thermoplastic	195
ICF Kaiser	190
SEI Engineers	173
Carnegie Group	165
Signal Applied Technology	157
Galletta Engineering	137
Daxus Corporation	128
RT Patterson	126
CDI Corporation	123
SAI Consulting	115
Transarc Corp.	111
Power Sustems TEch	110
Trimark Engineers	88
Computer Task Force	84
United Engineers	82
Williams Trebilock	68
Orbital Engineering	65
HDR Engineering	59
Pittsburgh High Tech Council	59
The Gateway Engineers	56
JRL Enterprises	53
Compucom	53
S. Hills Co. Civ. (Wakefield Intl.)	51
Conversion Systems	50
DL Holding	<u>50</u>
Sector Totals	6,523

Hospitals

Presbyterian University	5,194
Allegheny General	5,162
Mercy	3,526
West Penn	3,141
St. Francis General	3,042
Montefiore	2,760
Shadyside	2,664
Children's	2,193
Magee Women's	2,014
St Margaret Memorial	1,398
Southside	843
Central Medical	769
Rehabilitation Institute	608
Divine Providence	555
Podiatry Hospital	119
The Eye & Ear Inst.	73
Jefferson Health	<u>53</u>
Sector Totals	34,114

Hotels

Vista International	696
Sheraton	609
Hilton	582
William Penn	292
Hyatt	229
Ramada/Bigelow Hotel	166
Holiday Corporation	137
Western International	<u>80</u>
Sector Totals	2,791

Law Firms

Kirkpatrick Lockhart	646
Reed Smith	543
Buchanan Ingersoll	439
Eckert Seamans	364
Dickie Mcamey	288
Thorpe Reed	168
Klett Lieber	167
Legal Management	137
Meyer Darragh	118
Cohen & Grigsby	<u>115</u>
Sector Totals	2,985

Manufacturing

HJ Heinz	1,963
LTV Steel	879
Mathews International	511
Nabisco	501
Pittsburgh Brewing Co	324
Williams & Co	259
National Steel	256
Union Electric	218
Dresser Industries	213
McConway & Torley Corp	198
Continental Baking	174
Kerotest	170
American Textile	158
Cleveland Machine	157
Allegheny Ludlum	139
Sauer Mechanical	133
Geoffrey Boem	130
Beazer East	129
Braunlich Roessle	111
H-W Envelope	107
SMS Engineering	101
Chriss Candies	100
Metaltech	95
Beitler McKee Optical	92
J&L Specialty Products	92
Package Products	90
General Electric	85
RH Kuhn	85
Koolvent Aluminum	79
Diamond Carbon Co.	78
Allegheny Milworks	77
Weld Tooling	76
Heekin Can	75
Pena Mfg. Corp.	74
Pgh. Spring Inc.	72
Wheeling Pittsburgh	72
JK Miller Co.	72
Bearing Service Co.	72
U.S. Metalsource	72
National Electirc Coil	71
The Gage Co.	70
Cardillo Electric	69
Copperweld Corporation	68
Joy Industries	68
Minotte Mfg.	59
Pittsburgh Nipple Works	58
The Cassady Pierce	57
Milcraft Industrial	56

Manufacturing (cont.)	
WN Damgbach	55
Blumcraft of Pittsburgh	55
Scott Electric	54
Bunting Inc.	51
Robertson - Ceco	50
Payday Corp	50
Penna Macaroni Co.	50
Penna Engineering Corp.	46
Dravo Corp.	35
Lectromelt Corp.	16
Wean Inc.	<u>2</u>
Sector Tables	9,329

Printing & Typesetting	
Gayer Printing Co	93
Page Imaging	84
Typecraft Press	78
Miller Printing	70
Duquesne Litho Inc.	60
Acme Stamping	59
Superior Litho	<u>50</u>
Sector Totals	494

Real Estate Management	
Oxford Development	508
Alco Parking Corp	247
Tom Mistick & Son	141
Turner Construction	139
Federal St Construction	108
Mellon Stuart Co	108
NALCO	86
Oliver Realty	<u>85</u>
Sector Totals	1,422

Source: Department of Finance

**TABLE D-7A
CITY OF PITTSBURGH
EMPLOYMENT BY BUSINESS GROUP *
1982-1991**

<u>BUSINESS GROUP</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>
Construction	1,575	1,490	1,248	1,193	954	927	959	1,113	1,799	2,083
Higher and Specialized Education	23,300	24,599	25,617	26,552	28,238	30,975	32,589	33,764	32,814	33,155
Finance, Insurance and Real Estate	21,517	21,275	22,476	23,005	23,358	22,863	22,582	25,014	25,196	25,943
Government	30,695	31,191	27,517	27,738	28,028	30,733	30,838	30,279	30,245	29,988
Health Care and Hospitals	31,747	32,227	31,075	31,298	32,512	33,923	35,705	37,493	40,149	41,035
Manufacturing	43,455	37,269	34,599	32,953	30,038	28,006	28,099	27,479	27,709	27,952
Services	23,134	23,651	23,998	25,332	27,087	29,686	32,009	35,106	35,935	37,301
Trade and Retail	18,702	19,569	20,776	21,798	21,409	22,391	24,148	24,960	27,241	25,433
Transportation and Utilities	<u>13,033</u>	<u>12,008</u>	<u>10,910</u>	<u>13,101</u>	<u>9,654</u>	<u>9,576</u>	<u>9,721</u>	<u>9,825</u>	<u>9,795</u>	<u>9,910</u>
Total Sample Employment	207,158	203,279	198,216	199,970	201,278	209,080	216,650	225,033	230,883	232,800
Total City Employment	286,800	282,800	284,000	289,300	282,000	288,500	300,700	307,200	319,600	327,600

* City of Pittsburgh tax files employment sample of businesses with more than 50 employees.

Retail Trade

The City of Pittsburgh is the nation's 21st largest metropolitan market in terms of total retail sales. The following table shows retail sales for the City and County and for surrounding areas.

TABLE D-8
City of Pittsburgh
Total Retail Sales -- CMSA
1992

	Sales (000)	Percent of CMSA
Allegheny County (including the City).....	\$ 10,148,100	61.7%
Beaver County	1,078,068	6.6%
Fayette County	1,174,798	7.2%
Washington County	1,387,274	8.4%
Westmoreland County.....	<u>2,646,332</u>	<u>16.1%</u>
TOTAL CMSA.....	\$16,434,572	100%

Source: Sales and Marketing Management, "1993 Survey of Buying Power" August 30, 1993.

Total retail sales in the Consolidated Metropolitan Statistical Area ("CMSA") amounted to over \$14.5 billion in 1992, 17.65% of total retail sales of the Commonwealth. Retail sales in the City amounted to 18.03% of total sales for the CMSA, and 29.2% of total retail sales in the County. The City and County accounted for 61.7% of total retail sales in the CMSA.

Commercial Banks

The City is one of the five major banking centers in the nation. Major banks which are headquartered in the City include PNC Bank Corp. and Mellon National Corporation. Each has full service capability and extensive overseas operations.

Pittsburgh is a branch office city of the Cleveland District of the Federal Reserve System.

TABLE D-9
City of Pittsburgh
Domestic Commercial Banks
Total Deposits

	Total Deposits (\$000)
Major Commercial Banks:	
Mellon National Corporation	29,591,593
PNC Bank Corp.	11,281,599
Integra National Bank.....	5,439,063
Equibank	2,722,557
North Side Deposit Bank	219,816
Allegheny Valley Bank	189,530
Iron and Glass Bank	149,892
The Pennsylvania Capital	55,713
United American Savings.....	15,393

Source: Thompsons Bank Directory June 1993

Foreign Banks

In recent years, a number of major foreign banks have established offices in the City. This activity reflects the international economic importance of the area, as well as the growth of foreign firms who have located in the City and its environs or who have significant business commitments in the area.

TABLE D-10
City of Pittsburgh
Foreign Commercial Banks
Assets and Deposits

<u>Foreign Banks In Pittsburgh</u>	<u>Home Office</u>	Total Assets (Millions)(1)	Total Deposits Millions
Algemene Bank Nederland AMRO N.V.....	Netherlands	367,586	5,225
Daiwa Bank(2).....	Japan	N/A	N/A
Royal Bank of Canada (2).....	Canada	137,241(3)	N/A

- (1) Worldwide -- 3/92
(2) Wholesale or representative offices
(3) Worldwide -- 12/91

Source: Thompsons Bank Directory June 1993

Education

Colleges and Universities

More than 77,000 students attend institutions of higher learning in the City and surrounding areas. Major colleges and universities located in the City and County include:

TABLE D-11

**City of Pittsburgh
Colleges and Universities
Enrollment (FTE)**

	<u>1987-88</u>	<u>1988-89</u>	<u>1989-90</u>	<u>1990-91</u>	<u>1991-92</u>
Carlow College	737	669	785	905	1,094
Carnegie Mellon University	6,208	6,257	6,388	6,526	6,444
Chatham College.....	541	574	550	539	551
Community College of Allegheny County	11,349	11,541	12,858	13,387	13,616
Duquesne University	5,449	5,209	6,155	6,512	6,652
LaRoche College.....	1,082	1,159	1,068	1,034	1,004
Pennsylvania State University (McKeesport Campus).....	1,640	1,463	N/A	N/A	N/A
Pittsburgh Theological Seminary	259	261	277	270	264
Point Park College	1,648	1,687	1,810	1,811	1,724
Robert Morris College.....	3,807	3,867	3,853	3,698	3,749
University of Pittsburgh (Oakland)	22,207	22,485	22,464	22,715	22,714

(FTE: Full-Time Equivalent)

Source: Pittsburgh Council on Higher Education

Vocational-Technical Schools

In addition, vocational-technical schools in the area provide a broad array of training in a variety of fields. Vocational-technical training is offered by both proprietary schools and by the public school systems. There are approximately 20 proprietary vocational schools and approximately 12 public vocational schools in the City and surrounding areas.

TRANSPORTATION

Air Transportation

The Pittsburgh International Airport (PIA) serves the region. The airport, located in Allegheny County, encompasses 12,080 acres and is approximately 16 miles from the downtown area.

The Midfield Terminal Building, opened October 1, 1992, replaces the 40-year-old Main Terminal Building. It has 25 commuter gates, 75 domestic and international gates and room for expansion. There are 100,000 square feet of retail space and a 1,340-foot moving sidewalk in the new terminal building. It is the third largest facility of its kind in the country.

A new access highway is part of the Midfield expansion project, as are 17,400 parking spaces and a new airline fueling system.

The project cost, in excess of \$700 million, was funded primarily by Allegheny County airport revenue bonds that are payable out of airline rates and charges. Funding was also received from PENNDOT and the FAA. In studies completed prior to construction, 50,000 new jobs are projected to result from the new airport and development of adjacent areas.

PIA's service area includes 18 counties in western Pennsylvania, six counties in southeastern Ohio, 12 counties in northern West Virginia, and 2 counties in western Maryland. Passenger traffic at PIA shows steady and sustained growth since 1971. The trends in passenger volume at Pittsburgh International Airport from 1979 through 1991 are set forth in Table D-12 on the following page.

TABLE D-12
City of Pittsburgh
Passenger Volume Trend
Pittsburgh International Airport

<u>Year</u>	<u>Passenger Volume</u>	<u>Percentage Change Over Prior Year</u>
1979	5,560,697	15.1
1980	5,720,944	2.9
1981*	5,062,008	-11.5
1982*	4,984,148	-1.5
1983	5,919,322	18.8
1984	6,674,241	12.8
1985	7,471,939	12.0
1986	7,934,870	6.2
1987	8,684,933	9.5
1988	8,971,863	3.3
1989	8,533,955	-4.9
1990	8,534,457	-- **
1991	8,320,948	-2.5
1992	9,324,800	12.1

* Airlines reduced operations by 20% in 1981 and 1982 in response to a strike by Professional Air Traffic Controllers Organization.

** Represents less than 0.1%

Source: Allegheny County Department of Aviation.

The following air carriers serve Pittsburgh International Airport:

Certified Air Carriers

American Airlines
 British Airways
 Continental Airlines
 Delta Airlines
 Northwest Airlines
 Trans World Airlines
 United Airlines
 USAir

Commuter Air Carriers

American Eagle
 Chautauqua Airlines
 Christman Air System
 Comair (Delta Connection)
 CC AirContinental Express
 Crown Airways
 Direct Air
 Jet Stream International
 Pennsylvania Commuter Airlines
 Trans World Express
 United Express
 USAir Express

Source: Allegheny County Department of Aviation.

Allegheny County Airport is a general service airport which is the home base for many corporate and private aircraft.

Water Transportation

The Port of Pittsburgh on the Allegheny, Monongahela and Ohio Rivers, is the largest inland port in the country, and provides year round facilities for shipments to and from the South and Midwest regions of the United States. Shippers at the Port of Pittsburgh may ship to any port in the world by containerization, lash or seabee barge carriers.

There are 130 publicly and privately owned terminals with barge landings in the Port of Pittsburgh operated primarily for diversified commercial purposes. The public terminals are equipped to accommodate such bulk commodities as coal, sand, gravel, petroleum products, chemicals, iron and steel products, and finished products of all types. Other goods which move on the City's rivers include fertilizer, machinery, steel scrap, iron ore, billets, salt, synthetic rubber, lumber products and ferrous alloys.

Ten major barge lines operate on Port of Pittsburgh waters as common carriers. These barge lines utilize both private- and public-use terminals. A number of regulated contract carriers and other private carriers for hire also operate extensively into and out of the Port of Pittsburgh.

Water transport equipment currently in service includes open hopper barges, covered dry cargo barges, tank and deck barges. Typical tows move from the Port of Pittsburgh to St. Louis in about seven days. Specialized tows, such as unit tows for bulk liquids, cover the Port of Pittsburgh to New Orleans route in eight to twelve days.

Complete facilities for construction and repair of river boats of all types are in operation in the Port of Pittsburgh.

Rail Service

There are numerous trunk, short-line, switching and connecting railroads serving the region. It is estimated that ten percent of all U.S. rail freight originates or passes through the nine-county region surrounding the City. On-line trunk railroads serving the SMSA include:

Amtrak
Bessemer and Lake Erie Railroad
CSX
Conrail
Norfolk and Southern Railroad
Pittsburgh & Lake Erie Railroad

Motor Freight Service

The area is served by over 250 interstate and local trucking firms, 26 freight forwarders, and 81 household goods movers. The City is a strategically located transportation center, with overnight access by motor freight to the major markets of the Northeast and Midwest.

Mass Transit

The Port Authority of Allegheny County (PAT) is the regional transit agency serving Pittsburgh and Allegheny County. PAT is the ninth largest transit operation in the United States, serving approximately 300,000 passengers daily. A downtown subway system was completed and opened for passenger services in 1985. The East Busway, a 6.8-mile exclusive bus right-of-way connecting downtown with the Eastern suburbs, was completed in 1983 at a cost of \$110,000,000. The Busway has a capacity of 90,000 riders per day.

Passenger Bus Service

Greyhound Bus Lines provides regularly scheduled interstate bus service to the City. The Port Authority of Allegheny County provides local bus, streetcar and rail service. In addition, a variety of local bus companies provide intrastate, commuting, and charter services.

Utilities

Electricity

The City relies primarily upon coal as an energy source and is not heavily dependent upon oil and gas for the production of electricity. Some nuclear energy is used. In the region, the currently installed electric power generation capacity is 80% coal, 15% nuclear and 5% oil, the latter used mostly for peak capacity.

The electric power requirements of residential, commercial and industrial users in the City are provided primarily by the Duquesne Light Company which serves more than 569,000 customers in Allegheny and Beaver Counties and has a generating capacity in excess of 2,836,000 kilowatts. The Company is subject to regulation by the Pennsylvania Public Utilities Commission.

Natural Gas

The City's suppliers of natural gas are the Equitable Gas Company, People's Natural Gas Company, and Columbia Gas of Pennsylvania. Together they serve 128,807 customers in the City of Pittsburgh (118,723 residential; 9,963 commercial; and 121 industrial). All three are investor-owned utilities whose service areas cover large portions of Pennsylvania and neighboring states.

Water and Sewer

The Pittsburgh Water and Sewer Authority provides water service to the majority of water customers within the City and sewage collection service to the entire City. The climate and river valleys within the City region provide abundant water at reasonable cost.

Sewage treatment service is provided by Alcosan. Its service area includes the City, 77 neighboring municipalities in the County and parts of communities in Washington and Westmoreland Counties. Alcosan serves an area of 221 square miles with 297,000 customers.

DEMOGRAPHIC DATA

Population

Table D-13 shows population data for the City, the County and the SMSA from 1970 to 1990.

TABLE D-13

**City of Pittsburgh
Population
City, County, SMSA
1970-1990**

	City of Pittsburgh			Allegheny County (1)			Pittsburgh SMSA (2)		
	Average Annual Change			Average Annual Change			Average Annual Change		
	Population	Population	Percent	Population	Population	Percent	Population	Population	Percent
1970	520,089			1,084,899			796,229		
1975 (3)	448,900	(14,238)	(2.7%)	1,070,700	(2,840)	(0.3%)	801,403	1,034	0.1%
1980	423,938	(4,992)	(1.1%)	1,026,147	(8,911)	(0.8%)	813,809	2,482	0.3%
1990	369,879	(5,406)	(12.8%)	966,570	(5,958)	(0.6%)	720,556	(9,325)	(1.1%)

(1) Population of the County, excluding residents of the City.

(2) Population of the SMSA, excluding residents of the County.

(3) Estimates only.

Source: U.S. Census.

Housing

Detached single family housing continues to dominate residential construction in the County, although in Pittsburgh apartment and townhouse construction predominates. In 1992, the City of Pittsburgh issued building permits for 121 new residential housing units with an estimated total cost of \$6.7 million.

Because Pittsburgh was almost completely built up by 1950, more than 75% of the housing stock in the City is over forty years old and 50% is over sixty years old. The housing stock of the City, County, SMSA and Commonwealth is characterized as follows:

TABLE D-14
City of Pittsburgh
City, County, PMSA, and Commonwealth
Characteristics of Housing Units Comparison

	<u>1960</u>	<u>1970</u>	<u>1980</u>	<u>1990</u>
Total Housing Units:				
City of Pittsburgh.....	188,366	189,840	179,191	170,159
County of Allegheny.....	503,006	533,520	570,970	580,738
Pittsburgh PMSA.....	720,787	789,771	874,050	879,811
Pennsylvania.....	3,581,877	3,924,757	4,597,412	4,938,140
Percent Owner-Occupied:				
City of Pittsburgh.....	48.8%	50.3%	51.2%	52.3%
County of Allegheny.....	62.7%	64.8%	61.9%	66.2%
Pittsburgh PMSA.....	63.4%	67.8%	69.0%	72.6%
Pennsylvania.....	68.3%	68.0%	64.2%	70.6%
Median Value of Owner-Occupied Housing:				
City of Pittsburgh.....	\$11,000	\$12,500	\$31,500	\$41,200
County of Allegheny.....	12,300	16,000	43,300	57,100
Pittsburgh PMSA.....	12,900	15,300	42,800	51,800
Pennsylvania.....	10,200	13,600	39,100	69,700
Number of Persons per Housing Unit:				
City of Pittsburgh.....	3.1	2.8	2.4	2.5
Total County Housing Units:				
Percent of City of Pittsburgh	37.4%	35.5%	31.4%	29.3%

Source: U.S. Census of Housing: 1960, 1970, 1980, 1990.

From 1960 to 1990 the number of housing units in the County increased by 15.5%, while the number of housing units in the City decreased by 9.7%. Over the same period, the number of persons per housing unit in the City decreased 19% and the population declined by 27.1%. Between 1982 and 1992, average residential real estate sales prices in the City and County have increased as indicated by the following table:

TABLE D-15
County of Allegheny
Average Sale Price of Residential Property
1982 to 1992
(Market Transactions)

<u>Year</u>	<u>County of Allegheny</u>
1982.....	60,520
1983.....	62,347
1984.....	62,598
1985.....	65,052
1986.....	69,002
1987.....	74,298
1988.....	78,609
1989.....	82,247
1990.....	88,623
1991.....	99,818
1992.....	102,742

Source: City of Pittsburgh, Department of City Planning
 West Penn Multi-List

The Redevelopment Authority provides low-cost home improvement loans to low- and moderate-income families utilizing Community Development Block Grant ("CDBG"), Commonwealth and local funds, and has issued its bonds for this purpose. The Redevelopment Authority also uses CDBG funds to subsidize the interest rate on rehabilitation loans made by private lenders to owners of residential properties and on property rehabilitation loans made by private lenders to businesses in designated neighborhood retail districts. The Redevelopment Authority has functioned as a loan originator under U.S. Department of Housing and Urban Development programs in which capacity the Redevelopment Authority contracts with HUD to originate 3%, twenty-year housing rehabilitation loans or rehabilitation grants funded by HUD.

The Redevelopment Authority currently has in various stages of execution fifty-one redevelopment projects funded in part by the federal government, the Commonwealth and the City. The Redevelopment Authority has devoted a significant amount of its resources to the North Side Strategy Area, which is primarily residential and consists of six contiguous neighborhoods located in an area directly across the Allegheny River from the Golden Triangle.

Income

Personal Income

Total personal income of County residents increased from \$17,579 million in 1981 to \$28,997 million in 1991, an increase of 47.89%. Personal income in the CMSA increased by 85% from 1981 through 1991, while total personal income in the Commonwealth increased by 87%.

TABLE D-16
Total Personal Income
County, CMSA, and Commonwealth
Selected Years
1981-1991
(millions of dollars)

	Total Personal Income for County of <u>Allegheny Residents</u>	Total Personal Income for Pittsburgh <u>CMSA Residents</u>	Total Personal Income for Pennsylvania <u>Residents</u>
1981.....	17,579	25,459	123,756
1982.....	18,338	26,545	129,956
1983.....	18,225	26,199	136,409
1984.....	19,130	27,551	151,386
1985.....	20,702	31,972	160,820
1986.....	21,454	33,122	173,404*
1987.....	22,520	34,713	182,489*
1988.....	24,127	37,022	195,155*
1989.....	25,825	41,836	209,370*
1990.....	27,859	45,104	222,626**
1991.....	28,997	47,061	230,917**

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Survey of Current Business, April 1990. The CMSA has included Fayette County since June 1983.

* U.S. Department of Commerce, Bureau of Economic Analysis, Survey of Current Business, August, 1992.

** U.S. Department of Commerce, Bureau of Economic Analysis, Survey of Current Business, May, 1993.

Effective Buying Income and Household Income

The median household effective buying income for the CMSA in 1992 was \$30,623, 91.8% of the Commonwealth median household effective buying income, and 92.3% of the U.S. median household effective buying income. The Pittsburgh metropolitan market has the nation's 21st largest total effective buying income. Effective buying income (EBI) is defined as all personal income less personal taxes, non-tax payments (fines, fees and penalties) and contributions to social insurance. EBI is also commonly referred to as disposable or after-tax income.

**TABLE D-17
City of Pittsburgh
City and Metro Area Effective Buying Income
1992**

	Total EBI (000)	Median Household EBI	% of Households by EBI			
			\$10,000- 19,000	\$20,000 - 34,999	\$35,000 - 49,999	\$50,000 and over
Allegheny County (including the City)	22,191,983	32,368	17.1%	23.5%	18.6%	27.4%
Beaver County	2,403,273	27,558	20.4%	26.9%	18.8%	18.9%
Fayette County	2,201,134	22,081	24.4%	26.7%	15.2%	12.5%
Washington County	1,579,101	29,125	19.6%	25.1%	18.6%	22.2%
Westmoreland County	<u>5,271,722</u>	29,858	19.1%	25.7%	18.6%	23.3%
Total CMSA	33,647, 213	30,623				
Pennsylvania.....	187,576,965	33,350				
United States.....	3,916,947,023	33,178				

Source: Sales and Marketing Management, "1993 Survey of Buying Power" August 20, 1993.

Table D-18 sets forth information relating to the median household effective buying income in the City, the County, and the CMSA for the years 1987 through 1990, and 1992.

TABLE D-18
City of Pittsburgh
City and Metro Area Median Household Effective Buying Income 1987-1990 and 1992

	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1992*</u>
Allegheny County (including City)	26,083	24,328	25,912	28,017	32,368
City of Pittsburgh	19,543	18,172	19,357	N/A	24,188
Beaver County	27,867	25,414	25,603	27,665	27,558
Fayette County	18,797	17,491	18,617	20,070	22,081
Washington County	25,308	25,701	25,199	27,467	29,125
Westmoreland County	25,470	23,787	25,309	27,700	29,856
Total Pittsburgh CMSA	25,296	23,788	25,149	27,314	30,623
Pennsylvania	25,913	24,404	25,956	28,148	33,350
United States	25,888	24,488	25,976	N/A	33,178

Source: Sales and Marketing Management, "Survey of Buying Power, 1991," August 1992.
 * Source: Sales and Marketing Management "1993 Survey of Buying Power", August 30, 1993.

APPENDIX "E"

FORM OF MUNICIPAL BOND INSURANCE POLICY

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Financial Guaranty Insurance
Company
115 Broadway
New York, NY 10006
212 312-3000
800 352-0001



A GE Capital Company

Municipal Bond New Issue Insurance Policy

Issuer:

Policy Number:

Control Number:

Bonds:

Premium:

Financial Guaranty Insurance Company, "Financial Guaranty", a New York stock insurance company, in consideration of the payment of the premium and subject to the terms of this Policy, hereby unconditionally and irrevocably agrees to pay to Citibank, N.A., or its successor, as its agent (the "Fiscal Agent"), for the benefit of Bondholders, that portion of the principal and interest on the above-described debt obligations (the "Bonds") which shall become Due for Payment but shall be unpaid by reason of Nonpayment by the Issuer.

Financial Guaranty will make such payments to the Fiscal Agent on the date such principal or interest becomes Due for Payment or on the business Day next following the day on which Financial Guaranty shall have received Notice of Nonpayment, whichever is later. The Fiscal Agent will disburse to the Bondholder the face amount of principal and interest which is then Due for Payment but is unpaid by reason of Nonpayment by the Issuer but only upon receipt by the Fiscal Agent, in form reasonably satisfactory to it, of (i) evidence of the Bondholder's right to receive payment of the principal or interest Due for Payment and (ii) evidence, including any appropriate instruments of assignment, that all of the Bondholder's rights to payment of such principal or interest Due for Payment shall thereupon vest in Financial Guaranty. Upon such disbursement, Financial Guaranty shall become the owner of the Bond, appurtenant coupon or right to payment of principal or interest on such Bond and shall be fully subrogated to all of the Bondholder's rights thereunder, including the Bondholder's right to payment thereof.

This Policy is non-cancellable for any reason. The premium on this Policy is not refundable for any reason, including the payment of the Bonds prior to their maturity. This Policy does not insure against loss of any prepayment premium which may at any time be payable with respect to any Bond.

As used herein, the term "Bondholder" means, as to a particular Bond, the person other than the Issuer who, at the time of Nonpayment, is entitled under the terms of such Bond to payment thereof. "Due for Payment" means, when referring to the principal of a Bond, the stated maturity date thereof or the date on which the same shall have been duly called for mandatory sinking fund redemption and does not refer to any earlier date on which payment is due by reason of call for redemption (other than by mandatory sinking fund redemption), acceleration or other advancement of maturity and means, when referring to interest on a

Financial Guaranty Insurance
Company
115 Broadway
New York, NY 10006
212 312-3000
800 352-0001



A GE Capital Company

Municipal Bond New Issue Insurance Policy

Bond, the stated date for payment of interest. "Nonpayment" in respect of a Bond means the failure of the Issuer to have provided sufficient funds to the paying agent for payment in full of all principal and interest Due for Payment on such Bond. "Notice" means telephonic or telegraphic notice, subsequently confirmed in writing, or written notice by registered or certified mail, from a Bondholder or a paying agent for the Bonds to Financial Guaranty. "Business Day" means any day other than a Saturday, Sunday or a day on which the Fiscal Agent is authorized by law to remain closed.

In Witness Whereof, Financial Guaranty has caused this Policy to be affixed with its corporate seal and to be signed by its duly authorized officers in facsimile to become effective and binding upon Financial Guaranty by virtue of the countersignature of its duly authorized representative.

President

Effective Date:

Authorized Representative

Citibank, N.A., acknowledges that it has agreed to perform the duties of Fiscal Agent under this Policy.

Authorized Officer

Financial Guaranty Insurance
Company
115 Broadway
New York, NY 10006
212 312-3000
800 352-0001



A GE Capital Company

Endorsement To Financial Guaranty Insurance Company Insurance Policy

Policy Number:

Control Number:

It is further understood that the term "Nonpayment" in respect of a Bond includes any payment of principal or interest made to a Bondholder by or on behalf of the issuer of such Bond which has been recovered from such Bondholder pursuant to the United States Bankruptcy Code by a trustee in bankruptcy in accordance with a final, nonappealable order of a court having competent jurisdiction.

In Witness Whereof, Financial Guaranty has caused this Endorsement to be affixed with its corporate seal and to be signed by its duly authorized officers in facsimile to become effective and binding upon Financial Guaranty by virtue of the countersignature of its duly authorized representative.

President

Effective Date:

Authorized Representative

Acknowledged as of the Effective Date written above:

Authorized Officer
Citibank, N.A., as Fiscal Agent

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APPENDIX "F"
CONSULTING ENGINEER'S REPORT

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**THE PITTSBURGH WATER AND SEWER
AUTHORITY
PITTSBURGH, PENNSYLVANIA**

**STATUS REPORT ON
CURRENT CAPITAL IMPROVEMENT PROGRAM
AND
ADDITIONAL FUNDING REQUIREMENTS**

OCTOBER 1, 1993



CHESTER
ENVIRONMENTAL

P.O. Box 15851 · Pittsburgh, PA 15244
412-269-5700 · Fax 412-269-5749



CHESTER
ENVIRONMENTAL

Ref. No. 3548-06

October 1, 1993

Mr. David M. Matter, Chairman
The Pittsburgh Water and Sewer Authority
1010 Allegheny Building
429 Forbes Avenue
Pittsburgh, Pennsylvania 15219
Dear Mr. Matter:

Re: Status Report on
Current Capital Improvement Program
and
Additional Funding Requirements

We are pleased to present the attached report on the status of the current Capital Improvement Program as of October 1, 1993, which also sets forth the additional funding requirements for continuance of the Capital Improvement Program in 1994.

This report shows that by the end of 1993, approximately \$195,000,000 of the available \$200,777,000 for Capital Improvements will have been expended or encumbered. This represents approximately 97.1 percent of the current Capital Improvement Program Budget.

The report also presents a \$12,000,000 Capital Improvement Program for 1994, to be funded under the proposed 1993 Series Revenue Bond Issue.

We trust that this report will satisfy the Authority's needs in support of this proposed bond issue.

Very truly yours,

Donald W. Bertram, P.E.
Vice President
Construction Services Division

DWB/hmsl75a

**THE PITTSBURGH WATER AND SEWER AUTHORITY
STATUS REPORT ON
CURRENT CAPITAL IMPROVEMENT PROGRAM
AND
ADDITIONAL FUNDING REQUIREMENTS**

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**THE PITTSBURGH WATER AND SEWER AUTHORITY
STATUS REPORT ON
CURRENT CAPITAL IMPROVEMENT PROGRAM
AND
ADDITIONAL FUNDING REQUIREMENTS**

**SECTION I
HISTORY AND BACKGROUND**

**THE PITTSBURGH WATER AND SEWER AUTHORITY
STATUS REPORT ON
CURRENT CAPITAL IMPROVEMENT PROGRAM
AND
ADDITIONAL FUNDING REQUIREMENTS**

**SECTION I
HISTORY AND BACKGROUND**

A. GENERAL

The City of Pittsburgh, in February 1984, established The Pittsburgh Water and Sewer Authority under the provisions of the Commonwealth of Pennsylvania. The City charged the Authority with the responsibility of carrying out a major Capital Improvement Program recommended in a comprehensive study report entitled "Evaluation of the Water and Sewer Systems of the City of Pittsburgh," dated December 9, 1983.

The Authority took over operations of the Water and Sewer Systems on May 1, 1984 pursuant to the terms of the Lease and Management Agreement between the City of Pittsburgh and the Authority. Under this agreement, the City leased the Water and Sewer Systems to the Authority for a term of fifty years with renewal provisions. The Authority was authorized to operate and maintain the Water and Sewer Systems, construct all necessary improvements, establish and collect rates and charges for its service, and finance its operations and improvements through revenue collections and sale of bonds and notes payable solely from the Authority's revenues. The Authority appointed and designated the City as the Authority's agent to manage, operate and maintain the Water and Sewer Systems for the term of the lease, subject to the general supervision, direction and control of the Authority.

The Authority Board, On April 19, 1984 adopted, by Resolution No. 19 of 1984, a Capital Improvement Program, designed to maintain a satisfactory level of service to the Water and Sewer System's current users, to improve operating

efficiency of the Water and Sewer Systems and to address future user requirements. In order to implement the initial phase of this program, the Authority, in July 1984, issued \$93,600,000 Daily Adjustable Demand Water and Sewer System Revenue Bonds, Series of 1984. From proceeds of this bond issue, \$78,777,000 was deposited into the Construction Fund for the initial three-year period (Phase I) of the Capital Improvement Program. In June 1986, the Authority issued an additional \$134,700,000 Revenue Bonds, Series of 1986. From the 1986 Bond Issue, \$115,000,000 is available to complete the remainder of the program (Phase II). An additional \$7,000,000 was made available for Capital Improvement by Resolution No. 72 of 1993, adopted August 18, 1993. These additional funds were provided through a transfer from the Debt Service Reserve Fund in accordance with Section 6.04 of the Trust Indenture; which provides for the required funds for Debt Service Reserve Fund to be in the form of cash, a letter of credit or other credit instrument, a surety bond or a combination thereof. The Authority Board elected to replace the moneys in the fund with a surety bond. As a result, \$7,000,000 was transferred to the Construction Fund for Capital Improvements with the balance of moneys transferred to the Debt Service Fund.

B. THE WATER SYSTEM

Within the City of Pittsburgh's geographical boundaries, potable water and water for emergency use (fire protection) is provided to residential, commercial, industrial, public and non-profit facilities by the Authority and three independent water purveyors.

The Pennsylvania-American Water Company provides service in the southern and western sections of the City, while two small areas, one in the eastern and the other in the western end of the City, are served by the Wilksburg-Penn Joint Water Authority and the West View Water Authority, respectively. In each of these areas, the distribution system elements (water lines, valves, hydrants, etc.) are owned and maintained by the respective independent water purveyor. In addition, the Authority, through a number of interconnections with other systems, provides water for supply and/or emergency use to several abutting municipalities. The municipalities so served are as follows:

<u>Municipality/Authority</u>	<u>Purpose of Service</u>
Pennsylvania-American Water Co.	Supply
West View Water Authority	Supply
Reserve Township	Supply
Millvale	Emergency
Shaler Township	Emergency
Etna Borough	Emergency
Sharpsburg Borough	Emergency
Fox Chapel Water Authority	Emergency
Blawnox Borough	Supply

In September 1986, the Authority entered into an agreement with Pennsylvania-American Water Company for the Authority to supply up to twelve (12) million gallons of water per day to Pennsylvania-American Water Company for their use and resale to their customers. This agreement stipulates that the minimum daily billing by the Authority will be on the basis of four (4) million gallons per day. The interconnection was completed and service provided to the Pennsylvania-American Water Company in April 1988.

The Water system provides service to approximately 83,700 residential, commercial, industrial and public customers within the geographic boundaries of the City. This represents about 85 percent of the total customers within the City. The remaining 15 percent are served by the three independent water purveyors noted above. The water supply and distribution systems consists of a 117 million gallon per day rapid sand type filter treatment plant that was placed in service in 1969; approximately 1,200 miles of mains and service lines; 30,000 valves; 8,000 fire hydrants; 9 pumping stations; 4 reservoirs and 12 storage tanks. The total capacity of the reservoirs and storage tanks is approximately 455 million gallons which, based upon current average daily usage, is sufficient to provide storage equivalent to seven days of normal water usage.

The sole source of raw water for the system is the Allegheny River. In 1984, the Authority applied to the Pennsylvania Department of Environmental Resources for the transfer of the Water Allocation Permit from the City of Pittsburgh to the Authority. The City permit issued in 1943 provided for an allocation of 115 million gallons per day. The Pennsylvania Department of Environmental Resources issued a new Water Allocation Permit to the Authority on March 9, 1989. This permit is for 100 million gallons per day; however, the Pennsylvania Department of Environmental Resources has advised that they will reevaluate this allocation in the future in the event the Authority's demand increases as a result of growth within the City or through the sale of water to surrounding municipalities. The current average withdrawal of water from the Allegheny River is approximately 65 million gallons per day, and the maximum withdrawal made on any one day was approximately 90 million gallons during the past year.

C. THE SEWER SYSTEM

The Sewer System is part of a regional system which provides service to approximately 550,000 people, of which nearly 370,000 live within the City. The total drainage area served by the regional system is approximately 80 square miles of which the City comprises about 55 square miles or nearly 70 percent of the total. The Sewer System is primarily a combined system designed to carry both storm and sanitary flows. The system is comprised of an extensive network of approximately 1,100 miles of sewer lines, ranging from 8 inches to 14 feet in diameter, and four wastewater pumping stations. The average age of the sewer lines is between 60 and 70 years old, with some portions reaching nearly 150 years in age.

The Sewer System conveys wastewater to Allegheny County Sanitary Authority (ALCOSAN) interceptors, which are located along the Allegheny and Monongahela Rivers, for conveyance to ALCOSAN'S wastewater treatment facility for processing prior to discharge to the Ohio River. The ALCOSAN facility is operating in compliance with the National Pollutant Discharge Elimination System (NPDES) under Permit No. 0025984.

Twenty-four suburban municipalities also use this system, pursuant to agreements with the City, to convey their wastewater to ALCOSAN'S treatment facility. Following is a list of municipalities served by the Sewer System. This list indicates the percent of the municipality served, the area served, and the population served.

<u>Municipality</u>	<u>Percent Served</u>	<u>Area Served (Acres)</u>	<u>Population Served</u>
Baldwin Borough	30	911	7,380
Baldwin Township	100	33	32,680
Bellevue Borough	33	206	3,340
Bethel Park Borough	10	707	3,470
Braddock Hills Borough	14	106	360
Brentwood Borough	100	892	11,910
Carnegie Borough	6	46	600
Castle Shannon Borough	98	950	9,960
Churchill Borough	1	13	40
Crafton Borough	1	2	20
Dormont Borough	100	498	11,270
Edgewood Borough	100	372	1,740
Greentree Borough	39	532	2,230
Ingram Borough	9	25	390
Mt. Lebanon Township	43	1,632	14,780
Penn Hills Township	4	349	2,300
City of Pittsburgh	100	35,333	432,940
Pleasant Hills Borough	53	1,810	5,130
Reserve Township	53	661	2,280
Ross Township	12	1,055	4,210
Swissvale Borough	30	266	3,400
West Homestead Borough	5	27	150
West Mifflin Borough	15	1,290	3,940
Whitehall Borough	97	1,969	14,750
Wilkinsburg Borough	90	<u>1,294</u>	<u>21,300</u>
TOTALS		51,239	551,570

The Authority is responsible for the operation, maintenance and capital improvements for the system within the boundaries of the City of Pittsburgh, except for any capital expenses associated with the interceptor sewer in the Saw Mill Run Drainage Basin, which responsibility and liability was recently transferred to ALCOSAN.

**THE PITTSBURGH WATER AND SEWER AUTHORITY
STATUS REPORT ON
CURRENT CAPITAL IMPROVEMENT PROGRAM
AND
ADDITIONAL FUNDING REQUIREMENTS**

**SECTION II
CURRENT CAPITAL IMPROVEMENT PROGRAM**

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**THE PITTSBURGH WATER AND SEWER AUTHORITY
STATUS REPORT ON
CURRENT CAPITAL IMPROVEMENT PROGRAM
AND
ADDITIONAL FUNDING REQUIREMENTS**

**SECTION II
CURRENT CAPITAL IMPROVEMENT PROGRAM**

The current Capital Improvement Program was recommended in a report entitled "Evaluation of the Water and Sewer Systems of the City of Pittsburgh," dated December 9, 1983, prepared by Green International, Inc. The recommended improvements were determined to be \$149,140,000. The forecasted probable costs over the life of the program, allowing escalation, were estimated at \$190,000,000. The Pittsburgh Water and Sewer Authority adopted this Capital Improvement Program by Resolution No. 19 of 1984.

In order to finance the initial phase (Phase I) of the approved program, the Authority issued Series of 1984 Revenue Bonds in the amount of \$93,600,000 in July 1984. From the proceeds of this Bond Issue, \$78,777,000 was deposited into the Construction Fund for implementation of the Phase I Capital Improvement Program.

To finance the balance of the program, the Authority in June 1986 issued Series of 1986 Revenue Bonds in the amount of \$134,700,000. From the 1986 Bond Issue, \$115,000,000 was available to complete the program (Phase II).

An additional \$7,000,000 has been made available for capital improvements by transfer of funds from the Debt Service Reserve Fund as discussed in Section I of this report.

The Phase I Capital Improvement Program was reviewed and modified in early 1986 to reflect updated construction cost estimates, changes in priorities and sequence scheduling of specific projects. The Revised Phase I Capital

Improvement Program was adopted by the Authority by Resolution No.'s 3 and 3A of 1986. This program has since been continually reviewed, and the Phase I Capital Improvement Program has periodically been revised by Resolutions of the Authority as required to reflect changing conditions.

The Phase II Capital Improvement Program was adopted by the Authority by Resolution No. 38 of 1986. This program has also been continually reviewed and periodically revised by Resolutions of the Authority as required to reflect changing conditions.

Table I presents a summary of the current total Capital Improvement Program Budget by major Components for both the Water System and the Sewer System. The total amount represents the actual dollar amount funded through the Series of 1984, Series of 1986 Bond Issues, and the additional \$7,000,000 from the Debt Service Reserve Fund.

TABLE I
CURRENT CAPITAL IMPROVEMENT PROGRAM

WATER SYSTEM	<u>Budget</u>
Distribution System	\$ 62,135,081
Pumping and Storage	31,440,695
Treatment Plant	24,106,061
Tools and Equipment	2,032,361
Miscellaneous	<u>5,742,467</u>
TOTAL WATER	\$ 125,456,665
SEWER SYSTEM	30,869,906
CITY & URA PROJECTS	20,646,191
ENGINEERING & CONSTRUCTION MANAGEMENT	21,769,304
CONTINGENCIES	<u>2,034,934</u>
TOTAL	\$ 200,777,000

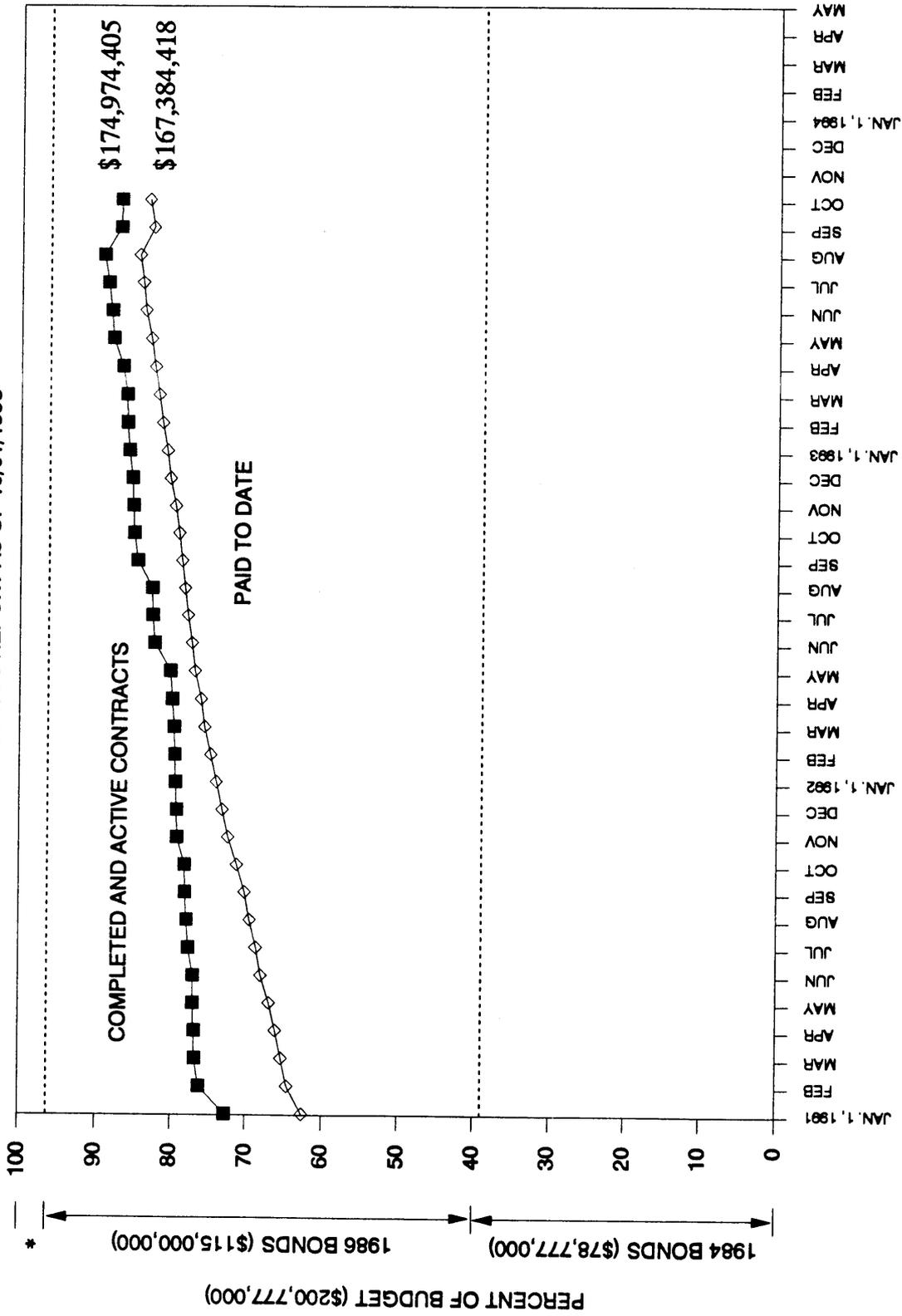
Exhibit "A", included herein, presents a listing of all projects completed as of October 1, 1993 under the current Capital Improvement Program as funded by the 1984 and 1986 Series Revenue Bonds. This exhibit includes the dollar value of all projects completed as of October 1, 1993, together with a listing of all currently active projects, those projects yet to be bid, and the total amount paid to date. Table II presents a summary of the data contained in Exhibit "A". As can be seen from Table II, the total value of completed and/or active contracts is approximately \$174,875,000 or 87.1 percent of the Capital Improvement Program Budget. As of October 1, 1993, \$167,385,000 had been paid out of this fund for Capital Improvement projects. This amount represents approximately 83.4 percent of the funds provided through the Authority Bond Issues. Included herein is a graph which shows the monthly status and progress of the program since January 1, 1991.

**TABLE II
CURRENT CAPITAL IMPROVEMENT PROGRAM
OCTOBER 1, 1993**

	<u>COMPLETED PROJECTS</u>	<u>ACTIVE PROJECTS</u>	<u>PROJECTS TO BE BID</u>	<u>TOTAL</u>	<u>PAID TO DATE</u>
WATER SYSTEM					
DISTRIB. SYSTEM	\$53,442,606	\$7,235,928	\$1,456,547	\$62,135,081	\$59,104,841
PUMPING & STORAGE	14,230,695	5,710,000	11,500,000	31,440,695	19,801,955
TREATMENT PLANT	19,781,061	4,325,000	0	24,106,061	22,647,273
TOOLS & EQUIPMENT	1,879,538	81,313	71,510	2,031,361	1,879,538
MISCELLANEOUS	<u>2,673,117</u>	<u>3,069,350</u>	<u>0</u>	<u>5,742,466</u>	<u>4,394,624</u>
TOTAL WATER SYSTEM	92,007,017	20,421,597	13,028,056	125,456,665	107,828,231
SEWER SYSTEM	19,608,541	7,221,365	4,040,000	30,869,906	25,822,857
CITY & URA PROJECTS	9,757,941	8,044,000	2,844,250	20,646,191	16,549,798
ENGINEERING	5,486,190	16,283,114	0	21,769,304	17,183,533
CONTINGENCIES	<u>0</u>	<u>0</u>	<u>2,034,934</u>	<u>2,034,934</u>	<u>0</u>
TOTALS	\$126,859,689	\$51,970,070	\$21,947,240	\$200,777,000	\$167,384,419

It is anticipated the Authority will be awarding new contracts valued at approximately \$20,000,000 by the end of the year; therefore, by the end of 1993, approximately \$195,000,000 of the \$200,777,000 available for the system improvements will have been expended or encumbered.

THE PITTSBURGH WATER AND SEWER AUTHORITY
 SEVEN YEAR CAPITAL IMPROVEMENT PROGRAM
 STATUS REPORT AS OF 10/01/1993



* \$7,000,000 TRANSFER FROM DEBT SERVICE RESERVE FUND (AUGUST 1993)

**THE PITTSBURGH WATER AND SEWER AUTHORITY
STATUS REPORT ON
CURRENT CAPITAL IMPROVEMENT PROGRAM
AND
ADDITIONAL FUNDING REQUIREMENTS**

**SECTION III
ADDITIONAL FUNDING REQUIREMENTS**

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**THE PITTSBURGH WATER AND SEWER AUTHORITY
STATUS REPORT ON
CURRENT CAPITAL IMPROVEMENT PROGRAM
AND
ADDITIONAL FUNDING REQUIREMENTS**

**SECTION III
ADDITIONAL FUNDING REQUIRMENTS**

The primary objectives of the Capital Improvement Program were to insure uninterrupted service to the Authority's customers and to enhance the system's capabilities. The Program was designed to maintain a satisfactory level of service to the water and sewer systems users, to improve operating efficiency, to address future requirements and to assure a safe supply of water to its users.

In order to assure the continuation of satisfying these primary objectives and to comply with current drinking water regulations promulgated by the Pennsylvania Safe Drinking Water Act (35 P.S. 721.4), additional funds are required for additional capital improvements identified over the past years.

The Pennsylvania Safe Drinking Water Act grants the Environmental Quality Board (EQB) the authority to adopt rules and regulations governing the provisions of drinking water to the public. 25 PA CODE CHAPTER 109, as amended, provides that "all finished water storage reservoirs be covered to prevent recontamination of water before consumption by the public." This regulation requires the covering of all finished water reservoirs by December 31, 1995.

The Authority's water system includes four open finished water reservoirs as follows:

	<u>Reservoir</u>	<u>Capacity</u>
1.	Highland No. 1	130 Million Gallons
2.	Highland No. 2	125 Million Gallons
3.	Lanpher	154 Million Gallons
4.	Herron Hill	11.5 Million Gallons

Current plans provide for the replacement of the open reservoir at Herron Hill with two concrete tanks. This project is funded under the current Capital Improvement Program budget and it is anticipated that bids will be received for construction of these tanks by the end of the year.

The current schedule provides for Lanpher Reservoir to be covered in 1994 and Highland No. 1 Reservoir in 1995. Highland No. 2 Reservoir will be taken out of service by December 31, 1995 and covered in 1996, thus complying with the State mandate. Funds to cover Lanpher Reservoir are recommended to be included in the proposed \$12,000,000 Capital Improvement Program to be funded in 1993 Series Bond Issue. Funds for covering of Highland No. 1 and No. 2 Reservoirs will be funded under future bond issues.

Following is a brief description of proposed Capital Improvements to be funded in the 1993 Series Bond Issue as identified for both the water system and the sewer system:

1. Party Line Separation - Bloomfield

Currently a number of water customers are served by common service lines serving two or more users. The customers are currently billed as "Flat Rate" customers and normally have low pressure and low volume services. The Authority plans to eliminate these party line services and install separate service lines for each customer. In the Bloomfield area of the City, 59 customers are served off common service lines. To eliminate this problem, approximately 2,500 linear feet of eight-inch water line and 59 services lines will be installed.

ESTIMATED COST \$425,000

2. Party Line Separation - Lawrenceville

In the Lawrenceville area of the City, 109 customers are served off common service lines. To eliminate this problem, approximately 2,900 linear feet of eight-inch water line and 109 service lines will be installed.

ESTIMATED COST \$450,000

3. Cover Lanpher Reservoir

To comply with the Pennsylvania Safe Drinking Water Act, a liner and floating cover are proposed to be installed on this reservoir in 1994.

ESTIMATED COST \$3,000,000

4. Crawford Square - Phase II

The Urban Redevelopment Authority (URA) recently completed the first phase of the Crawford Square Project which encompassed 303 new housing units south of Wylie Avenue between Crawford and Roberts Streets. This development required the relocation and installation of new water and sewer lines in the area to serve this development. The Pittsburgh Water and Sewer Authority reimbursed the URA the costs of the water and sewer system improvements. The URA is now planning Phase II of this development which will encompass 100 units in new housing in the area between Wylie and Bedford Avenues, west of Roberts Street. Additional water and sewer system improvements are required to serve Phase II.

ESTIMATED COST \$700,000

5. Millvale Pump Station

The Authority is entering into an agreement to supply water to the Borough of Millvale at a rate of approximately 400,000 gallons per day. To accomplish this, the Authority must construct a new pump station to meet the pressure requirements of Millvale.

ESTIMATED COST \$150,000

6. Design Engineering (Chlorination System and Residuals Handling)

An Engineering Study is currently underway to determine the most economical methods of rehabilitating the chlorination system at the treatment plant and for treating and disposing of sludge from the clarifiers

and filter backwash process. The chlorination system must be updated to receive, generate and inject chlorine at appropriate points in the treatment process. Discharge of sludge wastes from the treatment process directly to the river is no longer permitted and must be treated and disposed of on-site or discharged into the sewers for treatment by Alcosan. Upon completion of the Engineering Study, it is necessary to move directly into design engineering of the recommended improvements in order to comply with current Federal and State requirements.

ESTIMATED COST \$700,000

7. Steuben Street at Chartiers Avenue Water Line

A number of recent water line breaks in this area has resulted in disruption in both water distribution and traffic problems. It is proposed that the water lines in this area be replaced by a new 12-inch line from Chartiers Avenue to Wabash Avenue for a distance of approximately 900 feet.

ESTIMATED COST \$130,000

8. Larkins Way Water Line

The existing water line in Larkins Way between 17th Street and 29th Street is badly deteriorated and currently undersized to meet the water demands in the area and to provide adequate fire protection. To correct this problem, approximately 4,800 feet of 12-inch line must be installed.

ESTIMATED COST \$400,000

9. Ellsworth/Morewood Avenue Sewer

A relief sewer of approximately 1,800 feet is required to eliminate flooding to facilities from the intersection of Ellsworth Avenue and Morewood Avenue to the intersection of Amberson and Bayard.

ESTIMATED COST \$250,000

10. Kenton Way Sewer

The existing sewer on Kenton Way between Federal Street and Lithgow Avenue is located under City steps and is cracked and broken. The existing sewer is in need of restoration to reestablish proper flow through the system. It is proposed to replace approximately 340 feet of 15-inch sewer to correct this problem.

ESTIMATED COST \$100,000

11. Dinwiddie Street Sewer

The existing 36-inch brick sewer between Fifth Avenue and Wylie Avenue (approximately 2,600 feet), built in 1874, is in poor condition and in need of either replacement or relining. An internal inspection will be made to determine the most economical method to be used to restore proper service in this area.

ESTIMATED COST \$600,000

12. Dinwiddie Street Water Line

The existing water line between Fifth Avenue and Centre Avenue (approximately 1,850 feet), in the same area as the proposed sewer replacement proposed under Item 11, is over 115 years old and approximately 12 to 14 feet deep. During repair of a recent break in this line, field observations revealed the existing water line to be in an extremely poor condition. It is proposed that this section of water line be replaced at a lesser depth.

ESTIMATED COST \$400,000

13. Sewer Cleaning and TV Inspection

Flooding problems exist during storm conditions throughout the City and in order to investigate these problems to determine the most economical

method of correction, it is necessary to clean and internally inspect (TV) the sewer lines in the area. It is proposed to begin a program to accomplish this through an Annual Cleaning and TV Inspection Contract.

ESTIMATED COST \$400,000

14. Drainage Basin Modeling of Sewers

The Authority initiated a pilot program of developing a computer model of the interceptor sewers in the Boundry Street Drainage Basin and the Banksville Road Drainage Basin. With these models it is possible to analyze the sewer systems to identify problem areas and to determine required improvements. It is proposed to continue this program by modeling two or three additional drainage basins in 1994.

ESTIMATED COST \$500,000

15. Computerized Billing System

Rapid advancements in technology have resulted in the existing billing system being outdated and cumbersome to use. This system should be updated to the current state-of-the-art technology in order to improve billing efficiency and to properly provide valuable data for use in the operation and management of the water system.

ESTIMATED COST \$500,000

16. Miscellaneous Sewer Replacement and Sewer Lining

With the cleaning and TV inspection of sewer lines under Item 13, miscellaneous sewer lines will be identified that are in need of replacement or lining in order to eliminate problems. Funds must be budgeted for this work in 1994.

<u>SEWER REPLACEMENT ESTIMATED COST</u>	<u>\$700,000</u>
<u>SEWER LINING ESTIMATED COST</u>	<u>\$500,000</u>

17. Emergencies - Water and Sewer

Throughout the year, water line breaks or sewer line collapses result in emergency repairs that are beyond the capabilities of the Operating Department. These extraordinary repairs must be done with outside contractors with capital funds. Funds must be budgeted for such emergencies in 1994.

WATER LINE EMERGENCIES ESTIMATED COST \$300,000
SEWER LINE EMERGENCIES ESTIMATED COST \$300,000

18. Fire Hydrants

The Authority has established a program to replace a portion of its 8,000 fire hydrants annually. To continue this program in 1994, funds must be budgeted.

ESTIMATED COST \$200,000

19. Miscellaneous Tools and Equipment - Water Department

In order to properly maintain the water system and to maintain an adequate water laboratory, there is a continued need to replace and/or update existing equipment. Funds must be budgeted for these needs in 1994.

ESTIMATED COST \$300,000

The following Table III lists each of the above mentioned projects and estimated costs of each:

TABLE III
PROPOSED \$12,000,000 CAPITAL IMPROVEMENT PROGRAM
FOR 1994

<u>Proposed Project</u>	<u>Estimated Costs</u>
1. Party Line Separation - Bloomfield	\$ 425,000
2. Party Line Separation - Lawrenceville	450,000
3. Cover Lanpher Reservoir	3,000,000
4. Crawford Square - Phase III	700,000
5. Millvale Pump Station	150,000
6. Design Engineering - Chlorination System and Residual Handling	700,000
7. Steuben Street at Chartiers Ave. Water Line	130,000
8. Larkins Way Water Line	400,000
9. Ellsworth/Morewood Sewer	250,000
10. Kenton Way Sewer 100,000	
11. Dinwiddie Street Sewer	600,000
12. Dinwiddie Street Water Line	400,000
13. Sewer Cleaning and TV Inspection	400,000
14. Drainage Basin Modeling of Sewers	500,000
15. Computerized Billing System	500,000
16. Miscellaneous Sewer Replacement	700,000
17. Miscellaneous Sewer Lining	500,000
18. Water Line Emergencies	300,000
19. Sewer Line Emergencies	300,000
20. Fire Hydrants	200,000
21. Miscellaneous Tools and Equipment - Water Dept.	<u>300,000</u>
Subtotal	\$11,005,000
Contingencies	<u>995,000</u>
TOTAL	<u>\$12,000,000</u>

EXHIBIT "A"

**STATUS OF
CURRENT CAPITAL IMPROVEMENT PROGRAM**

CBWDISTS

THE PITTSBURGH WATER AND SEWER AUTHORITY
 CURRENT CAPITAL IMPROVEMENT PROGRAM
 WATER DISTRIBUTION
 OCTOBER 1, 1993

EXHIBIT NO.	LINE	DESCRIPTION	BUDGET	PAID TO DATE	COMMENTS

COMPLETED PROJECTS					
		PHASE I COMPLETE AS OF JULY 11, 1991	37,438,513.17	37,438,513.17	
		PHASE II COMPLETE AS OF JULY 11, 1991	7,636,354.25	7,636,354.25	
		PHASE III COMPLETE AS OF OCT 1, 1993	8,367,738.74	8,367,738.74	
		SUB-TOTAL	53,442,606.16	53,442,606.16	

ACTIVE PROJECTS					
A-6	D3	SMALL METERS - PURCHASE	2,315,841.16	2,315,841.16	
2A-1	8	CITY ASPHALT, 1992-93	250,000.00	175,159.54	
2A-1	11	WYLIE & WATTS	425,000.00	0.00	
2A-1	17B	LARGE METERS - BULK RATES	67,896.50	37,498.00	
2A-1	17D	VAULTS - ASPINWALL & SHARPSBURG	120,000.00	0.00	
2A-1	19	FERRULE REMOVAL	250,000.00	92,565.30	
2A-1	22	FORT PITT BLVD - EMERGENCY	50,000.00	0.00	
2A-1	23	WELSH WAY & BROSVILLE	350,000.00	220,916.16	
2A-1	24	SOUTHERN AVE. - LOTHROP EMERGENCY	61,513.69	30,561.56	
2A-1	30	HATFIELD & LEMINGTON - EMERGENCY	70,000.00	0.00	
2A-1	31	BOGGS AVENUE - EMERGENCY	70,000.00	0.00	
2A-2	40	FIRST AVENUE - TRY STREET	550,000.00	387,153.39	
2A-5	5A	REGULATOR VAULTS - HERRON HILL	27,760.00	10,618.00	
2A-5	5E	PUMP PARTS - HERRON HILL	12,916.43	0.00	
2A-5	6	RISERS AND LIDS	40,000.00	27,200.50	
2A-5	7	FIRE HYDRANTS	175,000.00	0.00	
2A-6	1	LARGE METERS	2,400,000.00	2,364,721.24	
		SUB-TOTAL	7,235,927.78	5,662,234.85	

PROJECTS TO BE BID					
2A-1	2	VENTURI - BUNKER HILL @ HIGHLAND	200,000.00	0.00	BID 1ST QTR 1994
2A-1	17	BULK WATER VAULTS & METERS	480,546.90	0.00	BID 4TH QTR 1993
2A-1	20	PARTY LINE SEPARATION - HOMEWOOD	776,000.00	0.00	BID 4TH QTR 1993
		SUB-TOTAL	1,456,546.90	0.00	

		TOTAL	62,135,080.84	59,104,841.01	

THE PITTSBURGH WATER AND SEWER AUTHORITY
 CURRENT CAPITAL IMPROVEMENT PROGRAM
 PUMPING AND STORAGE
 OCTOBER 1, 1993

EXHIBIT NO.	LINE	DESCRIPTION	BUDGET	PAID TO DATE	COMMENTS

COMPLETED PROJECTS					
		PHASE I COMPLETE AS OF JULY 11, 1992	10,052,277.38	10,052,277.38	
		PHASE II COMPLETE AS OF JULY 11, 1992	778,048.30	778,048.30	
		PHASE III COMPLETE AS OF OCT 1, 1993	3,400,369.68	3,400,369.68	
		SUB-TOTAL	14,230,695.36	14,230,695.36	

ACTIVE PROJECTS					
2A-9	2B	HIGHLAND NO. 2 - SLURRY WALL	2,500,000.00	2,414,751.75	
2A-9	2C	BEDFORD TANK	1,500,000.00	1,452,985.96	
2A-9	8A	AUX. A/C - CONTROL CENTER	50,000.00	44,622.45	
2A-9	9A	BRILLIANT WAREHOUSE - GENERAL	1,660,000.00	1,658,899.08	
		SUB-TOTAL	5,710,000.00	5,571,259.24	

PROJECTS TO BE BID					
2A-9	2D	CLEAN LANPHER RESERVOIR	500,000.00	0.00	BID 4TH QTR 1993
2A-9	4A	HERRON HILL RESERVOIR REPLACEMENT	11,000,000.00	0.00	BID 4TH QTR 1993
		SUB-TOTAL	11,500,000.00	0.00	
=====					
		TOTAL	31,440,695.36	19,801,954.60	

CBTREAT3

THE PITTSBURGH WATER AND SEWER AUTHORITY
 CURRENT CAPITAL IMPROVEMENT PROGRAM
 TREATMENT PLANT
 OCTOBER 1, 1993

EXHIBIT NO.	LINE	DESCRIPTION	BUDGET	PAID TO DATE	COMMENTS
COMPLETED PROJECTS					
		PHASE I COMPLETE AS OF JULY 11, 1992	2,378,662.64	2,378,682.64	
		PHASE II COMPLETE AS OF JULY 11, 1992	229,757.64	229,757.64	
		PHASE III COMPLETE AS OF OCT 1, 1993	17,172,620.88	17,172,620.88	
		SUB-TOTAL	19,781,061.16	19,781,061.16	
ACTIVE PROJECTS					
A-14	3 - 11	PLANT MODIFICATIONS	725,000.00	706,981.27	
2A-10	8A	CHEMICAL FEED SYSTEM - GENERAL	1,975,000.00	1,934,908.43	
2A-10	8B	CHEMICAL FEED SYSTEM - ELECTRICAL	160,000.00	147,980.00	
2A-10	12A	RESIDUALS HANDLING SYSTEM-GENERAL	610,000.00	76,342.50	
2A-10	12B	RESIDUALS HANDLING SYSTEM-ELEC	145,000.00	0.00	
2A-10	13	CONTROL SYSTEM - TREATMENT PHASE III	710,000.00	0.00	
		SUB-TOTAL	4,325,000.00	2,866,212.20	
PROJECTS TO BE BID					
		NONE	0.00	0.00	
		SUB-TOTAL	0.00	0.00	
		TOTAL	24,106,061.16	22,647,273.36	

CBTOWS

THE PITTSBURGH WATER AND SEWER AUTHORITY
 CURRENT CAPITAL IMPROVEMENT PROGRAM
 MISCELLANEOUS TOOL, EQUIPMENT & VEHICLES
 WATER SYSTEM
 OCTOBER 1, 1993

EXHIBIT NO.	LINE	DESCRIPTION	BUDGET	PAID TO DATE	COMMENTS
COMPLETED PROJECTS					
		PHASE I COMPLETE AS OF JULY 11, 1991	486,870.77	486,870.77	
		PHASE II COMPLETE AS OF JULY 11, 1991	802,311.88	802,311.88	
		PHASE III COMPLETE AS OF OCT 1, 1993	590,355.32	590,355.32	
		SUB-TOTAL	1,879,537.97	1,879,537.97	
ACTIVE PROJECTS					
2A-11	4D	ELECTRICAL SECURITY SYSTEM	41,363.00	0.00	
2A-11	4E	AUTOMATIC METER READING	39,950.00	0.00	
		SUB-TOTAL	81,313.00	0.00	
PROJECTS TO BE BID					
2A-11		MISC ITEMS	71,509.74	0.00	BID 4TH QTR 1993
		SUB-TOTAL	71,509.74	0.00	
		TOTAL	2,032,360.71	1,879,537.97	

CBMISW3

THE PITTSBURGH WATER AND SEWER AUTHORITY
 CURRENT CAPITAL IMPROVEMENT PROGRAM
 MISCELLANEOUS PROJECTS - WATER
 OCTOBER 1, 1993

EXHIBIT NO.	LINE	DESCRIPTION	BUDGET	PAID TO DATE	COMMENTS
COMPLETED PROJECTS					
		PHASE I COMPLETE AS OF JULY 1, 1991	1,332,174.03	1,332,174.03	
		PHASE II COMPLETE AS OF JULY 1, 1991	25,458.44	25,458.44	
		PHASE III COMPLETE AS OF OCT 1, 1993	1,315,484.10	1,315,484.10	
		SUB-TOTAL	2,673,116.57	2,673,116.57	
ACTIVE PROJECTS					
2A-12	1	CADD SYSTEM - DEC	1,760,000.00	1,199,626.41	
2A-12	1B	CADD SYSTEM - SEWER SYSTEM	500,000.00	0.00	
2A-13	1C	COMPUTER HYD MODEL	490,000.00	377,608.71	
2A-13	6B	SEWER SYSTEM STUDY	200,000.00	123,843.76	
2A-13	6C	PHASE III SOFTWARE	119,350.00	20,428.31	
		SUB-TOTAL	3,069,350.00	1,721,507.19	
PROJECTS TO BE BID					
		NONE	0.00	0.00	
		SUB-TOTAL	0.00	0.00	
		TOTAL	5,742,466.57	4,394,623.76	

CBSEWERS

THE PITTSBURGH WATER AND SEWER AUTHORITY
 CURRENT CAPITAL IMPROVEMENT PROGRAM
 SEWER PROJECTS

OCTOBER 1, 1993

EXHIBIT NO.	LINE	DESCRIPTION	BUDGET	PAID TO DATE	COMMENTS
COMPLETED PROJECTS					
		PHASE I COMPLETE AS OF JULY 11, 1991	8,173,338.06	8,173,338.06	
		PHASE II COMPLETE AS OF JULY 11, 1991	7,534,565.57	7,534,565.57	
		PHASE III COMPLETE AS OF OCT 1, 1993	3,900,636.97	3,900,636.97	
		SUB-TOTAL	19,608,540.60	19,608,540.60	
ACTIVE PROJECTS					
B-1	19	BANKSVILLE	3,712,367.50	3,712,367.70	
	24	McMONGLE			
	26	LUSTER			
2B-1	35	FERNERY - GLENBURY	1,000,000.00	967,299.03	
	54	PARKLYN - AARON			
2B-1	63	CATCH BASINS, 1992-93	450,000.00	396,196.65	
2B-1	64	MANHOLES, 1992-93	225,000.00	221,943.15	
2B-1	66	SEWER LINING	795,000.00	591,418.88	
		CECIL - FT DUQ BLVD TO PENN			
		BELLAIRE PLACE-BIRCHLANE TO WITT			
		DAWSON AVE -OAKLAND TO BOUQUET			
		CREEDMORE PLACE - EBEN TO HARCORE			
		HARCORE DRIVE - EDEN TO CREEMORE PL			
		EBEN STREET - HARCORE TO CREEDMORE			
		HAYES STREET - CHISLETT TO SAMANTHA WAY			
		JOSEPHINE STREET - NORTHVIEW TO 375' SOUTH			
		MARSHALL RD - MARSHALL AVE TO 400' NORTH			
		PENN AVE - #4546 TO CAROLL			
		CENTRE AVE-EAST BUSWAY TO 200' EAST			
		FAIR OAKS BY CO #1			
		MAYVILLE BY CO #1			
		TROPICAL STREET BY CO #2			
		JUNILLA STREET BY CO #2			
2B-1	68	CLYDE STREET	425,000.00	325,091.33	
2B-1	69	WILKENS AVE/DENNISTON	140,000.00	0.00	

2B-1	72	ANNUAL SEWER CONTRACT	473,997.50	0.00
		SOFFEL/CHRESS (\$54,404.13)		
		CHARLES ANDERSON (\$74,421.27)		
		JUNILLA (\$40,785.10)		
		TREVANION (\$57,895.39)		
		BELLINGHAM (\$139,436.33)		
		BALANCE (\$107,055.28)		

		SUB-TOTAL	7,221,365.00	6,214,316.74
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PROJECTS TO BE BID

2B-1	53	PROVOST/FAIRHAVEN	1,900,000.00	0.00	BID 2ND QTR 1994
2B-1	56	SOUTH 11TH STREET	120,000.00	0.00	BID 2ND QTR 1994
2B-1	73	CATCH BASINS - 1993	450,000.00	0.00	BID 4TH QTR 1993
2B-1	74	MANHOLES - 1993	300,000.00	0.00	BID 4TH QTR 1993
2B-3	1	UNSEWERED AREAS	670,000.00	0.00	BID 2ND & 3RD QTR 1994
2B-4	2	EQUIP.,TOOLS & VEHICLES 1988-89	200,000.00	0.00	BID 4TH QTR 1993
2B-4	3	EQUIP.,TOOLS & VEHICLES 1989-90	200,000.00	0.00	BID 1ST QTR 1994
2B-4	4	EQUIP.,TOOLS & VEHICLES 1990-91	200,000.00	0.00	BID 2ND QTR 1994

		SUB-TOTAL	4,040,000.00	0.00
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		TOTAL	30,869,905.60	25,822,857.34
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THE PITTSBURGH WATER AND SEWER AUTHORITY
CURRENT CAPITAL IMPROVEMENT PROGRAM
CITY AND URA PROJECTS
OCTOBER 1, 1993

EXHIBIT NO.	LINE	DESCRIPTION	BUDGET	PAID TO DATE	COMMENTS

COMPLETED PROJECTS					
		PHASE I COMPLETE AS OF JULY 11, 1991	5,740,466.46	5,740,466.46	
		PHASE II COMPLETE AS OF JULY 11, 1991	2,820,479.95	2,820,479.95	
		PHASE III COMPLETE AS OF OCT 1, 1993	1,196,994.86	1,196,994.86	
		SUB-TOTAL	9,757,941.27	9,757,941.27	

ACTIVE PROJECTS					
A-2	21	SOUTH CRAIG STREET - WATER	89,000.00	79,315.25	
B-1	16	SOUTH CRAIG STREET - SEWER	250,000.00	177,745.87	
ATT A	A-13	I-279 (EAST STREET)	260,000.00	0.00	
2A-2	6	ARLINGTON AVENUE - PHASE II (W&S)	1,250,000.00	1,223,008.78	
2A-2	7	ARLINGTON AVENUE - PHASE III (W&S)	1,450,000.00	1,432,938.59	
2A-2	29A	PITT TECH CENTER, ACCESS ROAD - URA	150,000.00	126,876.44	
2A-2	32	MOSSFIELD COURT - URA	135,000.00	96,567.25	
2A-2	35	STONELEA STREET	215,000.00	197,838.15	
2A-2	36	CRAWFORD/ROBERTS - PHASE I - URA	4,245,000.00	3,457,566.76	
		SUB-TOTAL	8,044,000.00	6,791,857.09	

PROJECTS TO BE BID ***					
2A-2	1	GRANT STREET - PHASES III & V (W&S)	950,000.00	0.00	1994 CONSTRUCTION
2A-2	4	SCHENLEY BRIDGE	5,500.00	0.00	1993 CONSTRUCTION
2A-2	10	PANTHER HOLLOW BRIDGE (W&S)	6,750.00	0.00	1994 CONSTRUCTION
2A-2	13	HARPEN ROAD - COLBY TO EVERGREEN (W&S)	220,000.00	0.00	1993 CONSTRUCTION
2A-2	15	WOOD STREET - LIBERTY TO FT. PITT(W&S)	700,000.00	0.00	1994 CONSTRUCTION
2A-2	16	FIRST AVENUE - STANWIX TO GRANT (W&S)	620,000.00	0.00	1993 CONSTRUCTION
2A-2	26	STADIUM DRIVE	100,000.00	0.00	1994 CONSTRUCTION
2A-2	34	WALBRIDGE STREET	242,000.00	0.00	1993 CONSTRUCTION
		SUB-TOTAL	2,844,250.00	0.00	

		TOTAL	20,646,191.27	16,549,798.36	

THE PITTSBURGH WATER AND SEWER AUTHORITY
CURRENT CAPITAL IMPROVEMENT PROGRAM
ENGINEERING
OCTOBER 1, 1993

EXHIBIT NO.	LINE	DESCRIPTION	BUDGET	PAID TO DATE	COMMENTS
COMPLETED PROJECTS					
		PHASE I COMPLETE AS OF JULY 1, 1991	4,037,210.53	4,037,210.53	
		PHASE II COMPLETE AS OF JULY 1, 1991	0.00	0.00	
		PHASE III COMPLETE AS OF OCT 1, 1993	1,448,979.62	1,448,979.62	
		SUB-TOTAL	5,486,190.15	5,486,190.15	
ACTICE PROJECTS					
ATT-A	E	PUMP STA REHAB - CHESTER	800,000.00	795,204.41	
ATT-A	E	BRILLIANT WAREHOUSE - G&H	58,900.00	58,925.00	
ATT-2A	E	REIMB. DEC WATER THUR 1994	1,875,000.00	1,139,155.43	
ATT-2A	E	CONSTR. MANAGEMENT - THRU 1994	9,000,000.00	6,865,280.76	
ATT-2A	E	HERRON HILL & BEDFORD - M. BAKER	500,000.00	393,657.03	
ATT-2A	E	HIGHLAND NO. 2 - D'APPOLONIA	106,214.27	105,056.22	
ATT-2A	E	SPRUCE WAY - D&L	2,000.00	1,102.86	
ATT-2A	E	MISC. SEWER DESIGN GAI	460,000.00	0.00	
ATT-2A	E	VARIOUS WATER & SEWER - KILLAM	400,000.00	341,203.20	
ATT-2A	E	PLANT CHLORINATION - MALCOLM PIRNIE	515,000.00	230,353.22	
ATT-2A	E	MILLVALE PUMP STA - MS	400,000.00	0.00	
ATT-2A	E	HIGHLAND # 2 - O'BRIEN - KREIT	360,000.00	354,677.00	
ATT-2A	E	CADD - MANG SYS - PLANGRAPHICS	100,000.00	78,258.75	
ATT-2A	E	GRAFIELD TANK - RUST	35,000.00	33,628.00	
ATT-2A	E	PERMITS - PENNDOT	1,000.00	250.00	
ATT-B	7	SEWER DESIGN - DUNCAN-LANGESE	380,000.00	373,595.70	
ATT-B	7	SEWER DESIGN-LORENZI DODDS	185,000.00	172,709.45	
ATT-2B	E	REIMB DEC SEWER THRU 1994	795,000.00	467,313.26	
ATT-2B	E	SEWER DESIGN - BCM	285,000.00	266,972.50	
ATT-2B	E	SEWER DESIGN - KILLAM	25,000.00	0.00	
		SUB-TOTAL	16,283,114.27	11,697,342.79	
PROJECTS TO BE AWARDED					
		NONE	0.00	0.00	
		SUB-TOTAL	0.00	0.00	
		TOTAL	21,769,304.42	17,183,532.94	

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38582

1-2. NAME OF ISSUER AND DESCRIPTION OF ISSUE : THE PITTSBURGH WATER AND SEWER AUTHORITY

3. STATE : A: PA,B: PA

4. DATED DATE : A: 10/15/1993,B: 10/15/1993

5. DATE OF FINAL MATURITY OF OFFERING : 09/01/2023B 6. DATE OF SALE : A: 10/27/1993,B: 10/27/1993

7. PAR VALUE OF OFFERING : \$ 289,755,000

8. PAR AMOUNT UNDERWRITTEN (if there is no underwriting syndicate): \$

9. AMENDED OR STICKERED OS? NO NUMBER OF SERIES IN OS : 2
(Enter Y or N) (Fill out one form for each series)

G-36

10. CHECK ALL THAT APPLY:

- a. At the option of the holder thereof, all securities in this offering may be tendered to the issuer of such securities or its designated agent for redemption or purchase at par value of more at least as frequently as every nine months until maturity, earlier redemption, or purchase by the issuer or its designated agent.
- b. At the option of the holder thereof, all securities in this offering may be tendered to the issuer of such securities or its designated agent for redemption or purchase at par value of more at least as frequently as every two years until maturity, earlier redemption, or purchase by the issuer or its designated agent.
- c. This offering is exempt from SEC rule 15c2-12 under section (c)(1) of that rule. Section (c)(1) of SEC rule 15c2-12 states that an offering is exempt from the requirements of the rule if the securities offered have authorized denominations of \$100,000 or more and or sold to no more than 35 persons each of whom the participating underwriter believes: (1) has the knowledge and expertise necessary to evaluate the merits and risks of the investment; and (2) is not purchasing for more than one account, with a view toward distributing the securities.

11. MANAGING UNDERWRITER : PaineWebber Incorporated

16. CUSIP NUMBERS (and corresponding maturity date)

09/01/1994A	725304CK3
09/01/1995A	725304CL1
09/01/1996A	725304CM9
09/01/1997A	725304CN7
09/01/1998A	725304CP2
09/01/1999A	725304CQ0
09/01/2000A	725304CR8
09/01/2001A	725304CS6
09/01/2002A	725304CT4
09/01/2003A	725304CU1
09/01/2004A	725304CV9
09/01/2005A	725304CW7
09/01/2006A	725304CX5
09/01/2007A	725304CY3
09/01/2008A	725304CZ0
09/01/2009A	725304DA4
09/01/2010A	725304DB2
09/01/2013A	725304DC0
09/01/2016A	725304DD8
09/01/2023B	725304DE6

17. MSRB rule G-34 requires that CUSIP numbers be assigned to each new issue of municipal securities unless the issue is ineligible for CUSIP number assignment under the eligibility criteria of the CUSIP Service Bureau.

Check here if the issue is ineligible for CUSIP number assignment.

State the reason why the issue is ineligible for CUSIP number assignment:

18. Submit two copies of the completed form along with the official statement to: Municipal Securities Rulemaking Board, 1818 N Street, NW, Suite 800, Washington, DC 20036-2491. Incomplete submissions will be returned for correction.