NEW YORK CITY WATER AND SEWER SYSTEM

A COMPONENT UNIT OF THE CITY OF NEW YORK

Combining Financial Statements
(Together with Independent Auditors’ Report)

June 30, 2019 and 2018

NEW YORK CITY WATER AND SEWER SYSTEM
(A Component Unit of The City of New York)

COMBINING FINANCIAL STATEMENTS
(Together with Independent Auditors' Report)

JUNE 30, 2019 AND 2018

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MARKS PANETH
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INDEPENDENT AUDITORS' REPORT

To the Members of the Joint Audit Committee of the
New York City Municipal Water Finance Authority and
New York City Water Board

We have audited the accompanying combining financial statements of the New York City Municipal Water Finance Authority and the New York City Water Board, which collectively comprise the New York City Water and Sewer System (the "System"), a component unit of The City of New York, as of and for the years ended June 30, 2019 and 2018, which collectively comprise the System's basic combining financial statements as listed in the table of contents, and the related notes to the combining financial statements.

Management's Responsibility for the Combining Financial Statements

Management is responsible for the preparation and fair presentation of these combining financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of the combining financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on these combining financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the combining financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the combining financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the combining financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the combining financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the combining financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the combining financial statements referred to above present fairly, in all material respects, the financial position of the New York City Municipal Water Finance Authority and the New York City Water Board as of June 30, 2019 and 2018, and the changes in their financial position and their cash flows for the years then ended in accordance with accounting principles generally accepted in the United States of America.

Other Matter – Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis on pages 3 through 14, the schedule of changes for total OPEB liability and related ratios on page 67, the schedule of the Authority's proportionate share of the net pension liability on page 68, and the schedule of the Authority's pension contributions on page 68 be presented to supplement the basic combining financial statements. Such information, although not a part of the basic combining financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic combining financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic combining financial statements, and other knowledge we obtained during our audits of the basic combining financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Marks Paneth LLP

New York, NY
October 15, 2019

Overview of the Financial Statements

The following is an overview of the financial activities of the New York City Water and Sewer System (the "System") as of and for the fiscal years ended June 30, 2019 and 2018. The System is a joint operation consisting of two legally separate and independent entities, the New York City Municipal Water Finance Authority (the "Authority") and the New York City Water Board (the "Water Board"). The System is a component unit of the City of New York (the "City").

The financial statements consist of four parts (1) management's discussion and analysis (this section), (2) the basic financial statements, (3) the notes to the financial statements and (4) required supplementary information.

The basic financial statements of the System, which include the combining statements of net position (deficit), the combining statements of revenues, expenses and changes in net position (deficit) and the combining statements of cash flows, are presented for the purposes of displaying entity-wide information in accordance with Governmental Accounting Standards Board ("GASB") requirements. These financial statements are prepared using the economic resources measurement focus and the accrual basis of accounting. Accordingly, revenues are recognized when earned, and expenses are recorded when a liability is incurred, regardless of the timing of the related cash flows.

Financial Analysis and Results of Operations

The following summarizes the activities of the System for the fiscal years 2019, 2018, and 2017 (in thousands):

	2019	2018	Restated (a) 2017	Variance 2019 vs 2018	Variance 2018 vs 2017
REVENUES:					
Operating revenues:					
Water supply and distribution	$ 1,416,713	$ 1,346,045	$ 1,407,328	$ 70,668	$ (61,283)
Sewer collection and treatment	2,252,574	2,140,214	2,237,652	112,360	(97,438)
Bad debt expense	852	(18,259)	(2,620)	19,111	(15,639)
Other operating revenues	149,660	187,308	186,355	(37,648)	953
Total operating revenues	3,819,799	3,655,308	3,828,715	164,491	(173,407)
Non-operating revenues:					
Subsidy income	176,346	175,620	166,715	726	8,905
Investment income	91,712	28,809	4,178	62,903	24,631
Total non-operating revenues	268,058	204,429	170,893	63,629	33,536
Total revenues	4,087,857	3,859,737	3,999,608	228,120	(139,871)
EXPENSES:					
Operations and maintenance	1,469,601	1,389,954	1,385,446	79,647	4,508
Other operating expenses	76,051	84,983	56,116	(8,932)	28,867
General and administrative	52,504	55,493	50,749	(2,989)	4,744
Depreciation and amortization	908,355	1,042,968	930,482	(134,613)	112,486
Capital distribution	110,750	22,789	45,789	87,961	(23,000)
Net loss on retirement of capital assets	2,423	48,609	44,452	(46,186)	4,157
Loss/(gain) on defeasance	26,058	14,991	(4,808)	11,067	19,799
Interest expense and cost of issuance	1,198,849	1,190,802	1,176,402	8,047	14,400
Total expenses	3,844,591	3,850,589	3,684,628	(5,998)	165,961
Net gain (loss) before capital contributions	243,266	9,148	314,980	234,118	(305,832)
CAPITAL CONTRIBUTIONS	12,448	19,642	6,225	(7,194)	13,417
CHANGE IN NET POSITION (DEFICIT)	255,714	28,790	321,205	226,924	(292,415)
NET POSITION - Beginning	1,083,743	1,054,953	733,748	28,790	321,205
NET POSITION - Ending	$ 1,339,457	$ 1,083,743	$ 1,054,953	$ 255,714	$ 28,790

(a) The restatement in fiscal year 2017 is the result of the System's implementing GASB 83, *Certain Asset Retirement Obligations.*

Operating Revenues

Operating revenues are comprised of water supply and distribution, sewer collection and treatment, bad debt expense, and other operating revenues.

2019-2018

Operating revenues increased by $165 million or 4.5% compared to fiscal year 2018. This increase was partly due to a 2.36% rate increase adopted by the Water Board for fiscal year 2019. It also reflects a one-time credit issued by the Water Board to certain customers, which lowered revenues in fiscal year 2018, as further described below.

2018-2017

Operating revenues decreased by $173 million largely due to the following: (i) a one-time credit issued to residential properties holders with three or fewer units totaling $121 million and (ii) credits issued to multifamily residential properties subject to rental affordability agreements, credits to senior homeowners, and credits for leak forgiveness totaling $19.3 million.

Other Operating Revenues

The following further details other operating revenues for fiscal years 2019, 2018, and 2017 (in thousands):

				Variance	
	2019	**2018**	**2017**	**2019 vs 2018**	**2018 vs 2017**
Upstate water fees	$ 66,180	$ 79,688	$ 85,410	$ (13,508)	$ (5,722)
Late payment fees	38,842	54,020	45,859	(15,178)	8,161
Change in residual interest in sold liens	(11,752)	(2,034)	2,274	(9,718)	(4,308)
Connection fees and permits	18,682	19,588	19,979	(906)	(391)
Service line protection program	37,708	36,046	32,833	1,662	3,213
Total other operating revenues	$ 149,660	$ 187,308	$ 186,355	$ (37,648)	$ 953

2019-2018

Upstate water fees declined by $13.5 million due to lower sales of water charged at both the entitlement and excess rates, in particular the further reduction of excess water revenues from the City of Newburgh.

Late payment fees decreased by $15.2 million compared to fiscal year 2018 due to fewer payments made for delinquent accounts. This amount fluctuates depending on the timeliness of customer payment.

The change in residual interest in sold liens decreased by $9.7 million compared to fiscal year 2018. This was due to fewer residual liens from previous lien sales residing with the Lien Trust.

The amounts received for the service line protection program increased by $1.7 million. The number of effective policies increased from approximately 270,000 on June 30, 2018, to approximately 274,000 by the end of fiscal year 2019.

2018-2017

Upstate water fees declined due to lower sales of water charged at both the entitlement and excess rates, in particular the reduction of excess water revenues from the City of Newburgh.

Fiscal year 2018 late payment fees returned to a typical range. In fiscal year 2017, late payment fees were reduced by a billing adjustment made mid-year to certain accounts relating to a change in interest rate. This lowered the total amount of late payment charges for fiscal year 2017. This amount fluctuates depending on the timeliness of customer payment.

The change in residual interest in sold liens decreased by $4.3 million compared to fiscal year 2017. This was due to fewer residual liens from previous lien sales residing with the Lien Trust.

The amounts received for the service line protection program increased by $3.2 million. The number of effective policies increased from approximately 254,000 on July 1, 2017 to approximately 270,000 by the end of fiscal year 2018.

Non-Operating Revenues

Non-operating revenues are comprised of subsidy income and investment income.

2019-2018

Investment income increased by $63 million compared to fiscal year 2018. The increase was due to $19.2 million of unrealized gains on both investments and forward purchase agreements in fiscal year 2019, compared to a loss of $24.4 million in fiscal year 2018, higher interest rates on invested assets and a minimal increase in arbitrage rebate payments, which is recorded as an offset to investment income.

2018-2017

Investment income increased by $24.6 million compared to fiscal year 2017. The increase was due to higher interest rates on invested assets and a decrease in arbitrage rebate payments, which is recorded as an offset to investment income.

Operating Expenses

Operating expenses are comprised of operations and maintenance, general and administrative, depreciation and amortization expense, and other operating expenses.

2019-2018

Total operations and maintenance expense increased by $79.6 million or 5.7% compared to fiscal year 2018. This is due primarily to an increase in the wastewater operating cost.

Depreciation and amortization expense decreased by $135 million compared to fiscal year 2018. In fiscal year 2018, a total of $3.7 billion of completed projects were removed from construction in progress into depreciable assets utility plant in service which resulted in the higher depreciation expense in fiscal year 2018, and along with asset retirements and adjustments, leveled out in fiscal year 2019.

2018-2017

Other operating expenses increased by $28.9 million compared to fiscal year 2017. The Department of Environmental Protection ("DEP") pollution remediation obligations went up by approximately $8.0 million in fiscal year 2018 due to several projects, including the reconstruction of facilities lighting at the North River Wastewater Treatment Plant ("WWTP"), Main Sewage Pump upgrades at the Bowery Bay WWTP, the activation of the City Tunnel No. 3, Stage 2, and asbestos removal at various DEP facilities. The filtration avoidance determination ("FAD") expense increased in fiscal year 2018 compared to fiscal year 2017. This increase was due to the wastewater management program with various New York upstate counties for maintaining and enhancing water quality.

In fiscal year 2018, depreciation expense increased due to the addition of $3.7 billion of new depreciable assets placed in service.

Non-Operating Expenses

Non-operating expenses are comprised of interest expense, loss on defeasance, cost of issuance, net loss on retirement of capital assets, and capital distribution.

2019-2018

Capital distribution increased by $88.0 million in fiscal year 2019. This was due to the System acquiring more land around the reservoirs and in the Gowanus Canal area and then granting them to the City.

Interest expense and cost of issuance increased by $8.0 million. This increase was primarily due to the issuance of additional debt.

Fiscal year 2019 cash defeasance resulted in an accounting loss of $26.1 million. This represents the difference between the carrying value of the defeased bonds and the amount transferred to fund the escrow account (using current resources) to defease the bonds. This loss was reported in the Systems' combining statement of revenues, expenses and changes in net position (deficit) (see Note 9).

2018-2017

Net loss on retirement of capital assets increased by $4.2 million due to the disposition of assets with carrying values greater than those in fiscal year 2017. This amount fluctuates depending on the amount of fixed asset disposed.

Interest expense and cost of issuance increased by $14.4 million. This increase was primarily due to the issuance of additional debt.

Fiscal year 2018 cash defeasance resulted in an accounting loss of $15.0 million. This represents the difference between the carrying value of the defeased bonds and the amount transferred to fund the escrow account (using current resources) to defease the bonds. This loss was reported in the Systems' combining statement of revenues, expenses and changes in net position (deficit) (see Note 9).

Change in Net Position (Deficit)

2019-2018

The change in net position (deficit) represents the net total of operating revenue and expenses, non-operating revenues and expenses, and capital contributions. The change in net position (deficit) increased by $227 million in fiscal year 2019.

2018-2017

The change in net position (deficit) represents the net total of operating revenue and expenses, non-operating revenues and expenses, and capital contributions. The change in net position (deficit) decreased by $292 million in fiscal year 2018.

Ending Net Position (Deficit)

2019-2018

The ending net position (deficit) represents the net total of operating revenue and expenses, non-operating revenues and expenses, capital contributions, and beginning balance of net position (deficit). Ending net position (deficit) increased by $256 million in fiscal year 2019.

2018-2017

The ending net position (deficit) represents the net total of operating revenue and expenses, non-operating revenues and expenses, capital contributions, and beginning balance of net position (deficit). Ending net position (deficit) increased by $28.8 million in fiscal year 2018.

The following is a summary of the System's assets, deferred outflows of resources, liabilities, deferred inflows of resources and net position (deficit) as of June 30 (in thousands):

	2019	2018	Restated (a) 2017	Variance 2019 vs 2018	Variance 2018 vs 2017
Current assets	$ 2,891,584	$ 3,274,730	$ 3,497,079	$ (383,146)	$ (222,349)
Residual interest in sold liens	61,822	73,574	75,607	(11,752)	(2,033)
Capital assets	30,975,053	30,063,299	29,536,272	911,754	527,027
Total assets	33,928,459	33,411,603	33,108,958	516,856	302,645
Deferred outflows of resources:					
Accumulated decrease in fair value of hedging derivative	107,158	76,115	100,438	31,043	(24,323)
Deferred changes in net pension liability	(385)	(353)	(184)	(32)	(169)
Unamortized asset retirement obligation	13,855	15,454	16,752	(1,599)	(1,298)
Deferred changes in OPEB liability	532	31	-	500.5360	31
Total deferred outflows of resources	121,160	91,247	117,006	29,913	(25,759)
Total assets and deferred outflows of resources	$ 34,049,619	$ 33,502,850	$ 33,225,964	$ 546,769	$ 276,886
Current liabilities	$ 1,371,692	$ 1,251,166	$ 1,369,149	$ 120,526	$ (117,983)
Long-term liabilities	31,325,449	31,158,544	30,785,167	166,905	373,377
Total liabilities	32,697,141	32,409,710	32,154,316	287,431	255,394
Deferred inflows of resources:					
Deferred changes in net pension liability	34	37	11	(3)	26
Deferred changes in OPEB liability	598	349	291	249	58
Unamortized deferred bond refunding costs	12,389	9,011	16,393	3,378	(7,382)
Total deferred inflows of resources	13,021	9,397	16,695	3,624	(7,298)
Net position (deficit):					
Net investment in capital assets	437,786	116,124	(204,403)	321,662	320,527
Restricted for debt service	1,624,802	1,501,529	1,781,994	123,273	(280,465)
Restricted for operations and maintenance	260,102	247,304	237,746	12,798	9,558
Unrestricted (deficit)	(983,233)	(781,214)	(760,384)	(202,019)	(20,830)
Total net position (deficit)	1,339,457	1,083,743	1,054,953	255,714	28,790
Total liabilities, deferred inflows of resources, and net position (deficit)	$ 34,049,619	$ 33,502,850	$ 33,225,964	$ 546,769	$ 276,886

(a) The restatement in fiscal year 2017 is the result of the System's implementing GASB 83, *Certain Asset Retirement Obligations.*

Current Assets

Current assets are comprised of restricted cash and cash equivalents, restricted, investments, accrued interest and subsidy receivable, receivable from the City of New York, and accounts receivable.

2019-2018

Current assets decreased by $383 million or 12%. Restricted investments, including restricted cash and cash equivalents, decreased by $302 million primarily in the construction fund. Construction fund balances fluctuate due to the timing of bonds issuances and payments to the City for capital costs. Net receivable decreased by $56 million and receivable from the City decreased by $20 million.

Deferred Outflows of Resources

Deferred outflows of resources are comprised of accumulated decrease in fair value of hedging derivative, deferred changes in net pension liability, unamortized asset retirement obligations, and deferred changes in OPEB liability.

2019-2018

Deferred outflows from hedging increased by $31.0 million or 41% compared to fiscal year 2018 due to a decline in the fair value of the hedging derivative instrument.

2018-2017

Accumulated decrease in fair value of hedging derivative decreased by $24.3 million or 24.2% compared to fiscal year 2017 because of an increase in the fair value of the hedging derivative instruments.

Current Liabilities

Current liabilities are comprised of accounts payable, interest payable, revenue received in advance, current portion of bonds and notes payable, payable to the City of New York, and service credits on customer accounts.

2019-2018

Current liabilities increased by $121 million or 9.6% compared to fiscal year 2018. This was primarily due to an increase of $120 million payable to the City, an increase of $58 million in the current portion of bonds and notes payable, which was offset by a decrease of $43 million of revenue received in advance and a decrease of $19 million of service credits on customer accounts.

2018-2017

Current liabilities decreased by $118 million or 8.6% compared to fiscal year 2017. This was primarily due to a decrease in the current portion of bonds and notes payable.

Long-term Liabilities

Long-term liabilities are comprised of bonds and notes payable, pollution remediation obligation, interest rate swap agreement – net, revenue requirements payable to the Authority, net pension liability, net OPEB liability, and other long-term liability.

2019-2018

Long-term liabilities increased by $167 million or 0.5% primarily due to the issuance of new debt to fund capital projects offset by the defeasance of debt using current revenues.

2018-2017

Long-term liabilities increased by $373 million or 1.2% primarily due to the issuance of new debt to fund capital projects.

Capital Assets

The System's capital assets include buildings, machinery and equipment, vehicles, water supply and wastewater treatment systems, and water distribution and sewage collection systems, as well as utility construction.

The Authority issues debt to pay for the capital improvements to the System and related costs. Costs related to the System's filtration avoidance determination, including land acquisition in the upstate watershed area and certain costs associated with pollution remediation, are financed with debt but are not recorded as the System assets on the combining statements of net position (deficit). The cumulative amount of expenses not capitalized as assets as of June 30, 2019 was $1.6 billion. These costs or distributions are expensed in the System's combining statements of revenues, expenses, and changes in net position (deficit) in the years incurred. The land purchased is granted to the City and becomes the City's capital asset because it is not subject to the method of capitalization under which the System reports its capital assets.

Capital assets as of June 30, are detailed as follows (in thousands):

	2019	2018	2017	Variance 2019 vs 2018	Variance 2018 vs 2017
NONDEPRECIABLE ASSETS:					
Utility construction in progress	$ 4,717,989	$ 3,394,126	$ 5,475,307	$ 1,323,863	$ (2,081,181)
DEPRECIABLE ASSETS:					
Utility plant in service:					
Buildings	35,821	35,767	34,936	54	831
Machinery and equipment	4,893,559	4,826,881	3,940,877	66,678	886,004
Vehicles	263,639	250,359	246,899	13,280	3,460
Water supply and distribution and wastewater treatment and sewage collection systems	36,749,341	36,345,548	33,670,666	403,793	2,674,882
Total utility plant in service	41,942,360	41,458,555	37,893,378	483,805	3,565,177
Less accumulated depreciation for:					
Buildings	29,602	28,003	26,455	1,599	1,548
Machinery and equipment	2,369,280	2,120,838	1,872,243	248,442	248,595
Vehicles	112,509	101,819	94,025	10,690	7,794
Water supply and distribution and wastewater treatment and sewage collection systems	13,173,905	12,538,722	11,839,690	635,183	699,032
Total accumulated depreciation	15,685,296	14,789,382	13,832,413	895,914	956,969
Total utility plant in service - net	26,257,064	26,669,173	24,060,965	(412,109)	2,608,208
Total capital assets - net	$ 30,975,053	$ 30,063,299	$ 29,536,272	$ 911,754	$ 527,027

2019-2018

Total gross additions to non-depreciable assets utility construction in progress were $1.8 billion and a total of $497 million of completed projects were moved from construction in progress into depreciable assets utility plant in service. This resulted in a $1.3 billion increase in construction in progress, representing a 39% net increase compared to fiscal year 2018. Total capital assets, net of depreciation, increased by $912 million, a 3% increase from fiscal year 2018 (see Note 3).

2018-2017

Total gross additions to non-depreciable assets utility construction in progress were $1.6 billion and a total of $3.7 billion of completed projects were moved from construction in progress into depreciable assets utility plant in service. This resulted in a $2.1 billion reduction in construction in progress, representing a 38% net decrease compared to fiscal year 2017. The System completed the construction of the Croton filtration plant at a cost of $2.4 billion, the Gowanus Canal facilities upgrade of $204 million, carbon addition facilities at various treatment plants of $121 million, supervisory control and data acquisition system at various treatment plants of $92.0 million, Catskills Delaware shaft 4 interconnection of $40.0 million, Tallman Island wet weather sewage flow maximization of $30.0 million and various other projects. Total capital assets, net of depreciation increased by $527 million, a 2% increase from fiscal year 2017 (see Note 3).

Debt Administration

The debt program of the Authority includes commercial paper notes and long-term debt issued to the public, as well as bond anticipation notes ("BANs") and interest-subsidized bonds issued to the New York State Environmental Facilities Corporation ("EFC"). Commercial program notes and BANs are interim financing instruments. In fiscal year 2019 and 2018, the Authority has not issued any commercial paper notes, relying instead on bond and BAN proceeds to reimburse the City for payments made for water and sewer capital projects. The Authority periodically issues long-term debt to retire outstanding commercial paper notes and BANs. The Authority also issues refunding bonds to refinance higher coupon debt and defeases debt using current revenues.

As of June 30, 2019, the total outstanding debt of the System was $30.0 billion, which, other than $28 million of BANs, was comprised of adjustable rate and fixed-rate long-term bonds.

The following table summarize debt program activities for the fiscal year ending June 30, 2019 (in thousands):

	Outstanding Principal Balance at June 30, 2018	Issued	Principal Retired	Principal Defeased	Outstanding Principal Balance at June 30, 2019
First Resolution Bonds	$ 1,928,706	$ -	$ (47,940)	$ (300,000)	$ 1,580,766
Second Resolution Bonds	27,870,962	2,859,504	(376,854)	(1,916,070)	28,437,542
Second Resolution BANs	215,734	324,824	-	(512,960)	27,598
Total Bonds Payable	$ 30,015,402	$ 3,184,328	$ (424,794)	$ (2,729,030)	$ 30,045,906

The following table summarize debt program activities for the fiscal year ending June 30, 2018 (in thousands):

	Outstanding Principal Balance at June 30, 2017	Issued	Principal Retired	Principal Defeased	Outstanding Principal Balance at June 30, 2018
First Resolution Bonds	$ 2,429,956	$ -	$ (15,430)	$ (485,820)	$ 1,928,706
Second Resolution Bonds	27,241,067	2,941,846	(381,086)	(1,930,865)	27,870,962
Second Resolution BANs	359,375	571,767	-	(715,408)	215,734
Total Bonds Payable	$ 30,030,398	$ 3,513,613	$ (396,516)	$ (3,132,093)	$ 30,015,402

In fiscal year 2019, the Authority issued $2.1 billion of water and sewer system revenue bonds to the public, including $1.1 billion of refunding bonds and $985 million of new money bonds. Additionally, the Authority issued $485 million of new money and $320 million of refunding water and sewer system revenue bonds to EFC. The Authority used new money bond proceeds to finance capital improvements to the System, to provide long-term financing of BANs that previously financed capital improvements to the System, and to pay for bond issuance costs.

During fiscal year 2019, the Authority issued $1.4 billion of bonds to refund $1.6 billion of outstanding bonds. These refundings resulted in an accounting gain of $6.0 million. The Authority reduced its aggregate debt service for principal and interest by $431 million and obtained an economic benefit (present value savings) of $326 million.

During fiscal year 2019, the Authority legally defeased $639 million of outstanding bonds using current resources. This resulted in an accounting loss of $25 million and a gross debt service savings of $1.3 billion.

In fiscal year 2018, the Authority issued $2.3 billion of water and sewer system revenue bonds to the public, including $1.4 billion of refunding bonds and $833 million of new money bonds. Additionally, the Authority issued $669 million of new money water and sewer system revenue bonds to EFC. The Authority used new money bond proceeds to finance capital improvements to the System, to provide long-term financing of BANs that previously financed capital improvements to the System, and to pay for bond issuance costs (see Note 9).

During fiscal year 2018, the Authority legally defeased $769 million of outstanding bonds using current resources. This resulted in an accounting loss of $15.0 million and a gross debt service savings of $1.7 billion (see Note 9).

Request for Information

This financial report is provided as an overview of the System's finances. Questions concerning any of the information in this report or requests for additional information should be directed to Investor Relations, New York City Municipal Water Finance Authority, 255 Greenwich Street, New York, New York 10007 or to NYWInvestors@omb.nyc.gov.

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NEW YORK CITY WATER AND SEWER SYSTEM

COMBINING STATEMENTS OF NET POSITION (DEFICIT)
June 30, 2019

ASSETS AND DEFERRED OUTFLOWS OF RESOURCES	New York City Water Board	New York City Municipal Water Finance Authority	Eliminations	Total
	(in thousands)			
ASSETS:				
CURRENT ASSETS:				
Restricted cash and cash equivalents	$ 15,664	$ 1,306,377	$ -	$ 1,322,041
Restricted investments	256,702	574,615	-	831,317
Accrued interest and subsidy receivable	2	7,387	-	7,389
Accounts receivable:				
Billed - less allowance for uncollectable water and sewer receivables of $403,455	381,973	-	-	381,973
Unbilled - less allowance for uncollectable water and sewer receivables of $27,618	348,864	-	-	348,864
Total current assets	**1,003,205**	**1,888,379**	**-**	**2,891,584**
NON-CURRENT ASSETS:				
Utility plant in service - less accumulated depreciation of $15,685,296	26,257,064	-	-	26,257,064
Utility plant construction	4,717,989	-	-	4,717,989
Total capital assets	**30,975,053**	**-**	**-**	**30,975,053**
Residual interest in sold liens	61,822	-	-	61,822
Revenue required to be billed by and received from the Water Board	-	11,199,913	(11,199,913)	-
Total non-current assets	**31,036,875**	**11,199,913**	**(11,199,913)**	**31,036,875**
Total assets	**32,040,080**	**13,088,292**	**(11,199,913)**	**33,928,459**
DEFERRED OUTFLOWS OF RESOURCES:				
Accumulated decrease in fair value of hedging derivative	-	107,158	-	107,158
Deferred changes in net pension liability	-	(385)	-	(385)
Unamortized asset retirement obligations	13,855	-	-	13,855
Deferred changes in OPEB liability	-	532	-	532
Total deferred outflows of resources	**13,855**	**107,305**	**-**	**121,160**
Total assets and deferred outflows of resources	**$ 32,053,935**	**$ 13,195,597**	**$ (11,199,913)**	**$ 34,049,619**

See notes to combining financial statements.

(Continued)

NEW YORK CITY WATER AND SEWER SYSTEM

COMBINING STATEMENTS OF NET POSITION (DEFICIT)
June 30, 2019

LIABILITIES, DEFERRED INFLOWS OF RESOURCES AND NET POSITION (DEFICIT)	Water Board	New York City Municipal Water Finance Authority	Eliminations	Total
		(in thousands)		
LIABILITIES:				
CURRENT LIABILITIES:				
Accounts payable	$ 10,758	$ 6,172	$ -	$ 16,930
Interest payable	-	53,514	-	53,514
Revenue received in advance	15,384	-	-	15,384
Current portion of bonds and notes payable	-	509,299	-	509,299
Payable to the City of New York	19,905	695,328	-	715,233
Service credits on customer accounts	61,332	-	-	61,332
Total current liabilities	**107,379**	**1,264,313**	**-**	**1,371,692**
LONG-TERM LIABILITIES:				
Bonds and notes payable	-	31,162,950	-	31,162,950
Pollution remediation obligation	33,021	-	-	33,021
Interest rate swap agreement - net	-	107,158	-	107,158
Revenue requirements payable to the Authority	11,199,913	-	(11,199,913)	-
Net pension liability	-	393	-	393
Net OPEB liability	-	1,828	-	1,828
Other long-term liability	17,850	2,249	-	20,099
Total long-term liabilities	**11,250,784**	**31,274,578**	**(11,199,913)**	**31,325,449**
Total liabilities	**11,358,163**	**32,538,891**	**(11,199,913)**	**32,697,141**
DEFERRED INFLOWS OF RESOURCES:				
Unamortized deferred bond refunding costs	-	12,389	-	12,389
Deferred changes in net pension liability	-	34	-	34
Deferred changes in OPEB liability	-	598	-	598
Total deferred inflows of resources	**-**	**13,021**	**-**	**13,021**
NET POSITION (DEFICIT):				
Net investment in capital assets	30,975,053	(30,537,267)	-	437,786
Restricted for debt service	-	1,624,802	-	1,624,802
Restricted for operations and maintenance	260,102	-	-	260,102
Unrestricted (deficit)	(10,539,383)	9,556,150	-	(983,233)
Total net position (deficit)	**20,695,772**	**(19,356,315)**	**-**	**1,339,457**
Total liabilities, deferred inflows of resources and net position (deficit)	**$ 32,053,935**	**$ 13,195,597**	**$ (11,199,913)**	**$ 34,049,619**

See notes to combining financial statements.

(Concluded)

NEW YORK CITY WATER AND SEWER SYSTEM

COMBINING STATEMENTS OF NET POSITION (DEFICIT)
June 30, 2018

ASSETS AND DEFERRED OUTFLOWS OF RESOURCES	Water Board	New York City Municipal Water Finance Authority	Eliminations	Total
		(in thousands)		
ASSETS:				
CURRENT ASSETS:				
Restricted cash and cash equivalents	$ 9,007	$ 1,265,802	$ -	$ 1,274,809
Restricted investments	247,302	932,776	-	1,180,078
Accrued interest and subsidy receivable	-	13,389	-	13,389
Accounts receivable:				
Billed - less allowance for uncollectable water and sewer receivables of $404,018	429,663	-	-	429,663
Unbilled - less allowance for uncollectable water and sewer receivables of $27,907	356,581	-	-	356,581
Receivable from the City of New York	20,210	-	-	20,210
Total current assets	**1,062,763**	**2,211,967**	**-**	**3,274,730**
NON-CURRENT ASSETS:				
Utility plant in service - less accumulated depreciation of $14,789,382	26,669,173	-	-	26,669,173
Utility plant construction	3,394,126	-	-	3,394,126
Total capital assets	**30,063,299**	**-**	**-**	**30,063,299**
Residual interest in sold liens	73,574	-	-	73,574
Revenue required to be billed by and received from the Water Board	-	11,588,295	(11,588,295)	-
Total non-current assets	**30,136,873**	**11,588,295**	**(11,588,295)**	**30,136,873**
Total assets	**31,199,636**	**13,800,262**	**(11,588,295)**	**33,411,603**
DEFERRED OUTFLOWS OF RESOURCES:				
Accumulated decrease in fair value of hedging derivative	-	76,115	-	76,115
Deferred changes in net pension liability	-	(353)	-	(353)
Unamortized asset retirement obligations	15,454	-	-	15,454
Deferred changes in OPEB liability	-	31	-	31
Total deferred outflows of resources	**15,454**	**75,793**	**-**	**91,247**
Total assets and deferred outflows of resources	**$ 31,215,090**	**$ 13,876,055**	**$ (11,588,295)**	**$ 33,502,850**

See notes to combining financial statements.

(Continued)

NEW YORK CITY WATER AND SEWER SYSTEM

COMBINING STATEMENTS OF NET POSITION (DEFICIT)
June 30, 2018

LIABILITIES, DEFERRED INFLOWS OF RESOURCES AND NET POSITION (DEFICIT)	Water Board	New York City Municipal Water Finance Authority	Eliminations	Total
		(in thousands)		
LIABILITIES:				
CURRENT LIABILITIES:				
Accounts payable	$ 6,871	$ 5,719	$ -	$ 12,590
Interest payable	-	53,203	-	53,203
Revenue received in advance	58,537	-	-	58,537
Current portion of bonds and notes payable	-	451,477	-	451,477
Payable to the City of New York	-	595,020	-	595,020
Service credits on customer accounts	80,339	-	-	80,339
Total current liabilities	**145,747**	**1,105,419**	**-**	**1,251,166**
LONG-TERM LIABILITIES:				
Bonds and notes payable	-	31,023,455	-	31,023,455
Pollution remediation obligation	37,561	-	-	37,561
Interest rate swap agreement - net	-	76,115	-	76,115
Revenue requirements payable to the Authority	11,588,295	-	(11,588,295)	-
Net pension liability	-	516	-	516
Net OPEB liability	-	1,457	-	1,457
Other long-term liability	18,051	1,389	-	19,440
Total long-term liabilities	**11,643,907**	**31,102,932**	**(11,588,295)**	**31,158,544**
Total liabilities	**11,789,654**	**32,208,351**	**(11,588,295)**	**32,409,710**
DEFERRED INFLOWS OF RESOURCES:				
Unamortized deferred bond refunding costs	-	9,011	-	9,011
Deferred changes in net pension liability	-	37	-	37
Deferred changes in OPEB liability	-	349	-	349
Total deferred inflows of resources	**-**	**9,397**	**-**	**9,397**
NET POSITION (DEFICIT):				
Net investment in capital assets	30,063,299	(29,947,175)	-	116,124
Restricted for debt service	-	1,501,529	-	1,501,529
Restricted for operations and maintenance	247,304	-	-	247,304
Unrestricted (deficit)	(10,885,167)	10,103,953	-	(781,214)
Total net position (deficit)	**19,425,436**	**(18,341,693)**	**-**	**1,083,743**
Total liabilities, deferred inflows of resources and net position (deficit)	**$ 31,215,090**	**$ 13,876,055**	**$ (11,588,295)**	**$ 33,502,850**

See notes to combining financial statements.

(Concluded)

NEW YORK CITY WATER AND SEWER SYSTEM

COMBINING STATEMENTS OF REVENUES, EXPENSES AND CHANGES IN NET POSITION (DEFICIT) FOR THE YEAR ENDED JUNE 30, 2019

	New York City		
	Water Board	Municipal Water Finance Authority	Total
		(in thousands)	
OPERATING REVENUES:			
Water supply and distribution	$ 1,416,713	$ -	$ 1,416,713
Sewer collection and treatment	2,252,574	-	2,252,574
Bad debt expense	852	-	852
Other operating revenues	149,660	-	149,660
Total operating revenues	**3,819,799**	**-**	**3,819,799**
OPERATING EXPENSES:			
Operations and maintenance	1,469,601	-	1,469,601
General and administrative	4,580	47,924	52,504
Other operating expenses	76,051	-	76,051
Depreciation and amortization expense	908,355	-	908,355
Total operating expenses	**2,458,587**	**47,924**	**2,506,511**
OPERATING INCOME (LOSS)	**1,361,212**	**(47,924)**	**1,313,288**
NON-OPERATING REVENUES (EXPENSES):			
Interest expense	-	(1,180,801)	(1,180,801)
Loss on defeasance	-	(26,058)	(26,058)
Cost of issuance	-	(18,048)	(18,048)
Net loss on retirement and impairment of capital assets	(2,423)	-	(2,423)
Subsidy income	-	176,346	176,346
Capital distributions	(110,750)	-	(110,750)
Investment income	9,849	81,863	91,712
NET INCOME (LOSS) BEFORE CAPITAL CONTRIBUTIONS	**1,257,888**	**(1,014,622)**	**243,266**
Capital contributions	12,448	-	12,448
CHANGE IN NET POSITION (DEFICIT)	**1,270,336**	**(1,014,622)**	**255,714**
NET POSITION (DEFICIT) - Beginning of year	**19,425,436**	**(18,341,693)**	**1,083,743**
NET POSITION (DEFICIT) - End of year	**$ 20,695,772**	**$ (19,356,315)**	**$ 1,339,457**

See notes to combining financial statements.

NEW YORK CITY WATER AND SEWER SYSTEM

COMBINING STATEMENTS OF REVENUES, EXPENSES AND CHANGES IN NET POSITION (DEFICIT) FOR THE YEAR ENDED JUNE 30, 2018

	New York City Water Board	New York City Municipal Water Finance Authority	Total
		(in thousands)	
OPERATING REVENUES:			
Water supply and distribution	$ 1,346,045	$ -	$ 1,346,045
Sewer collection and treatment	2,140,214	-	2,140,214
Bad debt expense	(18,259)	-	(18,259)
Other operating revenues	187,308	-	187,308
Total operating revenues	**3,655,308**	**-**	**3,655,308**
OPERATING EXPENSES:			
Operations and maintenance	1,389,954	-	1,389,954
General and administrative	5,661	49,832	55,493
Other operating expenses	84,983	-	84,983
Depreciation and amortization expense	1,042,968	-	1,042,968
Total operating expenses	**2,523,566**	**49,832**	**2,573,398**
OPERATING INCOME (LOSS)	**1,131,742**	**(49,832)**	**1,081,910**
NON-OPERATING REVENUES (EXPENSES):			
Interest expense	-	(1,171,567)	(1,171,567)
Loss on defeasance	-	(14,991)	(14,991)
Cost of issuance	-	(19,235)	(19,235)
Net loss on retirement and impairment of capital assets	(48,609)	-	(48,609)
Subsidy income	-	175,620	175,620
Capital distributions	(22,789)	-	(22,789)
Investment income	5,923	22,886	28,809
NET INCOME (LOSS) BEFORE CAPITAL CONTRIBUTIONS	**1,066,267**	**(1,057,119)**	**9,148**
Capital contributions	19,642	-	19,642
CHANGE IN NET POSITION (DEFICIT)	**1,085,909**	**(1,057,119)**	**28,790**
NET POSITION (DEFICIT) - Beginning of year	**18,339,527**	**(17,284,574)**	**1,054,953**
NET POSITION (DEFICIT) - End of year	**$ 19,425,436**	**$ (18,341,693)**	**$ 1,083,743**

See notes to combining financial statements.

NEW YORK CITY WATER AND SEWER SYSTEM

COMBINING STATEMENTS OF CASH FLOWS
FOR THE YEAR ENDED JUNE 30, 2019

	New York City		
	Water Board	Municipal Water Finance Authority	Total
		(in thousands)	
CASH FLOWS FROM OPERATING ACTIVITIES:			
Receipts from customers	$ 3,824,799	$ -	$ 3,824,799
Payments for operations and maintenance	(1,462,395)	-	(1,462,395)
Payments for administration	(1,027)	(47,865)	(48,892)
Net cash provided by (used in) operating activities	**2,361,377**	**(47,865)**	**2,313,512**
CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES:			
Proceeds from issuing bonds, notes and other borrowings - net of issuance costs	-	3,463,013	3,463,013
Receipts from contribution made by other organization	292	-	292
Acquisition and construction of capital assets	-	(1,867,102)	(1,867,102)
Payments by the Water Board to the Authority	(2,355,459)	2,355,459	-
Repayments of bonds, notes and other borrowings	-	(3,193,878)	(3,193,878)
Interest paid on bonds, notes and other borrowings	-	(1,116,389)	(1,116,389)
Net cash provided by (used in) capital and related financing activities	**(2,355,167)**	**(358,897)**	**(2,714,064)**
CASH FLOWS FROM INVESTING ACTIVITIES:			
Sales and maturities of investments	287,087	404,270	691,357
Purchases of investments	(293,999)	(26,945)	(320,944)
Interest on investments	7,359	70,012	77,371
Net cash provided by (used in) investing activities	**447**	**447,337**	**447,784**
NET INCREASE IN CASH AND CASH EQUIVALENTS	**6,657**	**40,575**	**47,232**
CASH AND CASH EQUIVALENTS - Beginning of year	**9,007**	**1,265,802**	**1,274,809**
CASH AND CASH EQUIVALENTS - End of year	**$ 15,664**	**$ 1,306,377**	**$ 1,322,041**

See notes to combining financial statements.

(Continued)

COMBINING STATEMENTS OF CASH FLOWS
FOR THE YEAR ENDED JUNE 30, 2019

	New York City		
	Water Board	Municipal Water Finance Authority	Total
		(in thousands)	
RECONCILIATION OF OPERATING INCOME / (LOSS) TO NET CASH PROVIDED BY (USED IN) OPERATING ACTIVITIES:			
Operating income (loss)	$ 1,361,212	$ (47,924)	$ 1,313,288
Adjustments to reconcile operating income (loss) to net cash provided by (used in) operating activities:			
Amortization	1,446	-	1,446
Depreciation	906,909	-	906,909
Other operating expenses paid for with bond proceeds	38,969	-	38,969
Pollution remediation expense	8,712	-	8,712
Changes in assets and liabilities:			
Pollution remediation liability	(4,539)	-	(4,539)
Receivables - net	55,406	-	55,406
Receivable from the City	40,115	-	40,115
Residual interest in sold liens	11,752	-	11,752
Accounts payable	3,553	59	3,612
Revenues received in advance	(43,153)	-	(43,153)
Refunds payable	(19,005)	-	(19,005)
NET CASH PROVIDED BY (USED IN) OPERATING ACTIVITIES	**$ 2,361,377**	**$ (47,865)**	**$ 2,313,512**

The following are the noncash capital and related financing activities (in thousands):
Interest expense includes the amortization of net (premium) and discount in the amount of $108,682 at June 30, 2019.
Capital expenditures in the amount of $695,328 had been incurred but not paid at June 30, 2019.
The Water Board received federal, state, and other capital contributions of $12,156 in fiscal year 2019.

See notes to combining financial statements. (Concluded)

NEW YORK CITY WATER AND SEWER SYSTEM

COMBINING STATEMENTS OF CASH FLOWS
FOR THE YEAR ENDED JUNE 30, 2018

	New York City Water Board	New York City Municipal Water Finance Authority	Total
		(in thousands)	
CASH FLOWS FROM OPERATING ACTIVITIES:			
Receipts from customers	$ 3,602,297	$ -	$ 3,602,297
Payments for operations and maintenance	(1,411,311)	-	(1,411,311)
Payments for administration	(2,042)	(50,201)	(52,243)
Net cash provided by (used in) operating activities	**2,188,944**	**(50,201)**	**2,138,743**
CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES:			
Proceeds from issuing bonds, notes and other borrowings - net of issuance costs	-	3,858,636	3,858,636
Receipts from contribution made by other organization	292	-	292
Acquisition and construction of capital assets	-	(1,592,121)	(1,592,121)
Payments by the Water Board to the Authority	(2,187,383)	2,187,383	-
Repayments of bonds, notes and other borrowings	-	(3,582,676)	(3,582,676)
Interest paid on bonds, notes and other borrowings	-	(1,113,958)	(1,113,958)
Net cash provided by (used in) capital and related financing activities	**(2,187,091)**	**(242,736)**	**(2,429,827)**
CASH FLOWS FROM INVESTING ACTIVITIES:			
Sales and maturities of investments	197,049	287,336	484,385
Purchases of investments	(205,582)	(368,337)	(573,919)
Interest on investments	4,496	39,189	43,685
Net cash provided by (used in) investing activities	**(4,037)**	**(41,812)**	**(45,849)**
NET DECREASE IN CASH AND CASH EQUIVALENTS	**(2,184)**	**(334,749)**	**(336,933)**
CASH AND CASH EQUIVALENTS - Beginning of year	**11,191**	**1,600,551**	**1,611,742**
CASH AND CASH EQUIVALENTS - End of year	**$ 9,007**	**$ 1,265,802**	**$ 1,274,809**

See notes to combining financial statements.

(Continued)

COMBINING STATEMENTS OF CASH FLOWS
FOR THE YEAR ENDED JUNE 30, 2018

	New York City		
	Water Board	Municipal Water Finance Authority	Total
		(in thousands)	
RECONCILIATION OF OPERATING INCOME / (LOSS) TO NET CASH PROVIDED BY (USED IN) OPERATING ACTIVITIES:			
Operating income (loss)	$ 1,131,742	$ (49,832)	$ 1,081,910
Adjustments to reconcile operating income (loss) to net cash provided by (used in) operating activities:			
Amortization	1,299	-	1,299
Depreciation	1,041,669	-	1,041,669
Other operating expenses paid for with bond proceeds	34,280	-	34,280
Pollution remediation expense	6,979	-	6,979
Changes in assets and liabilities:			
Pollution remediation liability	8,061	-	8,061
Receivables - net	(54,343)	-	(54,343)
Receivable from the City	14,305	-	14,305
Residual interest in sold liens	2,034	-	2,034
Accounts payable	3,620	(369)	3,251
Revenues received in advance	(11,024)	-	(11,024)
Refunds payable	10,322	-	10,322
NET CASH PROVIDED BY (USED IN) OPERATING ACTIVITIES	**$ 2,188,944**	**$ (50,201)**	**$ 2,138,743**

The following are the noncash capital and related financing activities (in thousands):
Interest expense includes the amortization of net (premium) and discount in the amount of $92,719 at June 30, 2018.
Capital expenditures in the amount of $595,020 had been incurred but not paid at June 30, 2018.
The Water Board received federal, state, and other capital contributions of $19,350 in fiscal year 2018.

See notes to combining financial statements. (Concluded)

1. ORGANIZATION

The New York City Water and Sewer System (the "System") provides water supply, treatment and distribution, and sewage collection, treatment, and disposal for the citizenry of the City of New York (the "City"). The System, as presented in the accompanying combining financial statements, began operations on July 1, 1985 and is a joint operation consisting of two legally separate and independent entities: the New York City Municipal Water Finance Authority (the "Authority") and the New York City Water Board (the "Water Board"). The Authority is a public benefit corporation created in accordance with the New York City Municipal Water Finance Act (the "Act"), duly enacted into law as Chapter 513 of the laws of 1984 of the State of New York (the "State"), as amended by Chapter 514 of the laws of 1984 of the State of New York. The Water Board was created by Chapter 515 of the laws of 1984 of the State of New York. The Act also empowers the Authority to issue debt to finance the cost of capital improvements to the System and to refund any and all outstanding bonds and general obligation bonds that the City issued for water and sewer purposes. The Act empowers the Water Board to lease the System from the City and to set and collect water rates, fees, rents and other charges for use of, or for services furnished, rendered, or made available by, the System to generate enough revenue to pay debt service on the Authority's debt and to place the System on a self-sustaining basis.

The Financing Agreement by and among the City of New York, the New York City Municipal Water Finance Authority and the New York City Water Board dated as of July 1,1985 (the "Agreement") provides that the Authority will issue bonds to finance the cost of capital investment and related costs of the System. It also sets forth the funding priority for debt service costs of the Authority, operating costs of the System, and the rental payment to the City.

The physical operation and capital improvements of the System are performed by the City's Department of Environmental Protection ("DEP") subject to contractual agreements with the Authority and the Water Board.

In accordance with Governmental Accounting Standards Board ("GASB") standards, the Water Board and the Authority are considered to be part of the same reporting entity (the "System") since they are fiscally interdependent. Accordingly, the accompanying combining financial statements for the System present the individual financial statements of the Water Board and the Authority as major funds. In addition, the accompanying combining financial statements present a total column, which represents the entity-wide financial statements of the System. Transactions and balances between the Water Board and the Authority are eliminated in the entity-wide combining financial statements.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The accompanying financial statements of the System have been prepared on the accrual basis of accounting. Revenues are recognized when earned and expenses are recognized when incurred. Other significant accounting policies are:

Component Unit—The System is a component unit of the City. The System leases the water and sewer related capital assets from the City, which is responsible for the operations, maintenance and capital improvement of the System. The System reimburses the City for costs incurred for operations and maintenance and issues debt to pay for capital improvements.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

Investments and Cash Equivalents—Investments and cash equivalents primarily consist of securities of the United States and its agencies, guaranteed investment contracts, forward purchase agreements, and the State of New York obligations. All investments are carried at fair value with the exception of money market funds that are carried at cost plus accrued interest. For purposes of the combining statements of cash flows and combining statements of net position (deficit), the System generally considers all highly-liquid debt instruments purchased with an original maturity of three months or less to be cash equivalents.

Restricted Assets—Proceeds from the issuance of debt and monies set aside for debt service and operation and maintenance of the System are classified as restricted cash and cash equivalents and restricted investments in the combining statements of net position (deficit), these restrictions are based on the requirements of the applicable bond resolutions.

Lien Sales and Residual Interest in Sold Liens—The City periodically sells tax liens secured by water and sewer rents and surcharges, for which the Water Board receives the applicable sale proceeds. At the time of sale, the Water Board recognizes the proceeds as operating revenue and removes the related receivables. The Water Board maintains a residual interest in the liens, which represents the amount estimated to be received by the Water Board if and when liens held by the purchasing trusts generate cash flows above the amounts needed by the trusts to pay their operating costs, bondholders, and satisfy reserve requirements.

Bond Premium and Discount and Bond Issuance Cost—Bond premiums and discounts are capitalized and amortized over the life of the related bond issue, using the effective yield method of amortization for bond premiums and discounts. Bond premiums and discounts are presented as additions or reductions to the face amount of the long-term bonds payable on the combining statements of net position (deficit). The amortized bond premiums and discounts are an off-set to interest expense on the combining statements of revenues, expenses and changes in net position (deficit). Bond issuance costs are recognized and expensed in the period incurred, except for bond insurance premiums that are amortized over the life of the related bonds.

Utility Plant—Utility plant acquired through purchase or internal construction is recorded at cost, net of retirements. It is the Water Board's policy to capitalize assets with a cost of $35,000 or more and a useful life of five years or longer. Contributed utility plant is recorded at its estimated historical cost based on appraisals or other methods when historical cost information is not available, net of accumulated depreciation. Depreciation is computed using the straight-line method based upon estimated useful lives, as follows:

Assets	Years
Buildings	40–50
Water supply and wastewater treatment systems	15–50
Water distribution and sewage collection systems	15–75
Machinery and equipment	5–35
Vehicles	10

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

Maintenance and repairs of property are charged to maintenance expense. Replacements and betterments are recorded as additions to utility plant. The System pays for certain improvements of assets that are not owned by the City or the System, as well as certain pollution remediation activities, through bond proceeds. These costs are shown as other operating expenses in the System's combining statements of revenues, expenses and changes in net position (deficit).

Contributed Capital—The System received federal, State and other capital contributions of $12.2 million and $19.4 million in fiscal years 2019 and 2018, respectively. These amounts are reported in the System's combining statements of revenues, expenses and changes in net position (deficit) below net income (loss) before capital contributions.

In addition, the System received $292,000 in fiscal years 2019 and 2018 respectively, from Westchester County (the "County") to compensate the System for constructing a water conduit that provides treated water to the County. The County payments are reported as capital contributions in the System's combining statements of revenues, expenses and changes in net position (deficit) below net income (loss) before capital contributions and as receipts from contribution made by other organization in the System's combining statements of cash flows.

Operating Revenues and Operating Expenses—Operating revenues consist of services provided to customers of the System. Revenues are reported net of allowances, discounts and refunds and are based on billing rates imposed by the Water Board and upon customers' water and sewer usage or, in some cases, characteristics of customer properties. The System records unbilled revenue at year-end based on meter readings collected as of June 30. As of June 30, 2019 and 2018, the System reported credits of $20.1 million and $141 million, respectively.

Operating expenses include, but are not limited to costs incurred for maintenance, repair, and operations of the System; administration costs of the Water Board and the Authority; and rental payments to the City, if requested. In fiscal years 2019 and 2018, the City did not request a rental payment.

Revenues Received in Advance—Revenues received in advance of the period to which they relate are unearned and recorded as revenue when earned. Customer account credit balances are reported as a current liability "service credits on customer accounts", and is not included in accounts receivable.

Unamortized Deferred Bond Refunding Costs—Deferred bond refunding costs represent the accounting gains or losses incurred in advance and current bond refundings. It is reported as deferred outflows of resources or deferred inflows of resources and is amortized over the lesser of the remaining life of the old debt or the life of the new debt. The amortized deferred bond refunding cost is an offset of interest expense on the combining statements of revenues, expenses and changes in net position (deficit).

Use of Estimates—The preparation of the combining financial statements in accordance with accounting principles generally accepted in the United States of America, requires management to make estimates and assumptions in determining the amounts of assets, deferred outflows of resources, liabilities, deferred inflows of resources, and disclosure of contingent liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

Pensions—Net pension liabilities are required to be recognized and disclosed using the accrual basis of accounting. The Authority recognizes a net pension liability for New York City Employee Retirement System Qualified Pension Plan ("NYCERS QPP" or "Pension Plan") in which it participates, which represents the Authority's proportional share of excess total pension liability over the Pension Plan assets—actuarially calculated—of a cost-sharing multiple-employer plan, measured as of the fiscal year-end.

Changes in the net pension liability during the period are recorded as pension expense, or as deferred inflow of resources or deferred outflow of resources depending on the nature of the change, in the period incurred. Those changes in net pension liability that are recorded as deferred inflow of resources or deferred outflow of resources are amortized over the weighted average remaining service life of all participants in the qualified Pension Plan and recorded as a component of pension expense beginning with the period in which they are incurred. The change in the Authority's proportion of the collective net pension liability and collective deferred outflow of resources and deferred inflow of resources related to the pension since the prior measurement date is recognized in current reporting period over a closed period that is equal to the average of the expected remaining service lives of all employees provided with a pension through the Pension Plan.

For the contribution to the Pension Plan, the difference during the measurement period between the total amount of the Authority's contribution and the amount of the Authority's proportionate share of the total of such contributions from all employers and all nonemployee contributing entities is recognized in the Authority's pension expense, beginning in the current reporting period, over a closed period that is equal to the average of the expected remaining service lives of all employees provided with pension through the Pension Plan. The amount not recognized in pension expense is reported as deferred outflow of resources or deferred inflow of resources related to the pension.

Projected earnings on qualified Pension Plan investments are recognized as a component (reduction) of pension expense. Differences between projected and actual investment earnings are reported as deferred inflow of resources or deferred outflow of resources and amortized as a component of pension expense on a closed basis over a five-year period beginning with the period in which the difference occurred.

Changes in total pension liability arising from changes of benefit terms are required to be included in pension expense in the period the change is first reported in the net pension liability. The changes in the total pension liability resulting from (1) differences between expected and actual experience with regard to economic and demographic factors and (2) changes of assumptions regarding the expected future behavior of economic and demographic factors or other inputs are recognized as a deferred outflow of resources or a deferred inflow of resources related to the pension and included in the pension expense over a period equal to the average of the expected remaining service lives of all employees that are provided with benefits through the Pension Plan.

Recent Accounting Pronouncements

As a component unit of the City, the System implements new GASB standards in the same fiscal year as they are implemented by the City. The following are discussions of the standards requiring implementation in the current year and standards that may impact the System in future years.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

- In January 2017, GASB issued Statement No. 84, *Fiduciary Activities* ("GASB 84"). The objective of GASB 84 is to improve guidance regarding the identification of fiduciary activities for accounting and financial reporting purposes and how those activities should be reported. The requirements of GASB 84 are effective for fiscal years beginning after December 15, 2018. The System has not completed the process of evaluating GASB 84, but does not expect it to have an impact on the System's combining financial statements.

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

- In March 2018, GASB issued Statement No. 88, *Certain Disclosures Related to Debt, including Direct Borrowings and Direct Placements* ("GASB 88"). The objective of GASB 88 is to improve consistency in the information that is disclosed in notes to government financial statements related to debt by defining debt for the purpose of note disclosure and to establish additional note disclosure requirements related to debt obligations of governments, including direct borrowing and direct placements. The requirements of GASB 88 are effective for fiscal years beginning after June 15, 2018. The adoption of GASB 88 required the System to disclose in Note 9 information related to unused lines of credit, assets pledged as collateral for debt, terms related to certain significant events with finance related consequences and separately describe amounts of detail borrowing.

- In June 2018, GASB issued Statement No. 89*, Accounting for Interest Cost Incurred before the End of a Construction Period* ("GASB 89"). The objectives of GASB 89 are to enhance the relevance and comparability of information about capital assets and cost of borrowing for a reporting period and to simplify accounting for certain interest costs by requiring interest costs incurred before the end of a construction period to be recognized as an expense/expenditure in governmental fund and government-wide financial statements. The requirements of GASB 89 are effective for fiscal years beginning after December 15, 2019, but the System adopted it in the current fiscal year. The adoption of GASB 89 did not have an impact on the System's combining financial statements as the System does not capitalize interest cost.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

- In August 2018, GASB issued Statement No. 90, *Majority Equity Interests* ("GASB 90"). GASB 90 clarifies the accounting and financial reporting requirements for a state and local government's majority equity interest in an organization that remains legally separate after acquisition. The requirements of GASB 90 are effective for fiscal years beginning after December 15, 2018. The System has not completed the process of evaluating GASB 90, but does not expect it to have an impact on the System's combining financial statements, as it has not made such acquisitions.
- In May 2019, GASB issued Statement No. 91, *Conduit Debt Obligations* ("GASB 91"). GASB 91 provides state and local government's with a single financial reporting method for conduit debt obligations by issuers. The requirements of GASB 91 are effective for fiscal years beginning after December 15, 2020, but the System adopted it in the current fiscal year. The adoption of GASB 91 did not have an impact on the System's combining financial statements, as it does not issue conduit debt.

3. UTILITY PLANT

The following is a summary of utility plant activity for the fiscal years ended June 30, 2019 and 2018 (in thousands):

	Balance at 6/30/2017	Additions	Deletions	Balance at 6/30/2018	Additions	Deletions	Balance at 6/30/2019
NONDEPRECIABLE ASSETS:							
Utility construction in progress	$ 5,475,307	$1,617,305	$3,698,486	$ 3,394,126	$1,821,086	$ 497,223	$ 4,717,989
DEPRECIABLE ASSETS:							
Utility plant in service:							
Buildings	34,936	831	-	35,767	54	-	35,821
Machinery and equipment	3,940,877	925,580	39,576	4,826,881	70,318	3,640	4,893,559
Vehicles	246,899	6,249	2,789	250,359	13,896	616	263,639
Water supply and distribution and wastewater treatment and sewage collection systems	33,670,666	2,765,826	90,944	36,345,548	412,955	9,162	36,749,341
Total utility plant in service	37,893,378	3,698,486	133,309	41,458,555	497,223	13,418	41,942,360
Less accumulated depreciation for:							
Buildings	26,455	1,548	-	28,003	1,599	-	29,602
Machinery and equipment	1,872,243	283,545	34,950	2,120,838	251,852	3,410	2,369,280
Vehicles	94,025	10,471	2,677	101,819	11,241	551	112,509
Water supply and distribution and wastewater treatment and sewage collection systems	11,839,690	746,105	47,073	12,538,722	642,217	7,034	13,173,905
Total accumulated depreciation	13,832,413	1,041,669	84,700	14,789,382	906,909	10,995	15,685,296
Total utility plant in service - net	24,060,965	2,656,817	48,609	26,669,173	(409,686)	2,423	26,257,064
Total capital assets - net	**$29,536,272**	**$4,274,122**	**$3,747,095**	**$30,063,299**	**$1,411,400**	**$ 499,646**	**$30,975,053**

4. DEPOSITS AND INVESTMENTS

Cash and Cash Equivalents—The System maintains deposits only at the depositary banks designated by the New York City Banking Commission. Further, as required by the Authority's bond resolutions, every bank, which holds the Authority's cash deposits, is required to have its principal office in the State of New York and have capital stock, surplus, and undivided earnings aggregating at least $100 million. As of June 30, 2019 and 2018, cash was comprised of bank deposits and there was no difference between the carrying amounts and bank balances.

At June 30, 2019 and 2018, the cash deposit balances were $207 million and $193 million, respectively. Of the June 30, 2019 and 2018 cash deposits, $500,000 was covered by federal depository insurance, and the remaining balance was collateralized with the securities held by the Trustee in their name.

Restricted cash and cash equivalents were comprised of the following at June 30, 2019 and 2018 (in thousands):

	2019	2018
Restricted cash and cash equivalents:		
Cash	$ 207,256	$ 192,724
Cash equivalents	1,114,785	1,082,085
Total restricted cash and cash equivalents	**$ 1,322,041**	**$ 1,274,809**

Custodial Credit Risk – Custodial credit risk is the risk that, in the event of the failure of the custodian, the System may not be able to recover the value of its deposits or collateral securities that are in the possession of an outside party. Deposits are exposed to custodial credit risk if they are not covered by depository insurance and the deposits are uncollateralized, collateralized with securities held by the pledging financial institution, or collateralizes with securities held by the pledging financial institution's trust department or agent but not in the government's name. As of June 30, 2019 and 2018, the System had $207 million and $193 million, respectively, of deposit that were collateralized with securities held by the trustee's trust department in the trustee's name.

Investments

The System invests funds that are not immediately required for operations, debt service, or capital expenses. Funds held by the Authority are invested pursuant to the Authority's bond resolutions and in accordance with its investment guidelines, which restrict investments to obligations of, or guaranteed by, the United States of America, to certain highly rated obligations of the State of New York, to certain certificates of deposit and similar instruments issued by highly rated commercial banks, to certain highly rated corporate securities or commercial paper securities, to certain repurchase agreements with highly rated institutions, to certain investment agreements with highly rated institutions, to certain highly rated money market funds, and to certain highly rated municipal obligations. All accounts held by the Water Board are invested in accordance with the Water Board's investment guidelines, which restrict investments to obligations of, or guaranteed by, the United States of America and to certain repurchase agreements with highly rated institutions.

4. DEPOSITS AND INVESTMENTS (CONTINUED)

The System had the following investments at June 30, 2019 and 2018 (in thousands):

	2019			2018		
Investments	**Water Board**	**Municipal Water Finance Authority**	**Total**	**Water Board**	**Municipal Water Finance Authority**	**Total**
U.S. Agencies securities	$ -	$ 742,221	$ 742,221	$ -	$ 1,166,844	$ 1,166,844
U.S. Treasury securities	256,702	319,264	575,966	247,302	593,180	840,482
New York State instrumentalities	-	52,369	52,369	-	73,644	73,644
Money Market funds	3,400	444,418	447,818	2	59,816	59,818
Guaranteed Investment Contracts	-	99,070	99,070	-	96,680	96,680
Forward Purchase Agreements	-	28,658	28,658	-	24,695	24,695
Total investments including cash equivalents	260,102	1,686,000	1,946,102	247,304	2,014,859	$ 2,262,163
Less amounts reported as cash equivalents	(3,400)	(1,111,385)	(1,114,785)	(2)	(1,082,083)	(1,082,085)
Total Investments	**$ 256,702**	**$ 574,615**	**$ 831,317**	**$ 247,302**	**$ 932,776**	**$1,180,078**

Fair Value Hierarchy—The System categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles. The hierarchy is based on the valuation inputs used to measure fair value of the assets. Level 1 inputs are quoted prices in an active market for identical assets; Level 2 inputs are significant other observable inputs; and Level 3 inputs are significant unobservable inputs.

The System has the following recurring fair value measurements as of June 30, 2019 and 2018 (in thousands):

- U.S. Treasury securities of $576 million and $840 million, respectively, are valued using a matrix pricing model (Level 2 inputs).
- U.S. Agencies securities of $742 million and $1.2 billion, respectively, are valued using a matrix pricing model (Level 2 inputs).
- New York State Instrumentalities of $52.4 million and $73.6 million, respectively, are valued using a matrix pricing model (Level 2 inputs).
- Money Market Funds of $448 million and $59.8 million, respectively, are valued using a matrix pricing model (Level 2 inputs).
- Guaranteed Investment Contract (“GIC”) of $99.1 million and $96.7 million, respectively, are valued using the market approach, with observable inputs and using a matrix pricing technique (Level 2 inputs).
- Forward Purchase Agreements of $28.7 million and $24.7 million, respectively, are valued using the market approach, with observable inputs and using a matrix pricing technique (Level 2 inputs).
- Interest Rate Derivatives of ($107) million and ($76.1) million, respectively, are valued using the income approach (Level 2 inputs).

4. DEPOSITS AND INVESTMENTS (CONTINUED)

Credit Risk—Both the Water Board and the Authority have Board approved investment guidelines and policies in place designed to protect principal by limiting credit risk. This is accomplished through ratings, collateral, and diversification requirements that vary according to the type of investment. Investments held by the System at June 30, 2019, and 2018 include obligations of, or guaranteed by, the United States of America, the Federal Home Loan Mortgage Corporation, the Federal Home Loan Bank, the Federal National Mortgage Association, the Federal Agriculture Mortgage Corporation, Resolution Funding Corporation, and the Federal Farm Credit Bank. Also held by the Authority are direct obligations of agencies or public authorities of the State of New York, which at the time of purchase were rated in one of the two highest rating categories. In addition, the Authority has entered into investment agreements and a guaranteed investment contract with financial institutions whose long-term debt obligations, or whose obligations under such an investment agreement or guaranteed investment contract, are guaranteed by a financial institution whose senior long-term debt obligations were rated in one of the two highest rating categories for comparable types of obligations by each rating agency at the time such agreement or contract was entered into.

Interest Rate Risk— Changes in interest rates impact fair value of investments. Investments by the System are not expected to be liquidated prior to maturity and investment agreements are not expected to be terminated prior to their expiration dates, thereby limiting cash flow exposure from rising interest rates.

Concentration of Credit Risk—Concentration of credit risk is the risk of loss attributed to the magnitude of the System's investment in a single issuer. The Authority's investment policy limits the amount the Authority may invest in any particular issuer. As of June 30, 2019, the Authority had 30% invested in Federally Guaranteed Securities, 38% in Agency Securities, 2% in State Guaranteed, 7% in Guaranteed Investment Contract, and 23% of First American Government Obligation Fund.

Segmented time distribution on investments and cash equivalents as of June 30, 2019 (in thousands):

Maturity Date	Fair value amount
Under 6 months	$ 1,411,442
Over 6 months to 1 year	19,502
Over 1 year to 3 years	232,950
Over 3 years and beyond	240,518
Over 3 years and beyond (GIC and Forward Purchase Agreement adjustments) [1]	41,690
Total	**$ 1,946,102**

[1] Includes the fair value of $28,658 related to Forward Purchase Agreements and $13,032 related to a GIC agreement.

4. DEPOSITS AND INVESTMENTS (CONTINUED)

Custodial Credit Risk—With respect to investments, custodial credit risk is the risk that, in the event of the failure of the custodian, the System may not be able to recover the value of its investment or collateral securities that are in the possession of an outside party. Investment securities are exposed to custodial credit risk if the securities are uninsured, are not registered in the name of their government, and are held by either the counterparty or the counterparty's trust department or agent but not in the name of the government. All of the investments, except for the GIC, which had a fair value of $99.1 million and $96.7 million at June 30, 2019 and 2018, respectively, were not registered in the System's name. The types and amounts of investments are listed in the table on page 32.

5. DERIVATIVE INSTRUMENTS

As of June 30, 2019, the Authority had the following (in thousands):

Type	Notional Amount	Effective Date	Maturity Date	Terms	Fair Value	Counterparty Credit Rating (Moody's/S&P/Fitch)
Hedging Derivatives						
Synthetic fixed rate	$ 240,600	10/24/07	6/15/36	pay 3.439% receive 67% of 1-month LIBOR	$ (64,295)	Aa2/AA-/NR
Synthetic fixed rate	$ 160,400	10/24/07	6/15/36	pay 3.439% receive 67% of 1-month LIBOR	$ (42,863)	Aa3/A+/AA-

LIBOR: London Interbank Offered Rate Index

Hedging Derivative Instruments— Effective October 24, 2007, the Authority executed two interest rate exchange agreements, in conjunction with its sale of $401 million of Adjustable Rate Fiscal 2008 Series BB Second Resolution Bonds. Under these agreements, the Authority pays a fixed interest rate of 3.439% in exchange for a floating rate based on 67% of one-month LIBOR on the combined notional amount of $401 million. The agreements are with two separate counterparties: one agreement with Goldman Sachs Mitsui Marine Derivative Products in the amount of $241 million and the second agreement with Bank of America in the amount of $160 million. These agreements allowed the Authority to achieve a fixed rate cost lower than the cost of conventional fixed rate debt at the time of issuance. The Authority's obligations under these interest rate exchange agreements are payable on a parity with the related Second Resolution revenue bonds.

Credit Risk— The risk that the counterparty (or its guarantor) will default under its agreement and the Authority would be left with unhedged variable rate debt. To continue to be hedged, the Authority may have to pay another entity to assume the position of the defaulting counterparty while not receiving an

5. DERIVATIVE INSTRUMENTS (CONTINUED)

offsetting payment from the defaulting counterparty (full or in part). The Authority seeks to limit credit risk by contracting with highly rated counterparties or requiring highly rated guarantees of the counterparty's obligations. In the event that a counterparty loses its high rating, the Authority has built in two forms of protection into its swap agreements. First, the Authority has required the counterparty to post collateral if its ratings fall below "Aa3" by Moody's and "AA-" by Standard and Poor's and the mark-to-market in the Authority's favor exceeds specified threshold amounts. Second, the Authority has the right to terminate the Interest Rate Exchange Agreement if the counterparty is downgraded below "A3" and "A-" by Moody's and S&P, respectively. In addition, the Authority monitors the credit ratings and overall financial condition of its counterparties and may exercise its right to assign the agreement to another counterparty if necessary, in its judgment, to mitigate credit risk, even in the absence of a significant credit rating downgrade.

Termination Risk— The counterparties can terminate the agreements upon the occurrence of certain events, when the mark-to-market value is such that the Authority would owe a termination payment to the counterparty. The counterparties may terminate the agreement only upon the occurrence of certain events, such as payment defaults by the Authority, other defaults which remain uncured for 30 days after notice, bankruptcy or insolvency of the Authority (or similar events), or a downgrade of the Authority's credit rating below "Baa2" and "BBB" by Moody's and Standard & Poor's, respectively.

Basis Risk— Basis risk is the risk of a mismatch between two floating rates. For example, the amount the Authority receives under an Interest Rate Exchange Agreement may be lower than the amount the Authority is required to pay on the bonds associated with the transaction, which would require the Authority to make up the shortfall.

Interest Rate Risk— Interest rate risk is the risk that changes in long-term interest rates will adversely affect the mark-to-market values of the Authority's swap instruments which may result in termination payments.

Financial Statements Effect—The fair value of hedging derivatives at June 30, 2019 and June 30, 2018 was a negative $107 million and negative $76.1 million, respectively. The Authority does not currently own investment derivatives.

6. LEASE AGREEMENT

The Water Board is a party to a long-term lease (the "Lease") with the City, which transfers the water and sewer related property to the Water Board for the term of the Lease. The Lease term commenced on July 1, 1985, and continues until the later of the fortieth anniversary of the commencement of the Lease or the date on which all bonds, notes or other obligations of the Authority are paid in full or provision for such payment has been made pursuant to the applicable debt instrument. The Lease provides for payments to the City to cover the following:

a. an amount sufficient to pay the cost of administration, maintenance, repair, and operation of the leased property, which includes overhead costs incurred by the City that are attributable to the leased

6. LEASE AGREEMENT (CONTINUED)

property, net of the amount of any federal, the State, or other operating grants received by the City and

b. an amount sufficient to reimburse the City for capital costs incurred by the City for the construction of capital improvements to the leased property that are not paid or reimbursed from any other source.

In addition to the payments described above, the Water Board pays rent to the City, if requested, each fiscal year in an amount not to exceed the greater of: (a) the principal and interest payable on general obligation bonds issued by the City for water and sewer purposes certified by the City to be paid within such fiscal year or (b) 15% of principal and interest payable on the bonds of the Authority to be paid within such fiscal year.

A summary of operations and maintenance and rental expenses for the years ended June 30 is as follows (in thousands):

	2019	2018
Water supply, treatment, transmission and distribution	$ 516,977	$ 506,831
Sewer collection and treatment systems	655,052	589,883
The City agency support cost	54,659	54,545
Fringe benefits	229,976	225,960
Judgments and claims	12,937	12,735
Operation and maintenance	1,469,601	1,389,954
Rental payments to the City	-	-
Total operations and maintenance expenses	**$ 1,469,601**	**$ 1,389,954**

7. PAYABLE TO AND RECEIVABLE FROM THE CITY

As of June 30, 2019 and 2018, all utility construction and other projects financed by the Authority debt and recorded by the System, which have not been reimbursed to the City, are recorded as a payable to the City. The Authority had a payable to the City of $695 million and $595 million, respectively, net of the amount of State or federal and other capital grants recognized by the City.

As of June 30, 2019 and 2018, the Water Board had payable to the City of $20.0 million and on June 30, 2018, the Water Board had a receivable due from the City of $20.2 million. The 2019 payable to the City is a result of an under payment of $20.0 million for operations and maintenance expense. The 2018 receivable from the City of $20.2 million is a result of the difference between budget estimates and actual expenses.

8. OTHER OPERATING EXPENSES

A summary of other operating expenses for the years ended June 30 is as follows (in thousands):

	2019	2018
Pollution remediation	$ 4,173	$ 15,040
Payments for watershed improvements	34,442	34,280
Asset retirement obligation	(48)	-
Program expense	37,484	35,663
Total other operating expenses	**$ 76,051**	**$ 84,983**

The City's DEP manages both the System's operations and its capital program, and it also manages other projects with long-term benefits to the System, which do not result in capital assets of the System and that are paid for using the Authority's bond proceeds. Such long-term benefit projects include payment for environmental protection, related improvement in the watershed areas, and pollution remediation projects throughout the System. The System has estimated these amounts based on the current value of outlays expected to be incurred for pollution remediation, which it is currently obligated to perform. Actual future outlays will differ from the estimated amounts if the prices or techniques for remediation measures change or differ from the estimates.

The System offers its residential customers the option to enroll into a protection program on their water and sewer lines against any breakage for a monthly fee. The fee is included in the participating customer utility bill. This protection program is offered by American Water Resources. In fiscal years 2019 and 2018, the System incurred program expenses of $37.5 million and $35.7 million, respectively.

9. LONG-TERM LIABILITIES

Debt Program Description

The Authority issues debt to finance the capital needs of the System. The Authority's debt is issued under two bond resolutions – the Water and Sewer System General Revenue Bonds Resolution ("First Resolution") and the Water and Sewer System Second General Resolution ("Second Resolution"). All bonds and notes, issued by the Authority, are special obligations of the Authority payable solely from and secured by a pledge of and lien on the gross revenue of the System, and from money and securities in any of the funds and accounts defined and established by the First Resolution and Second Resolution, subject to the priority of application, other than the arbitrage rebate fund. With respect to all of the Authority's debt, the Water Board has agreed to maintain rates and charges to provide revenues at levels sufficient to pay principal and interest requirements as well as to meet certain debt service coverage and operating cost funding requirements.

9. LONG-TERM LIABILITIES (CONTINUED)

The Authority's bond resolutions specify certain events of default, such as failure to pay debt service, failure to comply with the certain provisions of the bond resolutions and certain other governing documents, or seeking relief in bankruptcy that under certain conditions could result in acceleration of debt service payments.

The debt program of the Authority includes commercial paper notes and long-term debt, as well as bond anticipation notes ("BANs"), and interest-subsidized bonds issued to the New York State Environmental Facilities Corporation ("EFC"). While historically, proceeds of commercial paper notes were the main source of funds to reimburse the City for payments made for water and sewer capital projects, in fiscal years 2019 and 2018, the Authority exclusively relied on proceeds from BANs and long-term bond issuances to reimburse the City for the System's capital expenditures. The Authority issues long-term debt to retire commercial paper notes and BANs. The Authority also periodically issues refunding bonds to refinance higher-coupon debt and defeases bonds using current revenues.

The Authority is currently authorized to have outstanding up to $600 million of commercial paper notes. As of June 30, 2019 and 2018, none was outstanding. As of June 30, 2019 and 2018, there was $27.6 million and $216 million of BANs outstanding, respectively. As of June 30, 2019 and 2018, the BANs principal balance of $132 million and $464 million, respectively, was available for future draw down.

As of June 30, 2019, interest rates on the Authority's outstanding First and Second Resolution bonds ranged from a low of 0.90% on a direct borrowing from the EFC, to a high of 6.49% on certain outstanding Build America Bonds ("BABs") prior to interest subsidies from the federal government.

9. LONG-TERM LIABILITIES (CONTINUED)

Changes in Long-term Liabilities

In fiscal years 2019 and 2018, the long-term debt was as follows (in thousands):

Bonds/BANs Payable	Balance at June 30, 2018	Additions	Deletions	Balance at June 30, 2019	Due within one year
First resolution bonds	$ 1,928,706	$ -	$ (347,940)	$ 1,580,766	$ 81,550
Second resolution bonds (non EFC)	21,917,804	1,554,645	(1,623,000)	21,849,449	91,635
Bonds from direct borrowings (EFC)	5,953,158	804,859	(669,924)	6,088,093	308,516
Notes from direct borrowings (BANs)	215,734	324,824	(512,960)	27,598	27,598
Bonds from direct placement (RBC)	-	500,000	-	500,000	-
Total before premium and discounts	30,015,402	3,184,328	(3,153,824)	30,045,906	509,299
Premium/(discounts) - net	1,459,530	296,799	(129,986)	1,626,343	-
Total debt	$ 31,474,932	$ 3,481,127	$ (3,283,810)	$ 31,672,249	$ 509,299

Bonds/BANs Payable	Balance at June 30, 2017	Additions	Deletions	Balance at June 30, 2018	Due within one year
First resolution bonds	$ 2,429,956	$ -	$ (501,250)	$ 1,928,706	$ 47,940
Second resolution bonds (non EFC)	21,658,044	2,272,410	(2,012,650)	21,917,804	72,280
Bonds from direct borrowings (EFC)	5,583,023	669,436	(299,301)	5,953,158	303,659
Notes from direct borrowings (BANs)	359,375	571,767	(715,408)	215,734	27,598
Total before premium and discounts	30,030,398	3,513,613	(3,528,609)	30,015,402	451,477
Premium/(discounts) - net	1,236,352	364,063	(140,885)	1,459,530	-
Total debt	$ 31,266,750	$ 3,877,676	$ (3,669,494)	$ 31,474,932	$ 451,477

Debt Program Administration

In fiscal year 2019, the Authority issued $985 million of new money bonds to the public or through private placements, and issued an additional $485 million of new money bonds to EFC. The Authority used new money bond proceeds to finance capital improvements to the System, to provide long-term financing of BANs that previously financed capital improvements to the System, and to pay for bond issuance costs.

During fiscal year 2019, as further detailed in the bullets below, the Authority issued $1.4 billion of bonds to refund $1.6 billion of outstanding bonds. These refunding transactions resulted in a cumulative accounting gain of $6.0 million. The Authority reduced its aggregate debt service for principal and interest by $431 million and obtained an economic benefit (present value savings) of $326 million.

- On August 2, 2018, the Authority issued $320 million of fixed rate Second Resolution bonds Fiscal 2019 Series 1 bonds to EFC. The bonds refunded the following fixed rate Second Resolution bonds: $137 million of Fiscal 2008 Series 1 bonds, $157 million of Fiscal 2008 Series 2 bonds, and $71.7 million of Fiscal 2013 Series 1 bonds. The Authority reduced its overall debt service by $44.1 million and obtained an economic benefit of $36.5 million.

9. LONG-TERM LIABILITIES (CONTINUED)

- On August 21, 2018, the Authority issued $264 million of tax-exempt fixed rate Second Resolution bonds, Fiscal 2019 Series AA bonds. The bonds refunded $300 million of First Resolution adjustable rate bonds, Fiscal 2008 Series B bonds. The Authority reduced its overall debt service by $107 million and obtained an economic benefit of $101 million.

- On March 20, 2019, the Authority issued $416 million of tax-exempt fixed rate Second Resolution bonds, Fiscal 2019 Series EE bonds. The bonds refunded the following Second Resolution fixed rate bonds: $318 million of Fiscal 2009 Series EE bonds, $63.6 million of Fiscal 2009 Series FF bonds, and $87.2 million of Fiscal 2009 Series GG bonds. The Authority reduced its overall debt service by $151 million and obtained an economic benefit of $98.8 million.

- On April 17, 2019, the Authority issued $390 million of tax-exempt fixed rate Second Resolution bonds, Fiscal 2019 Subseries FF-2 bonds. The bonds refunded the following Second Resolution fixed rate bonds: $41.4 million of Fiscal 2009 Series FF bonds, $300 million of Fiscal 2009 Series GG bonds, and $101 million of Fiscal 2010 Series AA bonds. The Authority reduced its overall debt service by $129 million and obtained an economic benefit of $89.9 million.

In 2019, the Authority drew down $325 million of BANs proceeds.

In fiscal year 2018, the Authority issued $834 million of new money bonds to the public and an additional $669 million of new money bonds to EFC. The Authority used new money bond proceeds to finance capital improvements to the System, to provide long-term financing of BANs that previously financed capital improvements to the System, and to pay for bond issuance costs.

During fiscal year 2018, the Authority issued $1.44 billion of bonds to refund $1.6 billion of outstanding bonds. These refundings resulted in an accounting loss of $677 thousand. The Authority reduced its aggregate debt service for principal and interest by $424 million and obtained an economic benefit (present value savings) of $302 million.

During fiscal year 2018, the Authority drew down $572 million of BANs proceeds.

During fiscal year 2019, the Authority legally defeased $94.8 million of Fiscal 2010 Series FF bonds, $70.8 million of Fiscal 2011 Series GG bonds, $2.8 million of Fiscal 2012 Series FF bonds, $303 million of Fiscal 2011 Series EE bonds, $115 million of Fiscal 2012 Series BB bonds and $52.6 million of Fiscal 2012 Series CC bonds using current revenue by depositing $675 million into defeasance escrows. The defeasance transactions resulted in an accounting loss of $26.1 million that is reported in the System's combining statements of revenues, expenses and changes in net position (deficit) and aggregate reduction of debt service of $1.3 billion.

During fiscal year 2018, the Authority legally defeased $250 million of Fiscal 2011 Series GG bonds, $346 million of Fiscal 2012 Series AA bonds and $173 million of Fiscal 2012 Series CC bonds using current revenue by depositing $844 million into a defeasance escrow. This defeasance transaction resulted in an accounting loss of $15.0 million that was reported in the System's combining statements of revenues, expenses and changes in net position (deficit) and aggregate reduction of debt service of $1.7 billion.

9. LONG-TERM LIABILITIES (CONTINUED)

The Authority defeased some of its bonds by placing proceeds of refunding bonds or current revenue in irrevocable escrow accounts to provide for all future debt service payments on the defeased bonds. The escrow account assets and the liability for the defeased bonds are not included in the System's combining financial statements. As of June 30, 2019 and 2018, $1.4 billion and $802 million, of the Authority's defeased bonds, respectively, were still outstanding.

Index Rate Bonds

As of June 30, 2019, the Authority had outstanding $500 million of index rate bonds, which were purchased by a bank through direct placement. The index rate bonds pay interest based on a specified index. The terms of the index rate bonds also provide for 9% rate of interest, commencing on an identified step-up date, if such bonds are not converted or refunded prior to such date.

Variable Rate Demand Bonds

As of June 30, 2019, the Authority had $4.6 billion of variable rate demand bonds ("VRDBs") outstanding. VRDBs may be tendered at the option of their holders prior to their maturity. VRDBs are remarketed by remarketing agents on a daily or weekly basis. Interest rates determined by such remarketing agents for such periods represent the lowest rate of interest that would cause the VRDBs to have a market value equal to par. VRDBs interest rates cannot exceed 9%. In fiscal years 2019 and 2018, the VRDBs' interest rates averaged 1.5% and 1.1%, respectively.

The VRDBs are backed by either a Standby Bond Purchase Agreement ("SBPA") or a Letter of Credit ("LOC"), providing for the purchase of the VRDBs by a bank in the event they cannot be remarketed. In such case, the interest rate on the VRDBs would typically increase and would be determined by reference to specified index rates plus a spread (in some cases, with a minimum rate), up to a maximum rate of 25%. No VRDBs were held by such banks during the fiscal years ending June 30, 2019 and 2018. SBPAs and LOCs may be terminated by the respective banks upon the occurrence of specified events of default. None of the SBPAs or LOCs supporting adjustable rate demand bonds provides for acceleration. However, in connection with such LOCs, the Authority has agreed that, following a specified period of time in which the LOC bank holds unremarketed VRDBs, the Authority will exchange such VRDBs for refunding bonds maturing within five years and providing for amortization during such period.

The Authority had the following adjustable rate demand bonds at June 30, 2019:

9. LONG-TERM LIABILITIES (CONTINUED)

Series	Outstanding Principal Amount	Bank	Expiration Date
2011 DD-3A	$ 50,000,000	US Bank, N.A.	10/16/19
2011 DD-3B	50,000,000	State Street Bank and Trust Company	10/16/19
2008 BB-2	101,000,000	Bank of America, N.A.	10/22/19
2008 BB-5	50,000,000	Bank of America, N.A.	10/22/19
2016 AA-1	100,000,000	Bank of America, N.A.	10/28/19
2008 B-3	135,000,000	Bank of America, N.A.	03/17/20
2011 FF-1	100,000,000	Bank of America, N.A.	03/17/20
2003 F-1-B	50,000,000	US Bank, N.A.	03/27/20
2000-C	107,500,000	Sumitomo Mitsui Banking Corporation	06/04/20
2014 AA-4	100,000,000	Bank of Montreal	08/11/20
2007 CC-2	50,000,000	Bank of Montreal	10/05/20
2017 BB-2	50,000,000	Bank of Montreal	10/05/20
2006 AA-1A	100,000,000	State Street Bank and Trust Company	10/07/20
2006 AA-1B	100,000,000	State Street Bank and Trust Company	10/07/20
2008 B-1A	100,000,000	Sumitomo Mitsui Banking Corporation	03/03/21
2012 B-1	100,000,000	US Bank, N.A.	03/06/21
2012 B-2	100,000,000	State Street Bank and Trust Company	03/06/21
2012 B-3	75,000,000	State Street Bank and Trust Company	03/06/21
2012 B-4	50,000,000	State Street Bank and Trust Company	03/06/21
2009 BB-1	100,435,000	Landesbank Hessen-Thuringen Girozentrale	06/15/21
2009 BB-2	100,435,000	Landesbank Hessen-Thuringen Girozentrale	06/15/21
2011 FF-2	100,000,000	Landesbank Hessen-Thuringen Girozentrale	06/15/21
2015 BB-1	100,000,000	Bank of America, N.A.	07/09/21
2019 BB	100,000,000	Industrial and Commercial Bank of China Limited	09/10/21
2008 BB-1	100,000,000	Bank of Tokyo-Mitsubishi UFJ, Ltd.	09/13/21
2013 AA-2	150,000,000	Bank of Tokyo-Mitsubishi UFJ, Ltd.	09/13/21
2014 AA-1	125,000,000	JPMorgan Chase Bank, N.A.	09/17/21
2014 AA-2	125,000,000	JPMorgan Chase Bank, N.A.	09/17/21
2013 AA-1	50,000,000	PNC Bank, N.A.	10/02/21
2007 CC-1	160,500,000	Sumitomo Mitsui Banking Corporation	10/05/21
2017 BB-1A	100,000,000	State Street Bank and Trust Company	10/05/21
2017 BB-1B	100,000,000	State Street Bank and Trust Company	10/05/21
2017 BB-3	39,500,000	Sumitomo Mitsui Banking Corporation	10/05/21
2003 F-2	101,655,000	Citibank, N.A.	10/26/21
2016 AA-2	100,000,000	PNC Bank, N.A.	10/26/21
2011 DD-2	75,000,000	JPMorgan Chase Bank, N.A.	11/12/21
2001 F-1	100,000,000	Mizuho Bank, Ltd.	06/10/22
2015 BB-2	100,000,000	Mizuho Bank, Ltd.	06/14/22
2003 F-1-A	50,000,000	Barclays Bank PLC	06/17/22
2015 BB-4	100,000,000	Barclays Bank PLC	06/17/22
2014 AA-5	100,435,000	Mizuho Bank, Ltd.	08/19/22
2014 AA-6	100,435,000	Mizuho Bank, Ltd.	08/19/22
2012 A-1	100,000,000	Mizuho Bank, Ltd.	09/27/22
2012 A-2	100,000,000	Mizuho Bank, Ltd.	09/27/22
2010 CC	200,000,000	Barclays Bank PLC	12/13/22
2001 F-2	84,130,000	JPMorgan Chase Bank, N.A.	04/11/23
2015 BB-3	100,000,000	Sumitomo Mitsui Banking Corporation	07/07/23
2014 AA-3	100,000,000	TD Bank, N.A.	09/17/23
2011 DD-1	100,000,000	TD Bank, N.A.	11/16/23
	$ 4,631,025,000		

9. LONG-TERM LIABILITIES (CONTINUED)

Debt service requirements to maturity, including amounts relating to BANs with maturities greater than one year at June 30, 2019 are as follows (in thousands):

	Bonds		Bonds and Notes from Direct Borrowings and Direct Placements		
	Principal	Interest [1]	Principal	Interest [1]	Total
Year ending June 30,					
2020	$ 173,185	$ 1,120,325	$ 336,114	$ 275,676	$ 1,905,300
2021	197,870	1,116,250	294,809	265,962	1,874,891
2022	222,390	1,107,463	301,434	255,379	1,886,666
2023	229,320	1,097,122	302,614	242,755	1,871,811
2024	272,965	1,085,403	278,765	229,656	1,866,789
2025-2029	1,931,750	5,276,469	1,433,542	878,255	9,520,016
2030-2034	2,638,409	4,744,480	1,377,950	577,795	9,338,634
2035-2039	4,247,520	3,954,863	861,535	337,968	9,401,886
2040-2044	6,138,032	2,697,005	694,990	175,567	9,705,594
2045-2049	6,751,157	1,037,304	433,938	45,512	8,267,911
2050-2054	605,589	50,457	300,000	12,750	968,796
2055-2059	22,028	2,191	-	-	24,219
Total	**$ 23,430,215**	**$ 23,289,332**	**$ 6,615,691**	**$ 3,297,275**	**$ 56,632,513**

[1]Includes projected interest expense for variable rate bonds at 4.25% for fiscal year 2020 and thereafter. Variable rate bonds are remarketed daily or weekly, and interest rates are determined by the market on the day of sale.

Asset Retirement Obligations ("ARO")

Existing laws and regulations require the System to take specific action when retiring chemical and petroleum storage tanks. The System has approximately 462 above and underground tanks with a capacity ranging from 10 to 100,000 gallons. The New York State Department of Conservation Under Title 6 of the New York Codes, Rules and Regulations requires that the System take specific steps to permanently take out the service including the removal, transportation and disposal of liquid, sludge, hazardous waste, piping and the tanks themselves; and to take remedial actions on the area surrounding the tanks. Based on contract estimates and invoice for similar projects, the System's ARO for storage tanks was approximately $15.0 million and $15.2 million as of June 30, 2019 and 2018, respectively, with tanks having a remaining useful life ranging from 0 to 39 years.

DEP has entered into office space lease agreements requiring the removal of affixed furnishings including condensed filing systems, HVAC units, and distributions systems and the restoration of premises to original condition existing prior to installation of fixtures for which the System is responsible for paying. Based on engineer and architectural estimates, the ARO for leases was approximately $2.8 million as of June 30, 2019 and 2018, respectively. The remaining lease terms range from 4 to 5 years.

9. LONG-TERM LIABILITIES (CONTINUED)

Commitments and Contingencies

Construction—The System had contractual commitments of approximately $7.0 billion and $6.9 billion at June 30, 2019 and 2018, respectively, for water and sewer projects.

Risk Financing Activities—The System is self-insured and carries no commercial or insurance policies other than directors and officer's insurance for the Authority. Any claims made against the System are resolved through the City's legal support, and the amounts of the maximum liability for such judgments are described in the claims and litigation section below. The System is subject to claims for construction delays, property damage, personal injury, and judgments related to delays in construction deadlines under consent agreements.

Claims and Litigation—In accordance with the Lease, the Water Board is required to reimburse the City for any judgment or settlement paid by the City arising out of a tort claim to the extent that the City's liability is related to capital improvements and the operation or maintenance of the System. However, in no event shall the payment made to the City, in any fiscal year, exceed an amount equal to 5% of the aggregate revenues shown on the prior year's audited financial statements of the System. In addition, the System is required to reimburse the City, to the extent requested by the City, for the payment of any judgment or settlement arising out of a contract claim with respect to the construction of capital improvements of the System. In addition, the City has agreed, subject to certain conditions, to indemnify the Authority, the Water Board, and their staffs against any and all liability in connection with any act done or omitted in the exercise of their powers, which is taken or omitted in good faith in pursuance of their purposes under the Act. Currently, the City is a defendant in a significant number of lawsuits pertaining to the System. The litigation includes, but is not limited to, actions commenced and claims asserted against the City arising out of alleged torts, alleged breaches of contract, condemnation proceedings, and other alleged violations of law. As of June 30, 2019, the potential future liability attributable to the System for claims outstanding against the City was estimated to be $354 million. This amount is included in the estimated liability for unsettled claims, which is reported in the City's statement of net position (deficit). The potential future liability is the City's best estimate based on available information. The estimate maybe revised as further information is obtained and as pending cases are litigated.

Arbitrage Rebate—To maintain the exemption from federal income tax of interest on bonds issued subsequent to January 1, 1986, the System will fund amounts required to be rebated to the Federal Government pursuant to Section 148 of the Internal Revenue Code of 1986, as amended (the "Code"). The Code requires the payment to the United States Treasury of the excess amount earned on all non-purpose obligations over the amount that would have been earned if the gross proceeds of the issue were invested at a rate equal to the yield on the issue, together with any earnings attributable to such excess. Construction funds, debt service funds, or any other funds or accounts funded with proceeds of such bonds, including earnings, or pledged to or expected to be used to pay interest on such bonds are subject to this requirement. Payment is to be made after the end of the fifth bond year and after every fifth bond year thereafter and within 60 days after retirement of the bonds. During fiscal years 2019 and 2018, the System paid $0 million and $11.4 million, respectively, in arbitrage rebates. At June 30, 2019 and 2018, the Authority had a liability of $2.2 million and $1.4 million, respectively. These amounts are included in accrued payable expense in the combining statements of net position (deficit).

10. RESTRICTED ASSETS

As of June 30, 2019 and 2018, certain cash, investments, and accrued interest of the System were restricted as follows (in thousands):

	2019	2018
The Water Board		
Operation and maintenance reserve fund	$ 260,102	$ 247,304
Local water fund	12,264	9,005
Subtotal - The Water Board	272,366	256,309
The Authority		
Revenue fund	1,061,319	946,965
Debt service reserve fund	399,768	389,598
Construction fund	54,095	493,652
Escrow accounts	365,810	368,363
Subtotal - The Authority	1,880,992	2,198,578
Total restricted assets	**$ 2,153,358**	**$ 2,454,887**

The operation and maintenance reserve fund is established as a depository to hold a reserve as required by the First Resolution. At June 30 of each year, the reserve fund is required to hold one-sixth of the operating expenses as set forth in the following year's annual budget. It is funded through the cash receipts of the Water Board.

The local water fund is established as the account to which all revenues are deposited. Its assets are subject to the payment priority set forth in the Resolutions.

The revenue fund is established as a depository to fund the debt service, the Authority's expenses, debt service reserve, and escrow accounts. It is funded through cash transfers from the Water Board.

The debt service reserve fund is established as a depository to hold the First Resolution bond maximum annual debt service requirement for the next or any future fiscal year. It is funded through revenue bond proceeds and the revenue fund.

The debt service fund is established as a depository to pay all principal and interest payments on the Authority's debt for the current fiscal year. It is funded through the revenue fund. On or prior to June 30, the balances in the debt service fund are transferred to the revenue fund.

The construction fund is established as a depository to pay all capital construction costs incurred by the City and reimbursed by the Authority. It is funded through the proceeds of commercial paper, bond, and note sales.

The escrow account is established as a depository to refund debt in future years. It is funded through bond proceeds or the revenue fund.

11. PENSION PLANS

General information about the Pension Plan

Plan Description—The Authority's eligible employees are provided with pension benefits through the New York City Employee Retirement System Qualified Pension Plan ("NYCERS QPP" or "Pension Plan"). The Pension Plan is a cost-sharing, multiple-employer defined benefit pension plan administered by NYCERS.

The Pension Plan functions in accordance with existing State statutes and the City laws which are the basis by which benefit terms and the Authority's and its members' contribution requirements are established and amended. NYCERS issues a publicly-available financial report that can be obtained at www.nycers.org.

Benefits Provided—The Pension Plan provides pension benefits to retired employees generally based on the salary, length of service, member contributions, and membership tier ("Tier"). For certain members, voluntary member contributions also impact pension benefits provided. In addition, the Pension Plan provides automatic cost-of-living-adjustments ("COLA") and other supplemental pension benefits to certain retirees and beneficiaries. Subject to certain conditions, members become fully vested as to benefits upon the completion of five years of service for Tier I to Tier IV and ten years of service for Tier VI. Upon termination of employment before retirement, certain members are entitled to refunds of their own contributions, including accumulated interest, less any outstanding loan balances. In the event of disability during employment, participants may receive retirement allowances based on satisfaction of certain service requirements and other provisions. The Pension Plan also provides death benefits.

The State Constitution provides that pension rights of public employees are contractual and shall not be diminished or impaired. In 1973, 1976, 1983, and 2012, significant amendments made to the State Retirement and Social Security Law ("RSSL") modified certain benefits for employees joining the Pension Plan on or after the effective date of such amendments, creating membership tiers. Currently, there are several Tiers, referred to as Tier I, Tier II, Tier III, Tier IV, and Tier VI. Members are assigned a Tier based on membership date. Chapter 18 of the Laws of 2012 (Chapter 18/12) amended the retirement benefits of public employees who establish membership in the Pension Plan on or after April 1, 2012. Chapter 18/12 is commonly referred to as Tier VI. Tier VI is expected to reduce future employer pension contributions.

Certain members of Tier I and Tier II of the NYCERS QPP have the right to make voluntary excess contributions, which are supplemental voluntary contributions. Members can elect to direct these contributions to an investment program under which such accumulated contributions are credited with interest at rates set by statute ("Statutory Rates"). The Authority does not have any Tier I, Tier II, or Tier III members.

Contributions and Funding Policy—Contribution requirements of participating employers and active members are determined in accordance with State statutes and City laws and are generally funded within the appropriate fiscal year. Effective with fiscal year 2006, employer contributions are actuarially determined under the One-Year Lag Methodology ("OYLM"). Under OYLM, the actuarial valuation date is used for calculating the employer contributions for the second following fiscal year. For example, the June 30, 2017 actuarial valuation was used for determining the fiscal year 2019 statutory contributions. Member contributions vary by class.

11. PENSION PLANS (CONTINUED)

In general, Tier III and Tier IV members make basic contributions of 3.0% of salary regardless of age at membership. Effective October 1, 2000, in accordance with Chapter 126 of the Laws of 2000, Tier III and Tier IV members are not required to make any contributions after the 10th anniversary of their membership date or completion of ten years of credited service, whichever is earlier. Tier VI members who joined between April 1, 2012 and March 31, 2013 contribute 3% of salary. Beginning April 1, 2013, when Tier VI took effect, joining members contribute between 3.0% and 6.0% of salary, depending on their salary level.

Employer contributions are determined annually to be an amount that, together with member contributions and investment income, provides for the Pension Plan assets to be sufficient to pay benefits when due. The aggregate statutory contribution due to NYCERS QPP from all participating employers for fiscal years 2019 and 2018 was $3.7 billion and $3.4 billion, respectively and the amount of the Authority's contribution to the Pension Plan for such fiscal years 2019 and 2018 was $78 thousand and $111 thousand, respectively.

Information on the Employer's Proportionate Share of the Collective Net Pension Liability

The Authority's net pension liabilities reported at June 30, 2019 and 2018 were measured as of those fiscal year-end dates. The total pension liability used to calculate those net pension liabilities were determined by actuarial valuations as of June 30, 2018 and June 30, 2017, respectively, based on the OYLM described above, and rolled forward to the respective fiscal year-end measurement dates.

Information about the Authority net position and additions to and deductions from NYCERS QPP fiduciary net position has been determined on the same basis as that reported by NYCERS QPP. For this purpose, benefits and refunds are recognized when due and payable in accordance with the terms of the respective qualified pension plan, and investments are reported at fair value.

Actuarial Assumptions—Measurement of the total net pension liability, on which the net pension liability is based, requires the use of assumptions about numerous future events that affect the benefit payments that will be made to employees in retirement.

11. PENSION PLANS (CONTINUED)

The following table provides a brief description of the significant assumptions used in the June 30, 2018 actuarial valuation to determine the fiscal year 2019 Authority's contributions:

Actuarial Assumptions used for determining fiscal year 2019 Authority's Contributions

Item	Fiscal Year 2019 Authority's Contributions
Valuation Date	June 30, 2018 (Lag).
Assumed Rate of Return on Investment	7.0% per annum, net of investment expense. Actual return for variable funds.
Post-Retirement Mortality	Tables adopted by the Boards of Trustees during fiscal year 2019.
Active Service: Withdrawal, Death, Disability, and Retirement	Tables adopted by the Boards of Trustees during fiscal year 2019.
World Trade Center Benefit	Estimates of certain obligations.
Salary Increases	Tables adopted by the Boards of Trustees during fiscal year 2019. In general, Merit and Promotion Increases plus assumed General Wage Increase of 3.0% per year.
Assumed Cost-of-Living Adjustments	1.5% per year for Tier I, Tier II, Tier IV and certain Tier III and Tier VI retirees. 2.5% per year for certain Tier III and Tier VI retirees.
Liability Loads	Estimates of certain obligations.

In accordance with the Administrative Code of the City of New York and with appropriate practice, the NYCERS Board of Trustees of the actuarially-funded the Pension Plan is to periodically review and adopt certain actuarial assumptions as proposed by the Chief Actuary of the New York City Retirement Systems (the “Actuary”) for use in the determination of Employer Contributions, which are also generally used to determine the total pension liability, as applicable.

The fiscal year 2019 results reflect changes in the actuarial assumptions and methods since the prior year. The changes are primarily the result of an experience study performed by Bolton, Inc. which compared actual experience of the systems to that expected based on the prior set of actuarial assumptions and methods. These new actuarial assumptions and methods were adopted by each of the NYCRS retirement boards in early calendar year 2019.

11. PENSION PLANS (CONTINUED)

The long-term expected rate of return was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of the Pension Plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected real rates of return by the target asset allocation percentage and by adding expected inflation.

The target allocation and best estimates of arithmetic real rates of return for each major asset class are summarized in the following table:

	Target Asset Allocation	Long-Term Expected Real Rates of Return
Asset Class		
U.S. Public Market Equities	29.00%	7.00%
International Public Market Equities	13.00%	7.10%
Emerging Public Market Equities	7.00%	9.40%
Private Market Equities	7.00%	10.50%
Fixed Income (Core, TIPS, HY, Opportunistic, Convertibles)	33.00%	2.20%
Alternatives (Real Assets, Headge Funds)	11.00%	5.70%
Total	100.00%	

Discount Rate—The discount rate used to measure the total pension liability of the Pension Plan as of June 30, 2019 and 2018, was 7% per annum. The projection of cash flows used to determine the discount rate assumed that employee contributions will be made at the rates applicable to the current Tier for each member and that employer contributions will be made based on rates determined by the actuary. Based on those assumptions, the Pension Plan fiduciary net position is projected to be available to make all projected future benefit payments of current active and non-active members. Therefore, the long-term expected rate of return on the pension fund investments was applied to all periods of projected benefit payments to determine the total pension liability.

Sensitivity of the Authority's Proportionate Share of the Net Pension Liability to Changes in the Discount Rate—The following table presents the Authority's proportionate share of the net pension liability using the discount rate of 7.0%, as well as what the Authority's proportionate share of the net pension liability would be if it were calculated using a discount rate that is one-percentage point lower (6.0%) or one-percentage point higher (8.0%) than the current rate (in thousands):

	Sensitivity Analysis		
	Net Pension Liability as of June 30, 2019		
	1% Decrease (6.0%)	Current Discount Rate (7.0%)	1% Increase (8.0%)
Net Pension Liability	$ 607	$ 393	$ 213

11. PENSION PLANS (CONTINUED)

Pension Liabilities, Pension Expense, and Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions.

Pension Liability—At June 30, 2019 and 2018, the Authority reported a liability of $393 thousand and $516 thousand, respectively, for its proportionate share of the net pension liability. The Authority's portion of the net pension liability was based on projection of the Authority's long-term share of contributions to the Pension Plan relative to the projected contributions of all participating City governments and their component units, actuarially determined. At June 30, 2019 and 2018, the Authority's proportion was 0.002% and 0.003% respectively.

Pension Expense—For the years ended June 30, 2019 and 2018, the Authority recognized pension expense of ($16) thousand and ($5) thousand, respectively.

Deferred Outflows and Inflows of Resources—At June 30, 2019, the Authority reported total deferred outflows of resources and deferred inflows of resources related to pensions from the following sources:

	Deferred Outflows of Resources	Deferred Inflows of Resources
Difference between expected and actual experience	$ 32,882	$ 27,316
Changes of assumptions	251	16,489
Net difference between projected and actual earnings on pension plan investments	-	24,400
Changes in proportion and difference between the Authority's contributions and proportionate share of contributions	(417,710)	(34,317)
The Authority's contributions subsequent to the measurement date	-	-
Total	**$ (384,577)**	**$ 33,888**

Amounts reported as deferred outflows of resources and deferred inflows of resources related to pensions at June 30, 2019 will be recognized in pension expense as follows:

Year ended June 30,	Amount
2020	$ (110,897)
2021	(122,188)
2022	(92,934)
2023	(65,218)
2024	(24,790)
2025	(2,438)

12. OTHER POST-EMPLOYMENT BENEFITS

Plan Description—The Authority's Other Postemployment Benefits Plan ("OPEB Plan") is a single-employer defined benefit plan administered by the New York City Office of Labor Relations. The plan provides certain health and related benefits to eligible retirees and their beneficiaries/dependents of the New York City Municipal Water Finance Authority in accordance with GASB Statement No. 75, ("GASB 75") *Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions*.

The OPEB Plan consists of three programs: (1) the New York City Health Benefits Program, (2) Welfare Fund Program, and (3) Medicare Part B Program. The Authority's policy is to follow the eligibility criteria applicable to retirees of the City and to provide benefits substantially the same as those provided to the City retirees and eligible beneficiaries/dependents.

There are three classes of employees: active, inactive and retirees.

The following presents a summary of the Authority's census data used in the June 30, 2019 and 2018 OPEB actuarial valuations:

	2019	2018
Group		
Active	10	9
Active off payroll	2	2
Deferreds	1	0
Retired	5	4
Total	**18**	**15**

Funding Policy—The Authority is not required to provide funding for the OPEB Plan, other than the pay-as-you-go amount necessary to provide current benefits to retirees and eligible beneficiaries/dependents. For the years ended June 30, 2019 and 2018, the Authority had five and four retirees, respectively, and made contributions of $23.1 thousand and $20.3 thousand, respectively. Members are not required to contribute; although, retirees may elect basic health insurance programs and/or optional coverage that requires contributions. Plan retiree participants who opt for other basic or enhanced coverage must contribute 100% of the incremental costs above the premiums for the benchmark plan. The OPEB Plan also reimburses covered employees for 100% of the Medicare Part B premium rate applicable to a given year, and there is no retiree contribution to the welfare fund (the "Welfare Fund") that covers retirees for various health care benefits not provided through the basic coverage.

Annual OPEB Cost and Net OPEB Liability—The Authority's annual OPEB cost is calculated based on the annual expense ("Expense"), an amount that was actuarially determined in accordance with the parameters of GASB 75. Actuarial valuations involve estimates and assumptions about the probability of events far into the future. The entry age actuarial cost method was used in the actuarial valuation prepared as of June 30, 2018 for the fiscal year ending June 30, 2019, which was the basis for the fiscal year 2019 Expense calculation. Under this method, as used in this OPEB Plan valuation, the actuarial present value ("APV") of benefits ("APVB") of each individual included in actuarial valuation is allocated on a level basis over the earnings of the individual between entry age and assumed exit age(s). The employer portion

12. OTHER POST-EMPLOYMENT BENEFITS (CONTINUED)

of this APVB allocated to the valuation year is the employer normal cost. The portion of this APVB that is not provided for on the valuation date by the APV of future employer normal cost or future member contributions is the total OPEB Plan liability. The excess of the total OPEB Plan liability over the plan fiduciary net position, which represents the assets of the plan, is the net OPEB Plan liability.

All changes in the net OPEB Plan liability as of June 30, 2019 and 2018 are being amortized over the future working lifetime of all plan participants for purposes of calculating the expense except for the amount of change in plan assets, which would be amortized over a 5-year period using level-dollar amortization. This plan however, is not assumed to have any assets.

Total OPEB Liability—The Authority's total OPEB Plan liabilities of $1.8 million and $1.5 million, respectively, were measured as of June 30, 2019 and 2018, and were determined by actuarial valuations as of those dates.

The following table shows changes in the Authority's net OPEB Plan liability for fiscal years 2019 and 2018 (in thousands):

	2019	2018
Balance at beginning of the year	$ 1,457	$ 1,412
Changes for the year:		
Service cost	111	94
Interest	47	43
Difference between expected and actual experience	572	(106)
Changes in assumptions or other inputs	(336)	35
Actual benefit payments	(23)	(21)
Net changes	371	45
Net OPEB Plan liability - end of the year	**$ 1,828**	**$ 1,457**

The Authority's annual OPEB Plan expense for fiscal years 2019 and 2018 were as follows (in thousands):

	2019	2018
Components		
Service costs	$ 111	$ 94
Interest on the total OPEB Plan liability	47	43
Changes of assumptions	(60)	(20)
Difference between expected and actual experience	44	(23)
Total OPEB Plan Expense	**$ 142**	**$ 94**

12. OTHER POST-EMPLOYMENT BENEFITS (CONTINUED)

Funded Status and Funding Progress—As of June 30, 2019, the most recent actuarial measurement date, the cost was 0% funded. The total OPEB Plan liability for benefits was $1.8 million, and the plan fiduciary net position was $0, resulting in a net OPEB Plan liability of $1.8 million. The covered payroll (annual payroll of active employees covered by the OPEB Plan) was $.9 million, and the ratio of the net OPEB Plan liability to the covered payroll was 193.9%. The impact on the net OPEB Plan liability of a 1% increase or decrease in the discount rate and trend is included in on page 63.

Actuarial Methods Assumptions and Other Inputs—Actuarial valuations of an ongoing plan involve estimates of the value of reported amounts and assumptions about the probability of occurrence of events far into the future, such as assumptions about future employment, demographic, salary increase, mortality, and the healthcare cost trend. The actuarial assumptions used in the fiscal year 2019 and the fiscal year 2018 OPEB Plan valuations are a combination of those used in the New York City Employee Retirement Systems ("NYCERS") pension actuarial valuations and those specific to the OPEB Plan valuations.

Amounts determined regarding the funded status of the OPEB Plan and the annual Expense of the Authority are subject to continual revision as actual results are compared with past expectations and new estimates are made about the future. Projections of benefits for financial reporting purposes are based on the types of benefits provided at the time of each valuation and the historical pattern of the sharing of benefit costs between the employer and employees to that point. The actuarial methods and assumptions used include techniques that are designed to reduce short-term volatility in total OPEB Plan liability, consistent with the long-term perspective of the calculations.

The actuarial assumptions used in the fiscal year 2019 and fiscal year 2018 OPEB Plan valuations are classified as those used in the New York City Retirement Systems ("NYCRS") valuations and those specific to the OPEB valuations.

The OPEB Plan actuarial valuations incorporate only the use of certain NYCERS demographic and salary increase assumptions. The NYCERS demographic and salary scale assumptions are unchanged from the prior OPEB Plan actuarial valuation. For purposes of determining pension obligations, the demographic and salary scale assumptions requiring NYCERS Board approval (available on the website of the Office of the Actuary at www.nyc.gov/actuary) were adopted by each respective Board of Trustees during fiscal year 2012. Chapter 3 of the Laws of 2013 enacted those actuarial assumptions and methods that require New York State Legislation.

12. OTHER POST-EMPLOYMENT BENEFITS (CONTINUED)

The OPEB Plan-specific actuarial assumptions used in the fiscal year 2019 OPEB Plan valuation are as follows:

Valuation Date	June 30, 2018
Measurement Date	June 30, 2019
Discount Rate	2.79% per annum for the June 30, 2018 measurement date. 2.98% for the June 30, 2018 valuation date.[1]
Actuarial Cost Method	Entry age calculated on an individual basis with the actuarial value of projected benefits allocated on a level basis over eranings from hire through age of exit.
Salary Increase	3.00% per annum which includes an inflation rate of 2.50% and a general wage increase rate of 0.50%. For more information see the Silver Books.
Inflation	2.50%
Per-Capita Claims Costs	EBCBS and GHI plans are insured via a Minimum Premium arrangement while the HIP and many of the other HMOs are community rated. Costs reflect age adjusted premiums for all plans. HIP HMO and GHI/EBCBS non-Medicare premiums have been adjusted for Health Savings Agreement changes.

[1] Rates are based solely on the S&P Municipal Bond 20 Year High Grade Rate Index, since the plan has no assets, as per guidance under GASB 75.

Employer premium contribution schedules for the month of July 2018 and January 2019 were reported by the New York City Office of Labor Relations (“OLR”). In most cases, the premium contributions remained the same throughout the year. HIP HMO Medicare rates varied by date and by specific Plan options. These variations are the result of differing Medicare reimbursements. The various monthly rates were blended by proportion of enrollment. For other rates, where the January 2019 premium rate was different than the July 2018 premium rate, the valuation assumed that the January 2019 premium rate was more representative of the long-term cost of the arrangement.

These assumptions are generally unchanged from the previous valuation except as noted below. The NYCERS pension assumptions are provided in the five “Silver Books” available on the Reports page of The Office of the Actuary website (www.nyc.gov/actuary).

12. OTHER POST-EMPLOYMENT BENEFITS (CONTINUED)

The probability of retirement set out in each of the Silver Books is assumed to be 100% at either age 63 or 70, depending upon the program of benefits for the individual employee. For the OPEB Plan valuation, 100% of the individuals remaining in service at these ages are assumed to either retire with a benefit or to terminate employment without a benefit, depending upon whether they have attained the requisite service.

Based on those assumptions, the City's OPEB Plan's fiduciary net position was projected to be available to make all projected OPEB Plan payments for current active and inactive employees until 2026. After that time, benefit payments will be funded on a pay-as-you go basis. The discount rate is the single equivalent rate which results in the same present value as discounting future benefit payments made from assets at the long-term expected rate of return and discounting future benefit payments funded on a pay-as-you-go basis at the Municipal Bond 20-year Index Rate.

Results for the OPEB Plans for Component Units are presented using a discount rate of the Municipal Bond 20-year Index Rate, since there is no pre-funding assumed for these plans.

The initial monthly premium rates used in the valuations are shown in the following table:

	MONTHLY RATES	
Plan	**2019**	**2018**
HIP HMO		
Non-Medicare Single	$ 729.97	$ 652.44
Non-Medicare Family	1,783.60	1,598.47
Medicare	170.84	164.98
GHI/EBCBS		
Non-Medicare Single	741.40	620.08
Non-Medicare Family	1,947.32	1,625.27
Medicare	191.64	172.42
Other HMOs [1]		
Non-Medicare Single	1,075.01	1,018.56
Non-Medicare Family	2,409.82	2,223.80
Medicare Single	338.86	311.79
Medicare Family	668.49	621.50

[1] Other HMO premiums represent the total premium for medical (not prescription drug) coverage, including retiree contributions.

12. OTHER POST-EMPLOYMENT BENEFITS (CONTINUED)

Welfare Fund - For the fiscal year 2018 valuation, the Welfare Fund contribution reported for fiscal year 2018, including any reported retroactive amounts, was used as the per capita cost for valuation purposes.

The calculations reflect an additional one-time $100 contribution for fiscal year 2019 in July 2018 and fiscal year 2020 in July 2019.

Reported annual contribution amounts for the last two years are shown in Appendix B, Tables 2a to 2e of the OPEB Plan valuation report dated September 14, 2018.

Welfare Fund rates are based on actual reported union Welfare Fund code for current retirees.

The weighted average annual contribution rates used for future retirees is shown below.

	ANNUAL RATE	
	2019	**2018**
NYCERS	$ 1,870	$ 1,850

Contributions are assumed to increase by 3.5% annually starting in fiscal year 2020.

Medicare Part B Premiums are as follows:

Calendar Year	Monthly Premium
2013 - 2015	$ 104.90
2016	109.97
2017	113.63
2018	125.85
2019	134.43

2019 Medicare Part B premiums are assumed to increase by Medicare Part B trend rates.

Medicare Part B premium reimbursement amounts have been updated to reflect the actual premium rates announced for calendar years through 2019. Due to limited cost-of-living increase in Social Security benefits for calendar years 2017, 2018, and 2019, some Medicare Part B participants will not be charged the Medicare Part B premium originally projected or ultimately announced for those years. Thus, the valuation uses a blended estimate as a better representation of future Part B premium costs.

12. OTHER POST-EMPLOYMENT BENEFITS (CONTINUED)

For the fiscal year 2019 OPEB Plan valuation, the annual premium used was $1,561.68, which is equal to 12 times an average of the calendar year 2018 and 2019 monthly premiums shown.

For calendar year 2019, the monthly premium was determined as follows:

(a) 3.5% of the basic $104.90 monthly hold-harmless amount, assuming that there would be no claims made for the slight increase in Part B premiums for continuing retirees, and

(b) 96.5% of the announced premiums of $135.50 for calendar year 2019, representing the proportion of the Medicare population that will pay the announced amount.

Overall Medicare Part B Premium amounts are assumed to increase by the following percentages to reflect the income-related increases in Medicare Part B Premiums for high income individuals.

Fiscal Year	Income-Related Medicare Part B Increase
2019	5.0%
2020	5.2
2021	5.3
2022	5.4
2023	5.5
2024	5.6
2025	5.8
2026	5.9
2027 and later	6.0

Medicare Part B Premium Reimbursement Assumption - 90% of Medicare participants are assumed to claim reimbursement; based on historical data.

12. OTHER POST-EMPLOYMENT BENEFITS (CONTINUED)

Health Care Cost Trend Rate ("HCCTR") - Covered medical expenses are assumed to increase by the following percentages. For purposes of measuring entry age calculations, actual historic plan increases are reflected to the extent known, with further historic trend rates based on the trend assumed for fiscal year 2019 valuation.

HCCTR ASSUMPTIONS

Fiscal Year Ending [1]	Pre-Medicare Plans	Medicare Plans	Medicare Part B Premiums	Welfare Fund Contributions
2019	7.00%	5.00%	5.88% [1]	3.50%
2020	7.00	5.00	5.00	3.50
2021	6.75	4.90	5.00	3.50
2022	6.50	4.90	5.00	3.50
2023	6.25	4.80	5.00	3.50
2024	6.00	4.80	5.00	3.50
2025	5.75	4.70	5.00	3.50
2026	5.50	4.70	5.00	3.50
2027	5.25	4.60	5.00	3.50
2028	5.00	4.60	5.00	3.50
2029	4.75	4.50	5.00	3.50
2030 and later	4.50	4.50	5.00	3.50

[1] Reflects actual calendar year premium for the first 6 months of FY20 (July 2019 to December 2019) and 5.0% trend for remaining 6 months

Age and Gender-Related Morbidity - The premiums are age and gender adjusted for GHI/EBCBS, HIP HMO and Other HMOs. The assumed relative costs of coverage are consistent with information presented in the 2013 study *Health Care Costs - From Birth to Death*, sponsored by the Society of Actuaries.

For non-Medicare costs, a sample of factors used are:

Age	Male	Female	Age	Male	Female
20	0.170	0.225	45	0.355	0.495
25	0.146	0.301	50	0.463	0.576
30	0.181	0.428	55	0.608	0.671
35	0.227	0.466	60	0.783	0.783
40	0.286	0.467	64	0.957	0.917

Children costs assumes a factor of 0.229.

12. OTHER POST-EMPLOYMENT BENEFITS (CONTINUED)

For Medicare costs, relative factors based on the Yamamoto Study for net Medicare costs for 2010 for inpatient, outpatient, and professional costs were blended. Prescription drug costs were not reflected as NYCHBP excludes most drugs from coverage. Professional costs were weighted at 64%, based on the GHI portion of the combined GHI/EBCBS premiums reported historically. Inpatient costs were weighted as twice as prevalent as outpatient costs based on the relative allocation suggested in the Yamamoto Study.

Costs prior to age 65 were approximated using the non-Medicare data, but they assume that individuals under age 65 on Medicare had an additional disability-related morbidity factor.

Medicare costs prior to age 65 assume an additional disability-related morbidity factor. A sample of factors are:

Age	Male	Female	Age	Male	Female
20	0.323	0.422	65	0.919	0.867
25	0.278	0.565	70	0.946	0.885
30	0.346	0.804	75	1.032	0.953
35	0.432	0.876	80	1.122	1.029
40	0.545	0.878	85	1.217	1.116
45	0.676	0.929	90	1.287	1.169
50	0.883	1.082	95	1.304	1.113
55	1.159	1.260	99 and older	1.281	0.978
60	1.493	1.470			

The age adjustment for the non-Medicare GHI/EBCBS premium reflects a 5% reduction in the GHI portion of the monthly premium (with the GHI portion representing $349.58 out of the $741.40 for single coverage and $928.59 out of the $1,947.32 for family coverage for fiscal year 2019 rates) and a 3% reduction in the EBCBS portion of the premium (with the EBCBS portion representing the remainder of the premiums) for the estimated margin that is expected to be returned.

Mortality Rates— The fiscal year 2019 pension valuation included changes to mortality. These new assumptions have also been reflected in this valuation.

Participation— Active participation assumptions are based on actual elections for current retirees. Portions of current retirees not eligible for Medicare are assumed to change elections upon attaining age 65 based on the patterns of elections of Medicare-eligible retirees. The participation assumptions have been updated since the prior valuation to reflect recent experience. Detailed assumptions appear in the following table.

12. OTHER POST-EMPLOYMENT BENEFITS (CONTINUED)

PLAN PARTICIPATION ASSUMPTIONS

Benefits	NYCERS
Pre-Medicare	
- GHI/EBCBS	72%
- HIP HMO	20
- Other HMO	4
- Waiver	4
Medicare	
- GHI	72
- HIP HMO	20
- Other HMO	4
- Waiver	4
Post-Medicare Migration	
- Other HMO to GHI	0
- HIP HMO to GHI	0
- Pre-Med. Waiver	
** To GHI @ 65	0
** To HIP @ 65	0

This non-filer group also includes some participants who do not qualify for coverage because they were working less than 20 hours a week at termination.

Dependent Coverage—Dependent coverage is assumed to terminate when a retiree dies.

Dependents—Dependent assumptions based on distribution of coverage of recent retirees are shown in the following table. Actual spouse data is shown for current retirees. Child dependents of current retirees are assumed to receive coverage until age 26.

Based on experience under the OPEB Plan for NYCERS, male retirees were assumed to be four (4) years older than their wives, and female retirees were assumed to be two (2) years younger than their husbands.

Children are assumed to be covered for eight (8) years after retirement. For employees eligible to retire based only on service, children are assumed to be covered for an additional five (5) years.

12. OTHER POST-EMPLOYMENT BENEFITS (CONTINUED)

DEPENDENT COVERAGE ASSUMPTIONS

Group	NYCERS
Male	
- Single Coverage	35
- Spouse	35
- Child/No Spouse	5
- Spouse and Child	25
Total	**100%**
Female	
- Single Coverage	70
- Spouse	20
- Child/No Spouse	5
- Spouse and Child	5
Total	**100%**

Demographic Assumptions - The fiscal year 2019 pension valuation included changes to several demographic assumptions including retirement, mortality, disability, withdrawal, and salary scale. These new assumptions have also been reflected in this valuation.

COBRA Benefits—Although COBRA beneficiaries pay 102% of "premiums," typical claim costs for COBRA participants run about 50% greater than costs for other participants.

There is no cost to The Authority for COBRA beneficiaries who enroll in community-rated HMOs, including HIP, since these individuals pay their full community rate. However, the City's costs under the experience-rated GHI/EBCBS coverage are affected by the claims for COBRA-covered individuals.

In order to reflect the cost of COBRA coverage, the cost of excess claims for GHI-covered individuals and families is estimated assuming that 15% of employees not eligible for other benefits elect COBRA coverage for 15 months. A lump-sum COBRA cost of $1,100 was assumed for terminations during fiscal year 2019. This lump-sum amount is increased by the Pre-Medicare HCCTR for future years but is not adjusted for age-related morbidity.

Cadillac Tax—The OPEB Plan valuation includes an explicit calculation of the high-cost plan excise tax ("Cadillac Tax") that will be imposed beginning in 2022 under HCR.

12. OTHER POST-EMPLOYMENT BENEFITS (CONTINUED)

The tax is 40% of the excess of (a) over (b) where (a) is the cost of medical coverage and (b) is the statutory limits ($10,200 for single coverage and $27,500 for family coverage), adjusted for the following:

- For Pre-Medicare retirees above the age of 55, the limit will be increased by $1,650 for single coverage and $3,450 for family coverage.
- For 2019, the limits are increased by CPI + 1% (e.g. 3.25%). For each year after 2019, the limits are further increased by CPI (e.g. 2.25%). The indexing of limits starts in 2018; the tax is first applied in 2022.

The impact of the Cadillac Tax for the program benefit is calculated based on the following assumptions about the cost of medical coverage:

- The cost for each benefit option without age adjustment (GHI, HIP, or other HMO, combined with the average cost of Medicare Part B premium reimbursement, if applicable) was separately compared to the applicable limit.
- The additional Cadillac Tax due to the riders or optional benefit arrangements is assumed to be reflected in the contribution required for the rider or optional benefit.
- Pre-Medicare retirees under age 55 are not assumed to have the higher limits that apply to employees engaged in high-risk professions because the majority of employees included in this valuation are not in such professions.

In cases where the Authority provides only a portion of the OPEB Plan benefits, which give rise to the Cadillac Tax, the calculated Cadillac Tax is allocated to the appropriate paying entity in proportion to the OPEB liabilities for relevant OPEB Plan benefits.

Active/Inactive Liabilities—40% of the measured liability of the Active/Inactive population. This is roughly equivalent to assuming that 60% of the Active/Inactive members will terminate membership prior to vesting and not receive OPEB.

Sensitivity of the Net OPEB Plan Liability to Changes in the Discount Rate

Sensitivity of the Authority's Proportionate Share of the Net OPEB Plan Liability to Changes in the Discount Rate—The following table presents the Authority's proportionate share of the net OPEB Plan liability using the discount rate of 2.79 percent, as well as what the Authority's proportionate share of the net OPEB Plan liability would be if it were calculated using a discount rate that is one-percentage point lower (1.79 percent) or one-percentage point higher (3.79 percent) than the current rate (in thousands):

12. OTHER POST-EMPLOYMENT BENEFITS (CONTINUED)

	Sensitivity Analysis Net OPEB Plan Liability as of June 30, 2019		
	1% Decrease (1.79%)	Current Discount Rate (2.79%)	1% Increase (3.79%)
Total OPEB Plan Liability	$ 2,163	$ 1,828	$ 1,565

Sensitivity of the Net OPEB Plan Liability to Changes in the Healthcare Cost Trend Rate

The following presents the total OPEB Plan liability of the Authority, as well as what the Authority's total OPEB Plan liability would be if it were calculated using healthcare cost trend rates that are 1-percent-point lower or 1-percent-point higher than the current healthcare cost trend rates:

	Sensitivity Analysis Net OPEB Plan Liability as of June 30, 2019		
	1% Decrease (6.00% decreasing to 3.50%)	Healthcare Cost Trend Rates (7.00% decreasing to 4.50%)	1% Increase (8.00% decreasing to 5.50%)
Total OPEB Plan Liability	$ 1,478	$ 1,828	$ 2,333

Deferred Outflows of Resources and Deferred Inflows of Resources Related to the OPEB Plan

At June 30, 2019, the Authority reported deferred outflows of resources and deferred inflows of resources related to the OPEB Plan from the following sources:

	Deferred Outflows of Resources	Deferred Inflows of Resources
Difference between expected and actual experience	$ 505	$ 152
Changes of assumptions or other inputs	27	446
Total	**$ 532**	**$ 598**

12. OTHER POST-EMPLOYMENT BENEFITS (CONTINUED)

Amounts reported as deferred outflows of resources and deferred inflows of resources related to OPEB Plan will be recognized in OPEB expense as follows:

Fiscal Year Ended June 30,		Amount
2020	$	(15.7)
2021		(15.7)
2022		(15.7)
2023		(15.7)
2024		(15.7)
2025		(15.1)
2026		13.0
2027		14.2

13. POLLUTION REMEDIATION OBLIGATIONS

The System reports pollution remediation obligations ("PROs") as required by the GASB. The System's PROs may arise as a result of: (1) federal, State, and local laws and regulations, (2) violations of pollution-related permits or licenses, (3) a determination by the System that there is an imminent endangerment to public health and safety as a result of an existing pollution condition, (4) the System's being named in a lawsuit to compel remediation or being identified by a regulator as a party responsible or potentially responsible for remediation, and/or (5) the System's voluntarily commencement of remediation. As of June 30, 2019 and 2018, the System reported $33 million and $37.6 million of liabilities for known PROs, respectively.

The System has estimated these amounts based on the current value of outlays expected to be incurred for pollution remediation, which it is currently obligated to perform. Actual future outlays will differ from the estimated amounts if the prices or techniques for remediation measures change or differ from estimates, if and when additional information about existing pollution conditions becomes known to the System in the future and/or if applicable laws or regulations change.

Remediation outlays for certain pollution conditions currently known to the System are not included in the reported liabilities because they are not yet reasonably estimable. These include certain locations that the System has been informed have been designated under federal law as Superfund sites to address alleged hazardous substances, pollutants, or contaminants at these sites and for which the System may be named as a potentially responsible party for the remediation because there are the System's facilities operated at these locations.

14. SUBSEQUENT EVENTS

- On July 2, 2019, the Authority issued $459.6 million of fixed rate tax-exempt Second Resolution bonds, Fiscal 2020 Series AA. Proceeds of the bonds were used to refund the following amounts of fixed rate Second Resolution bonds: $141.6 million of Fiscal 2009 Series EE, $165 million of Fiscal 2009 Series FF, $108.7 million of Fiscal 2009 Series GG, and $135.7 million of Fiscal 2010 Series BB. The proceeds of Fiscal 2020 Series AA also paid for bond issuance costs.

- On July 9, 2019, the Authority drew down $2.4 million of Fiscal 2012 Series 1 BAN proceeds. The proceeds were used pay for the costs to improvement to the System.

- On July 11, 2019, the Authority drew down $178.5 million of Fiscal 2020 Series 1 BAN proceeds to pay for the costs of improvements to the System.

- On July 17, 2019, pursuant to the terms of Fiscal 2012 Series 1 BAN issued by the Authority to EFC, the total then outstanding BAN principal amount of $30.0 million was forgiven by EFC.

- On July 17, 2019, the Authority issued $450.0 million of fixed rate tax-exempt Second Resolution bonds, Fiscal 2020 Series BB. Proceeds of the bonds were uses to pay for the costs of improvements to the System and to pay for bond issuance costs.

- On October 10, 2019, the Authority drew down $149.8 million of Fiscal 2020 Series 1 BAN proceeds. The proceeds were used pay for the costs to improvement to the System.

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REQUIRED SUPPLEMENTARY INFORMATION

(UNAUDITED)

Required Supplementary Information (UNAUDITED)

Schedule of changes for total OPEB Plan liability and related ratios as of June 30 (in thousands):

	2019	2018	2017	2016
Total OPEB Plan Liability				
Service cost	$ 111	$ 94	$ 101	$ 136
Interest	47	42	43	43
Changes of benefit terms	-	-	-	-
Differences between expected and actual experience	572	(106)	(96)	(8)
Changes of assumptions	(336)	35	(222)	-
Benefits payments	(23)	(20)	(15)	(17)
Net change in total OPEB Plan Liability	**371**	**45**	**(189)**	**154**
Total OPEB Plan liability - beginning	1,457	1,412	1,601	1,447
Total OPEB Plan Liability - ending	**$ 1,828**	**$ 1,457**	**$ 1,412**	**$ 1,601**
Covered payroll	$ 942	$ 859	$ 1,038	$ 1,148
Total OPEB Plan Liability as a percentage of covered payroll	193.9%	169.6%	135.9%	139.5%

Notes to the Schedule:

Changes of assumption: Changes of assumption and other inputs reflect the effects of changes in the discount rate each period.
The following are the discount rates used in each period:

2019	2.79%
2018	2.98%
2017	3.13%
2016	2.71%

The Authority funds OPEB benefits on a pay-as-you-go basis and contributions are not actuarially determined. Therefore, the required supplementary information related to actuarially determined contributions for the 10 most current fiscal years is not applicable.

*This data is presented for those years for which information is available.

Required Supplementary Information (UNAUDITED)

SCHEDULE OF THE AUTHORITY'S PROPORTIONATE SHARE OF THE NET PENSION LIABILITY
Last 10 Fiscal Years* (in thousands):

		2019	2018	2017	2016	2015	2014	2013
Authority's proportion of the net pension liability	%	0.002	0.003	0.004	0.005	0.005	0.005	0.005
Authority's proportionate share of the net pension liability	$	393	516	828	1,215	1,012	901	1,154
Authority's covered payroll	$	942	859	1,038	1,148	1,289	1,181	1,124
Authority's proportionate share of the net pension liability as percentage of its covered employee payroll	%	41.72	60.07	79.77	105.84	78.51	76.29	102.67
Plan fiduciary net position as a percentage of the total pension liability	%	78.8	78.8	74.8	69.6	73.1	75.3	67.2

*This data is presented for those years for which information is available.

SCHEDULE OF THE AUTHORITY'S PENSION CONTRIBUTIONS
Last 10 Fiscal Years (in thousands):

		2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially determined contribution	$	78	111	136	170	161	141	136	157	113	121
Contribution in relation to the actuarially determined contribution	$	(78)	(111)	(136)	(170)	(161)	(141)	(136)	(157)	(113)	(121)
Contribution deficiency (excess)	$	-	-	-	-	-	-	-	-	-	-
Authority's covered payroll[1]	$	942	859	1,038	1,148	1,289	1,181	1,124	919	1,026	676
Contribution as a percentage of covered payroll	%	8.28	12.92	13.10	14.81	12.49	11.94	12.10	17.08	11.01	17.90

[1] Covered payroll data from the actuarial valuation date with one-year lag.