NEW ISSUE **RATINGS: See "RATINGS" herein**

In the opinion of Wyatt, Tarrant & Combs, LLP, Bond Counsel, (i) under the Internal Revenue Code as presently enacted and construed and subject to the conditions and limitations set forth herein under the caption "TAX TREATMENT," interest on the Series 2020 Notes is excludable from gross income for Federal income tax purposes and (ii) the Series 2020 Notes are exempt from ad valorem taxation, and the interest thereon is exempt from income taxation, by the Commonwealth of Kentucky and all of its political subdivisions and taxing authorities. See " TAX TREATMENT" herein.

$226,340,000
LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT SEWER AND DRAINAGE SYSTEM SUBORDINATED BOND ANTICIPATION NOTES, SERIES 2020

msd
Safe, clean waterways

Dated: Date of Delivery	**Due: October 20, 2021**
Interest Rate: 5.00%	**Priced to Yield:0.220%**
	CUSIP: 546589 S60

Interest on the Series 2020 Notes is payable from their dated date at maturity on October 20**,** 2021.

The above-captioned notes (the "Series 2020 Notes") are being issued pursuant to the provisions of Chapters 58, 65 and 76 of the Kentucky Revised Statutes, as amended (collectively, the "Act") and a Subordinated Debt Resolution adopted by the District on April 26, 2010, as supplemented by a Subordinate Debt Sale Resolution adopted by the District on August 24, 2020 (collectively, the "Note Resolution"). The Series 2020 Notes are secured by a lien on and security interest in the revenues of the District derived from the operation of the District's sewer and drainage system (the "System"), subject and subordinate, however, to the lien thereon securing certain bonds and other indebtedness issued, or to be issued, under the provisions of the District's Revenue Bond Resolution adopted on December 7, 1992, as amended to date and as hereafter amended from time to time (collectively, the "Bond Resolution"). See "SECURITY AND SOURCE OF PAYMENT FOR THE SERIES 2020 NOTES" herein.

The Series 2020 Notes are fully registered notes in denominations of $5,000 or any integral multiple thereof, without coupons. The Series 2020 Notes are issuable under a book entry system, registered in the name of The Depository Trust Company ("DTC") or its nominee. There will be no distribution of the Series 2020 Notes to the ultimate purchasers. See "THE SERIES 2020 NOTES" - Book Entry System" and APPENDIX E herein. Principal and interest on the Series 2020 Notes is payable at the designated office of The Bank of New York Mellon Trust Company, N.A, as Bond Registrar and Paying Agent (the "Paying Agent and Registrar").

The Series 2020 Notes are *not* subject to redemption prior to maturity.

The Series 2020 Notes are special and limited revenue obligations of the District and do not constitute a debt, liability or general obligation of the District, the Commonwealth of Kentucky or any political subdivision or taxing authority thereof, including the Louisville/Jefferson County Metro Government or the County of Jefferson, Kentucky, within the meaning of the Constitution and laws of the Commonwealth of Kentucky. See "SECURITY AND SOURCES OF PAYMENT FOR THE SERIES 2020 NOTES" herein.

The Series 2020 Notes are offered when, as and if issued by the District and received by the Underwriters, subject to prior sale and to withdrawal or modification of the offer without notice and subject to the approval of legality by Wyatt, Tarrant & Combs, LLP, Louisville, Kentucky, Bond Counsel to the District. Certain legal matters will be passed upon for the District by its General Counsel, Paula M. Purifoy, Esq. The Series 2020 Notes are expected to be available for delivery on or about October 14, 2020.

BofA Securities

Dated: September 22, 2020

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT

Board Members
Marita Willis, Chair
Daniel Arbough, Vice Chair
Andrew Bailey
Cyndi Caudill
Jason Williams
Keith Jackson
J.T. Sims
Ricky Mason

Executive Director and Secretary-Treasurer
James A. “Tony” Parrott

Chief Financial Officer
Brad Good

Chief of Operations
Brian Bingham

Chief Engineer
David Johnson

General Counsel
Paula M. Purifoy, Esq.

CERTIFIED PUBLIC ACCOUNTANTS
Crowe LLP
Louisville, Kentucky

BOND COUNSEL
Wyatt, Tarrant & Combs LLP
Louisville, Kentucky

FINANCIAL ADVISOR
Robert W. Baird & Co. Incorporated
Louisville, Kentucky

PAYING AGENT AND REGISTRAR
The Bank of New York Mellon Trust Company, N.A
Louisville, Kentucky

REGARDING THIS OFFICIAL STATEMENT

This Official Statement, which includes the cover page, has been prepared by the Louisville and Jefferson County Metropolitan Sewer District (the "District") in connection with the sale by the District of $226,340,000 aggregate principal amount of its Sewer and Drainage System Subordinated Bond Anticipation Notes, Series 2020. Information concerning the authorization, purpose, terms, conditions of sale and sources of payment of, and security for, the Series 2020 Notes is included herein. Insofar as such information embodies statements of opinion, or estimates, even if not so labeled, it should be regarded as suggesting independent investigation or consultation of other sources prior to making investment decisions. Certain information may not be the most current that is available; however, attempts were made to date and document the sources of the information included herein.

No dealer, broker, salesman or other person has been authorized by the District to give any information or to make any representation, other than those contained in this Official Statement, and, if given or made, such other information or representations must not be relied upon as having been given by the District. This Official Statement does not constitute an offer to sell or the solicitation of an offer to buy, nor shall there be any sale of the Series 2020 Notes by any person in any jurisdiction in which it is unlawful for such person to make such offer, solicitation or sale. The information and expressions of opinion herein are subject to change without notice, and neither the delivery of this Official Statement nor any sale made hereunder shall, under any circumstances, create any implication that there has been no change in the affairs of the District since the date hereof.

Neither this Official Statement nor any verbal or written representations by or on behalf of the District before sale of the Series 2020 Notes should be regarded as part of the contract with the holders thereof from time to time.

All financial and other information presented herein has been provided by the District from its records, except for information expressly attributed to other sources. It is intended to show recent historic information and is not intended to indicate future or continuing trends in the financial position or other affairs of the District. No representation is made that past experience, as might be shown by such financial and other information, will necessarily continue or be repeated in the future.

Insofar as the statements contained in this Official Statement involve matters of opinion or estimates, even if not expressly stated as such, such statements are made as such and not as representations of fact or certainty, no representation is made that any of such statements have been or will be realized, and such statements should be regarded as suggesting independent investigation or consultation of other sources prior to the making of investment decisions. Certain information may not be current; however, attempts were made to date and document the sources of the information included herein. Neither this Official Statement nor any oral or written representations by or on behalf of the District preliminary to sale of the Bonds should be regarded as part of the District's contract with the successful bidder or the holders from time to time of the Series 2020 Notes.

References herein to provisions of Kentucky law, whether codified in the Kentucky Revised Statutes ("KRS") or uncodified, or of the Kentucky Constitution, are references to such provisions as they presently exist. Any of those provisions may from time to time be amended, repealed or supplemented.

As used in this Official Statement, "debt service" means principal of and interest on the obligations referred to, and "Commonwealth" or "Kentucky" means the Commonwealth of Kentucky.

TABLE OF CONTENTS

Appendices

$226,340,000
LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT SEWER AND DRAINAGE SYSTEM SUBORDINATED BOND ANTICIPATION NOTES, SERIES 2020

INTRODUCTION

The purpose of this Official Statement, which includes the cover page and appendices hereto, is to provide certain information with respect to the issuance of the Series 2020 Notes.

This introduction is not a summary of this Official Statement. It is only a brief description of and guide to, and is qualified by, more complete and detailed information contained in the entire Official Statement, including the cover page and appendices hereto, and the documents summarized or described herein. A full review should be made of the entire Official Statement. The offering of the Series 2020 Notes to potential investors is made only by means of the entire Official Statement.

Any capitalized terms not otherwise defined in this Official Statement shall have the meaning ascribed to them in "Appendix A – Definitions of Certain Terms and Summary of Provisions of the Bond Resolution and Note Resolution."

The District

The Series 2020 Notes are being issued by the Louisville and Jefferson County Metropolitan Sewer District (the "District"), a public body corporate and politic and a political subdivision of the Commonwealth of Kentucky.

The District was created pursuant to the Act in 1946 to provide adequate sewer and drainage facilities and service in and around the City of Louisville, Kentucky (the "City") and within Jefferson County, Kentucky (the "County"). In 1987, the District became the sole local authority for providing flood control and storm water drainage services in a drainage service area which included the City of Louisville, many small incorporated areas of the County, and portions of the unincorporated areas of the County (collectively hereinafter referred to as the "Drainage Service Area"). Substantially all the governmental and corporate functions of the City and the County merged effective January 6, 2003 into a single consolidated local government known as Louisville/Jefferson County Metro Government. The consolidated local government replaced and superseded the governments of the City and the County. The City no longer exists as a separate legal entity.

Purpose of the Series 2020 Notes

The proceeds of the Series 2020 Notes will be used to: (i) pay the costs of issuing the Series 2020 Notes and (ii) refund and retire on October 23, 2020 the District's outstanding Sewer and Drainage System Subordinated Bond Anticipation Notes, Series 2019 (the "Series 2019 Notes"). To the extent the proceeds of the Series 2020 Notes, net of the costs of their issuance, exceed the amount required to refund the Series 2019 Notes, the excess will be used to pay costs of improvements to the District's sewer and drainage system (the "System"), including (a) wastewater and drainage system expansion and improvements; (b) improvements to wastewater treatment facilities; (c) rehabilitation of combined sewer overflow systems; (d) improvements to flood control and drainage facilities; (e) construction of collector sewers; (f) construction and improvements of detention and retention basins; (g) construction of interceptor sewers; (h) combined sewer overflow and sanitary overflow abatement projects; (i) construction and improvements to force mains; (j) repairs and improvements to pumping stations; (k) construction of regional storage facilities; and (l) miscellaneous improvements and acquisition of equipment and mapping hardware and software (collectively, the "Series 2020 Project").

The Series 2020 Project is part of the District's overall capital improvement program, which is more fully described in the Consulting Engineer's Report attached hereto as **Appendix F**.

Security and Source of Payment for the Series 2020 Notes

Pursuant to the provisions of Chapters 58, 65 and 76 of the Kentucky Revised Statutes, as amended (the "Act") and a Subordinated Debt Resolution adopted by the District on April 26, 2010, as supplemented by a Subordinate Debt Sale Resolution adopted by the District on August 24, 2020 (collectively, the "Note Resolution"), the District has pledged to the payment of the principal of, premium, if any, and interest on the Series 2020 Notes as and when same shall become due and payable: (i) the proceeds of the Series 2020 Notes pending their application pursuant to the Note Resolution, (ii) the proceeds of the sale of bonds the District expects to issue to retire the Series 2020 Notes at maturity, (iii) all Revenues, (iv) all amounts on deposit in the Funds or Accounts established under the Bond Resolution (as hereinafter defined) or the Note Resolution, except amounts required to be rebated to the United State Treasury, (iv) such other amounts as may be pledged from time to time by the District as security for the Series 2020 Notes, and (vi) all proceeds of the foregoing.

THE SERIES 2020 NOTES ARE SECURED ON A BASIS INFERIOR AND SUBORDINATE TO BONDS AND OTHER OBLIGATIONS HERETOFORE ISSUED, OR TO BE ISSUED, AND SECURED BY A FIRST LIEN PLEDGE ON THE PLEDGED PROPERTY PURSUANT TO THE BOND RESOLUTION ADOPTED BY THE DISTRICT ON DECEMBER 7, 1992, AS AMENDED MARCH 4, 1993, JUNE 30, 1993, DECEMBER 14, 1994, JANUARY 25, 1996, AND FEBRUARY 24, 2003, AND AS FURTHER SUPPLEMENTED OR AMENDED FROM TIME TO TIME (COLLECTIVELY, THE "BOND RESOLUTION").

THE SERIES 2020 NOTES DO NOT CONSTITUTE AN INDEBTEDNESS OF THE DISTRICT, THE COMMONWEALTH OF KENTUCKY OR ANY POLITICAL SUBDIVISION OR TAXING AUTHORITY THEREOF, INCLUDING THE LOUISVILLE/JEFFERSON COUNTY METRO GOVERNMENT AND THE COUNTY OF JEFFERSON, KENTUCKY, WITHIN THE MEANING OF THE CONSTITUTION OF THE COMMONWEALTH OF KENTUCKY. THE SERIES 2020 NOTES ARE PAYABLE SOLELY FROM THE REVENUES OF THE SYSTEM AND THE ASSETS AND REVENUES PLEDGED THEREFOR UNDER THE RESOLUTION, AND NEITHER THE FAITH AND CREDIT NOR THE TAXING POWER OF THE DISTRICT, THE COMMONWEALTH OF KENTUCKY OR ANY POLITICAL SUBDIVISION OR TAXING AUTHORITY THEREOF, INCLUDING THE LOUISVILLE/JEFFERSON COUNTY METRO GOVERNMENT AND THE COUNTY OF JEFFERSON, KENTUCKY, IS PLEDGED TO THE PAYMENT OF THE PRINCIPAL OF, PREMIUM, IF ANY, AND INTEREST ON THE SERIES 2020 NOTES. THE DISTRICT HAS NO TAXING POWER. (SEE "SECURITY AND SOURCE OF PAYMENT FOR THE SERIES 2020 NOTES," herein).

Description of the Series 2020 Notes

No Early Redemption. The Series 2020 Notes are *not* subject to redemption prior to their maturity (see "THE SERIES 2020 NOTES – Redemption," herein).

Denominations. The Series 2020 Notes will be issued in principal amounts of $5,000 and integral multiples thereof.

Book Entry. The Series 2020 Notes are issuable only as fully registered Series 2020 Notes, without coupons. The Series 2020 Notes, when issued, will be registered in the name of Cede & Co., as nominee of The Depository Trust Company, New York, New York, which will act as securities depository for the Series

2020 Notes. Purchasers will not receive certificates representing their ownership interest in the Series 2020 Notes purchased. So long as DTC or its nominee is the registered owner of the Series 2020 Notes, payments of the principal of and interest due on the Series 2020 Notes will be made directly to DTC. Principal of and interest on the Series 2020 Notes will be paid directly to DTC by The Bank of New York Mellon Trust Company, N.A, as Paying Agent and Registrar (the "Paying Agent" and "Registrar"). See "BOOK-ENTRY SYSTEM" and APPENDIX E - "Book-Entry Only System" herein.

Interest. The Series 2020 Notes will bear interest at the rate set forth on the cover hereof, payable at maturity on October 20, 2021. Interest will be computed on the basis of a 360-day year of twelve thirty-day months, accrued from the date of delivery.

Tax Treatment

In the opinion of Bond Counsel, under the Internal Revenue Code (the “Code”) as presently enacted and construed, interest on the Series 2020 Notes is excludible from gross income for Federal income tax purposes. In rendering this opinion, Bond Counsel has assumed continuing compliance with certain covenants designed to meet the requirements of Section 103 of the Code. Bond Counsel expresses no other opinion as to the federal tax consequences of purchasing, holding or disposing of the Series 2020 Notes. The Series 2020 Notes are exempt from ad valorem taxation, and the interest thereon is exempt from income taxation, by the Commonwealth of Kentucky and all of its political subdivisions and taxing authorities.

The District has not designated the Series 2020 Notes as "qualified tax exempt obligations" under Section 265 of the Code.

See **Appendix D** for the form of the opinion Bond Counsel proposes to deliver in connection with the Series 2020 Notes.

Parties to the Issuance of the Series 2020 Notes

The Paying Agent and Registrar for the Series 2020 Notes is The Bank of New York Mellon Trust Company, N.A. Legal matters incidence to the issuance of the Series 2020 Notes and with regard to the tax-exempt status of the interest thereon are subject to the approving legal opinion of Wyatt, Tarrant & Combs LLP, Louisville, Kentucky, Bond Counsel. Certain legal matters will be passed upon for the District by its General Counsel, Paula M. Purifoy, Esq. The financial advisor to the District with regard to the issuance of the Series 2020 Notes is Robert W. Baird & Co. Incorporated, Louisville, Kentucky.

Authority for Issuance

Authority for the issuance of the Series 2020 Notes is provided by Chapters 58, 65 and 76 of the Kentucky Revised Statutes (the "Act") and the Note Resolution.

Offering and Delivery of the Series 2020 Notes

The Series 2020 Notes are offered when, as and if issued by the District. The Series 2020 Notes will be delivered on or about October 14, 2020 in New York, New York through The Depository Trust Company (DTC).

Disclosure Information

This Official Statement speaks only as of its date, and the information contained herein is subject to change. This Official Statement and the continuing disclosure documents of the District are intended to be made available through one or more repositories. Copies of the basic documentation relating to the Series 2020 Notes, including the Note Resolution and the form of the Series 2020 Notes, are available from the District.

The District has deemed this preliminary Official Statement to be final for the purposes of Securities and Exchange Commission Rule 15c2-12, except for certain information on the cover page hereof which has been omitted in accordance with the Rule and will be included in the final Official Statement.

Additional Information

Additional information concerning this Official Statement, as well as copies of the basic documentation relating to the Series 2020 Notes, is available from Robert W. Baird & Co. Incorporated, Financial Advisor to the District, 500 West Jefferson Street, Suite 700, Louisville, Kentucky 40202, Telephone (502) 588-1763.

Brief descriptions of the Series 2020 Notes, the sources of payment and security for the Series 2020 Notes, the District, the System, the Note Resolution and the Bond Resolution are included in this Official Statement. Certain information with respect to the District is included in the Appendices hereto. Capitalized terms not otherwise defined herein shall have the meanings assigned to them in the Note Resolution. All summaries herein of documents and agreements are qualified in their entirety by reference to such documents and agreements, copies of which are available at the office of the District.

THE SERIES 2020 NOTES

General

The Series 2020 Notes are to be issued only as fully registered notes in denominations of $5,000 or any integral multiple thereof without coupons. The Series 2020 Notes will be dated their date of delivery, will bear interest from that date as described herein, payable at maturity on October 20, 2021.

The Series 2020 Notes shall be payable at the designated office of the Paying Agent and Registrar with respect to principal or premium, if any, in any coin or currency of the United States of America which at the time of payment is legal tender for the payment of public or private debts. All interest will be payable at maturity by check of the Paying Agent mailed to such registered owner who shall appear as of the close of business on the fifteenth day (or if such day shall not be a business day, the preceding business day) of the calendar month next preceding such maturity date on the registration books of the District maintained by the Registrar, or if the registered owner shall be the registered owner of Series 2020 Notes in the aggregate principal amount of $1,000,000 or more, by wire transfer, if the registered owner has requested payment in such manner at such wire address as shall have been furnished by the registered owner on or prior to the fifteenth day next preceding the maturity date of the Series 2020 Notes (or if such date shall not be a business day, the next succeeding business day).

Each registered Series 2020 Note shall be transferable only upon the books of the Registrar, at the request of the registered owner thereof or by his authorized attorney upon surrender thereof together with an assignment satisfactory to the Registrar duly executed by the registered owner or his duly authorized attorney. Upon the transfer of any such Series 2020 Note, the District shall issue in the name of the transferee a new registered Series 2020 Note or Series 2020 Notes of any authorized denominations and of the same aggregate principal amount as the surrendered Series 2020 Note. If any Series 2020 Note is mutilated, lost, stolen or destroyed, the District will execute and deliver a new Series 2020 Note in accordance with the Note Resolution.

No Early Redemption

The Series 2020 Notes are *not* subject to redemption prior to their stated maturity.

Book Entry System

The Series 2020 Notes initially will be issued solely in book entry form to be held in the book-entry only system maintained by DTC. So long as such book-entry system is used, only DTC will receive or have the right to receive physical delivery of Series 2020 Notes and Beneficial Owners will not be or be considered to be, and will not have any rights as, owners or holders of the Series 2020 Notes under the Note Resolution. For additional information about DTC and the book-entry-only system see "APPENDIX E – Book-Entry Only System."

THE INFORMATION IN THIS SECTION AND IN APPENDIX E CONCERNING DTC AND DTC'S BOOK-ENTRY SYSTEM HAS BEEN OBTAINED FROM SOURCES THAT THE DISTRICT BELIEVES TO BE RELIABLE, BUT THE DISTRICT TAKES NO RESPONSIBILITY FOR THE ACCURACY THEREOF.

Exchange and Transfer

The registration of any Series 2020 Note may be transferred only upon the books of the District kept by the Registrar, by the owner thereof, in person or by his or her attorney duly authorized in writing, upon surrender of such Series 2020 Note at the designated office of the Registrar accompanied by a written instrument of transfer satisfactory to the Registrar and duly executed by the owner or by his or her duly authorized attorney. Any Bond may be exchanged at the designated office of the Registrar for new Series 2020 Notes of any authorized denominations and of the same aggregate principal amount of Series 2020 Notes as the surrendered Series 2020 Note. The Registrar will not charge for any new bond issued upon any transfer or exchange, but may require the owner requesting such exchange to pay any tax, fee or other governmental charge required to be paid with respect to such exchange or transfer. Neither the District nor the Registrar is required to exchange or transfer any Bond during the period commencing on the fifteenth day of the month preceding an interest payment date and ending on such interest payment date.

PLAN OF FINANCE

The proceeds of the Series 2020 Notes will be used to: (i) pay the costs of issuing the Series 2020 Notes; (ii) refund and retire on October 23, 2020 the Series 2019 Notes; and (iii) pay the costs of capital improvements to the System. Any premium received from the sale of the Series 2020 Notes may be used for (i) permitted construction expenditures or (ii) to pay the costs of issuing the Series 2020 Notes.

Sources and Uses of Funds

Sources	
Principal Amount of Series 2019 Notes	$226,340,000.00
Original Issue Premium	10,972,963.20
Amount on Deposit in Debt Service Account	7,299,465.00
TOTAL	$244,612,428.20

Uses	
Retirement of Series 2019 Notes	$233,639,465.00
Construction Fund	10,808,932.34
Costs of Issuance	146,150.00
Underwriter's Discount	17,880.86
TOTAL	$244,612,428.20

DEBT SERVICE REQUIREMENTS

		Series 2020C Debt Service						
Fiscal Year Ending 6/30	Total Senior Lien Bond Debt Service(1)(2)	Principal	Interest	Total P+I	Direct Payments(3)	Net Senior Lien Bond Debt Service	Subordinated Debt Service(4)(5)	Total Net Debt Service(6)
2021	$135,132,970.88	$1,275,000.00	$1,358,579.40	$2,633,579.40	($10,359,939.45)	$127,406,610.83	$11,251,039.46	$138,657,650.29
2022	136,961,981.28	1,185,000.00	2,325,295.76	3,510,295.76	(10,359,939.45)	130,112,337.59	8,440,917.47	138,553,255.06
2023	137,170,981.28	1,190,000.00	2,321,740.76	3,511,740.76	(10,359,939.45)	130,322,782.59	12,577,471.91	142,900,254.50
2024	132,402,481.28	3,000,000.00	2,315,671.76	5,315,671.76	(10,359,939.45)	127,358,213.59	17,843,690.61	145,201,904.20
2025	133,330,931.28	3,065,000.00	2,294,071.76	5,359,071.76	(10,359,939.45)	128,330,063.59	17,889,117.61	146,219,181.20
2026	129,564,681.28	3,130,000.00	2,267,406.26	5,397,406.26	(10,359,939.45)	124,602,148.09	24,299,861.93	148,902,010.02
2027	144,742,306.28	1,220,000.00	2,231,098.26	3,451,098.26	(10,359,939.45)	137,833,465.09	11,072,332.61	148,905,797.70
2028	135,252,643.78	3,220,000.00	2,215,116.26	5,435,116.26	(10,359,939.45)	130,327,820.59	17,811,151.44	148,138,972.03
2029	135,372,912.52	3,300,000.00	2,164,240.26	5,464,240.26	(10,359,939.45)	130,477,213.33	17,666,818.42	148,144,031.75
2030	115,646,050.02	3,355,000.00	2,111,440.26	5,466,440.26	(10,359,939.45)	110,752,550.83	37,392,853.85	148,145,404.68
2031	93,916,843.78	3,420,000.00	2,054,405.26	5,474,405.26	(10,220,525.00)	89,170,724.04	59,108,172.02	148,278,896.06
2032	94,468,243.78	3,485,000.00	1,993,529.26	5,478,529.26	(10,220,525.00)	89,726,248.04	59,555,004.89	149,281,252.93
2033	93,890,787.52	3,585,000.00	1,928,011.26	5,513,011.26	(10,220,525.00)	89,183,273.78	60,097,307.19	149,280,580.97
2034	154,236,875.02	3,410,000.00	1,857,028.26	5,267,028.26	(10,220,525.00)	149,283,378.28	-	149,283,378.28
2035	148,406,287.52	9,240,000.00	1,788,828.26	11,028,828.26	(10,220,525.00)	149,214,590.78	-	149,214,590.78
2036	135,333,993.76	22,505,000.00	1,594,788.26	24,099,788.26	(10,220,525.00)	149,213,257.02	-	149,213,257.02
2037	153,648,031.26	4,690,000.00	1,099,678.26	5,789,678.26	(10,220,525.00)	149,217,184.52	-	149,217,184.52
2038	153,584,231.26	4,865,000.00	988,056.26	5,853,056.26	(10,220,525.00)	149,216,762.52	-	149,216,762.52
2039	155,555,531.26	5,045,000.00	872,512.50	5,917,512.50	(10,220,525.00)	151,252,518.76	-	151,252,518.76
2040	154,163,536.26	4,740,000.00	738,820.00	5,478,820.00	(8,393,859.26)	151,248,497.00	-	151,248,497.00
2041	151,617,656.26	5,470,000.00	613,210.00	6,083,210.00	(6,453,125.00)	151,247,741.26	-	151,247,741.26
2042	149,487,743.76	5,675,000.00	468,255.00	6,143,255.00	(4,383,859.38)	151,247,139.38	-	151,247,139.38
2043	147,278,356.26	5,885,000.00	317,867.50	6,202,867.50	(2,233,875.00)	151,247,348.76	-	151,247,348.76
2044	93,554,956.26	6,110,000.00	161,915.00	6,271,915.00	-	99,826,871.26	-	99,826,871.26
2045	100,900,943.76	-	-	-	-	100,900,943.76	-	100,900,943.76
2046	100,897,150.00	-	-	-	-	100,897,150.00	-	100,897,150.00
2047	74,648,287.50	-	-	-	-	74,648,287.50	-	74,648,287.50
2048	31,287,887.50	-	-	-	-	31,287,887.50	-	31,287,887.50
2049	6,550,437.50	-	-	-	-	6,550,437.50	-	6,550,437.50
2050	6,552,000.00	-	-	-	-	6,552,000.00	-	6,552,000.00
	$3,535,557,720.10	$112,065,000.00	$38,081,565.82	$150,146,565.82	($217,048,838.14)	$3,468,655,447.78	$355,005,739.39	$3,823,661,187.17

Notes:

(1) On March 25, 2020, the District entered into a Forward Delivery Bond Purchase Agreement with an institutional investor providing for the sale of the District's Sewer and Drainage System Revenue Bonds, Series 2021A in the principal amount of $246,555,000 to be issued and delivered on August 17, 2021. The proceeds of the sale of the Series 2021A Bonds will be used to redeem and refund on November 15, 2021 all of the District's Series 2011A Bonds outstanding on that date. The Series 2011A Bonds are included in this table as outstanding because they have not been legally defeased. See "RECENT AND PENDING TRANSACTIONS OF THE DISTRICT" herein.

(2) Total Senior Lien Bond Debt Service excludes debt service on the District's refunded 2013C Bonds and includes the debt service on the District's Series 2020C Bonds. See "RECENT AND PENDING TRANSACTIONS OF THE DISTRICT " below regarding the District's expected issuance of its Series 2020C Bonds for the purpose of advance refunding the oustanding Series 2013C Bonds.

(3) Due to sequestration, the federal direct payments on the Louisville and Jefferson County Metropolitan Sewer District Sewer and Drainage System Revenue Bonds, Series 2009C Build America Bonds and Louisville and Jefferson County Metropolitan Sewer District Sewer and Drainage System Revenue Bonds, Series 2010A Build America Bonds were reduced by 5.7% for fiscal years 2020 through 2030. For fiscal years 2024 through 2043, the federal direct payments are assumed at the original rate due on the outstanding Series 2009C BABs and 2010A BABs.

(4) Includes estimated net swap payments based on the 1-month LIBOR 5-year average as of August 18, 2020 (1.28%).

(5) Subordinated debt service for FY 2021 takes into account the original issue premium received on the sale of the 2019 BAN; the net premium of $4,102,839.54 was subtracted from the gross interest of $7,299,465.00, resulting in a net interest payment of $3,196,625.46 for FY 2021. Subordinated debt service for FY 2022 takes into account the original issue premium received on the sale of the 2020 BAN; the net premium of $11,119,43.20 was subtracted from the gross interest of $11,505,616.67, resulting in a net interest payment of $386,503.47 for FY 2022.

(6) Does not include the principal of the Series 2019 Bond Anticipation Notes payable at maturity.

SECURITY AND SOURCES OF PAYMENT FOR THE SERIES 2020 NOTES

The Series 2020 Notes are special and limited obligations of the District payable solely from and secured as to the payment of the principal and interest thereon, in accordance with their terms and the provisions of the Note Resolution, solely by the Pledged Property which is defined by the Note Resolution to be the proceeds of the sale of the Series 2020 Notes, the proceeds of the sale of bonds the District expects to issue to retire the Series 2020 Notes at maturity, all Revenues, all amounts on deposit in the Funds or Accounts established under the Bond Resolution or Note Resolution, except amounts required to be rebated to the United State Treasury, such other amounts as may be pledged from time to time by the District as security for the payment of bonds, notes or other evidences of indebtedness authenticated and delivered pursuant to the Bond Resolution or Note Resolution, and all proceeds of the foregoing.

The Series 2020 Notes are secured by and payable solely from pledged revenues derived from the collection of rates, rents and charges for the services rendered by the System as set forth in the Note Resolution. The Series 2020 Notes do not constitute an indebtedness of the Louisville/Jefferson County Metro Government or the County of Jefferson, Kentucky.

THE SERIES 2020 NOTES ARE SECURED ON A BASIS INFERIOR AND SUBORDINATE TO BONDS AND OTHER OBLIGATIONS HERETOFORE ISSUED, OR TO BE ISSUED, AND SECURED BY A FIRST LIEN PLEDGE ON THE PLEDGED PROPERTY PURSUANT TO THE BOND RESOLUTION ADOPTED BY THE DISTRICT ON DECEMBER 7, 1992, AS AMENDED MARCH 4, 1993, JUNE 30, 1993, DECEMBER 14, 1994, JANUARY 25, 1996, AND FEBRUARY 24, 2003, AND AS FURTHER SUPPLEMENTED OR AMENDED FROM TIME TO TIME (COLLECTIVELY, THE "BOND RESOLUTION").

The District has heretofore issued its Sewer and Drainage System Revenue Bonds outstanding in the amounts shown below (the "Outstanding Bonds"), each series of which ranks on a basis superior to the Series 2020 Notes as to the pledge of Pledged Property.

Series	Dated Date	Original Principal Amount	Principal Amount Outstanding*
Series 2009C	24-Nov-09	$180,000,000	180,000,000
Series 2010A	30-Nov-10	330,000,000	330,000,000
Series 2011A	24-Aug-11	263,360,000	246,225,000
Series 2013A	23-May-13	115,790,000	115,790,000
Series 2013B	23-May-13	119,515,000	112,575,000
Series 2013C**	27-Nov-13	100,000,000	99,250,000
Series 2014A	25-Nov-14	80,000,000	79,750,000
Series 2015A	21-Oct-15	175,000,000	173,160,000
Series 2015B	21-Oct-15	81,750,000	71,515,000
Series 2016A	30-Aug-16	150,000,000	149,290,000
Series 2016B	30-Aug-16	28,315,000	23,915,000
Series 2016C	30-Aug-16	67,685,000	50,515,000
Series 2017A	22-Aug-17	175,000,000	161,895,000
Series 2017B	29-Aug-17	35,725,000	32,885,000
Series 2018A	31-May-18	60,380,000	60,380,000
Series 2019	19-Aug-19	30,910,000	24,770,000
Series 2020A	30-Jul-20	225,000,000	225,000,000
		$2,218,430,000	$2,136,915,000

* As of September 1, 2020

** The 2013C Bonds are to be advance refunded and defeased by the 2020C Bonds as described herein.

As provided in the Bond Resolution, Additional Bonds may be issued on a parity with the Outstanding Bonds to finance the Cost of Acquisition and Construction of Additional Facilities upon the satisfaction of certain conditions. The Bond Resolution further provided that Refunding Bonds may be issued from time to time to refund outstanding obligations. The Series 2020 Notes will be inferior and subordinate as to the pledge of the Pledged Property with respect to any such Additional Bonds or Refunding Bonds issued on a parity with the Outstanding Bonds. The District recently issued $225,000,000 of Refunding Bonds designated as its Sewer and Drainage System Revenue Refunding Bonds, Series 2020A and anticipates the future issuance of Additional Bonds in connection with the District's Capital Improvement Program described in "Appendix F - Consulting Engineer's Report." Furthermore, the District anticipates issuing Additional Bonds to retire the Series 2020 Notes at maturity. For additional information relating to the conditions for the issuance of Additional Bonds see Appendix A – Definitions of Certain Terms and Summary of Provisions of the Bond Resolution and Note Resolution- Summary of Certain Provisions of the Bond Resolution – Additional Bonds".

SWAPS, SUBORDINATED DEBT, AND OTHER FINANCIAL INSTRUMENTS

General

The District has entered into interest rate swap agreements with two counterparties as part of the management of its outstanding debt. Generally, each interest rate swap agreement calls for periodic net payments from or to the District depending upon whether a specified market interest rate index is above or below a specified fixed rate or another specified market interest rate index during that period. Each such swap agreement allows the District, at its option, to terminate the agreement at any time. Upon any such termination, a termination payment is to be made, calculated based on the mark-to-market value of the swap agreement plus dealer's spread. The swap agreements provide that under certain circumstances the counterparty to the swap agreement (but not the District) may be required to post collateral, depending upon the credit rating of that counterparty, with the amount of collateral required based on the mark-to-market value of the swap. The interest rate swap agreements entered into by the District provide that the counterparties to the agreements must post collateral if their respective ratings fall below A+/A 1. The agreements also provide the counterparties the right to terminate the agreements if the District's unenhanced bond rating is downgraded below BBB/Baa. The District's obligations under all of its outstanding swap agreements are unsecured and subordinate to all Bonds issued and outstanding under the Bond Resolution. Certain provisions of the District's outstanding swap agreements are summarized below.

The Bond Resolution permits the District to issue Senior Subordinated Debt secured by Revenues of the System, subject to the prior and senior lien on such Revenues of all Bonds issued and outstanding under the Bond Resolution. The decision of the District from time to time whether to issue Senior Subordinated Debt or Bonds depends, among other things, upon its assessment of market conditions at the time of issuance.

To provide interim financing for its capital projects, the District has issued and continues to issue as Senior Subordinated Debt under the Note Resolution the District's Sewer and Drainage System Subordinated Bond Anticipation Notes, including the outstanding Series 2019 Notes and the Series 2020 Notes offered hereby. Each series of such Notes has been or will be retired with the proceeds of renewal Notes issued under the Note Resolution, including the retirement of the Series 2019 Notes with proceeds of the Series 2020 Notes as described herein, or with the proceeds of Refunding Bonds issued under the Bond Resolution.

The District has from time to time entered into agreements with various counterparties to provide for the investment of amounts in various funds established under the Bond Resolution or the Note Resolution. Generally such agreements provide for the investment of funds at a contractually fixed rate of return to the District during their respective terms and provisions for termination, at the option of the District, based on payment of a termination fee determined based on the mark-to-market value of the contract plus dealer's spread.

The District reserves the right to enter into, amend, and terminate any existing or future interest rate swap transactions or other agreements or derivative transactions, from time to time, as part of its overall debt, investment or general management strategy. See also "APPENDIX A — Definitions of Certain Terms and Summary of Provisions of the Bond Resolution and Note Resolution".

Floating-to-Fixed Swap

In 2001, the District entered into two forward-starting interest rate swaps (the "1999 Swaps") pursuant to which beginning in November 2009 the District would pay a fixed rate of 4.4215% and receive 67% of the 30-day LIBOR index on a notional amount corresponding to the approximate amount needed to refund the District's Series 1999 Bonds. The District's original strategy in entering into the 1999 Swaps was to "lock in" a fixed rate for the variable rate debt that could be issued in 2009 to refund the Series 1999 Bonds. In August 2009, the District decided instead to refund the Series 1999 Bonds with proceeds of its fixed rate Series 2009B Bonds and its fixed rate Series 2009A Notes. The Series 2009A Notes were refunded by the fixed rate Series 2010A Notes, which were currently refunded by the Series 2011A Notes, which were then in turn refunded by the Series 2011B Notes. The Series 2011B Notes were subsequently currently refunded by the Series 2012A Notes, which in turn were currently refunded by subsequent sequential series of refunding notes, the latest in such series of refunding notes being the currently outstanding Series 2019 Notes. The Series 2019 Notes will be currently refunded with the proceeds of Series 2020 Notes.

In August 2009, the District reversed that portion of the 1999 Swaps which corresponded in amount and amortization schedule to the portion of the Series 2009B Bonds used to refund the Series 1999 Bonds. The reversed portions of the 1999 Swaps were subsequently terminated in April 2013. The only portion of the 1999 Swaps that remain in effect is the non-reversed portion of the 1999 Swaps, which has a termination date of May 15, 2033 and amortizes in amounts that correspond with the expected maturity structure of a future hypothetical bond issue the District may issue under the Bond Resolution to permanently refinance the Series 2020 Notes. The District's expectation is that variable payments received under the non-reversed portion of the 1999 Swaps will hedge future interest rate movements for any fixed-rate Bonds hereafter issued under the Bond Resolution (or any other fixed rate renewal notes hereafter issued under the Subordinated Debt Resolution) to refinance the Series 2020 Notes. See “Note 7 – Long Term Debt” in “Appendix B -- Audited Financial Statements for the Fiscal Year ended June 30, 2019. As of August 31, 2020, the estimated aggregate mark-to-market value of the non-reversed portion of the 1999 Swaps was approximately *negative* $90,109,412.

The District has not yet begun to renegotiate with the counterparties to its outstanding interest rate swaps the replacement of 30-day LIBOR as the reference rate for the payments it receives under those swaps when LIBOR is expected to be discontinued after 2021. The District is unable at the present time to predict the outcome of those renegotiations.

Commercial Paper Program

On May 29, 2018 the District adopted a resolution (the “Program Note Resolution”) authorizing the issuance of its Sewer and Drainage System Subordinated Program Notes (“Program Notes”), consisting of Commercial Paper Notes and Direct Purchase Notes, for the purpose of (i) financing the cost of improvements or additions to the System and (ii) refinancing other Program Notes. Program Notes are issued as Senior Subordinated Debt of the District, secured, on a parity with the Series 2020 Notes offered by this Official Statement and any other outstanding or hereafter issued Senior Subordinated Debt of the District, by a subordinate and junior lien on the Revenues of the System, subject to the prior and senior lien on such Revenues of all Bonds issued and outstanding under the Bond Resolution. Program Notes (both

Commercial Paper Notes and Direct Purchase Notes) may be issued in an aggregate principal amount not to exceed $500,000,000 at any one time outstanding.

Commercial Paper Notes may be issued and sold, at public or private sale, as taxable or tax-exempt notes, maturing in 270 days or less (but not later than July 1, 2021) as determined by the District, and bearing interest at a rate or rates determined by the District (not in excess of 12% per annum for taxable notes or 10% per annum for tax-exempt notes). Commercial Paper Notes are payable only from (i) proceeds of the sale of other Commercial Paper Notes issued under the Program Note Resolution and used to refund outstanding Commercial Paper Notes, (ii) the proceeds of Direct Purchase Notes or other loans from the Banks (as defined below) used to refund outstanding Commercial Paper Notes, and (iii) the proceeds of Bonds issued to pay outstanding Commercial Paper Notes.

Liquidity support for each subseries of Commercial Paper Notes issued under the Program Note Resolution is provided by Bank of America, N.A. or JPMorgan Chase Bank, National Association (each a "Bank" and collectively the "Banks"). As an alternative to the sale of Commercial Paper Notes to investors, the Program Note Resolution authorizes the District in its discretion to issue and sell to the Banks, as Senior Subordinated Debt of the District under the Program Note Resolution, Direct Purchase Notes, evidencing loans from the Banks to the District. Direct Purchase Notes shall mature (but not later than July 1, 2021) and bear interest as provided in the respective note purchase agreement between the District and each Bank and may be issued only as tax-exempt notes. The note purchase agreement between the District and one of the Banks provides that until the termination of such agreement at no time shall the aggregate principal amount of Direct Purchase Notes held by such Bank be less than $100,000. The District has begun negotiations with both Banks for an extension of their respective Commercial Paper liquidity support facilities to June 30, 2023.

The District expects to issue Bonds from time to time under the Bond Resolution to retire any Program Notes (Commercial Paper Notes or Direct Purchase Notes) outstanding at maturity and not to be refunded with other Program Notes. On July 30, 2020, the District issued its Sewer and Drainage System Revenue Refunding Bonds, Series 2020A in the aggregate principal amount of $225,000,000 for the purpose of paying and retiring outstanding Commercial Paper Notes maturing within 90 days after the issuance of the Series 2020A Bonds.

As of August 31, 2020, there was issued and outstanding under the Program Note Resolution, in addition to the $100,000 minimum outstanding principal amount of Direct Purchase Notes, $135,000,000 aggregate principal amount of Commercial Paper Notes with a term to maturity of not more than one hundred one days and an interest rate of not more than 0.32% per annum.

THE DISTRICT

General

The District was created and established pursuant to the Act, as a public body corporate, in 1946, in the interest of the public health and for the purpose of providing adequate sewer and drainage facilities. The District had complete jurisdiction, control, possession, and supervision of the then existing sewer and drainage system in the City and the power and authority to operate, maintain, reconstruct, and improve such system and construct additions, betterments, and extensions thereto within the limits of the District area as defined in the Act. The District assumed jurisdiction over and administration of the then existing sewer and drainage system in the City on November 16, 1946, pursuant to Ordinance No. 90, Series 1946, passed by the Board of Aldermen of the City and approved by the Mayor thereof in accordance with the requirements of the Act.

Administration and Management of the District

The business, activities, and affairs of the District are managed, controlled, and conducted by a board (the "Board"), composed of eight members, not more than five of whom shall be affiliated with the same political party. The members are appointed by the Mayor subject to the approval of the Council of the Louisville/Jefferson County Metro Government ("Metro Council"). All appointments to the Board are made for three-year terms. The present members of the Board and the expiration dates of their respective terms are as follows.

Board Members	Term Expires
Marita Willis (Chair)	June 30, 2022
Daniel Arbough (Vice-Chair)	June 30, 2021
Andrew Bailey	July 31, 2021
Jason Williams	February 28, 2021
Keith Jackson	August 31, 2023
J.T. Sims	July 31, 2023
Cyndi Caudill	August 31, 2020
Ricky Mason	July 31, 2022

The Board has delegated and placed the conduct of the day-to-day business affairs of the District under the direction of an Executive Director supported by administrative, engineering, legal and business staffs. Short biographies of key members of the District's senior management team are set forth below:

James A. Parrott, Executive Director and Secretary-Treasurer

James A. "Tony" Parrott has served as the Executive Director of the District since July 2015, having been appointed to this role after 30 years in the public utility business, including 10 years in the top leadership role of the Metropolitan Sewer District of Greater Cincinnati. He holds a Communications Degree from Georgetown College and sits on the Board of Directors for the National Association of Clean Water Agencies. On February 26, 2019, the District's employment agreement with Mr. Parrott to serve as Executive Director was extended through September 13, 2023.

David Johnson, Chief Engineer

David Johnson has been employed by the District for 22 years, all within the Engineering Division. He most recently served as the Development and Storm Water Services Director before being promoted to Chief Engineer in 2020. Mr. Johnson is a Licensed Professional Engineer in the Commonwealth of Kentucky and holds a Bachelor of Science and a Master of Engineering Degree from the J.B. Speed School of Engineering at the University of Louisville. On March 23, 2020, Mr. Johnson entered into an employment agreement with the District to serve as Chief Engineer through March 23, 2021, subject to automatic renewal for up to four additional one-year renewal periods.

Brian Bingham, Chief of Operations

Brian Bingham join the District in 2004 as the Regulatory Services Director to oversee the development and implementation of the Wet Weather Consent Decree. He assumed oversight of the District's Operations Group, including Wastewater, Drainage, and Flood Protection, in 2013. His previous experience includes 20 years of engineering and program management in the private consulting engineering business. Mr. Bingham has a Bachelor of Science degree in Civil Engineering from the J. B. Speed School of Engineering at the University of Louisville.

Brad Good, Chief Financial Officer

Brad Good has been employed by the District as Controller since 2016 and was promoted to Chief Financial Officer in 2020. His previous experience includes 15 years in various accounting and finance positions in the hotel industry. Mr. Good is a certified public accountant and has a Bachelor of Science degree in Animal Science from Kansas State University and a post-baccalaureate degree in accounting from Indiana University Southeast.

Angela Akridge, Chief Strategy Officer

Angela Akridge began working for the District as an engineering cooperative education intern and upon completion of her civil engineering bachelor's and master's degrees from the University of Louisville Speed Scientific School, she joined the District as a full-time employee. Since that time she has served the community through multiple leadership, management and technical positions throughout her 27+ years at the District. She was appointed MSD's Chief Engineer in 2015 and most recently appointed to the newly created position of Chief Strategy Officer for Business Transformation and Regulatory Compliance in 2019.

Lynne Fleming, Human Resources Director

Lynne Fleming has been the District's Director of Human Resources since January 2012. She has over 18 years' experience in HR having previously served the City of Louisville and Louisville Metro Government as Assistant Director of Human Resources. Ms. Fleming is a licensed attorney. During her 8 years with the City of Louisville Law Department, Ms. Fleming focused her practice in the areas of labor and employment law and civil rights litigation. She was also a litigator in the adult trial division of the Louisville-Jefferson County Public Defender's Office for the first 8 years of her legal career. Ms. Fleming has a Bachelor of Arts degree in International Affairs with a Business Concentration from Xavier University and a Juris Doctor degree from the University of Louisville Brandeis School of Law.

Paula Purifoy, General Counsel and Legal Director

Paula Purifoy joined the District in 2002 and has served as the District's General Counsel and Legal Director since 2007. She leads the District's legal division, advising the District's executive leadership team on a wide variety of legal and business matters, and also serves as Counsel to the District's Board. Prior to joining the District, Ms. Purifoy was in private practice at law firms representing both government and private companies. Ms. Purifoy holds a Bachelor of Arts in Political Science and Juris Doctor degrees from the University of Louisville.

René Patterson-Lindsay, Chief Procurement Officer

René Patterson-Lindsay has been employed by the District since 1994 and was promoted to Chief Procurement Officer in 2018. During her tenure she has worked the last 24 years in Procurement and Supplier Diversity. Ms. Lindsay is a certified public procurement officer and has a Bachelor of Science degree in Business Administration from Spalding University.

Kimberly Reed, Chief Innovation Officer

Kim Reed has been the Chief Innovation Officer of the District since March of 2019. She previously worked for the Louisville Water Company in various leadership positions. She has had a diverse career of over 20 years in the electric, gas, water, and waste water utility industries. Ms. Reed has a

Bachelor of Science in Chemical Engineering and a Master of Business Administration (MBA), both from the University of Louisville.

Tom Luckett, Chief Information Officer

Tom Luckett has been the One Water chief information officer of the Louisville Water Company and the Metropolitan Sewer District since 2016. His previous experience includes information technology leadership and technical positions in the finance, transportation, and global manufacturing industries. Mr. Luckett has over forty-five years of experience in the field of information technology. He holds a Ph.D. in Leadership, an MBA, and B.S. in business administration degrees.

The Sewer System

The District is authorized by KRS Chapter 76 to provide wastewater collection, treatment, and disposal services in Jefferson County. Through inter-local agreements, the District also provides wastewater collection, treatment, and disposal services to portions of Oldham County and Bullitt County. The District's sewer system extends throughout much of the developed portions of Jefferson County and includes approximately 600 miles of combined sewers (which carry sanitary wastewater during dry weather and a combination of stormwater and sanitary wastewater during wet periods), 2,700 miles of sanitary sewers, more than 260 pumping stations, five regional Water Quality Treatment Centers, and an estimated 1,400 miles of lateral connections to buildings.

The District's wastewater treatment capacity as of June 30, 2020 was as follows:

WASTEWATER TREATMENT PLANT CAPACITY

Plant	Current Capacity MGD	Avg Daily Flow MGD	Eventual Capacity MGD	Customer Base Residential	Customer Base Commercial	Customer Base Industrial	Year Total	Built	Treatment Process
Morris Forman	120.0	100.6	120.0	120,233	13,810	309	134,352	1958	Secondary added in 1976.
Derek R. Guthrie	60.0	55.9	60.0	64,079	3,773	38	67,890	1986	Secondary
Hite Creek	6.0	4.9	9.0	10,989	665	9	11,663	1970	Tertiary: sand filter
Cedar Creek	7.5	7.2	11.3	18,432	1,084	11	19,527	1995	Tertiary: sand filter
Floyd's Fork	6.5	4.8	9.8	9,752	568	5	10,325	2001	Tertiary: sand filter
Total Treatment System	200.0	173.4	215.1	223,485	19,900	372	243,757		

MGD: Million Gallons per Day
Source: Metropolitan Sewer District

The Drainage System

Under an interlocal government cooperation agreement effective January 1, 1987, the District became the sole local authority for providing flood control and storm water drainage services in the Drainage Service Area. The District is responsible for the operation, maintenance, replacement, improvements and additions to existing flood control facilities and public storm water drainage facilities within the Drainage Service Area. The stormwater drainage system is comprised of various types of facilities to collect, convey, retain, and discharge stormwater runoff into the sewers, rivers, streams, and creeks eventually draining into the Ohio River. These facilities include open channels, ditches, streams, ponds, pipes, culverts, conduits, bridge structures, detention basins, retention basins, pump stations, and other facilities. By having a single authority responsible for drainage services and a dedicated source of revenue, the community benefits by having a more efficient, cost effective drainage service program.

One Water Initiative

In January of 2012 Mayor Greg Fischer of the Louisville/Jefferson County Metro Government formed the Louisville Utilities and Public Works Advisory Group (the "Advisory Group") to examine the operations of the Louisville Water Company, a Kentucky corporation wholly owned as a public enterprise by the Louisville/Jefferson County Metro Government ("Louisville Water Company"), the District, and Metro Government's Department of Public Works & Assets ("DPW") to determine whether synergies exist between the entities that would allow for improved service or reduced costs. The Advisory Group, along with efforts of an experienced utility industry consulting corporation, and of due diligence teams of the District and Louisville Water Company, produced a final Report on Due Diligence Analysis and Recommendation in February 2014. As a result of those efforts, the District and the Board of Waterworks of the Louisville/Jefferson County Metro Government, the governing body of the Louisville Water Company (the "Board of Waterworks") entered into an Interlocal Cooperation Agreement (the "Original ILA") on March 11, 2014, as approved by the Kentucky Attorney General on March 31, 2014. The Original ILA, effective through June 30, 2033 (unless earlier terminated by either party on six months' notice), provided for, among other items, the joint and/or cooperative development, provision, sharing and management of certain back-office, administrative and/or support services. The goal of the ILA is to create coordinated teams of employees from both entities with the capability of delivering superior customer service at lower costs than would a combination of the existing two entities.

On August 24, 2015, the District and the Board of Waterworks entered into an Amended and Restated Interlocal Cooperation Agreement (the "Amended ILA," and together with the Original ILA, the "ILA"), as approved by the Kentucky Attorney General on September 17, 2015. The Amended ILA was entered into to establish a joint administrative board known as the One Water Board and to provide for more efficient implementation and expansion of the services provided in the Original ILA. The One Water Board consists of two members each from the District's Board and the Board of Waterworks and a member appointed by the Mayor. The One Water Board is responsible for the overall administration of the One Water shared and/or consolidated services program. The Amended ILA is effective through June 30, 2035 (unless earlier termination by either party on 180 days' notice).

The One Water Board created a three-year strategic plan in 2018 and has developed various initiatives for the sharing of services in five functional groups plus one specialty area of focus. The five functional groups are procurement, fleet, human resources, information technology, and customer service. The specialty area of focus is energy savings. Through the One Water Partnership's shared services program (consisting of various shared contracts, shared labor/resources and shared processes), Louisville Water Company and the District strive to achieve the Partnership's mission of improving the customer experience, creating efficiencies, and driving revenue growth.

THE SERVICE AREA

The combined area of the former City and the County ("Louisville Metro") is located in the north-central portion of the Commonwealth on the south bank of the Ohio River. Louisville Metro is the largest city in Kentucky and is the core of the Louisville Metropolitan Statistical Area (MSA) which includes, in addition to Louisville Metro, the counties of Bullitt, Oldham and Shelby, in Kentucky, and Clark, Floyd, and Harrison, in Indiana. The Louisville MSA has exhibited a nationally familiar pattern of population dispersion from its core urban area to the balance of Louisville Metro, and from Louisville Metro to the adjacent counties in Kentucky and Indiana.

Annual Population Estimates

	Louisville Metro(1)	Louisville MSA(2)

1970	695,000	991,801
1980	684,300	1,054,368
1990	665,200	1,058,425
2000	693,604	1,161,975
2010	741,096	1,267,691
2011	746,906	1,310,945
2014	760,026	1,269,702
2015	763,623	1,278,413
2016	765,352	1,350,207
2017	771,158	1,293,953
2018	770,517	1,297,301
2019	766,757	1,265,108

(1)Source: Population Division, U.S. Census Bureau website: www.census.gov (Jefferson County, KY)
(2)Source: Population Division, U.S. Census Bureau website: www.census.gov (Louisville/Jefferson County, KY-IN)

Louisville Metro possesses a diverse economic base which has exhibited the national pattern of a shift away from manufacturing towards services. In 2019 the average per capita personal income in Louisville-Jefferson County as reported by the U.S. Bureau of Economic Analysis was $54,357.

Louisville Metro Major Employers

Rank	Company	Employment
1	United Parcel Service, Inc.	25,090
2	Jefferson County Public Schools	14,484
3	Norton Healthcare, Inc.	13,828
4	Ford Motor Co.	13,020
5	Humana Inc.	12,360
6	UofL Health Inc.	12,000
7	The Kroger Co.	9,300
8	Baptist Healthcare System Inc.	7,346
9	Walmart Inc.	6,650
10	University of Louisville	6,620

Source: *Louisville Business First* (7/17/20)

RATES AND CHARGES

Wastewater Service and Drainage Service Charges

The District derives its revenue for wastewater service and drainage service from the collection of rates, rentals and charges established in accordance with the provisions of the Act for services rendered within the Service Area to customers served by the District's facilities. Wastewater Service Rates and Drainage Service Rates, are billed and collected by Louisville Water Company on behalf of the District under terms of an agreement executed in January 2013 and ending in December 2027. These rates are billed simultaneously with the water bill on a single statement payable in total for wastewater, drainage and water service rendered. Customers are billed bimonthly except for larger industrial/commercial accounts which are billed monthly. In the event of nonpayment of any such wastewater rates, rentals, or charges for a period of more than 30 days after they become due and payable, Louisville Water Company is required by law to discontinue water service.

The District wastewater service rates include a fixed service charge based on the size of the public water meter serving the property plus a charge for each 1,000 gallons of water consumed on the premises. Each customer has the option of installing private meters to record water usage which does not enter the sewers. Industrial and commercial customers may use this option to obtain credit for water which does not enter the sewers. Drainage service rates are charged based on measured impervious areas with one equivalent service unit assigned for each 2,500 square feet of impervious area (residential unit). Out of a total of 259,125 wastewater customer accounts, approximately 35 accounts have no public water meter because they are residential accounts served by well water. Such accounts are charged a fixed fee.

The District's wastewater and drainage service revenues for the past five fiscal years were as follows:

	Wastewater Revenue (dollars in thousands)					Drainage Revenue (dollars in thousands)				
Fiscal Year	Residential	Commercial	Industrial	Other	Total	Residential	Commercial	Industrial	Other	Total
2016	101,405	58,343	19,878	3,966	183,592	20,439	31,231	3,219	-	54,889
2017	108,809	61,860	21,218	3,078	194,965	22,111	33,421	3,445	-	58,977
2018	116,457	66,651	24,439	3,088	210,635	23,811	35,778	3,864	415	63,868
2019	122,830	71,054	23,172	2,412	219,468	25,716	38,775	4,373	842	69,706
2020	140,125	74,134	21,759	1,789	237,807	27,684	41,960	4,815	593	75,052

Source: Metropolitan Sewer District

Rate Making Process

To amend its Schedule of Rates, Rentals and Charges in effect from time to time, the District adopts and publishes a preliminary rate resolution, receives public comment for a period of 30 days, and then adopts a final rate resolution. The Metro Government's Code of Ordinances provides that, in the event the District's net revenues are less than 1.10 times the debt service on the District's outstanding revenue bonds for any consecutive six-month period, the District's Schedule of Rates, Rentals and Charges shall be amended in order to maintain such 1.10 debt service coverage, provided that the aggregate of the adjustments for any 12-month period shall not generate additional revenue from wastewater and drainage service charges in excess of 7% and that an explanation of proposed rate increases in excess of 4% shall be delivered to the Metro Council at least 60 days prior to the approval of the District's Board. Any rate increase that would generate additional revenue from wastewater and drainage service charges in excess of 7% for a 12-month period requires Metro Council approval. "Net revenues" are defined for such purpose as gross revenue from wastewater service charges less operating expenses and debt service payments other than debt service payments on the District's outstanding revenue bonds.

Rate History

The following table shows the District's combined wastewater and drainage service charge rate increases during the last five years and the resulting additional revenues. Additional revenues from the rate increases are approximate and assume constant water usage.

Historical Service Charge Revenue					
	8/1/2015	8/1/2016	8/1/2017	8/1/2018	8/1/2019
Rate Increase	5.50%	6.90%	6.90%	6.90%	6.90%
Annual additional revenue from rate increase	10,373,950	10,733,000	11,525,000	12,258,000	12,872,000

Source: Metropolitan Sewer District

Customer Growth

The following tables show the growth in the total number of the District's wastewater customers and drainage service customers.

Historical Active Wastewater Customer Totals					
	FY 16	FY 17	FY 18	FY 19	FY 20
Residential	216,593	217,979	219,186	220,412	221,796
Commercial	19,057	19,658	19,350	19,373	21,331
Industrial	407	340	348	360	385
Total	236,057	237,977	238,884	240,145	243,512
% Growth	0.43%	0.79%	0.14%	0.86%	1.40%

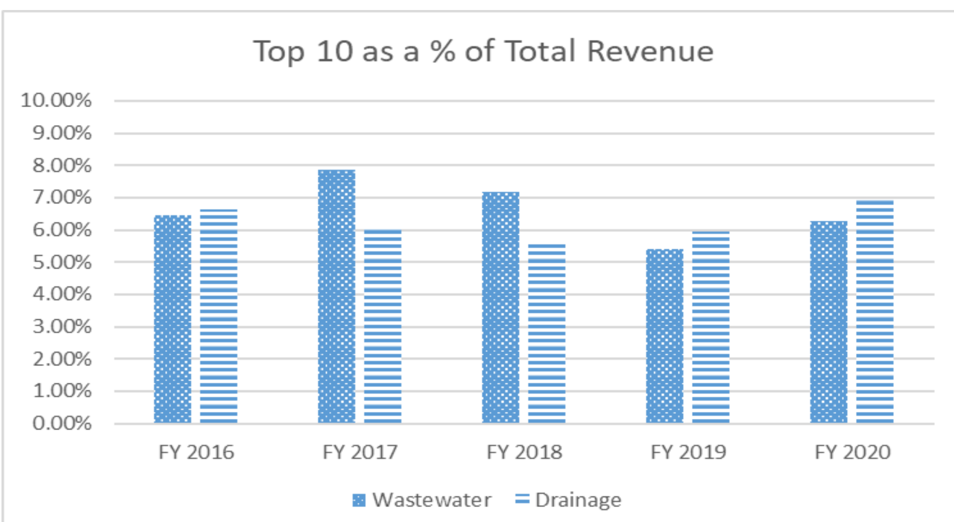
Source: Metropolitan Sewer District

Historical Active Drainage Customer Totals		
	FY19	FY 20
Residential	206,499	207,317
Commercial	14,024	14,087
Industrial	257	271
Total	220,780	221,675
% Growth		0.41%

Source: Metropolitan Sewer District

Top 10 Customers

The following table shows the District's top 10 wastewater and drainage customers as a % of total revenue for the past five fiscal years.



Source: Metropolitan Sewer District

The following tables shows the District's top 10 wastewater and drainage customers in fiscal year 2020.

Top 10 Wastewater Customers

Rank	Customer Name	FY '20 Wastewater Billed	Percent Total Wastewater Revenue
1	Heaven Hill Distilleries	$ 3,794,811	1.60%
2	Lubrizol Advanced Material	2,484,802	1.04%
3	Swift Pork Co.	1,824,854	0.77%
4	The Chemours Company FC LLC	1,708,171	0.72%
5	Early Times Distillery	1,133,691	0.48%
6	Ford Motor Co.	856,205	0.36%
7	Rohm & Haas	848,525	0.36%
8	Ford Motor Co.	841,538	0.35%
9	Haier US Appliance Solutions	791,125	0.33%
10	Clariant Corporation	663,981	0.28%
	Total	14,947,704	6.29%
	Total FY 20 Wastewater Revenue:	$237,807,086	

Top 10 Drainage Customers

Rank	Customer Name	FY 20 Drainage Billed	Percent Total Drainage Revenue
1	Regional Airport Authority	$ 1,456,296	1.94%
2	United Parcel Service	891,547	1.19%
3	Jeff Co Bd of Ed	801,474	1.07%
4	Ford Motor Co.	407,035	0.54%
5	LIT Industrial Limited Partner	308,182	0.41%
6	Kentucky State Fair	288,484	0.38%
7	Regional Airport Authority	286,371	0.38%
8	University of Louisville	264,526	0.35%
9	Seaboard System RR-00822	245,945	0.33%
10	Churchill Downs Inc	244,642	0.33%
	Total	5,194,502	6.92%
	Total FY 20 Drainage Revenue:	$ 75,051,622	

Source: Metropolitan Sewer District

FINANCIAL OPERATIONS

Historical Financial Operations

The District derives its revenues primarily from customer payments for wastewater and stormwater services, which accounts for 98% of operating revenues. Other operating revenues include inflow and infiltration fees, capacity charges and other miscellaneous system fees and charges, which accounts for the remaining 2% of operating revenues. Non-operating revenues include interest income earned on investments and the federal interest subsidy on the District's Build America Bonds. The current portion of assessments payments is also included in non-operating revenue for purposes of coverage calculations per the Resolution.

The District's Finance Department provides detailed monthly reports on cash and investments, revenues, expenses, variances to budget and capital spending to management and the Board. The following table presents historical revenues, expenses and changes in net position using information contained in the District's audited financial statements for its fiscal years 2016 through 2020. The District's audited financial statements for the fiscal year ended 2019 are found in Appendix B.

Historical Revenues, Expenses and Changes in Net Postion
Fiscal Year ended June 30
($ in thousands)

	FY16	FY17	FY18	FY19	FY20 (Unaudited)
Operating revenue:					
Wastewater service charges	$ 183,592	$ 194,965	$ 210,636	$ 219,467	$ 237,807
Drainage service charges	54,888	58,978	63,868	69,706	75,052
Other operating income	4,810	5,691	4,645	5,195	6,198
Total operating revenue	243,290	259,634	279,149	294,368	319,057
Operating expenses:					
Service and administrative costs	121,674	122,098	142,711	154,325	167,771
Capitalization/recovery of cost	(30,516)	(31,949)	(38,147)	(38,383)	(39,643)
Capitalized overhead (over) under applied	-	-	88	-	-
Depreciation and amortization	62,820	77,156	77,954	87,882	98,872
Total operating expenses	153,978	167,305	182,606	203,824	227,000
Income (loss) from operations	89,312	92,329	96,543	90,544	92,057
Non-operating revenue (expense):					
Gain/Loss Disposal of Assets	-	-	-	14	(15,007)
Investment income	7,559	4,047	6,280	8,338	5,275
Build America bond refund	10,332	10,226	10,249	10,339	10,325
Interest expense - bonds	(86,818)	(90,117)	(95,041)	(94,831)	(92,274)
Interest expense - swaps	(9,514)	(8,926)	(7,724)	(6,468)	(7,622)
Interest expense - other	(8,601)	(9,317)	(9,873)	(13,497)	(13,129)
Amortization of debt discount/premium	12,052	13,701	15,198	14,344	12,687
Amoritzation of loss on refunding	(1,949)	(3,070)	(3,147)	(2,817)	(2,403)
Capitalized interest	21,051	20,074	21,859	18,582	13,043
Change in fair values - swaps	(22,951)	26,072	16,317	(13,597)	(20,445)
Total non-operating revenue (expenses), net	(78,839)	(37,310)	(45,882)	(79,593)	(109,550)
Net income / (loss) before contributions	10,473	55,019	50,661	10,951	(17,493)
Contributions					
Property owner assessments	-	2,376	-	-	-
All other	5,037	10,513	12,726	50,926	9,085
Increase (decrease) in net position	15,510	67,908	63,387	61,877	(8,408)
Net position, beginning of year	585,070	600,580	668,488	708,674	770,551
Net poistion, OCEA merger	-	-	-	-	13,735
Restatement for GASB 68 implementation	-	-	-	-	-
Restatement for GASB 75 implementation	-	-	(23,201)	-	-
Net Position, beginning of year, as restated	585,070	600,580	645,287	708,674	784,286
Net position, end of year	$ 600,580	$ 668,488	$ 708,674	$ 770,551	$ 775,878

Source: Metropolitan Sewer District

The following table presents historical senior debt service coverage for each of the last five fiscal years.

Historical Debt Service Coverage
Fiscal Year ended June 30
($ in thousands)

	2016	2017	2018	2019	2020 Unaudited
Revenues:					
Service charges	$ 238,480	$ 253,943	$ 274,504	$ 289,173	$ 312,859
Other operating income	4,810	5,691	4,645	5,195	6,198
Assessments	9,457	1,375	1,232	1,258	909
Investment income	17,278	14,273	16,531	18,692	15,600
Less: capitalized investment income	-	-	-	-	-
Total revenues	270,025	275,282	296,912	314,318	335,566
Operating expenses:					
Service and administrative costs[1]	117,671	119,586	131,948	142,082	149,945
Less: capitalized overhead	(30,516)	(31,949)	(38,148)	(38,383)	(39,643)
Capitalization Rate	26%	27%	29%	27%	26%
Total operating expenses	87,155	87,637	93,800	103,699	110,302
Net revenues	182,870	187,645	203,112	210,619	225,264
Aggregate debt service:					
Current maturities of long-term debt	31,825	33,655	33,906	40,358	40,637
Interest expense - senior lien	86,818	90,117	95,041	94,831	92,274
Less: capitalized interest expense	(21,051)	(20,074)	(21,859)	(18,582)	(13,043)
Aggregate net debt service	$ 97,592	$ 103,698	$ 107,088	$ 116,607	$ 119,868
Debt service coverage ratio[2]	187%	181%	190%	181%	188%

[1]Excludes the actuarial portion of changes to GASB 68 pension expense and GASB 75 OPEB for the year
[2]Excludes the actuarial portion of changes to GASB 68 pension expense and GASB 75 OPEB for the year

Source: Metropolitan Sewer District

Projected Financial Operations

Both historic revenues and expenses of the District for prior fiscal years and projected revenues and expenses of the District for the current and future fiscal years are reflected in the charts below. The projected revenues reflect the increases in rates and charges adopted by the District for fiscal year 2021 and the anticipated increases in rates and charges for fiscal years 2022 through 2025. The projected financial results for fiscal years 2021 through 2025 incorporate assumptions as of the date of this Official Statement. The projected debt service requirements include anticipated debt service for the Series 2020C Bonds.

The information on projected revenues and expenses constitute a "forward looking statement" under federal securities law. Actual revenues, expenses, or both could differ materially from those forecasted and there can be no assurance that such estimates of future results will be achieved. For example, there can be no assurance that the MSD Board will approve any proposed revision of the District's Schedule of Rates, Rentals and Charges. In general, important factors that could cause actual results to differ materially from the revenues or expenses presently estimated include, but are not limited to, material changes in the size and composition of the District's service area, unanticipated changes in law or unanticipated material litigation, a material downturn in economic activity, efficiency of operations and the capital construction and expenditure plans and results of the District.

Analysis of Acutal and Projected Financial Results Fiscal Years ended/ending June 30 ($ in thousands)	FY18 Actual	FY19 Actual	FY20 Actual Unaudited	FY21 Budget	FY22 Projected	FY23 Projected	FY24 Projected	FY25 Projected
Rate Increase[1]	*6.90%*	*6.90%*	*6.90%*	*5.00%*	*6.90%*	*6.90%*	*6.90%*	*6.90%*
Operating Revenues								
Wastewater service charges	$ 210,636	$ 219,467	$ 237,807	$ 242,846	$ 257,465	$ 271,187	$ 287,020	$ 303,779
Drainage service charges	63,868	69,706	75,052	78,488	83,903	89,692	95,881	102,497
Other operating income	4,645	5,194	6,198	4,275	4,350	4,350	4,350	4,375
Total Operating Revenues	279,149	294,367	319,057	325,609	345,718	365,229	387,251	410,651
Non-Operating Revenues								
Assessments	1,232	1,137	909	850	1,000	1,000	1,000	1,000
BAB refund	10,248	10,339	10,325	10,338	10,338	10,338	10,986	10,986
Investment income	6,283	8,339	5,275	5,640	5,866	6,100	6,344	6,598
Total Non-Operating Revenues	17,763	19,815	16,509	16,828	17,204	17,438	18,330	18,584
Total Available Revenue	296,912	314,182	335,566	342,437	362,922	382,667	405,581	429,235
Operating Expenses								
Total operating expenses	131,948	142,082	149,945	153,521	163,363	172,557	178,032	183,633
Captialized cost	(38,148)	(38,383)	(39,643)	(36,886)	(39,207)	(39,688)	(39,167)	(38,563)
Net Operating Expense	93,800	103,699	110,302	116,635	124,156	132,869	138,865	145,070
Net Revenues Available for Debt Services	203,112	210,483	225,264	225,802	238,767	249,798	266,716	284,165
Debt Service								
Total senior debt service[2]	128,947	135,189	132,911	142,055	144,716	149,024	152,951	154,348
Capitalized interest	(21,859)	(18,582)	(13,043)	(18,984)	(19,069)	(19,790)	(20,800)	(20,754)
Total subordinated debt service	17,695	19,966	20,751	26,392	27,359	27,481	32,156	32,173
Total Outstanding & Projected Debt Service	124,783	136,573	140,619	149,463	153,006	156,715	164,307	165,767
Senior Debt Service Coverage	190%	181%	188%	183%	190%	193%	202%	213%
Total Debt Service Coverage	163%	154%	160%	151%	156%	159%	162%	171%
Aggregate Net Debt Service	107,088	116,607	119,868	123,071	125,647	129,234	132,151	133,594
110% of Aggregate Net Debt Service	117,797	128,268	131,855	135,378	138,212	142,157	145,366	146,953
Subordinate Debt Service	17,695	19,966	20,751	26,392	27,359	27,481	32,156	32,173
110% of Subordinated Debt Service	19,465	21,963	22,826	29,031	30,095	30,229	35,372	35,390

[1] Projections include the former Oldham County Environmental Authority customers which are on a different rate schedule

[2] Projections assume bonds issued in 2022 and 2024 are issued on a senior lien basis

Source: Metropolitan Sewer District

CAPITAL IMPROVEMENT PROGRAM

Consulting Engineer's Report

Jacobs Engineering Group, Inc., Louisville, Kentucky (the "Consulting Engineers") has been retained by the District as its engineering consultant. The most recent report of the Consulting Engineers is appended to this Official Statement as Appendix F. The projections shown in "Appendix F — Consulting Engineer's Report" are based, among other things, on the District's Capital Improvement Plan in effect as of the date of such report. Except as specifically described herein, there can be no assurance that the District will not amend or revoke the Capital Improvement Program described in "Appendix F - Consulting Engineer's Report" or that the District will issue or support bonds or other funding for the Capital Improvement Program in its current form or as amended or any substitute therefor.

Consent Decree

In August 2005, the District entered into a joint Consent Decree agreement with the federal government and the Commonwealth of Kentucky. The Consent Decree created the framework for a 19-year program to manage and mitigate combined sewer overflows (CSOs), and eliminate sanitary sewer overflows (up to a certain storm event). In 2009, the Consent Decree was amended to address recordkeeping and Water Quality Treatment Center bypasses and treatment performance.

To meet the requirements of the Amended Consent Decree, the District developed the Integrated Overflow Abatement Program (IOAP), which was later incorporated into the Critical Repair and Reinvestment Plan. Key capital projects included in the IOAP include:

- **CSO Storage Basins.** Large storage basins are under design or construction at strategic locations in the District's combined sewer system to temporarily store flows during rain events. When capacity is available, these stored flows will be released back into the collection system for treatment. These basins are a foundation of the District's CSO control strategy and must be operational by state and federally-enforced deadlines.

- **Green Infrastructure Projects.** Green infrastructure works by capturing stormwater flows in natural systems before they can enter the underground pipe network and thus creates additional capacity within the sewer system. Additionally, these systems remove pollutants through natural filtration systems so that any flows that must pass through them carry a reduced pollutant load. The District is committed to integrating green infrastructure as part of its overflow control strategy and has implemented an innovative system of cost-sharing with other public agencies and private developers to leverage the District's investment in green infrastructure to the extent it furthers the District's service offerings.

- **Capacity, Management, Operations and Maintenance (CMOM) Projects.** An essential component to the long-term success of the IOAP is an effective CMOM program that makes sure the wastewater collection system operates effectively. Elements of this program include capital investment, sewer inspection and cleaning, repair of defects found in sewers, and removal of illicit and illegal connections to the system.

- **Nine Minimum Controls (NMC) Projects**. Reporting requirements for the NMC program will be phased out after the completion of the District's obligations under the Consent Decree. The NMC principles related to optimizing operation of the combined sewer system will remain in full force and effect, with the enforcement mechanism shifted from the Consent Decree to the Morris Forman WQTC discharge permit. One critical item that will continue after the IOAP is completed is the continued implementation and optimization of the District's Real Time Control system that maximizes storage in the collection system through a series of automated dams and gates.

The cost of the capital improvements required to be completed under the Amended Consent Decree is currently estimated to be approximately $1.149 billion, of which approximately $974 million has been spent as of June 30, 2020 and has been financed or refinanced with proceeds of the District's Sewer and Drainage System Revenue Bonds, Series 2008, Series 2009C, Series 2010A, Series 2013C, Series 2014A, Series 2015A, Series 2016A, Series 2017A, and Program Notes refinanced with proceeds of the Series 2020A Bonds. The projected total cost has increased due to budgeted increases for construction contingencies in accordance with industry standards, as well as increases in projected construction costs required to comply with regulatory requirements. The District continues to diligently monitor costs and does not expect further significant cost increases.

All schedule milestones on IOAP projects to mitigate sewer overflows across the service area have been met. Local waterways are safer and cleaner today as a result of these expenditures. This required regulatory work has consumed the majority of the District's capital expenditures; however, these projects have only addressed a fraction of the wastewater, stormwater and flood protection assets under the District's purview. An unintended consequence of compliance with this Federal Order has been deferred asset management on the remaining infrastructure.

The District is prioritizing capital dollars on those assets that pose the greatest risks to public health and safety. At this time, several Sanitary Sewer Overflow (SSO) abatement projects must be deferred to allow focus on necessary work at the Morris Forman Water Quality Treatment Center and the Paddy's Run Flood Pump Station. In the meantime, the District continues construction of the Waterway Protection Tunnel and is collecting data on overflow abatement projects implemented to date along with overflow activity in the remaining project areas.

The District maintains regular coordination and communications with the EPA and the Kentucky Division of Water on Consent Decree progress. Those communications have focused on the increasing risks to public health and safety requiring the reprioritization of capital expenditures.

Critical Repair and Reinvestment Plan

The District's 20-year Comprehensive Facility Plan published in June 2017 ("Facility Plan") represents the District's most ambitious planning effort in a decade. Working with the Wet Weather Team Stakeholder Group and District staff, the Facility Plan Team reviewed the challenges our community faces now and in the future and has developed a roadmap to protect the area's health, economic vitality, and environment. The recommendations in this plan are the result of well-vetted analyses from some of the most experienced engineers in Louisville Metro. The recommendations are essential to maintaining reliable and properly sized facilities that will allow the District to fulfill its responsibility for safe, clean waterways and to help preserve and promote our competitiveness as a city.

Wastewater collection and treatment is the District's largest service offering and was the original reason the District was formed by state statute in 1946. Fully implementing the Facility Plan recommendations will accomplish the following wastewater service objectives:

- Fulfill the obligation of the Consent Decree, including completing all the projects contained in the IOAP on schedule
- Provide facilities that comply with the other environmental regulations the District is governed by and provide a plan to remain in compliance with future regulations currently under development
- Renew and replace aging wastewater infrastructure to provide reliable service and the lowest overall cost using a best-practice asset management approach
- Position the District to support the community's ability to grow responsibly as economic development opportunities become available

The District assumed responsibility for stormwater management, including both drainage and interior floodplain management for most of Jefferson County in 1987. The drainage system at that time had a backlog of thousands of drainage complaints that the District was expected to correct. While the District has invested hundreds of millions of dollars in drainage infrastructure since 1987, drainage problems still are found across the entire county. In addition, the increased frequency of extreme storms that have been observed in Louisville Metro have raised customer concerns about the adequacy of our drainage and interior floodplain management systems. While current development standards require mitigation of the drainage impacts of land use changes, analysis of historical trends shows a significant reduction in natural green space and an increase in impervious services that do not allow stormwater to seep into the ground. Runoff from impervious surfaces also causes increased runoff volume and greatly increased runoff peak flows. Together, these factors exacerbate the observed deficiencies in the stormwater system that the District now has responsibility for, impacting neighborhood drainage in addition to interior floodplain inundation. Implementing the Facility Plan recommendations will accomplish the following stormwater management objectives:

- Improve the level of protection against public health and property risks caused by inadequate stormwater drainage systems
- Continue support for the Project DRI neighborhood drainage solutions
- Expand the efforts of the MS4 program to reduce stormwater contamination of our waterways, primarily through BMPs and continued proactive support of green infrastructure solutions to both quantity and quality concerns
- Recognize and respond to the impact of changing weather patterns including the increased frequency of extreme storms

The Ohio River Flood Protection System (ORFPS) was developed in response to the flood of 1937. This system of levees, floodwalls, and flood pumping stations has protected Louisville since it became operational in the 1950s. While the system has an outstanding record of reliability, much of the system is more than 60 years old and includes antiquated equipment that cannot be repaired with standard parts available today. In addition, the same changing precipitation and land use patterns that affect drainage and inland floodplain management also impact the flood pumping stations and related appurtenances. Implementing the Facility Plan recommendations will accomplish the following ORFPS objectives:

- Maintain protection from Ohio River floods entering Louisville by proactive preventive and predictive maintenance activities related to the levee, floodwall, and all gates and other penetration closures that keep floodwaters at bay
- Modernize the flood pumping stations with current mechanical and electrical equipment that can provide continued reliability and a predictable cost because parts will be more readily available at a more reasonable cost
- Expand the capacity of those flood pumping stations to enhance community protection in response to changing precipitation and land use patterns

Implementing the recommendations for all three service areas will require a significant investment from the community. Based on the analyses of this Facility Plan, meeting the critical needs of the community is estimated to cost $4.3 billion over the next two decades. Unlike the IOAP, which is required by the Consent Decree to be completed, most stormwater management and flood protection capacity projects developed in the Facility Plan are not specifically required by regulation. Providing for infrastructure renewal and replacement, and improving the consistent level of service in stormwater management and flood protection are local decisions driven by the District's mission to provide safe, clean waterways for the community. The District will implement the Facility Plan to the extent funding is provided through the rate-setting process. If sufficient funding is not provided to complete the recommended projects in the 20-year planning period, then projects will be deferred to the future, when funding comes available.

RECENT AND PENDING TRANSACTIONS OF THE DISTRICT

On March 25, 2020, the District entered into a Forward Delivery Bond Purchase Agreement with Bank of America, N.A. (the "Bank") providing for the sale to the Bank of the District's Sewer and Drainage System Revenue Bonds, Series 2021A (the "Series 2021A Bonds") in the principal amount of $246,555,000 to be issued and delivered on August 17, 2021. The proceeds of the sale of the Series 2021A Bonds when issued and delivered will be used to defease, and to redeem and refund on November 15, 2021, all of the District's Sewer and Drainage System Revenue Bonds, Series 2011A outstanding on that date.

The Forward Delivery Bond Purchase Agreement provides that, upon the issuance of the Series 2021A Bonds, the District shall enter into with the Bank a Continuing Covenant Agreement which will provide that if an Event of Default shall have occurred and be continuing under the Continuing Covenant Agreement, the Bank may by written notice to the District declare the outstanding principal of and interest on the Series 2021A Bonds to be immediately due and payable. Redacted copies of the Forward Delivery Bond Purchase Agreement and the Continuing Covenant Agreement are attached to the event notice which the District posted on March 26, 2020 on the Municipal Securities Rulemaking Board's Electronic Municipal Market Access (EMMA) website and which is available there at the following hyperlink: https://emma.msrb.org/ES1470532.pdf.

The District received an invitation on July 20, 2020 from the Kentucky Infrastructure Authority to submit an application for a 2021 Clean Water State Revolving Fund loan in the amount of $8,270,000 for three pump station projects. The District anticipates closing on this loan during fiscal year 2021.

On July 27, 2020, MSD's Board adopted a resolution effecting a 5% increase in wastewater and drainage volume and service charges, optional and quality charge rates assessed to commercial and industrial customers, and a 10% Emergency Wastewater Rate Assistance Program discount on wastewater service charges for eligible customers, effective August 1, 2020 through July 31, 2021On July 30, 2020, the District issued its Sewer and Drainage System Revenue Refunding Bonds, Series 2020A (the "Series 2020A Bonds") in the aggregate principal amount of $225,000,000 for the purpose of paying and retiring outstanding the District's Commercial Paper Notes maturing within 90 days after the issuance of the Series 2020A Bonds.

The District has been approached by the Bullitt County (Kentucky) Fiscal Court to acquire the Bullitt County Sanitation District (BCSD). This acquisition is in the due diligence phase. BCSD has approximately 4,200 customers.

The District plans to sell and issue by December 31, 2020 to the U.S. Environmental Protection Agency (the "EPA") the District's Sewer and Drainage System Revenue Bonds, Series 2020B (2020 WIFIA Project) (the "Series 2020B Bonds") in the maximum aggregate principal amount of $96,926,900 (increased by the amount of interest thereon that is capitalized and added to principal in accordance with the WIFIA Loan Agreement referred to below). The Series 2020B Bonds will mature not later than May 15, 2060 and will bear interest at a fixed rate established upon issuance equal to the interest rate of a U.S. Treasury bond of a similar maturity. The Series 2020B Bonds will be issued under the District's General Bond Resolution, as supplemented by the District's Thirtieth Supplemental Sewer and Drainage System Revenue Bond Resolution adopted on July 27, 2020, on a parity as to security and sources of payment with the District's Series 2020C Bonds and all other Bonds previously or hereafter issued under the General Bond Resolution. The Series 2020B Bonds will be issued to evidence the District's payment obligations under a Loan Agreement (the "WIFIA Loan Agreement") between the District, as borrower, and the EPA, as lender, pursuant to the federal Water Infrastructure Finance and Innovation Act, as amended, 33 U.S.C. §§ 3901-3914 ("WIFIA").

The Series 2020B Bonds will be issued for the purpose of financing the design and construction of a new biosolids processing solution at the District's Morris Forman Water Quality Treatment Center (the "WIFIA Project"), located in Louisville, Kentucky, with an average design capacity of 120 million gallons per day, a peak wet weather capacity of 350 million gallons per day, and an anticipated maximum month solids loading of 154 dry tons per day. The WIFIA Project will replace the District's outdated existing biosolids dryers with a reconfigured solids treatment process including new thermal hydrolysis pretreatment facilities and associated new equipment, and repurposed facilities and equipment from the existing treatment train. The complete list of new construction and rehabilitation includes: demolishing existing drying facilities; modifying existing liquid sludge holding tank and existing wet cake bins; rehabilitating and reusing existing blend tanks and anaerobic digester; and constructing a new sludge screening facility, cake receiving facility, cake storage bins, thermal hydrolysis pretreatment facility, high-solids centrifuges, cake loadout facility, sidestream treatment facility, combined head and power facility, and odor facility. The construction of the WIFIA Project is expected to be completed by July 2025.

Concurrently with the sale of the Series 2020 Notes offered hereby, the District will offer for sale its Sewer and Drainage System Revenue Refunding Taxable Bonds, Series 2020C (the "Series 2020C Bonds") in the tentative principal amount of $111,185,000 for the purpose of defeasing, and advance refunding and redeeming on May 15, 2023, the District's Sewer and Drainage System Revenue Refunding Bonds, Series 2013C maturing on and after May 15, 2024. The District expects to issue the Series 2020C Bonds shortly after the issuance of the Series 2020 Notes.

COVID-19 PANDEMIC

The World Health Organization has declared a pandemic following the outbreak of COVID-19, a respiratory disease caused by a new strain of coronavirus. In response to this novel coronavirus, on March 6, 2020, the Governor of Kentucky issued Executive Order 2020-215, declaring a State of Emergency under KRS Chapter 39A and activating the Kentucky Emergency Operations Plan. On March 13, 2020, President Donald Trump declared a national emergency and made federal government funds available to help states and local governments fight the pandemic. The current spread of COVID-19 is altering the behavior of businesses and individuals in a manner that will have negative effects on economic activity and therefore adversely affect the financial conditions of the Commonwealth and the District, either directly or indirectly.

District operations have continued, largely uninterrupted, by the pandemic. The District has taken measures to safeguard its employees while enabling them to perform their work. Many administrative personnel are now teleworking, operational personnel have been supplied with personal protective equipment, and the District has made other modifications following CDC guidelines that enable it to continue to provide wastewater treatment, drainage and flood protection to the community. These efforts have created additional expenses for the District but to date all such expenses can be funded out of the currently approved fiscal year budget and the District expects to be able to absorb such expenses going forward.

As the federal, state, and local governments, including the District, continue efforts to contain and limit the spread of COVID-19, revenue collections may deviate from historical or anticipated collections and may have an adverse impact on the financial position and operations of the District to a degree that cannot currently be estimated. As of June 30 2020, MSD has $100 million of unrestricted operating cash on hand, which is expected to be adequate to fund essential services and make timely debt service payments. In addition, MSD can issue Program Notes to provide short-term funding for its capital improvement program. The District, however, is not able to predict and makes no representations as to the future economic impact of the COVID-19 pandemic on the District, the operations of the District, or the financial position of the District.

On March 16, 2020, in response to the COVID-19 pandemic, Louisville Water Company (LWC) stopped disconnecting water service for non-payment of water and sewer bills and LWC and the District ceased assessing late charges on past due balances. Since that date the District has seen its volume of delinquent accounts grow from approximately 500 accounts valued at $100,000 prior to the pandemic to 13,500 accounts valued at $4.2 million as of August 15, 2020. The District is working in conjunction with LWC to offer payment plans and other assistance programs to enable customers to bring their accounts current. The District has increased its allowance for doubtful accounts in response to the growth in delinquent accounts and the collectability of these accounts is not known. The District estimates lost revenue from the cessation of late charge penalties of $750,000 in its fiscal year 2020 and up to $1.5 million in fiscal year 2021. As of August 15, 2020, LWC has not yet determined when it will resume water service disconnections for nonpayment and begin assessing late charge penalties on delinquent accounts.

Certain statements contained in this Official Statement are “forward-looking statements.” Particularly because of the evolving nature of the current public health crisis, no assurances can be given that any projected future results described herein will be achieved, and actual results may differ materially from the projected future results described herein. In this respect, the words “estimate,” “forecast,” “project,” “anticipate,” “expect,” “intend,” “believe,” “budget” and similar expressions are intended to identify forward-looking statements. All projections, forecasts, assumptions and other forward-looking statements in this Official Statement are expressly qualified in their entirety by this cautionary statement.

PENDING LITIGATION

There is no litigation or other legal proceeding pending or, to the knowledge of the District, threatened to restrain or enjoin the issuance, sale or delivery of the Series 2020 Notes or the implementation of the plan of financing described herein, or in any way contesting or affecting the validity of the Series 2020 Notes or the plan of financing described herein or any proceedings of the District taken with respect to the issuance or sale of the Series 2020 Notes, the pledge or application of any moneys or securities provided for the payment of the Series 2020 Notes or the existence or powers of the District insofar as they relate to the authorization, sale and issuance of the Series 2020 Notes or such pledge or application of moneys and securities or the implementation of the plan of financing described herein.

There is no litigation or other legal proceeding pending or, to the knowledge of the District, threatened which challenges the authority of the District to operate the System or to collect revenues therefrom or which contests the creation, organization or existence of the District or the title of any of its Board members or executive staff to their respective offices.

On April 10, 2009 the United States District Court for the Western District of Kentucky, Louisville Division (the “Court”), entered an Amended Consent Decree, in Civil Action No.:3:08-CV-00608-CRS (the “Amended Consent Decree”). The Amended Consent Decree amended, superseded and replaced the original Consent Decree entered by the Court on August 12, 2005 between the Commonwealth of Kentucky, the United States of America and the District. The Amended Consent Decree resolved all pending claims of violations of the Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977, and the Water Quality Act of 1987 (the “Clean Water Act”) pursuant to 33 U.S.C. 1251 et seq. and the regulations promulgated thereunder.

By entering into the Amended Consent Decree the District neither admitted nor denied the alleged violations described therein but did acknowledge that sanitary sewer overflows and unauthorized discharges have occurred and the District accepted the obligations imposed under the Amended Consent Decree. To date, the District has complied with all submittals and reporting requirements contained in the Amended Consent Decree. A copy of the Amended Consent Decree is available at the offices of the District. The District intends to perform all Capital Improvement Programs and other requirements contained in the Amended Consent Decree. The Amended Consent Decree contains stipulated penalties for the District’s failure to comply with provisions contained in the Amended Consent Decree.

The Final Sanitary Sewer Discharge Plan and the CSO Long Term Control Plan were submitted concurrently and certified on December 19, 2008, under the title of the Integrated Overflow Abatement Plan (IOAP). The IOAP was accepted by the Court and incorporated by reference into the Amended

Consent Decree by an Order signed February 12, 2010, that was entered into the public record February 15, 2010. The IOAP was amended in 2012 and 2014 to improve compliance and adjust capital project schedules.

By letter dated October 25, 2013, the United States Department of the Treasury (the "Treasury") notified the District that the District had apparently violated regulations governing the use of State and Local Government ("SLGS") securities by impermissibly using the Treasury's SLGS program to create a cost-free option and invited the District to respond. The District responded by letter dated February 13, 2014. On June 6, 2014, the Treasury issued a final agency decision stating, in effect, that the District had violated the regulations. The Treasury suspended the District from participating in the SLGS program for five years, but left open the possibility of a waiver with respect to the purchase of certain SLGS securities. The District disagreed with the final agency decision, but elected not to contest the decision in court.

By letter dated September 3, 2015, the United States Department of Justice ("DOJ") notified the District of an investigation into whether the District's violations of the SLGS regulations may give rise to civil monetary liability and that it was considering initiating civil litigation against the District. DOJ invited the District to present its position and to explore the possibility of resolving the matter without litigation. On October 2, 2019, DOJ and the District reached a resolution without the DOJ filing suit. As part of the resolution, the DOJ agreed to release the District from any civil monetary claim it may have under various common law theories (breach of contract, payment by mistake, unjust enrichment and fraud) for the District's participation in the Treasury's SLGS program, conditioned upon payment by the District of approximately $1.3 million to the DOJ. The resolution was not an admission of liability by the District or a concession by the DOJ that the claims it released were not well founded. By letter dated September 27, 2019, which stated it was being provided for informational purposes and not as part of the resolution of DOJ's claims, DOJ informed the District that, based on the facts known to DOJ, DOJ "has no present intention to pursue any further investigation and/or to file suit under the False Claims Act, 31U.S.C. §§ 3729-3733," against the District in connection with its participation in the SLGS program.

The District is a defendant from time to time in various lawsuits. Although the outcome of these lawsuits is not presently determinable, it is the opinion of the District that resolution of these matters will not result in a material adverse effect on the operations, properties or financial condition of the District.

Except as disclosed above, there is no litigation or other legal proceeding pending or, to the knowledge of the District, threatened against or affecting the District or its Board wherein an unfavorable decision, ruling or finding might have a materially adverse effect on the operations, properties or financial condition of the District.

APPROVAL OF LEGAL PROCEEDINGS

The issuance of the Series 2020 Notes is subject to the approval of Wyatt, Tarrant & Combs LLP, Louisville, Kentucky, Bond Counsel, whose approving opinion will be delivered with the Series 2020 Notes. Certain legal matters will be passed upon for the District by its General Counsel, Paula M. Purifoy, Esq.

Bond Counsel has reviewed legal matters incident to those sections of the Official Statement entitled "The Series 2020 Notes," "Security and Sources of Payment for the Series 2020 Notes," "Tax Treatment," and "Appendix A – Definitions of Certain Terms and Summary of Provisions of the Bond Resolution and Note Resolution," and is of the opinion that the statements contained in such sections are, as to law and legal conclusions, correct and that such sections fairly summarize the contents of the documents therein described. Bond Counsel assumes no responsibility for the accuracy or completeness of other statements or financial information contained in this Official Statement.

TAX TREATMENT

General

In the opinion of Wyatt, Tarrant & Combs, LLP, Bond Counsel, (i) under the Internal Revenue Code (the "Code") as presently enacted and construed, interest on the Series 2020 Notes is excludable from gross income for federal income tax purposes and (ii) the Series 2020 Notes are exempt from ad valorem taxation, and the interest thereon is exempt from income taxation, by the Commonwealth of Kentucky and all of its political subdivisions and taxing authorities.

A copy of the form of opinion of Bond Counsel for the Series 2020 Notes is set forth in Appendix D.

The Code imposes various restrictions, conditions, and requirements relating to the qualification of the Series 2020 Notes as so-called "tax-exempt" bonds. The District has covenanted to comply with certain restrictions designed to ensure that interest on the Series 2020 Notes will not be includable in gross income for federal income tax purposes. Failure to comply with these covenants could result in the Series 2020 Notes not qualifying as "tax-exempt bonds," and thus interest on the Series 2020 Notes being includable in the gross income of the holders thereof for federal income tax purposes. Such failure to qualify and the resulting inclusion of interest could be required retroactively to the date of issuance of the Series 2020 Notes. The opinion of Bond Counsel assumes compliance with these covenants. However, Bond Counsel has not undertaken to determine (or to inform any person) whether any actions taken (or not taken) or events occurring (or not occurring) after the date of issuance of the Series 2020 Notes may adversely affect either the federal or Kentucky tax treatment of the Series 2020 Notes.

Certain requirements and procedures contained or referred to in the Note Resolution and other relevant documents may be changed and certain actions (including, without limitation, defeasance of the Series 2020 Notes) may be taken or omitted under the circumstances and subject to the terms and conditions set forth in such documents. Bond Counsel expresses no opinion as to any Series 2020 Notes or the interest thereon if any such change occurs or action is taken or omitted upon the advice or approval of bond counsel other than Wyatt, Tarrant & Combs, LLP.

Although Bond Counsel for the Series 2020 Notes is of the opinion that interest on the Series 2020 Notes will be excludible from gross income for federal income tax purposes and the Series 2020 Notes will be exempt from Kentucky income tax, as described above, the ownership or disposition of, or the accrual or receipt of interest on, the Series 2020 Notes may otherwise affect a Holder's Federal, state or local tax liabilities. The nature and extent of these other tax consequences may depend upon the particular tax status of the Holder or the Holder's other items of income or deduction. Bond Counsel expresses no opinions regarding any tax consequences other than what is set forth in its opinion and each Holder or potential Holder is urged to consult with tax counsel with respect to the effects of purchasing, holding or disposing the Series 2020 Notes on the tax liabilities of the individual or entity.

Receipt of interest on or the ownership or disposition of Series 2020 Notes may result in other collateral federal, state or local tax consequence for certain taxpayers. Such effects may include, without limitation, increasing the federal tax liability of certain foreign corporations subject to the branch profits tax imposed by Section 884 of the Code, increasing the federal tax liability of certain insurance companies under Section 832 of the Code, increasing the federal tax liability and affecting the status of certain S Corporations subject to Sections 1362 and 1375 of the Code, increasing the federal tax liability of certain individual recipients of Social Security or Railroad Retirement benefits under Section 86 of the Code and limiting the amount of the earned income credit under Section 32 of the Code that might otherwise be available. Ownership of any of the Series 2020 Notes may also result in the limitation of interest and certain other deductions for financial institutions and other taxpayers pursuant to Section 265 of the Code. Residence of the Holder of Series 2020 Notes in a state other than Kentucky or being subject to tax in a state other than Kentucky, may result in income or other tax liabilities being imposed by such states or their political subdivisions based on the interest or other income from the Series 2020 Notes.

The District has not designated the Series 2020 Notes as "qualified tax-exempt obligations" under Section 265 of the Code.

Original Issue Premium

"Acquisition Premium" is the excess of the cost of a note over the stated redemption price of such note at maturity. The Series 2020 Notes have a yield that is lower than their stated interest rate, as shown on the cover page hereto, and are therefore being initially offered and sold to the public at an Acquisition Premium. For federal income tax purposes, the amount of Acquisition Premium on each note the interest on which is excludable from gross income for federal income tax purposes ("tax-exempt notes") must be amortized and will reduce the bondholder's adjusted basis in that note. However, no amount of amortized Acquisition Premium on tax-exempt notes may be deducted in determining a noteholder's taxable income for federal income tax purposes. The amount of any Acquisition Premium paid on the Series 2020 Notes that must be amortized during any period will be based on the "constant yield" method, using the original bondholder's basis in such bonds and compounding semiannually. This amount is amortized ratably over each semiannual period on a daily basis.

Holders of the Series 2020 Notes should consult their own tax advisors as to the effect of Acquisition Premium with respect to their own tax situation and as to the treatment of Acquisition Premium for state and local tax purposes.

FINANCIAL STATEMENTS

The financial statements of the District for the fiscal year ended June 30, 2019 included in **Appendix B** of this Official Statement, which is an integral part of this Official Statement, have been audited by Crowe LLP, independent auditors, as stated in their report.

The preliminary and unaudited financial statements of the District for the fiscal year ended June 30, 2020 are included in **Appendix C**, which is an integral part of this Official Statement.

RATINGS

Moody's Investors Service, Inc. ("Moody's") and S&P Global Ratings, a division of Standard & Poor's Financial Services LLC. ("S&P") have assigned the ratings of "MIG 1" and "SP-1+", respectively, to the Series 2020 Notes. Such ratings reflect only the views of the respective rating agency. An explanation of the significance of the rating given by Moody's may be obtained from Moody's at Moody's Investors Service, Inc., 7 World Trade Center, 250 Greenwich Street, Public Finance Group - 23rd Floor, New York, New York 10007, (212) 553-0300. An explanation of the rating given by S&P may be obtained from S&P Global Ratings, 55 Water Street, New York, New York 10041, (212) 438-2124. There is no assurance that such ratings will continue for any given period of time or that they will not be revised downward or withdrawn entirely by a rating agency if in its judgment circumstances so warrant. Any such downward revision or withdrawal of such a rating could have an adverse effect on the market price of the Series 2020 Notes.

UNDERWRITING

The Series 2020 Notes are being purchased for reoffering by BofA Securities Inc. (the "Underwriter"). The Underwriter has agreed to purchase the Series 2020 Notes at a purchase price of $237,295,082.34 (representing the par amount of the Series 2020 Notes, plus original issue premium of $10,972,963.20, less underwriter's discount of $17,880.86). The initial public offering price, which produces the yield set forth on the cover page of this Official Statement, may be changed by the Underwriter and the Underwriter may offer and sell the Series 2020 Notes to certain dealers (including dealers depositing Series 2020 Notes into investment trusts) and others at prices lower than the offering price which produces the yield set forth on the cover page.

FINANCIAL ADVISOR

Robert W. Baird & Co, Incorporated has been employed as Financial Advisor to the District in connection with the issuance of the Series 2020 Notes. The Financial Advisor's fee for services rendered with respect to the sale of the Series 2020 Notes is contingent upon the issuance and delivery thereof. This Official Statement was prepared and distributed by the Financial Advisor. The information set forth herein was obtained from the District and other sources believed to be reliable, but is not guaranteed as to accuracy or completeness by, and is not to be construed as a representation of the Financial Advisor.

CONTINUING DISCLOSURE

In accordance with Securities and Exchange Commission Rule 15c2-12 (the "Rule"), the District will agree, pursuant to a Continuing Disclosure Certificate to be dated and delivered as of the date of issuance and delivery of the Series 2020 Notes (the "Disclosure Certificate"), to cause the following information to be provided:

(i) to the Municipal Securities Rulemaking Board (the "MSRB"), certain annual financial information and operating data, including audited financial statements prepared in accordance with generally accepted accounting principles as applied to governmental units, generally consistent with the information contained in the Official Statement under the heading "RATES AND CHARGES – Wastewater and Drainage Service Revenues" and in "Appendix B" (Audited Annual Financial Statement); such information shall be provided on or before the January 1 following the fiscal year ending on the preceding June 30, commencing with the fiscal year ended June 30, 2020; provided that the audited financial statements may not be available by such date, but will be made available immediately upon delivery thereof by the auditor to the Obligated Person;

(ii) In a timely manner not in excess of ten business days after the occurrence of the event to the MSRB, notice of the occurrence of the following events, with respect to the Series 2020 Notes:

(1) Principal and interest payment delinquencies;
(2) Non-payment related defaults, if material;
(3) Unscheduled draws on debt service reserves reflecting financial difficulties;
(4) Unscheduled draws on credit enhancements reflecting financial difficulties;
(5) Substitution of credit or liquidity providers, or their failure to perform;
(6) Adverse tax opinions, the issuance by the Internal Revenue Service of proposed or final determinations of taxability, Notices of Proposed Issue (IRS Form 5701-TEB) or other material notices or determinations with respect to the tax status of the security, or other material events affecting the tax-exempt status of the

security;

(7) Modifications to rights of security holders, if material;

(8) Bond calls, if material, and tender offers;

(9) Defeasances;

(10) Release, substitution or sale of property securing repayment of the securities, if material;

(11) Rating changes;

(12) Bankruptcy, insolvency, receivership or similar event of the obligated person (Note: For the purposes of this event, the event is considered to occur when any of the following occur: The appointment of a receiver, fiscal agent or similar officer for an obligated person in a proceeding under the U.S. Bankruptcy Code or in any other proceeding under state or federal law in which a court or governmental authority has assumed jurisdiction over substantially all of the assets or business of the obligated person, or if such jurisdiction has been assumed by leaving the existing governing body and officials or officers in possession but subject to the supervision and orders of a court or governmental authority, or the entry of an order confirming a plan of reorganization, arrangement or liquidation by a court or governmental authority having supervision or jurisdiction over substantially all of the assets or business of the obligated person);

(13) The consummation of a merger, consolidation, or acquisition involving an obligated person or the sale of all or substantially all of the assets of the obligated person, other than in the ordinary course of business, the entry into a definitive agreement to undertake such an action or the termination of a definitive agreement relating to any such actions, other than pursuant to its terms, if material;

(14) Appointment of a successor or additional trustee or the change of name of a trustee, if material;

(15) Incurrence of a financial obligation of the obligated person, if material, or agreement to covenants, events of default, remedies, priority rights, or other similar terms of a financial obligation of the obligated person, any of which affect security holders, if material; and

(16) Default, event of acceleration, termination event, modification of terms, or other similar events under the terms of the financial obligation of the obligated person, any of which reflect financial difficulties.

(iii) in a timely manner, to the MSRB, notice of a failure of an obligated person to provide the required Annual Financial Information on or before the date specified in the Continuing Disclosure Certificate.

For purposes of the events listed above, the Rule defines “financial obligation” to mean (a) a debt obligation; (b) a derivative instrument entered into in connection with, or pledged as security or a source of payment for, an existing or planned debt obligation; or (c) a guarantee of a debt obligation or a derivative instrument entered into in connection with, or pledged as security or a source of payment for, an existing or planned debt obligation. The term “financial obligation” does not include municipal securities as to which a final official statement has been provided to the MSRB consistent with the Rule.

With respect to the events set forth in the Rule:

(a) the District is the obligated person for the Series 2020 Notes;
(b) there are no credit enhancements for the Series 2020 Notes;
(c) there are no debt service reserves securing the Series 2020 Notes; and
(d) there are no liquidity providers for the Series 2020 Notes.

The Disclosure Certificate provides holders of the Series 2020 Notes, including beneficial owners of the Series 2020 Notes, with certain enforcement rights in the event of a failure by the District to comply with the terms thereof; however, a default under the Disclosure Certificate does not constitute an event of default under the Note Resolution. The Disclosure Certificate may also be amended or terminated under certain circumstances in accordance with the Rule as more fully described therein. Holders of the Series 2020 Notes are advised that the Disclosure Certificate, the form of which is obtainable from the Financial Advisor, should be read in its entirety for more complete information regarding its contents.

Pursuant to outstanding continuing disclosure undertakings (the "Existing Undertakings") the District is required to file certain annual financial information with the MSRB by January 1 of each year. The District has filed its annual financial information in accordance with the Existing Undertakings and, to the best of the District's knowledge, is in material compliance with the continuing disclosure undertaking requirements of the Rule in connection with its outstanding obligations that are subject to such requirements. In the past five years, the District has been made aware that there have been changes to the credit ratings on certain obligations of the District resulting from changes to the credit rating of credit enhancers providing bond insurance for those obligations, for which continuing disclosure event notices were not filed. Such changes to the credit ratings were made without any formal notice of the change to the District.

CONCLUDING STATEMENT

The foregoing summaries or descriptions of provisions of the Note Resolution and all references to other materials not purporting to be quoted in full, are only brief outlines of certain provisions thereof and do not purport to be complete statements of such documents and provisions. Reference is hereby made to the complete documents, copies of which will be furnished by the District upon request, for further information.

Any statements in this Official Statement involving matters of opinion, whether or not expressly so stated, are intended as such and not as representations of fact. This Official Statement is not to be construed as a contract or agreement between the District and the purchasers or holders of any of the Series 2020 Notes.

This Official Statement has been approved by the District as of the date set forth on the cover hereof.

LOUISVILLE AND JEFFERSON COUNTY
METROPOLITAN SEWER DISTRICT

By:/s/ Marita Willis
Chair

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APPENDIX A

DEFINITIONS OF CERTAIN TERMS AND SUMMARY OF PROVISIONS OF THE BOND RESOLUTION AND NOTE RESOLUTION

DEFINITIONS OF CERTAIN TERMS AND SUMMARY OF PROVISIONS OF THE BOND RESOLUTION AND NOTE RESOLUTION

The descriptions and summaries set forth herein are not intended to be comprehensive or definitive, and reference is made to the Bond Resolution and the Note Resolution for the complete details of all terms and conditions. All statements herein are qualified in their entirety by reference to the Bond Resolution and Note Resolution. Copies of the Bond Resolution and Note Resolution are available from the District.

Definitions

"Account" means an Account established pursuant to the Bond Resolution, including the General Subaccount in the Note Account and the Subordinated Debt Subaccounts.

"Accountant" shall mean an independent, certified public accountant, or a firm of independent, certified public accountants, selected by the District.

"Accountant's Certificate" means a certificate of an independent certified public accountant or firm of accountants (who may be the accountant or firm which regularly audits the books of the District) selected by the District.

"Accreted Value" means, with respect to any Capital Appreciation Bond, an amount equal to the principal amount of such Capital Appreciation Bond (determined on the basis of the principal amount per $5,000 at maturity thereof) plus the amount assuming semiannual compounding of earnings which would be produced on the investment of such principal amount, beginning on the dated date of such Capital Appreciation Bond and ending at the maturity date thereof, at a yield which, if produced until maturity, will produce $5,000 at maturity. As of any Valuation Date, the Accreted Value of any Capital Appreciation Bonds shall mean the amount set forth for such date in the Supplemental Resolution authorizing such Capital Appreciation Bonds and as of any date other than a Valuation Date, the sum of (a) the Accreted Value on the preceding Valuation Date and (b) the product of (1) a fraction, the numerator of which is the number of days having elapsed from the preceding Valuation Date and the denominator of which is the number of days from such preceding Valuation Date to the next succeeding Valuation Date and (2) the difference between the Accredited Values for such Valuation Dates.

"Accrued Aggregate Debt Service" for any period means, as of any date of calculation and with respect to any Series, an amount equal to the sum of the amounts of accrued Debt Service with respect to all Series, calculating the accrued Debt Service with respect to each Series at an amount equal to the sum of [i] interest on the Bonds of such Series accrued and unpaid and to accrue to the end of the then current calendar month and [ii] Principal Installments due and unpaid and that portion of the Principal Installment for such Series next due which would have accrued (if deemed to accrue in the manner set forth in the definition of Debt Service) to the end of such calendar month. The principal and interest portions of the Accreted Value and Appreciated Value of Capital Appreciation Bonds and Capital Appreciation and Income Bonds, respectively, becoming due at maturity or by virtue of a Sinking Fund Installment shall be included in the calculations of accrued and unpaid and accruing interest or Principal Installments in such manner and during such period of time as is specified in the Supplemental Resolution authorizing such Bonds.

"Act" means Kentucky Revised Statutes Chapters 58, 65 and 76, including particularly Sections et seq., inclusive, and Section 56.513, as the same may be from time to time amended, and successor provisions.

"Act of Bankruptcy" shall mean any of the following events:

(a) The District shall (1) apply for or consent to the appointment of, or the taking of possession by, a receiver, custodian, trustee, liquidator or the like of the District, or of all or a substantial part of the property of any of them, (2) commence a voluntary case under the Federal Bankruptcy Code (as now or hereafter in effect) or (3) file a petition seeking to take advantage of any other law relating to bankruptcy, insolvency, reorganization, winding-up or composition or adjustment of debts; or

(b) A proceeding or case shall be commenced, without the application or consent of the District, as the case may be, in any court of competent jurisdiction, seeking (1) the liquidation, reorganization, dissolution, winding-up, or the composition or adjustment of debts, of the District,
(2) the appointment of a trustee, receiver, custodian, liquidator or the like of the District or of all or any substantial part of the assets of the District, or (3) similar relief in respect of the District under any law relating to bankruptcy, insolvency, reorganization, winding-up or composition or adjustment of debts, and such proceeding or case shall continue undismissed, or an order, judgment or decree approving or ordering any of the foregoing shall be entered and continue unstayed and in effect for a period of 30 days from the commencement of such proceeding or case.

"Additional Bonds" means Bonds authenticated and delivered upon original issuance pursuant to the Bond Resolution and any Bonds thereafter authenticated and delivered in lieu of or in substitution for such Bonds pursuant to the Bond Resolution.

"Affiliate" of any specified Person shall mean any other Person directly or indirectly controlling or controlled by or under direct or indirect common control with such specified Person. For purposes of this definition, "control" when used with respect to any specified Person shall mean the power to direct the management and policies of such Person, directly or indirectly, whether through the ownership of voting securities by contract or otherwise; and the terms "controlling" and "controlled" have meanings correlative to the foregoing.

"Agent Member" shall mean a member of, or participant in, the Securities Depository.

"Aggregate Debt Service" for any period means, as of any date of calculation and with respect to all Bonds, the sum of the amounts of Debt Service for such period.

"Aggregate Net Debt Service" for any period means, as of any date of calculation and with respect to all Bonds, the Aggregate Debt Service for such period, less any amounts available or expected to be available in the ordinary course for the payment of Debt Service during such period pursuant to the Resolution (including but not limited to interest or other income available or expected to be available for payment of Debt Service during such period from the Reserve Account).

"Annual Budget" means the budget adopted or in effect for a particular Fiscal Year as provided in the Resolution.

"Appreciated Value" means, with respect to any Capital Appreciation and Income Bond up to the Interest Commencement Date, an amount equal to the principal amount of such Capital Appreciation and Income Bond (determined on the basis of the principal amount per $5,000 at the Interest Commencement

Date thereof) plus the amount, assuming semi-annual compounding of earnings which would be produced on the investment of such principal amount, beginning on the dated date of such Capital Appreciation and Income Bond and ending on the Interest Commencement Date, at a yield which, if produced until the Interest Commencement Date, will produce $5,000 at the Interest Commencement Date. As of any Valuation Date, the Appreciated Value of any Capital Appreciation and Income Bond shall mean the amount set forth for such date in the Supplemental Resolution authorizing such Capital Appreciation Bonds and as of any date other than a Valuation Date, the sum of (a) the Appreciated Value on the preceding Valuation Date and (b) the product of (1) a fraction, the numerator of which is the number of days having elapsed from the preceding Valuation Date and the denominator of which is the number of days from such preceding Valuation Date to the next succeeding Valuation Date and (2) the difference between the Appreciated Values for such Valuation Dates.

"Authorized District Representative" shall mean the Chairperson or Vice-Chairperson or Executive Director or Director of Finance or Secretary or Treasurer of the District or such Persons as, at the time, are designated to act in behalf of the District by written certificate furnished to the Paying Agent and the District, containing the specimen signature of each such Person and signed on behalf of the District.

"Authorized Denominations" shall mean $5,000 or any integral multiple thereof.

"Authorized Investments" shall mean any of the following securities, to the extent legal for investment of the District's funds: [a] Government Obligations and, to the extent from time to time permitted by law, [b] obligations of [i] Federal Home Loan Banks, senior debt obligations, [ii] Federal Home Loan Mortgage Corporation, participation certificates and senior debt obligations, [iii] Student Loan Marketing Association, senior debt obligations, [iv] Resolution Funding Corporation and [v] Federal National Mortgage Association mortgage-backed securities and senior debt obligations; [c] money market funds registered under the Federal Investment Company Act of 1940, whose shares are registered under the Federal Securities Act of 1933, and having a rating by Standard and Poor's of AAAm-G, AAAm or AAm; [d] certificates of deposit or time deposits of any bank, any branch of any bank, trust company or national banking association or any savings and loan association; provided, however, that such certificates of deposit or time deposits shall be fully secured, to the extent not insured by the Federal Deposit Insurance Corporation or the Federal Savings and Loan Insurance Corporation, by Government Obligations in which the Note Registrar has a perfected first security interest, [e] investment agreements (for investment of moneys held in the Construction and Acquisition Fund) or other investments approved in writing by the Insurer, [f] commercial paper rated at the time of purchase, "Prime-1" by Moody's and "A-1" or better by S&P, [g] bonds or notes issued by any state or municipality which are rated by Moody's and S&P in one of the two highest rating categories assigned by such agencies, [h] federal funds or banker acceptances with a maximum term of 1 year with a rating of "Prime- 1" or "A-3" or better by Moody's and "A-1" or "A" or better by S&P, and [i] any repurchase agreement approved in writing by the Insurer or any repurchase agreement with a term not in excess of 30 days that is a legal investment for public funds under state law (as determined by a written legal opinion delivered to the District) and is with a primary dealer on the Federal Reserve reporting dealer list rated A or better by Moody's and S&P or any bank or trust company (including the Note Registrar) rated "A" or better by Moody's and S&P for Government Obligations or obligations described in [b] above in which the Note Registrar shall be given a first security interest and on which no third party shall have a lien. The underlying repurchase obligations must be valued weekly and marked to market at a current market price plus accrued interest of at least 104% (105% if the underlying securities are Federal National Mortgage Association Mortgage-backed securities and senior debt obligations) of the amount of the repurchase obligations of the bank or trust company. All obligations purchased must be transferred to the Note Registrar or a third party agent by physical delivery or by an entry made on the records of the issuer of such obligations. Any investment in a repurchase agreement shall be considered to mature on the date the obligor providing the repurchase agreement is obligated to repurchase the obligations. Any investment in obligations described in [a] and [b] above may be made in the form of an entry made on the records of the issuer of the particular obligation.

The Note Registrar, any Paying Agent, or other custodian of funds of the District, respectively, may trade with itself in the purchase and sale of securities for such investment and may charge its ordinary and customary fees for such trades, including cash sweep account fees. In the absence of any direction from the District, the Note Registrar, any Paying Agent, or other custodian of funds of the District, respectively, shall invest all funds in sweep accounts, money market funds and similar short-term investments, provided that all such investments shall constitute Authorized Investments.

"Authorized Newspaper" means The Bond Buyer or any other financial newspaper customarily published at least once a day for five days (other than legal holidays) in each calendar week, printed in the English language and of general circulation in the Borough of Manhattan, City and State of New York.

"Authorized Officer of the District" means any person authorized by the District to perform the act or sign the document in question.

"Board" means the Board of the District, or such board, commission or agency as may succeed to the duties and responsibilities of such Board.

"Bond" or "Bonds" means any bonds, notes or other evidences of indebtedness (other than Subordinated Debt), as the case may be, authenticated and delivered pursuant to the Resolution.

"Bond Counsel" means a nationally recognized municipal bond attorney or firm of municipal bond attorneys, acceptable to the District.

"Bond Fund" means the Bond Fund established in the Resolution.

"Bondholder" or "Holder of Bonds" or "Holder" means any person who shall be the registered owner of any Bond or Bonds. Notwithstanding this definition, with respect to any Bonds which are registered in Book-Entry Form, the Paying Agent shall be entitled to rely upon written instructions from a majority of the beneficial owners of the Bonds with reference to consent, if any, required from Bondholders under the Resolution.

"Bond Register" means the form or system or document in which the ownership of Bonds is recorded by the Bond Registrar.

"Bond Registrar" means any bank or trust company organized under the laws of any state of the United States of America or national banking association appointed by the District to perform the duties of Bond Registrar enumerated in the Resolution.

"Bond Resolution" shall mean the District's Sewer and Drainage System Revenue Bond Resolution as adopted on December 7, 1992, and amended on March 4, 1993, June 30, 1993, December 14, 1994, January 25, 1996 and February 24, 2003, as the same may be further amended and supplemented from time to time.

"Book-Entry Form" or "Book-Entry System" means, with respect to the Bonds, a form or system, as applicable, under which (i) the ownership of beneficial interests in Bonds and bond service charges may be transferred only through a book entry and (ii) physical Bond certificates in fully registered form are registered only in the name of a Securities Depository or its nominee as Holder, with the physical Bond certificates in the custody of a Securities Depository.

"Business Day" means any day other than a Saturday, Sunday or legal holiday in the Commonwealth or a day on which either Bond Registrar, the Paying Agent or the District is legally authorized to close.

"Capital Appreciation Bonds" means any Bonds issued under the Resolution as to which interest is payable only at the maturity or prior redemption of such Bonds, as further described in the Resolution.

"Capital Appreciation and Income Bonds" means any Bonds issued under the Resolution as to which interest is deferred prior to the Interest Commencement Date, as further described in the Resolution.

"Chairperson" means the Chairperson of the District, or such Officer of the District as may succeed to the duties and responsibilities of the Chairperson.

"Closing Date" shall mean the date of the issuance and delivery of a series of Notes.

"Code" shall mean the Internal Revenue Code of 1986, as amended, as it applies to the Notes, including applicable regulations and revenue rulings thereunder.

"Commonwealth" means the Commonwealth of Kentucky.

"Construction and Acquisition Fund" means the Construction and Acquisition Fund established in the Resolution.

"Cost of Construction and Acquisition" means, with respect to a Project, the District's costs, expenses and liabilities paid or incurred or to be paid or incurred by the District in connection with the planning, engineering, designing, acquiring, constructing, installing and financing, of a Project and the obtaining of all governmental approvals, certificates, permits and licenses with respect thereto, including, but not limited to, all costs relating to the acquisition, construction and installation of a Project and the cost of any demolitions or relocations necessary in connection therewith, any good faith or other similar payment or deposits required in connection with the purchase of a Project, the cost of acquisition by or for the District of real and personal property or any interests therein, and costs of the District incidental to such construction, acquisition or installation all costs relating to injury and damage claims relating to a Project, the cost of any indemnity or surety bonds and premiums on insurance, preliminary investigation and development costs, engineering fees and expenses, contractors' fees and expenses, the costs of labor, materials, equipment and utility services and supplies, legal and financial advisory fees and expenses, interest and financing costs, including, without limitation, bank commitment, line of credit, and letter of credit fees, bond insurance and indemnity premiums, and any other means of providing credit enhancement or credit support, costs incurred in connection with interest rate exchanges, futures contracts or other similar financing arrangements, fees and expenses of the Fiduciaries, including reasonable fees and expenses of counsel to the Fiduciaries, administration and general overhead expense and costs of keeping accounts and making reports required by the Resolution prior to or in connection with the completion of construction of a Project, amounts, if any, required by the Resolution to be paid into the Bond Fund to provide, among other things, for interest accruing on Bonds and to provide for the Debt Service Reserve Requirement or to be paid into the Renewal and Replacement Account for any of the respective purposes thereof, payment when due (whether at the maturity of principal or the due date of interest or upon redemption or purchase) on any indebtedness of the District, including Bonds, notes and Subordinate Debt, incurred in respect of any of the foregoing, and working capital and reserves therefor, and all federal, state and local taxes and payments in lieu of taxes legally required to be paid in connection with a Project and shall include reimbursements to the District for any of the above items theretofore paid by or on behalf of the District. It is intended that this definition of Cost of Construction and Acquisition be broadly construed to encompass all costs, expenses and liabilities of the District related to a Project which on the date of adoption of the Resolution or in the future shall be permitted to be funded with the proceeds of Bonds pursuant to the provisions of the laws of the Commonwealth.

"Credit Facility" means, a letter of credit, surety bond, loan agreement, standby purchase agreement or other credit agreement, facility or insurance or guaranty arrangement which has been rated not lower than "A" by Moody's or S&P's, or which is issued by an entity whose unsecured long term debt or claims paying ability is rated not lower than "A" by Moody's or S&P's, in either case, pursuant to which the District or another person is entitled to obtain funds to pay Bonds and interest thereon tendered to the District or a third party for payment, purchase or redemption in accordance with the Resolution.

"Debt Service" for any period means, as of any date of calculation and with respect to any Series, an amount equal to [i] the interest accruing during such period on Bonds of such Series plus [ii] the portion of each Principal Installment for such Series which would accrue during such period if such Principal Installment were deemed to accrue periodically in equal amounts from the next preceding Principal Installment due date for such Series (or, if there shall be no such preceding Principal Installment due date, from a date one year preceding the due date of such Principal Installment or from the date of issuance of the Bonds of such Series, whichever date is later). For Variable Interest Rate Bonds, the annual interest rate thereon and the resulting Debt Service shall be calculated by an Authorized Officer and evidenced by a certificate from such Authorized Officer of the District in accordance with the following procedure: for any Variable Interest Rate Bonds Outstanding on the date such certificate is delivered, an Authorized Officer of the District shall estimate the Debt Service on such Bonds upon reliance upon a written estimate of such Debt Service by the District's financial advisor which estimate shall include assumptions with respect to the interest rate or rates to be borne by such Bonds and the amounts and due dates of the Principal Installments for such Bonds; provided, however, that the interest rate or rates assumed to be borne by any Variable Interest Rate Bonds shall not be less than the interest rate borne by such Variable Interest Rate Bonds at the time that an Authorized Officer of the District delivers such certificate. The principal and interest portions of the Accreted Value and Appreciated Value of Capital Appreciation Bonds and Capital Appreciation and Income Bonds, respectively, becoming due at maturity or by virtue of a Sinking Fund Installment shall be included in the calculations of accrued and unpaid and accruing interest or Principal Installments in such manner and during such period of time as is specified in the Supplemental Resolution authorizing such Bonds.

"Debt Service Account" means the Debt Service Account of the Bond Fund.

"Debt Service Reserve Requirement" as of a particular date of computation means an amount, computed separately for each Series of Bonds, equal to the least of [i] ten percent (10%) of the face amount of such Series, [ii] one hundred percent (100%) of the maximum Aggregate Net Debt Service (as of the computation date) in the current or any future Fiscal Year and [iii] one hundred twenty-five percent (125%) of average Aggregate Net Debt Service (as of the computation date) in the current or any future Fiscal Year. For Variable Interest Rate Bonds, the Debt Service Reserve Requirement shall be the maximum permitted amount with interest calculated at the lesser of the 30-year Revenue Bond Index (published by The Bond Buyer no more than two weeks prior to the date of sale of such Variable Interest Rate Bonds) or the Maximum Interest Rate. If any Variable Interest Rate Bond shall be converted to a fixed rate Bond for the remainder of the term thereof, and as a result thereof a nominal deficiency shall be created in the Bond

Fund, the Debt Service Reserve Requirement shall be adjusted so as to exclude the amount of such deficiency, but the Debt Service Reserve Requirement shall be increased in each Fiscal Year or portion thereof after the date of such conversion by an amount equal to one hundred percent (100%) of the nominal deficiency, until there is no longer a nominal deficiency.

"Default" shall mean any event which with the giving of notice or lapse of time, or both, would constitute an Event of Default.

"Defaulted Interest" shall have the meaning stated in Note Resolution.

"Defeasance Obligations" means (i) cash, (ii) U.S. Treasury Certificates, Notes and Bonds (including State and Local Government Series - "SLGS"), (iii) direct obligations of the United States Treasury which have been stripped by the Treasury itself (CATS, TIGRS and similar securities), (iv) interest components of obligations of the Resolution Funding Corporation in book-entry form if such obligations have been stripped by request to the Federal Reserve Bank of New York, (v) pre-refunded municipal bonds rated "Aaa" by Moody's and "AAA" by S&P; however, if the issue is only rated by S&P, then the pre-refunded bonds must have been pre-refunded with cash, direct U.S. or U.S. guaranteed obligations, or AAA rated pre-refunded municipals, (vi) obligations issued by the following agencies which are backed by the full faith and credit of the United States: (a) direct obligations or fully guaranteed certificates of beneficial ownership of the U.S. Export-Import Bank (Eximbank), (b) certificates of beneficial ownership of the Farmers Home Administration, (c) obligations of the Federal Financing Bank, (d) participation certificates of the General Services Administration, (e) guaranteed Title XI financings of the U.S. Maritime Administration, (f) United States guaranteed New Community Debentures, (g) United States guaranteed public housing notes and bonds, and (h) project notes and local authority bonds of the U.S. Department of Housing and Urban Development, and (vii) any other investments approved in writing by the Insurer.

"District" means the Louisville and Jefferson County Metropolitan Sewer District, a public body corporate and political subdivision, created and established pursuant to the Act.

"District Certificate" shall mean a certificate signed by an Authorized District Representative and delivered to the Paying Agent.

"District Note" shall mean any Note registered in the name of the District or any beneficial ownership interest in the Notes held by the District.

"District Request", "District Order" or "District Consent" shall mean, respectively, a written request, order or consent of the District, signed by an Authorized District Representative and delivered to the Paying Agent.

"District Resolution" shall mean a resolution or other appropriate enactment by the District certified by the Secretary or another Authorized District Representative to have been duly adopted by the District and to be in full force and effect on the date of such certification, and delivered to the Paying Agent.

"Eastern Time" shall mean the prevailing time in the City of Louisville, Kentucky.

"Eligible Moneys" shall mean (a) proceeds of the sale of Notes not sold to the District or an Affiliate of the District, (b) moneys deposited with the Paying Agent by the District (including proceeds of Notes sold to an Affiliate of the District) for the benefit of the Noteholders for more than 183 days during which no Act of Bankruptcy has occurred as evidenced by a certificate of the District, (c) moneys with respect to which the District delivers to the Paying Agent an Opinion of Counsel with nationally recognized expertise in bankruptcy acceptable to the Paying Agent that such payments will not constitute a voidable transfer or preference under and pursuant to Section 547 of the Federal Bankruptcy Code and (d) investment income on the foregoing types of money.

"Event of Default" shall have the meaning given to such term herein under the caption "Events of Default."

"Extraordinary Services and Extraordinary Expenses" shall mean all reasonable services rendered and all reasonable expenses incurred by the Paying Agent under the Resolution other than Ordinary Services and Ordinary Expenses.

"Federal Reserve Bank" means any one of the central banks constituting the Federal Reserve System, created by the Federal Reserve Act of 1913, as amended, in order to regulate and aid the member banks in its respective Federal Reserve district.

"Fiduciary" or "Fiduciaries" means the Bond Registrar, the Paying Agents, or any or all of them, as may be appropriate or any bank, trust company, national banking association, savings and loan association, savings bank or other banking association selected by the District as a depositary of monies and securities held under the provisions of the Resolution, and may include the Bond Registrar.

"Fiscal Year" means each twelve (12) month period commencing on July 1 and ending on the succeeding June 30.

"Fitch" shall mean Fitch Ratings, its successors and their assigns, and if such corporation shall be dissolved or liquidated or shall no longer perform the functions of a municipal securities rating agency, Fitch shall be deemed to refer to any other nationally recognized municipal securities rating agency designated by the District.

"Fund" or "Funds" means, as the case may be, each or all of the Funds established in the Resolution.

"Government Obligations" when used with respect to Bonds shall mean (i) any direct obligations of the United States of America (including obligations issued or held in book-entry form on the books of the Department of the Treasury) or obligations the principal and interest on which are unconditionally guaranteed by the United States of America, and (ii) bonds, debentures, notes or other evidences of indebtedness issued or guaranteed by any of the following federal agencies (including stripped obligations thereof if such obligations have been stripped by the issuing agency itself) provided such obligations are backed by the full faith and credit of the United States of America: [1] Farmer's Home Administration; [2] General Services Administration; [3] United States Maritime Administration - Guaranteed Title XI Financing; [4] Federal Financing Bank; [5] United States Department of Housing and Urban Development; [6] U.S. Export - Import Bank; [7] Federal Housing Administration Debentures, and [8] Government National Mortgage Association guaranteed mortgage-backed bonds and guaranteed pass- through obligations.

"Government Obligations" when used with respect to Notes shall mean, direct general obligations of, or obligations the prompt payment of the principal of and the interest on which are fully and unconditionally guaranteed by, the United States of America. In addition, investments having a maturity of seven days or less in a money market or other fund, which fund is rated by Moody's and S & P in the highest rating category, and investments of which fund are exclusively in Government Obligations, shall be considered investments in Government Obligations.

"Granting Clauses" means the granting clauses appearing at the beginning of the Resolution. "Immediate Notice" shall mean notice (a) by telex, telecopier or telephone, or delivery by hand, (b) promptly followed by written notice by first class mail, postage prepaid, and (c) to such address or such telex, telecopier or telephone number as the Person receiving such notice shall have previously furnished to the Paying Agent in writing.

"Independent" when used with respect to any specified Person shall mean such a Person who (a) is in fact independent; (b) does not have any direct financial interest or any material indirect financial interest in the District or any Affiliate of the District, other than the payment to be received under a contract for services to be performed by such Person; and (c) is not connected with the District or any Affiliate of the District, as an official, officer, employee, promoter, underwriter, trustee, partner, subsidiary, director or Person performing similar functions.

"Interest Payment Date" shall mean the date or dates for the payment of interest on each series of Notes as provided in the applicable series of Notes.

"Insurer" means any nationally recognized company engaged in the business of insuring bonds which may from time to time insure the payment of the principal of and interest on all or a portion of the Bonds of any Series.

"Interest Commencement Date" means, with respect to any particular Capital Appreciation and Income Bond, the date specified in the Supplemental Resolution authorizing such Bonds, (which date must be prior to the maturity date for such Bonds) after which interest ceases to be deferred and compounds and the interest becomes currently payable.

"Investment Securities" means any of the following securities, to the extent legal for investment of the District's funds: [a] Government Obligations and, to the extent from time to time permitted by law, [b] obligations of [i] Federal Home Loan Banks, senior debt obligations, [ii] Federal Home Loan Mortgage Corporation, participation certificates and senior debt obligations, [iii] Student Loan Marketing Association, senior debt obligations, [iv] Resolution Funding Corporation and [v] Federal National Mortgage Association mortgage-backed securities and senior debt obligations; [c] money market funds registered under the Federal Investment Company Act of 1940, whose shares are registered under the Federal Securities Act of 1933, and having a rating by Standard and Poor's of AAAm-G, AAAm or AAm; certificates of deposit or time deposits of any bank, any branch of any bank, trust company or national banking association or any savings and loan association; provided, however, that such certificates of deposit or time deposits shall be fully secured, to the extent not insured by the Federal Deposit Insurance Corporation or the Federal Savings and Loan Insurance Corporation, by Government Obligations in which the Bond Registrar has a perfected first security interest, [e] investment agreements (for investment of moneys held in the Construction and Acquisition Fund) or other investments approved in writing by the Insurer, [f] commercial paper rated at the time of purchase, "Prime-1" by Moody's and "A-1" or better by S&P, [g] bonds or notes issued by any state or municipality which are rated by Moody's and S&P in one of the two highest rating categories assigned by such agencies, [h] federal funds or banker acceptances with a maximum term of 1 year with a rating of "Prime-1" or "A-3" or better by Moody's and "A-1" or "A" or better by S&P, and [i] any repurchase agreement approved in writing by the Insurer or any repurchase agreement with a term not in excess of 30 days that is a legal investment for public funds under state law (as determined by a written legal opinion delivered to the District) and is with a primary dealer on the

Federal Reserve reporting dealer list rated A or better by Moody's and S&P or any bank or trust company (including the Bond Registrar) rated "A" or better by Moody's and S & P for Government Obligations or obligations described in [b] above in which the Bond Registrar shall be given a first security interest and on which no third party shall have a lien. The underlying repurchase obligations must be valued weekly and marked to market at a current market price plus accrued interest of at least 104% (105% if the underlying securities are Federal National Mortgage Association Mortgage-backed securities and senior debt obligations) of the amount of the repurchase obligations of the bank or trust company. All obligations purchased must be transferred to the Bond Registrar or a third party agent by physical delivery or by an entry made on the records of the issuer of such obligations. Any investment in a repurchase agreement shall be considered to mature on the date the obligor providing the repurchase agreement is obligated to repurchase the obligations. Any investment in obligations described in [a] and [b] above may be made in the form of an entry made on the records of the issuer of the particular obligation.

The Bond Registrar, any Paying Agent, other Fiduciaries, or other custodian of funds of the District, respectively, may trade with itself in the purchase and sale of securities for such investment and may charge its ordinary and customary fees for such trades, including cash sweep account fees. In the absence of any direction from the District, the Bond Registrar, any Paying Agent, other Fiduciaries, or other custodian of funds of the District, respectively, shall invest all funds in sweep accounts, money market funds and similar short-term investments, provided that all such investments shall constitute Investment Securities.

"Maturity" when used with respect to any Note shall mean the date on which the principal of such Note becomes due and payable as therein provided, whether at the Stated Maturity or by declaration of acceleration, call for redemption or otherwise.

"Maximum Interest Rate" means, with respect to any particular Variable Interest Rate Bond, an annual rate of interest, which shall be set forth in the Supplemental Resolution authorizing such Bond, that shall be the maximum rate of interest such Bond may at any time bear.

"Minimum Interest Rate" means, with respect to any particular Variable Interest Rate Bond, an annual rate of interest which may (but need not) be set forth in the Supplemental Resolution authorizing such Bond, that shall be the minimum rate of interest such Bond may at any time bear.

"Moody's" means Moody's Investors Service, Inc., a corporation organized and existing under the laws of the State of Delaware, its successors and their assigns, if any.

"Month" means a calendar month.

"Net Revenues" for any period shall mean Revenues, less Operating Expenses for such period. "Noteholder", "Owner", "owner", "Holder" or "holder" or any similar term, when used with reference to any of the Notes, shall mean any Person who shall be the registered owner on the records of the Note Registrar of any then Outstanding Notes.

"Notes" shall mean the District's Subordinated Sewer and Drainage System Revenue Notes issued pursuant to the Note Resolution.

"Note Account" shall mean the fund created in Section 5.2 of the Note Resolution. "Note Documents" shall mean the Note Resolution and the Notes.

"Note Register" shall have the meaning specified in Section 2.5 of the Note Resolution.

"Note Registrar" shall mean the Paying Agent in its capacity as bond registrar, appointed and serving in such capacity pursuant to the Note Resolution.

"Note Resolution" or "Subordinated Debt Resolution" shall mean the Subordinate Debt Resolution adopted by the District on April 26, 2010, as amended by the Subordinate Debt Sale Resolution adopted on August 24, 2020.

"Notice by Mail" or "notice" of any action or condition "by Mail" shall mean a written notice meeting the requirements of the Note Resolution mailed by first-class mail, postage prepaid, to the Holders of specified Notes at the addresses shown in the Note Register. If, because of the temporary or permanent suspension of mail service or for any other reason, it is impossible or impracticable to mail any such notice in the manner described, then such notification in lieu thereof as shall be made with the approval of the Paying Agent shall constitute a sufficient notice.

"Official Statement" shall mean the offering document for a series of Notes to be used by the Underwriter to offer such Notes, as from time to time amended.

"Operating Expenses" means the District's reasonable, ordinary, usual or necessary current expenses of maintenance, repair and operation of the System, determined in accordance with generally accepted accounting principles and the enterprise basis of accounting. Operating Expenses shall include, without limiting the generality of the foregoing, [i] expenses not annually recurring, [ii] administrative and engineering expenses (to the extent not paid or reimbursed as a Cost of Construction and Acquisition), payments to pension or retirement funds properly chargeable to the System, insurance premiums, fees and expenses of Paying Agents and legal expenses, [iii] interest on, redemption premium on, or principal of, Subordinated Debt, [iv] any other expenses required to be paid by the District under the provisions of the Resolution or by law and [v] amounts reasonably required to be set aside in reserves for operating items or expenses the payment of which is not then immediately required.

However, Operating Expenses do not include [i] reserves for extraordinary maintenance or repair, or any allowance for depreciation, or any deposits or transfers to the credit of the Bond Fund or the Renewal and Replacement Account, nor any amounts paid or required to be paid to the United States of America pursuant to the Resolution (except to the extent such rebate amounts must be paid from Revenues other than the investment income that generated the liability to the United States), [ii] non- capital Costs of Acquisition and Construction or other costs, to the extent composed of non-capital expenses, salaries, wages and fees that are necessary or incidental to capital improvements for which debt has been issued and which may be paid from proceeds of such debt or [iii] losses from the sale, abandonment, reclassification, revaluation or other disposition of properties of the System nor such property items, including taxes and fuel, which are capitalized pursuant to the then existing accounting practice of the District.

"Opinion of Counsel" means an opinion signed by an attorney or firm of attorneys of nationally recognized standing in the field of law relating to municipal bonds (who may be counsel to the District) selected by the District.

"Option Bonds" means Bonds which by their terms may be tendered by and at the option of the Holder thereof for payment or purchase by the District or a third party prior to the stated maturity thereof, or the maturities of which may be extended by and at the option of the Holder thereof

"Ordinary Services and Ordinary Expenses" shall mean those services normally rendered and those expenses normally incurred by a paying agent, bond registrar or trustee under instruments similar to the

Note Resolution, including all costs of administering the optional redemption provisions contained in the Note Resolution including, but not limited to, reasonable attorneys' fees.

"Outstanding" when used with respect to Notes shall mean, as of the date of determination, all Notes theretofore authenticated and delivered under the Note Resolution, except:

Notes theretofore canceled by the Paying Agent or delivered to the Paying Agent for cancellation;

(a) Notes for whose payment or redemption money (which shall be Eligible Moneys to the extent, if any, provided in the Resolution) in the necessary amount has been theretofore deposited with the Paying Agent in trust for the Holders of such Notes, provided that, if such Notes are to be redeemed, notice of such redemption has been duly given pursuant to the Resolution or provision therefor satisfactory to the Paying Agent has been made;

(b) Notes in exchange for or in lieu of which other Notes have been authenticated and delivered pursuant to the Resolution; provided, however, that in determining whether the Holders of the requisite principal amount of Notes Outstanding have given any request, demand, authorization, direction, notice, consent or waiver hereunder, District Notes shall be disregarded and deemed not to be Outstanding, except that, in determining whether the Paying Agent shall be protected in relying upon any such request, demand, authorization, direction, notice, consent or waiver, only Notes of which the Responsible Officer of the Paying Agent located at the Paying Agent's principal corporate trust office has actual knowledge are District Notes are disregarded; and

(c) For purposes of any consent, request, demand, authorization, direction, notice, waiver or other action to be taken by the Holders of all or a specified percentage of Outstanding Notes hereunder, all District Notes.

"Outstanding" when used with reference to Bonds, means, as of any date, Bonds theretofore or thereupon being authenticated and delivered under the Resolution except:

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

(ii) Bonds (or portion of Bonds) for the payment or redemption of which monies, equal to the principal amount or Redemption Price thereof, as the case may be, with interest to the date of maturity or redemption date shall be held in trust under the Resolution and set aside for such payment or redemption (whether at or prior to the maturity or redemption date), provided that if such bonds (or portion of Bonds) are to be redeemed, notice of such redemption shall have been given or provision satisfactory to the District shall have been made for the giving of such notice as provided in the Resolution;

(iii) Bonds in lieu of or in substitution for which other Bonds shall have been authenticated and delivered pursuant to the Resolution;

(iv) Bonds deemed to have been paid as provided in the Resolution; and

(v) Option Bonds deemed tendered in accordance with the provisions of the Supplemental Resolution authorizing such Bonds on the applicable adjustment or conversion date if interest thereon shall have been paid through such applicable date and the purchase price thereof shall have been paid or amounts are available for such payment as provided in the

Resolution.

"Paying Agent" means any bank or trust company organized under the laws of any state of the United States of America or any national banking association designated as paying agent for the Bonds of any Series, and its successor or successors hereafter appointed in the manner provided in the Resolution.

"Payment of the Notes" shall mean the payment in full of principal of, premium, if any, and interest on the Notes or provisions for such payment sufficient to discharge the Note Resolution.

"Person" shall mean any natural person, corporation, limited liability company, joint venture, cooperative, partnership, trust or unincorporated organization, government or governmental body or agency, political subdivision or other legal entity, as in the context may be appropriate.

"Pledged Property" means and includes the following property, as and when received by or for the account of the District, in each case pending the application or expenditure thereof in accordance with the Resolution: [i] the proceeds of sale of Bonds, [ii] all Revenues, [iii] all amounts on deposit in the Funds or Accounts established under the Resolution, [iv] such other amounts as may be pledged from time to time by the District as security for the payment of Bonds and [v] all proceeds of the foregoing.

"Principal Installment" means, as of the date of calculation and with respect to any Series, so long as any Bonds thereof are Outstanding, [i] the principal amount of Bonds of such Series due on a certain future date for which no Sinking Fund Installments have been established (including the principal amount of Option Bonds tendered for payment and not purchased), [ii] the Sinking Fund Installment due on a certain future date for Bonds of such Series and [iii] if such future dates coincide, the sum of such principal amount and such Sinking Fund Installment.

"Prior Bonds" or "Senior Debt" shall mean any bonds, notes or other obligations issued on a parity as to security and sources of payment pursuant to the Bond Resolution.

"Project" means a capital project of the District to be financed or refinanced with the proceeds of any of the Notes, and with respect to the Series 2020 Notes shall mean the refunding of certain of the District's outstanding Sewer and Drainage System Subordinated Bond Anticipation Notes, Series 2017.

"Rating Agency" shall mean Moody's, S&P and/or Fitch.

"Record Date" means a Regular Record Date or a Special Record Date.

"Redemption Date" when used with respect to any Note to be redeemed shall mean the date on which it is to be redeemed pursuant to the Resolution.

"Redemption Price" means, with respect to any Bond, the principal amount thereof plus the applicable premium, if any, payable upon redemption thereof pursuant to such Bond.

"Redemption Price" when used with respect to any Note to be redeemed shall mean the price at which it is to be redeemed.

"Refunding Bonds" means all Bonds, whether issued in one or more Series or as part of a Series, authenticated and delivered on original issuance pursuant to the Resolution.

"Renewal and Replacement Account" means the account of that name which is maintained pursuant to the Resolution.

"Reserve Account" means the Reserve Account of the Bond Fund.

"Resolution" means the Sewer and Drainage System Revenue Bond Resolution of the District originally adopted on December 9, 1992 and amended and restated in its entirety on June 30, 1993, as from time to time amended or supplemented.

"Responsible Officer" when used with respect to the Paying Agent shall mean the chairman or vice-chairman of the board of directors, the chairman or vice-chairman of the executive committee of the board of directors, the president, any vice-president, any trust officer, or any other officer of the Paying Agent customarily performing functions similar to those performed by any of the above designated officers and who, in any event is located at the principal corporate trust office of the Paying Agent and shall also mean, with respect to a particular corporate trust matter any other officer to whom such matter is referred because of his knowledge of and familiarity with the particular subject; with respect to any signature on or authentication of Notes by the Paying Agent, the term "Responsible Officer" shall also include any authorized signers of the Paying Agent.

"Revenue Fund" means the Revenue Fund which is maintained pursuant to the Resolution. "Revenues" means all revenues, rates, fees, rents, charges and other operating income and receipts, as derived by or for the account of the District from or for the operation, use or services of the System, determined in accordance with generally accepted accounting principles and the enterprise basis of accounting. Revenues shall include, without limiting the generality of the foregoing, [i] revenue from capital charges recovered or reimbursed to the District, capacity charges and service connection fees, [ii] acquisition surcharges and assessments levied by the District (regardless of whether any of the same are allocated or designated by the District for capital expenditures) and [iii] interest or other income received or to be received from any source, including but not limited to interest or other income received or to be received on any monies or securities held pursuant to the Resolution. Revenues shall not include customer deposits and contributions in aid of construction, except to the extent the same would constitute revenues or income in accordance with generally accepted accounting principles.

"S&P" shall mean Standard & Poor's Ratings Group, a division of McGraw-Hill Financial Services Company, a corporation organized and existing under the laws of the State of New York, its successors and their assigns, and if such corporation shall be dissolved or liquidated or shall no longer perform the functions of a municipal securities rating agency, S&P shall be deemed to refer to any other nationally recognized municipal securities rating agency designated by the District.

"Secretary-Treasurer" means the Secretary-Treasurer of the District, or such officer of the District as may succeed to the duties and responsibilities of the Secretary-Treasurer.

"Securities Exchange Act" means the Securities Exchange Act of 1934, as amended.

"Securities Depository" means any securities depository that is a "clearing corporation" within the meaning of the New York Uniform Commercial Code and a "clearing agency" registered pursuant to the provisions of Section 17A of the Securities Exchange Act, operating and maintaining, with its participants or otherwise, a Book-Entry System to record ownership of beneficial interests in bonds and bond service charges, and to effect transfers of bonds in Book-Entry Form, and means, initially, The Depository Trust Company (a limited purpose trust company), New York, New York.

"Securities Depository Nominee" means any nominee of a Securities Depository and shall initially mean Cede & Co., New York, New York, as nominee of The Depository Trust Company.

"Senior Debt" or "Prior Bonds" shall mean any bonds, notes or other obligations issued on a parity as to security and sources of payment pursuant to the Bond Resolution.

"Senior Subordinated Debt Fund" means the Senior Subordinated Debt Fund which is maintained pursuant to the Resolution.

"Series" means all of the Bonds authenticated and delivered on original issuance and identified pursuant to the Resolution or any Supplemental Resolution authorizing such Bonds as a separate Series of Bond, and any Bonds thereafter authenticated and delivered in lieu of or in substitution for such Bonds pursuant to the Resolution, regardless of variations in maturity, interest rate, Sinking Fund Installments, or other provisions.

"Series 2020 Notes" shall mean the District's Sewer and Drainage System Subordinated Bond Anticipation Notes, Series 2020 issued pursuant to the Note Resolution.

"Sinking Fund Installment" means an amount so designated which is established pursuant to the Resolution.

"Stated Maturity" when used with respect to any Note or any installment of interest thereon shall mean the date specified in such Note as the fixed date on which principal of such Note or such installment of interest is due and payable.

"Subordinated Debt Subaccounts" shall have the meaning assigned to such term in Section 6.05 of the Note Resolution.

"Subordinated Debt" means indebtedness of the System which is subordinate to the Bonds issued under the Resolution including the Senior Subordinated Debt.

"Supplemental Resolution" means any resolution supplemental to or mandatory of this Resolution adopted by the District in accordance with the Resolution.

"System" means [i] the sewer facilities, drainage facilities and all appurtenant facilities or any other facilities owned, operated or controlled by the District from time to time, [ii] any Project and [iii] all improvements, additions, extensions and betterments to the foregoing which may be hereafter acquired by the District by any means whatsoever.

"Trust Funds" shall mean all of the funds and accounts held by the Paying Agent pursuant to Note Resolution, but otherwise excluding the Rebate Fund.

"Trust Moneys" shall have the meaning stated in the Note Resolution.

"Valuation Date" means with respect to any Capital Appreciation Bonds and Capital Appreciation and Income Bonds, the date or dates set forth in the Supplemental Resolution authorizing such Bonds on which specific Accreted Values or Appreciated Values are assigned to the Capital Appreciation Bonds and Capital Appreciation and Income Bonds, as the case may be.

"Variable Interest Rate" means a variable interest rate to be borne by a Series of Bonds or any one or more maturities within a Series of Bonds.

"Variable Interest Rate Bonds" for any period means bonds which during such period bear a Variable Interest Rate, provided that Bonds the interest rate on which shall have been fixed for the remainder of the term thereof shall no longer be Variable Interest Rate Bonds.

"Vice-Chairperson" means the Vice-Chairperson of the District, or such officer of the District as may succeed to the duties and responsibilities of the Vice-Chairperson.

SUMMARY OF PROVISIONS OF THE BOND RESOLUTION

The Pledge Affected by the Resolution.

The Bonds are special and limited obligations of the District payable, solely from and secured as to the payment of the principal and Redemption Price thereof, and interest thereon, in accordance with their terms and the provisions of the Resolution, solely from the Pledged Property. There are by the Resolution pledged and assigned as security for the payment of the principal and Redemption Price of, and interest on, the Bonds in accordance with their terms and the provisions of the Resolution, subject only to the provisions of the Resolution permitting the application thereof for the purposes and on the terms and conditions set forth in the Resolution, the Pledged Property.

Establishment of Funds and Accounts; Application of Revenues.

The Resolution establishes the following Funds and Accounts:

(a) Construction and Acquisition Fund to be held by the District,

(b) Revenue Fund to be held by the District,

(c) Bond Fund to be held by the Paying Agent which shall consist of a Debt Service Account and a Reserve Account,

(d) Renewal and Replacement Account to be held by the District, and

(e) Senior Subordinated Debt Fund to be held by the District.

The District may, for accounting or allocation purposes, [i] establish one or more additional accounts or subaccounts within the Construction and Acquisition Account, the Revenue Fund, the Bond Fund or the Renewal and Replacement Account, or [ii] to the extent not expressly prohibited by other provisions hereof, commingle amounts between or among any or all of such Funds or Accounts, except the Senior Subordinated Debt Fund.

Construction and Acquisition Fund.

There shall be paid into the Construction and Acquisition Fund the amounts required to be so paid by the provisions of the Resolution, and there may be paid into the Construction and Acquisition Fund, at the option of the District, any monies received by the District from any source, unless required to be otherwise applied as provided by the Resolution. Amounts in the Construction and Acquisition Fund shall be applied to pay the Cost of Construction and Acquisition in the manner provided in the

Resolution and the Supplemental Resolution authorizing a Series of Bonds to finance the Cost and Acquisition of a Project.

There shall be established within the Construction and Acquisition Fund a separate account for a Project.

The proceeds of insurance, if any, maintained pursuant to the Resolution against physical loss of or damage to the System, or of contractors' performance bonds or other assurances of completion with respect thereof, or pertaining to the period of construction thereof, shall be paid into the appropriate separate account in the Construction and Acquisition Fund.

The Secretary-Treasurer of the District shall make payments from the Construction and Acquisition Fund, except payments and withdrawals pursuant to the Resolution as described in the next paragraph, in the amounts, at the times, in the manner, and on the other terms and conditions set forth in the Resolution. The Secretary-Treasurer or other Authorized Officer of the District shall maintain adequate records in respect of all payments made, including [a] the particular account established within the Construction and Acquisition Fund from which such payment is to be made, [b] the name and address of the person, firm or corporation to whom payment is due, [c] the amount to be paid and [d] the particular item of the Cost of Construction and Acquisition to be paid and that the cost or the obligation in the stated amount is a proper charge against the Construction and Acquisition Fund which has not been previously paid. The Secretary-Treasurer shall issue a check for each payment required by such requisition or shall by interbank transfer or other method arrange to make the payment required by such requisition.

Notwithstanding any of the provisions of the Resolution as described under this caption, except as provided below, to the extent that other monies are not available therefor, amounts in the Construction and Acquisition Fund shall be applied to the payment of Principal Installments of and interest on Bonds when due; provided, however, that proceeds (and investment earnings thereon) from the issuance by the District of Senior Subordinated Debt shall not be subject to the priority in favor of the Bonds created by the Resolution, but may instead be pledged by the District as security and a source of payment first for the Senior Subordinated Debt pursuant to the resolution or resolutions of the District authorizing such Senior Subordinated Debt, in which event such amounts shall be applied to the payment of debt service on the Senior Subordinated Debt when due to the extent that other monies are not available therefor, and shall not be used to pay debt service on any Bonds if there is any Senior Subordinated Debt which remains outstanding and unpaid.

An adequate record of the completion of construction of a Project financed in whole or in part by the issuance of Bonds shall be maintained by an Authorized Officer of the District. The balance in the separate account in the Construction and Acquisition Fund established therefor shall be transferred to the Reserve Account in the Bond Fund, if and to the extent necessary to make the amount of such Account equal to the Debt Service Reserve Requirement, and any excess amount shall be paid over or transferred to the District for deposit in the Revenue Fund.

Application of Revenues.

All Revenues shall be promptly deposited by the District upon receipt thereof into the Revenue Fund.

There shall be withdrawn in each month the following amounts, for deposit as set forth below and in the order of priority set forth below.

(i) To the Bond Fund, (i) for credit to the Debt Service Account, the amount, if any, required so that the balance in such Account shall equal the Accrued Aggregate Debt Service as of the last day of the then current month or, if interest or principal are required to be paid to Holders of Bonds during the next succeeding month on a day other than the first day of such month, Accrued Aggregate Debt Service as of the day through and including which such interest or principal is required to be paid and (ii) for credit to the Reserve Account, the amount, if any, required for such Account, after giving effect to any surety bond, insurance policy, letter of credit or other similar obligation deposited in such Account pursuant to the Resolution, to equal one-twelfth (1/12) of the difference between (a) the amount then in the Reserve Account immediately preceding such deposit and (b) the actual Debt Service Reserve Requirement as of the last day of the then current month; and

(ii) To the Senior Subordinated Debt Fund the amount, if any, required to pay the scheduled base and additional rental payments when due on the Senior Subordinated Debt and make deposits, if any, for reserves therefor, in accordance with the provisions of, and subject to the priorities and limitations and restrictions provided in, the Senior Subordinated Debt; and

(iii) Each month the District shall pay from the Revenue Fund such amounts as are necessary to meet Operating Expenses for such month; and

(iv) To the Renewal and Replacement Account, a sum equal to 1/12 of the amount, if any, provided in the Annual Budget to be deposited in the Renewal and Replacement Account during the then current Fiscal Year; provided that, if any such monthly allocation to the Renewal and Replacement Account shall be less than the required amount, the amount of the next succeeding monthly payment shall be increased by the amount of such deficiency.

The balance of monies remaining in the Revenue Fund after the above required payments have been made may be used by the District for any lawful purpose relating to the System; provided, however, that none of the remaining monies shall be used for any purpose other than those hereinabove specified unless all current payments and including all deficiencies in prior payments, if any, have been made in full and unless the District shall have complied fully with all the covenants and provisions of the Resolution.

So long as there shall be held in the Debt Service Account and the Reserve Account an amount sufficient to pay in full all Outstanding Bonds in accordance with their terms (including principal or applicable sinking fund Redemption Price and interest thereon), no transfers shall be required to be made to the Bond Fund; and provided further, that any deficiency in the Reserve Account, after giving effect to any surety bond, insurance policy or letter of credit deposited in such Account pursuant to the Resolution as described in the fourth paragraph under the caption "Bond Fund - Reserve Account" herein, other than a deficiency attributable to a withdrawal of amounts therefrom pursuant to the Resolution as described in the first paragraph under the caption "Bond Fund - Reserve Account" herein, shall be cured by depositing into the Reserve Account each month during the period commencing with the month following the month in which the determination of the deficiency was made an amount equal to one-twelfth (1/12th) of the deficiency, except that, if a new valuation of Investment Securities held in the Reserve Account is made pursuant to the Resolution during the period that such deposits are required, then the obligation of the District to make deposits during the balance of such period on the basis of the preceding valuation shall be discharged and the deposits, if any, required to be made for the balance of such period shall be determined under this proviso on the basis of the new valuation.

Bond Fund - Debt Service Account.

The Paying Agent, from amounts deposited therein, shall pay out of the Debt Service Account, [i] on or before each interest payment date for any of the Bonds, the amount required for the interest payable on such date, [ii] no later than each Principal Installment due date, the amount required for the Principal Installment payable on such due date and [iii] no later than any redemption date for the Bonds, the amount required for the payment of interest on the Bonds then to be redeemed. In the case of Variable Interest Rate Bonds, the District shall furnish the Paying Agent with a certificate setting forth the amount to be paid on such Bonds on each interest payment date, such certificate shall be furnished on or prior to the appropriate Record Date with respect to any interest payment date. Such amounts shall be applied by the Paying Agents on or after the due dates thereof. The Paying Agent shall also pay out of the Debt Service Account, from amounts deposited therein, the accrued interest included in the purchase price of Bonds purchased for retirement.

Amounts accumulated in the Debt Service Account with respect to any Sinking Fund Installment may be applied on or prior to the 40th day next preceding the due date of such Sinking Fund Installment, to [i] the purchase of Bonds of the Series and maturity for which such Sinking Fund Installment was established or [ii] the redemption at the applicable sinking fund Redemption Price of such Bonds, if then redeemable by their terms. All purchases of any Bonds pursuant to the Resolution as described in this paragraph shall be made at prices not exceeding the applicable sinking fund Redemption Price of such Bonds plus accrued interest. The applicable sinking fund Redemption Price (or principal amount of maturing Bonds) of any Bonds so purchased or redeemed shall be deemed to constitute part of the Debt Service Account until such Sinking Fund Installment date, for the purpose of calculating the amount of such Account. As soon as practicable after the 40th day preceding the due date of any such Sinking Fund Installment, the District shall proceed to call for redemption, by giving notice as provided in the Resolution, on such due date Bonds of the Series and maturity for which such Sinking Fund Installment was established (except in the case of Bonds maturing on a Sinking Fund Installment date) in such amount as shall be necessary to complete the retirement of the unsatisfied balance of such Sinking Fund Installment. The District shall pay out of the Debt Service Account to the appropriate Paying Agents, on or before such redemption date (or maturity date), the amount required for the redemption of the Bonds so called for redemption (or for the payment of such Bonds then maturing), and such amount shall be applied by such Paying Agents to such redemption (or payment).

Unless otherwise provided by the District, upon any purchase or redemption pursuant to the Resolution of Bonds of any Series and maturity for which Sinking Fund Installments shall have been established, there shall be credited, in increments of $5,000 to the extent practicable, toward each succeeding Sinking Fund Installment thereafter to become due on Bonds, of the same series and maturity (other than the Sinking Fund Installment next coming due) an amount bearing the same ratio, to the Sinking Fund Installment, as the total principal amount of Bonds purchased or redeemed bears to the total principal amount of all the Sinking Fund Installments to be credited. The portion of any principal Sinking Fund Installment remaining after the deduction of any such amounts are credited toward the same shall constitute the unsatisfied balance of such Sinking Fund Installment for the purpose of calculation of Sinking Fund Installments due on a future date. The amount, if any, deposited in the Debt Service Account from the proceeds of each Series of Bonds shall be set aside in such Account and applied to the payment of interest on Bonds as provided in the Resolution or in accordance with certificates of the District delivered pursuant to the Resolution or, if the District shall modify or amend any such certificate by a subsequent certificate signed by an Authorized Officer of the District, then in accordance with the most recent amended certificate.

In the event of the refunding of any Bonds, the District may withdraw from the Debt Service Account in the Bond Fund all, or any portion of, the amounts accumulated therein with respect to Debt Service on the Bonds being refunded and deposit such amounts with itself to be held for the payment of the principal or Redemption Price, if applicable, and interest on the Bonds being refunded; provided that such withdrawal shall not be made unless (a) immediately thereafter Bonds being refunded shall be deemed to have been paid pursuant to the Resolution as described herein under the caption "Defeasance," and (b) the amount remaining in the Debt Service Account in the Bond Fund, after giving effect to the issuance of Refunding Bonds and the disposition of the proceeds thereof, shall not be less than the requirement of such Account pursuant to the Resolution in the second paragraph under this caption. In the event of such refunding, the District may also withdraw from the Debt Service Account in the Bond Fund all, or any portion of, the amounts accumulated therein with respect to Debt Service on the Bonds being refunded and deposit such amounts in any fund or Account under the Resolution; provided, however, that such withdrawal shall not be made unless items (a) and (b) referred to hereinabove have been satisfied and provided, further, that, at the time of such withdrawal, there shall exist no deficiency in any Fund or Account held under the Resolution, as confirmed in writing to the Bond Registrar by the Secretary- Treasurer.

Bond Fund - Reserve Account.

If five days prior to any interest or Principal Installment due date with respect to any Series of Bonds payment for such interest or Principal Installment in full has not been made or provided for, the District shall forthwith withdraw from the Reserve Account an amount not exceeding the amount required to provide or such payment in full and deposit such amount in the Debt Service Account for application to such payment.

Whenever the amount in the Reserve Account shall exceed the Debt Service Reserve Requirement, after giving effect to any surety bond, insurance policy or letter of credit deposited in such Account pursuant to the Resolution as described in the fourth paragraph under this caption, such excess shall be deposited in the Debt Service Account.

Whenever the amount in the Reserve Account (exclusive of any surety bond, letter of credit or insurance policy therein), together with the amount in the Debt Service Account is sufficient to pay in full all Outstanding Bonds in accordance with their terms (including principal or applicable sinking fund Redemption Price and interest thereon), the funds on deposit in the Reserve Account shall be transferred to the Debt Service Account. Prior to said transfer, all investments held in the Reserve Account shall be liquidated to the extent necessary in order to provide for the timely payment of principal and interest (or Redemption Price) on the Bonds.

In lieu of the required transfers or deposits to the Reserve Account, the District may cause to be deposited into the Reserve Account a surety bond or an insurance policy for the benefit of the holders of the Bonds or a letter of credit in an amount equal to the difference between the Debt Service Reserve Requirement and the sums then on deposit in the Reserve Account, if any, after the deposit of such surety bond, insurance policy or letter or credit. Such difference may be withdrawn by the District and be deposited in the Revenue Fund. The surety bond, insurance policy or letter of credit shall be payable (upon the giving of notice as required thereunder) on any due date on which monies will be required to be withdrawn from the Reserve Account and applied to the payment of a Principal Installment of or interest on any Bonds and such withdrawal cannot be met by amounts on deposit in the Reserve

Account. If a disbursement is made pursuant to a surety bond, an insurance policy or a letter of credit provided pursuant to this subsection, the District shall be obligated either (i) to reinstate the maximum limits of such surety bond, insurance policy or letter of credit or (ii) to deposit into the Reserve Account, funds in the amount of the disbursement made under such surety bond, insurance policy or letter of credit, or a combination of such alternatives, as shall provide that the amount in the Reserve Account equals the Debt Service Reserve Requirement. Any other provision under this caption to the contrary notwithstanding, for each particular Series of Bonds or portion thereof which is insured by an Insurer, the right of the District under the Resolution to cause a surety bond or an insurance policy to be deposited into the Reserve Account in lieu of the required transfers or deposits thereto shall be subject to the condition that the District obtain the prior written consent of the Insurer as to the structure and the issuer of such surety bond or insurance policy.

In the event of the refunding of any Bonds, the District may withdraw from the Reserve Account in the Bond Fund all, or any portion of, the amounts accumulated therein with respect to the Bonds being refunded and deposit such amounts with itself to be held for the payment of the principal or Redemption Price, if applicable, and interest on the Bonds being refunded; provided that such withdrawal shall not be made unless (a) immediately thereafter the Bonds being refunded shall be deemed to have been paid pursuant to the Resolution as described in the second paragraph under the caption "Defeasance" herein, and (b) the amount remaining in the Reserve Account in the Bond Fund, after giving effect to the issuance of the Refunding Bonds and the disposition of the proceeds thereof, shall not be less than the Debt Service Reserve Requirement.

If any withdrawals are made from the Reserve Account pursuant to the Resolution, the resulting deficiency, if any, shall be remedied by the application of monthly payments into the Reserve Account as set forth in the Resolution, or by transfers from the Renewal and Replacement Account or both, until the amount on deposit in the Reserve Account is equal to the Debt Service Reserve Requirement, whereupon such deposits shall be discontinued until such time, if any, that there is again a deficiency.

Renewal and Replacement Account.

Monies to the credit of the Renewal and Replacement Account may be applied to the cost of major replacements, repairs, renewals, maintenance, betterments, improvements, reconstruction or extensions of the System or any part thereof as may be determined by the Board.

If at any time the monies in the Debt Service Account, the Reserve Account and the Revenue Fund shall be insufficient to pay the interest and Principal Installments becoming due on the Bonds, then the District shall transfer from the Renewal and Replacement Account for deposit in the Debt Service Account the amount necessary (or all the monies in said Fund if less than the amount necessary) to make up such deficiency.

Any balance of monies and securities in the Renewal and Replacement Account not required to meet a deficiency as set forth above or for any of the purposes for which the Renewal and Replacement Account was established, may, on direction of the District, be transferred from the Renewal and Replacement Account to the Reserve Account, if and to the extent necessary to make the amount in such Account equal to the Debt Service Reserve Requirement, and any balance may be deposited in the Debt Service Account or the Revenue Fund.

Senior Subordinated Debt Fund.

Subject to the provisions of the Resolution described in the next paragraph, the District shall apply amounts in the Senior Subordinated Debt Fund to the payment of debt service or the scheduled base and additional rental payments when due on the Senior Subordinated Debt and make deposits, if any, for reserves therefor in accordance with the provisions of, and subject to the priorities and limitations and restrictions provided in, the Senior Subordinated Debt.

Notwithstanding any of the other provisions of the Resolution described under this caption, if at any time the amount on deposit in the Reserve Account shall be less than the Debt Service Reserve Requirement, the District shall forthwith transfer from the Senior Subordinated Debt Fund for deposit in the Reserve Account the amount necessary (or all moneys in said Senior Subordinated Debt Fund, if necessary) to make up such deficiency.

Amounts in the Senior Subordinated Debt Fund which the District at any time determines to be in excess of the requirements of such fund may, at the discretion of the District, be transferred to the Debt Service Account or the Renewal and Replacement Account.

Investments.

In making any investment in any Investment Securities with monies in any Fund or Account established under the Resolution, the District may combine, to the extent permitted by law, or instruct such Fiduciary to combine, such monies with monies in any other Fund or Account, but solely for purposes of making such investment in such Investment Securities.

Monies held in the Bond Fund, the Revenue Fund, the Renewal and Replacement Account, the Senior Subordinated Debt Fund and the Construction and Acquisition Fund shall be invested and reinvested to the fullest extent practicable in Investment Securities, maturing not later than such times as shall be necessary to provide monies when needed for payments to be made from such Fund or Account. The Fiduciary, shall make all such investments of monies held by it in accordance with written instructions from time to time received from an Authorized Officer of the District.

Interest (net of that which represents a return of accrued interest) or gain realized on investments in such Funds and Accounts other than the Reserve Account of the Bond Fund, shall be paid into the Revenue Fund, provided that gain realized from the liquidation of an investment shall be governed by the provisions described below. Interest earned or gain realized on investments in the Reserve Account shall be transferred to the Debt Service Account, provided that gain realized from the liquidation of an investment shall be governed by the provisions of the Resolution as described in the first paragraph under the caption "Valuation and Sale of Investments" herein.

Nothing in the Resolution shall prevent any Investment Securities acquired as investments of or security for funds held under the Resolution from being issued or held in book-entry form on the books of the Department of the Treasury of the United States.

Nothing in the Resolution shall preclude any Fiduciary from investing or reinvesting monies through its respective trust department; provided, however, that the District may, in its discretion, direct that such monies be invested or reinvested in a manner other than through such respective trust department.

Valuation and Sale of Investments.

Obligations purchased as an investment of monies in any Fund or Account created under the provisions of the Resolution shall be deemed at all times to be a part of such Fund or Account. Any profit realized from the liquidation of such investment shall be credited to such Fund or Account, and any loss resulting from the liquidation of such investment shall be charged to the respective Fund or Account.

In computing the amount in any Fund or Account created under the provisions of the Resolution for any purpose provided in the Resolution, investments shall be valued at the then market price (as of the time of valuation) thereof. The accrued interest paid in connection with the purchase of an investment shall be included in the value thereof until interest on such investment is paid. Such computation shall be determined on June 30 and December 31 in each Fiscal Year and at such other times as the District shall determine.

Additional Bonds.

One or more Series of Additional Bonds may be authenticated and delivered upon original issuance at any time or from time to time for the purpose of paying all or a portion of the Cost of Construction and Acquisition of a Project. The proceeds, including accrued interest, of the Additional Bonds of each Series shall be applied simultaneously with the delivery of such Bonds as provided in the Supplemental Resolution authorizing such Series. The conditions for the issuance of Additional Bonds to finance the Acquisition and Construction of Additional Facilities include a certificate of an Authorized Officer of the District setting forth (A) for any period of 12 consecutive calendar months within the 24 calendar months preceding the date of the authentication and delivery, the Net Revenues for such period, and (B) the Aggregate Net Debt Service during the same period for which Net Revenues are computed, with respect to all Series of Bonds which were then Outstanding (excluding from Aggregate Net Debt Service any Principal Installment or portion thereof which was paid from sources other than Net Revenues), and showing that the amount set forth in (A) is equal to or greater than 110% of the amount set forth in (B). The conditions for the issuance of Additional Bonds to finance the Acquisition and Construction of Additional Facilities include a certificate of an Authorized Officer of the District setting forth (A) for the last full Fiscal Year of 12 months (ending June 30) immediately preceding the date of the authentication and delivery, the Net Revenues for such period, or, at the option of the District, for the last 12 consecutive full calendar months immediately preceding the date of the authentication and delivery, the Net Revenues for such period, and (B) the estimated maximum Aggregate Net Debt Service in the current or any future Fiscal Year with respect to [i] all Series of Bonds which are then Outstanding and [ii] the Additional Bonds then proposed to be authenticated and delivered (and for this purpose all Series of Bonds Outstanding plus such proposed Additional Bonds shall be treated as a single Series; that is, the maximum Aggregate Net Debt Service shall be computed collectively with respect to all such Bonds, and not computed cumulatively or separately for each particular Series), and showing that the amount set forth in (A) is equal to or greater than 110% of the amount set forth in (B). For purposes of computing the amount set forth in (A), Net Revenues may be increased to reflect the following amounts: [i] any increases in the rates, fees, rents and other charges for services of the System made subsequent to the commencement of such period and prior to the date of such certificate, [ii] any estimated increases in Net Revenues caused by any Project or Projects having been placed into use and operation subsequent to the commencement of such period and prior to the date of such certificate, as if such Project or Projects had actually been placed into use and operation for the entire period chosen in (A) above and [iii] 75% of any estimated increases in Net Revenues which would have been derived from the operation of any Project or Projects with respect to which the Cost of Construction and Acquisition is to be paid from proceeds of the Additional Bonds proposed to be authenticated and delivered, as if such Project or Projects had actually been placed into use and operation for the entire period chosen in (A) above.

Refunding Bonds.

One or more Series of Refunding Bonds may be issued at any time to refund [i] Outstanding Bonds of one or more Series or [ii] one or more maturities within a Series of any Bonds. Refunding Bonds shall be issued in a principal amount sufficient, together with other monies available therefor, to accomplish such refunding and to make the deposits in the Funds and Accounts under the Resolution required by the provisions of the Supplemental Resolution authorizing such Bonds.

Refunding Bonds of each Series shall be authenticated and delivered by the Bond Registrar only upon satisfaction of the following conditions (in addition to the other documents required by the Resolution) of: [i] Instructions to the Bond Registrar, satisfactory to it, to give due notice of redemption, if applicable, of all the Bonds to be refunded on a redemption date or dates specified in such instructions, subject to the provisions of the Resolution described hereinafter under the caption "Defeasance"; [ii] if the Bonds to be refunded are not by their terms subject to redemption or will not be redeemed within the next succeeding 60 days, instructions to the escrow agent described in the Resolution, satisfactory to it, to mail the notice provided for in the Resolution described hereinafter under the caption "Defeasance" to the Holders of the Bonds being refunded; [iii] either (a) cash (including cash withdrawn and deposited pursuant to the Resolution as described herein under the captions "Bond Fund - Debt Service Account" and "Bond Fund - Reserve Account," respectively) in an amount sufficient to effect payment at the applicable Redemption Price of the Bonds to be refunded, together with accrued interest on such Bonds to the redemption date, which monies shall be held by the escrow agent described in the Resolution or any one or more of the Paying Agents in a separate account irrevocably in trust for and assigned to the respective Holders of the Bonds to be refunded or (b) Investment Securities in such principal amounts, of such maturities, bearing such interest, and otherwise having such terms and qualifications and any monies, as shall be necessary to comply with the provisions of the Resolution as described herein under the caption "Defeasance", which Investment Securities and monies shall be held in trust and used only as provided in the Resolution described hereinafter under the caption "Defeasance"; and [iv] such further documents and monies as are required by the provisions of the Resolution or any Supplemental Resolution adopted pursuant to the Resolution.

The proceeds, including accrued interest, of the Refunding Bonds of each Series shall be applied simultaneously with the delivery of such Bonds for the purposes of making deposits in such Funds and Accounts under the Resolution as shall be provided by the Supplemental Resolution authorizing such Series of Refunding Bonds and shall be applied to the refunding purposes thereof in the manner provided in such Supplemental Resolution.

Subordinated Debt.

The District may, at any time, or from time to time, issue debt or enter into a contract, lease, installment sale agreement or other instrument or lend credit to or guarantee debts, claims or other obligations of any person for any of its corporate purposes payable out of, and which may be secured by a pledge of, such amounts as may from time to time be available for the purpose of payment thereof; provided, however, that such pledge shall be, and shall be expressed to be, subordinate and junior in all respects to the pledge and lien created by the Resolution as security for the Bonds.

Creation of Liens; Sale and Lease of Property.

The District shall not issue any bonds, notes, debentures or other evidences of indebtedness of similar nature, other than the Bonds, payable out of or secured by a pledge or assignment of the Pledged Property and shall not create or cause to be created any lien or charge on the Pledged Property; provided, however, that nothing contained in the Resolution shall prevent the District from issuing, if and to the extent permitted by law [i] evidences of indebtedness (a) payable out of monies in the Construction and Acquisition Fund as part of the Cost of Construction and Acquisition of the System or (b) payable out of, or secured by a pledge or assignment of, Revenues to be received on and after such date as the pledge of the Pledged Property provided in the Resolution shall be discharged and satisfied as provided in the Resolution or [ii] Subordinated Debt.

Facilities of the System shall not be sold, leased, mortgaged or otherwise disposed of, except as follows: (A) The District may sell or exchange at any time and from time to time any property or facilities constituting part of the System, at such consideration as the District in its sole discretion deems reasonable or appropriate under all the circumstances, but only if it shall determine that ownership by the District of such property or facilities is not necessary or is not material for the purposes of the District in the operation of the System as a whole; or (B) The District may lease or make contracts or grant licenses for the operation of, or make arrangements for the use of, or grant easements or other rights with respect to, any part of the System, provided that any such lease, contract, license, arrangement, easement or right does not materially impede the operation by the District or its agents of the System and [ii] does not materially impair or adversely affect the rights or security of the Bondholders under the Resolution.

Operation and Maintenance of System.

The District shall at all times use its best efforts to operate or cause to be operated the System properly and in an efficient and economical manner, and shall use its best efforts to maintain, preserve and keep the same or cause the same to be so maintained, preserved and kept, with the appurtenances and every part and parcel thereof, in good repair, working order and condition, and shall from time to time make or cause to be made, all necessary and proper repairs, replacements and renewals so that at all times the operation of the System may be properly and advantageously conducted. In rendering any report, certificate or opinion requested pursuant to the Resolution, an Authorized Officer of the District may rely upon information, certificates, opinions or reports required to be provided by others pursuant to the Resolution, and upon other sources which an Authorized Officer of the District considers reliable, and other considerations and assumptions as deemed appropriate by an Authorized Officer of the District.

Annual Budget.

On or before the first day of each Fiscal Year commencing with the Fiscal Year beginning July 1, 1993, the District shall prepare and adopt an Annual Budget for operating purposes for the ensuing Fiscal Year and will furnish copies thereof to any holder of any Bond. Said Annual Budget shall set forth in reasonable detail the estimated Revenues and Operating Expenses and other anticipated expenditures relating to the System for such Fiscal Year. Following the end of each fiscal quarter and at such other times as the District shall determine, the District shall review its estimates set forth in the Annual Budget for such Fiscal Year, and if a material change has occurred in such estimates, the District also may at any time adopt an amended Annual Budget for the remainder of the then current Fiscal Year.

Rents, Rates, Fees and Charges.

The District shall fix, establish, maintain and collect rates, fees, rents and charges for services of the System, which, together with other "Available Revenues" (as hereinafter defined) are expected to produce Available Revenues which will be at least sufficient for each Fiscal Year to pay the sum of [a] an amount equal to 110% of the Aggregate Net Debt Service for such Fiscal Year; and [b] the amount, if any, to be paid during such Fiscal Year into the Reserve Account in the Bond Fund (other than amounts required to be paid into such Account out of the proceeds of Bonds); and [c] all Operating Expenses for such Fiscal Year as estimated in the Annual Budget; and [d] to the extent not included in the foregoing, an amount equal to the debt service on the Senior Subordinated Debt, any other Subordinated Debt or other debt of the District for such Fiscal Year computed as of the beginning of such Fiscal Year; and [e] amounts necessary to pay and discharge all charges or liens payable out of the Available Revenues when due and enforceable.

For purposes of the preceding paragraph, "Available Revenues" means (i) revenues from all rates, rents and charges and other operating income derived or to be derived by the District from or for the operation, use or services of the System, (ii) any other amounts received from any other source by the District and pledged by the District as security for the payment of Bonds and (iii) interest received or to be received on any moneys or securities held pursuant to the Resolution and paid or required to be paid into the Revenue Fund or required to be retained in the Debt Service Account in the Bond Fund or transferred to the Debt Service Account in the Bond Fund. "Available Revenues" will exclude, however, any interest income which is capitalized pursuant to generally accepted accounting principles and the enterprise basis of accounting for governmental enterprises, as promulgated by the Governmental Accounting Standards Board, and governmental grants, in-kind contributions of assets and any assessments levied by the District to the extent that such grants, in-kind contributions and assessments are not recognized as operating revenues, other revenues or extraordinary gains pursuant to generally accepted accounting principles for governmental enterprises, as promulgated by the Governmental Accounting Standards Board. Nothing herein under this caption or in the definition of "Available Revenues" for purposes of the covenant described in the preceding paragraph, shall be construed so as to prohibit the District from taking into account interest earned on moneys or securities held under the Resolution, and other income available or expected to be available in the ordinary course for the payment of Debt Service pursuant to the Resolution, in calculating Aggregate Net Debt Service on the Bonds for any calculation period for purposes hereof or otherwise, nor prohibit the District from taking into account interest earned on moneys or securities held under any Resolution or indenture or similar document adopted or entered into in connection with an issuance of Subordinated Debt, and other income available or expected to be available in the ordinary course for the payment of debt service on Subordinated Debt, in calculating debt service payable on Subordinated Debt for any calculation period for purposes hereof or otherwise.

Promptly upon [i] any material decrease in the Revenues anticipated to be produced by any rates, fees, rents or charges or any later review thereof, [ii] any material increase in expenses of operation of the System not contemplated at the time of adoption of the rates, fees, rents and charges then in effect or any later review thereof or [iii] any other material change in the circumstances which were contemplated at the time such rates, fees, rents and charges were most recently reviewed, but not less frequently than once every 12 months, the District shall review the rates, fees, rents and charges so established and shall promptly establish or revise such rates, fees, rents and charges as necessary to comply with the foregoing requirements, provided that such rates, fees, rents and charges shall in any event produce Revenues sufficient, together with other Revenues, if any, available therefor, to enable the District to comply with all its covenants under the Resolution.

In estimating Aggregate Debt Service or Aggregate Net Debt Service on any Variable Interest Rate Bonds for purposes of the first paragraph under this caption, the District shall be entitled to assume that such Variable Interest Rate Bonds will bear such interest rate or rates as the District shall determine; provided, however, that the interest rate or rates assumed shall not be less than the interest rate borne by such Variable Interest Rate Bonds at the time such estimate is made.

Insurance

Maintenance of Insurance.

The District shall provide protection for the System to the extent necessary to properly conduct the business of the System. Said protection may consist of insurance, self-insurance and indemnities. Any insurance shall be in the form of policies or contracts for insurance with insurers of good standing, shall be payable to the District and may provide for such deductibles, exclusions, limitations, restrictions and restrictive endorsements customary in policies for similar coverage issued to entities operating properties similar to the properties of the System.

Application of Insurance Proceeds.

In the event of any loss or damage to the System covered by insurance, the District will, with respect to each such loss, promptly repair, reconstruct or replace the parts of the System affected by such loss or damage to the extent necessary to the proper conduct of the operation of the business of the System, shall cause the proceeds of such insurance to be applied for that purpose to the extent required therefor, and pending such application shall hold the proceeds of any insurance policy covering such damage or loss in trust to be applied for that purpose to the extent required therefor. Any excess insurance proceeds received by the District shall be transferred to the Revenue Fund.

Accounts and Reports.

The District shall keep or cause to be kept proper books of record and account (separate from all other records and accounts) in which complete and correct entries shall be made of its transactions relating to the System and each Fund and Account established under the Resolution and which, together with all other books and papers of the District, including insurance policies, relating to the System, shall at all times be subject to the inspection of the Bondholders and the Holders of an aggregate of not less than ten percent (10%) in principal amount of the Bonds then Outstanding or their representatives duly authorized in writing.

The District shall annually, within 180 days after the close of each Fiscal Year commencing with the Fiscal Year ending June 30, 1993, prepare an audit for such Fiscal Year, accompanied by a certificate of an Accountant relating to the System which shall include the following statements in reasonable detail: a statement of assets and liabilities as of the end of such Fiscal Year; and a statement of Revenues and Operating Expenses for such Fiscal Year. Such Certificate shall state whether or not, to the knowledge of the signer, the District is in default with respect to any of the covenants, agreements or conditions on its part contained in the Resolution, and if so, the nature of such default.

The reports, statements and other documents required pursuant to any provisions of the Resolution shall be available for the inspection of Bondholders and shall be mailed to each Bondholder who shall file a written request therefor with the District. The District may charge for such reports, statements and other documents, a reasonable fee to cover reproduction, handling and postage.

Tax Covenants Relating to the Internal Revenue Code.

The District shall do the following with respect to Bonds which, when initially issued, are the subject of an Opinion of Counsel to the effect that interest thereon is excluded from gross income for

Federal income tax purposes pursuant to the Internal Revenue Code of 1986 or any successor thereto (the "Code"): [a] in order to maintain the exclusion of interest on the Bonds from gross income for Federal income tax purposes, and for no other purpose, the District shall comply with the Code; [b] in furtherance of the covenant contained in the preceding paragraph, the District shall make any and all payments required to be made to the United States Department of the Treasury in connection with the Bonds pursuant to Section 148(f) of the Internal Revenue Code; and [c] Notwithstanding any other provision of the Resolution to the contrary, so long as necessary in order to maintain the exclusion from gross income of interest on the Bonds for Federal income tax purposes, the covenants contained in this Section thereon, including any payment or defeasance thereof pursuant to the Resolution as described under the caption "Defeasance" herein.

Events of Default.

Each of the following events (being those provided by Section 76.160 of the Kentucky Revised Statutes) is hereby declared an "event of default"; that is, if: [a] payment of the principal of any of the Bonds is not made on the date therein specified for payment thereof, nor within thirty (30) days thereafter, or payment of any installment of interest is not made on the date specified for such payment, nor within thirty (30) days thereafter, or [b] default shall be made in the due and punctual observance or performance of any of the covenants, conditions and agreements on the part of the District, in the Bonds or in the Resolution, or in any pertinent law contained, and such default shall continue for a period of thirty (30) days.

Rights Arising Upon Occurrence of Event of Default.

That upon the happening of any event of default specified in the Resolution as described immediately above, the provisions of said Section 76.160 of Kentucky Revised Statutes shall become operative, and the holder or holders of twenty percent (20%) in principal amount or more of the Bonds then Outstanding pursuant to the Resolution may, by an instrument or instruments filed in the office of the County Clerk of Jefferson County, Kentucky, and approved or acknowledged in the same manner as a deed to be recorded, apply to a Judge in the Circuit Court of such County to appoint a trustee to represent all of the Bondholders. Upon such application, such Judge shall appoint a trustee and such trustee may, and upon the written request of the holder or holders of twenty percent (20%) in principal amount or more of the Bonds Outstanding under the Resolution, shall, in his or its name, (a) by mandamus or other suit, action or proceeding at law, or in equity, including mandatory injunction, enforce all rights of the District to collect rates, rentals and other charges adequate to carry out any agreement as to, or pledge of, the revenues and income of the District, and to require the District and its officers to carry out any other agreement with the Bondholders and to perform its and their duties imposed by law; (b) bring suit upon the Bonds; (c) by action or suit in equity require the District to account as if it were the trustee of an express trust for the Bondholders; (d) by action or suit in equity enjoin any acts or things which may be unlawful or in violation of the rights of Bondholders; (e) declare all Bonds due and payable; and (f) pursue any other rights or remedies available at law or in equity. For any Bonds registered in Book-Entry Form, notwithstanding the above definition of "Bondholder," the Paying Agent shall be entitled to rely upon written instructions from a majority of the beneficial owners of the Bonds with reference to consent, if any, required from Holders pursuant to the terms of the Resolution.

Any such trustee, whether or not all Bonds have been declared due and payable, shall be entitled as of right upon application to such Court to the appointment of a receiver, who may enter upon and take possession of the System, or any part or parts thereof, and operate and maintain the same, and collect and receive all rentals, rates, and other charges, and other revenues and income, of the District, thereafter arising therefrom, in the same manner as the District and its officers might do, and shall deposit all such monies in a separate account and apply the same in such manner as such Court shall direct. In any suit, action or proceeding, by the trustee, the fees, counsel fees and expenses of the trustee and of the receiver, if any, shall constitute disbursements taxable as costs. All costs and disbursements allowed by the Court shall be a first charge on any revenue and income derived from the System. Such trustee shall, in addition to the foregoing, have and possess all of the powers necessary or appropriate for the exercise of any functions specifically set forth herein or incident to the general representation of the Bondholders in the enforcement and protection of their rights.

Rights of Insurer.

Any other provision of the Resolution to the contrary notwithstanding, and to the extent permitted by law (including the Act), for each particular Series of Bonds or portion thereof that is insured by an Insurer, the exercise by the court appointed trustee or the Bondholders of any rights, powers or privileges granted thereto in the Resolution shall require the written consent of the Insurer, if the Insurer is not then in breach or default of its obligations under its insurance policy.

Bond Registrar; Paying Agents.

The Resolution permits the appointment by the District of a Bond Registrar and one or more Paying Agents. Any Paying Agent or Bond Registrar may at any time resign and be discharged of the duties and obligations created by the Resolution by giving at least 60 days written notice to the District and the other Paying Agents or Bond Registrars. Any Paying Agent or Bond Registrar may be removed at any time by an instrument filed with such Paying Agent or Bond Registrar and signed by an Authorized Officer of the District. Any successor Paying Agent or Bond Registrar shall be appointed by the District and shall be a bank or trust company organized under the laws of any state of the United States or a national banking association, having capital stock, surplus and undivided earnings aggregating at least $10,000,000, and willing and able to accept the office on reasonable and customary terms and authorized by law to perform all the duties imposed upon it by the Resolution.

Amendments and Supplemental Resolutions.

Any modification or amendment of the Resolution and of the rights and obligations of the District and of the Holders of the Bonds thereunder, in any particular, may be made by a Supplemental Resolution, with the written consent given as provided in the Resolution of [i] the Holders of at least a majority in principal amount of the Bonds Outstanding at the time such consent is given and [ii] if less than all of the Series of Bonds then Outstanding are affected by the modification or amendment, the Holders of at least a majority in principal amount of the Bonds of each Series so affected and Outstanding at the time such consent is given; provided that if such modification or amendment will, by its terms, not take effect so long as any Bonds of any specified like Series and maturity remain Outstanding, the consent of the Holders of such Bonds shall not be required and such Bonds shall not be deemed to be Outstanding for the purpose of any calculation of Outstanding Bonds under this Section. No such modification or amendment shall permit a change in the terms of redemption (including Sinking Fund Installments) or maturity of the principal of any Outstanding Bond or of any installment of interest thereon or a reduction in the principal amount or the Redemption Price thereof or in the rate of interest thereof without the consent of the Holder of such Bond, or shall reduce the percentages or otherwise affect the classes of Bonds the consent of the Holders of which is required to effect any such modification or amendment, or shall change or modify any of the rights or obligations of any Fiduciary without its written assent thereto. For the purpose of this caption, a Series shall be deemed to be affected by a modification or amendment of the Resolution if the same adversely affects or diminishes the rights of the Holders of Bonds of such Series. The District may in its sole discretion determine whether or not, in accordance with the foregoing powers of amendment, Bonds of any particular Series or maturity would be affected by any modification or amendment of the Resolution and any such determination shall be binding and conclusive on the District and all Holders of Bonds.

For any one or more of the following purposes and at any time or from time to time, a Supplemental Resolution of the District may be adopted, which, when adopted, shall be fully effective in accordance with its terms: [1] to close the Resolution against, or provide limitations and restrictions in addition to the limitations and restrictions contained in the Resolution on, the authentication and delivery of Bonds or the issuance of other evidences of indebtedness; or [2] to add to the covenants and agreements of the District in the Resolution, other covenants and agreements to be observed by the District which are not contrary to or inconsistent with the resolutions as theretofore in effect; or [3] to add to the limitations and restrictions in the Resolution, other limitations and restrictions to be observed by the District which are not contrary to or inconsistent with the Resolution as theretofore in effect; or [4] to authorize Bonds of a Series; or [5] to authorize one or more series of Subordinated Debt; or [6] to authorize, in compliance with all applicable law, Bonds of each Series to be issued in the form of coupon Bonds; or [7] to authorize, in compliance with all applicable law, Bonds of each Series to be issued in the form of Bonds issued and held in book-entry form on the books of the District or any Fiduciary appointed for that purpose by the District; or [8] notwithstanding any other provisions of the Resolution, to authorize Bonds of a Series having terms and provisions different than the terms and provisions theretofore provided in the Resolution; or [9] to confirm, as further assurance, any pledge or assignment under, and the subjection to any security interest, pledge or assignment created or to be created by, the Resolution of the Pledged Property and Credit Facilities or other agreements; or [10] to comply with the provisions of any federal or state securities law, including, without limitation, the Trust Indenture Act of 1939, as amended or comply with Section 103 of the Internal Revenue Code of 1986 or 1954, as applicable, as amended, or successor provisions; or [11] to modify any of the provisions of the Resolution in any other respect whatever, provided that [i] such modification shall be, and be expressed to be, effective only after all Bonds of each Series Outstanding at the date of the adoption of such Supplemental Resolution shall cease to be Outstanding and [ii] such Supplemental Resolution shall be specifically referred to in the text of all Bonds of any Series authenticated and delivered after the date of the adoption of such Supplemental Resolution and of Bonds issued in exchange therefore or in place thereof; or [12] to cure any ambiguity, defect or inconsistency provided that there is no material adverse impact on Bondholders.

Consent of the Insurer When Consent of Bondholder Required; Notice.

The Insurer, and not the registered Holders thereof, shall be deemed to be the Holder of Bonds of any Series as to which it is the Insurer at all times for the purpose of giving any approval or consent to the execution and delivery of any Supplemental Resolution or any amendment, change or modification of the Resolution which, as specified in the Resolution, requires the written approval or consent of the Holders of at least a majority in aggregate principal amount of Bonds of such Series at the time Outstanding. In such cases where the consent of the Insurer shall be necessary pursuant to the Resolution for the execution of a particular amendment, the District shall be required to send a copy of such amendment to S&P's. In addition, in such cases where the consent of the Insurer shall not be necessary pursuant to the Resolution for the execution of a particular amendment, the District shall provide the Insurer with written notice of such amendment prior to or within a reasonable time after the execution thereof.

Defeasance.

If the District shall pay or cause to be paid, or there shall otherwise be paid, to the Holders of all Bonds the principal or Redemption Price, if applicable, and interest due or to become due thereon, at the times and in the manner stipulated in the Bonds and in the Resolution, then the pledge of the Pledged Property and all covenants, agreements and other obligations of the District to the Bondholders, shall thereupon cease, terminate and become void and be discharged and satisfied.

Bonds or interest installments, or portions thereof, for the payment or redemption of which monies shall have been set aside and shall be held in trust by the Paying Agents (through deposit by the District of funds for such payment or redemption or otherwise) at the maturity or redemption date thereof shall be deemed to have been paid within the meaning and with the effect expressed in the Resolution. Subject to the provisions of the Resolution, any Outstanding Bonds shall prior to the maturity or redemption date thereof be deemed to have been paid within the meaning and with the effect expressed in the Resolution if the following conditions are met: (a) if any of such Bonds are to be redeemed on any date prior to their maturity, the District shall have instructed the Bond Registrar to mail as provided in the Resolution notice of redemption of such Bonds (other than Bonds which have been purchased or otherwise acquired by the District and delivered to the Bond Registrar as hereinafter provided prior to the mailing of notice of redemption), (b) there shall have been deposited with an escrow agent either cash (including amounts, if any, withdrawn and deposited pursuant to the Resolution as described herein under the captions "Bond Fund - Debt Service Account" and "Bond Fund - Reserve Account") in an amount which shall be sufficient, or Defeasance Obligations (including any Defeasance Obligations issued or held in book-entry form on the books of the Department of the Treasury of the United States) the principal of and the interest on which when due will provide cash which, together with any other cash on deposit with the escrow agent, shall be sufficient, to pay when due the principal or Redemption Price, if applicable, and interest due and to become due on the Bonds on or prior to the redemption date or maturity date thereof; as the case may be and (c) if the Bonds are not by their terms subject to redemption within the next succeeding 60 days, the District shall have instructed the Bond Registrar to mail a notice to the Holders of such Bonds to be paid or redeemed, that the deposit required by (b) above has been made and that the Bonds are deemed to have been paid in accordance with this Section and stating the maturity or redemption date upon which monies are expected to be available for the payment.

Such escrow agent shall, as and to the extent necessary, apply amounts held by it pursuant to this Section to the retirement of Bonds in amounts equal to the unsatisfied balances (determined as provided in the Resolution as described herein under the caption "Bond Fund - Debt Service Account") of any Sinking Fund Installments with respect to such Bonds, all in the manner provided in the Resolution. The escrow agent shall, if so directed by the District prior to the maturity or redemption date, as applicable, of Bonds deemed to have been paid in accordance with the provisions of the Resolution described under this caption, apply cash, redeem or sell Defeasance Obligations so deposited with such escrow agent and apply the proceeds thereof, together with any cash on deposit with the escrow agent, to the purchase of such Bonds (and the Bond Registrar shall immediately thereafter cancel all such Bonds so purchased and delivered to it); provided, however, that the cash and Defeasance Obligations remaining on deposit with such escrow agent after the purchase and cancellation shall be sufficient to pay when due the principal or Redemption Price, as applicable, and interest due or to become due on all remaining Bonds in respect of which such cash and Defeasance Obligations are being held by such escrow agent on or prior to the redemption date or maturity date thereof, as the case may be. Except as otherwise provided in the Resolution, neither Defeasance Obligations nor cash deposited with such escrow agent pursuant to the Resolution nor principal or interest payments on any such Defeasance Obligations shall be withdrawn or used for any purpose other than, and shall be held in trust for, the payment of the principal or Redemption

Price, as applicable, and interest on the Bonds with respect to which such cash and Defeasance Obligations have been deposited. Any excess cash received from such principal or interest payments on such Defeasance Obligations shall be paid over to the District as received by such escrow agent, free and clear of any trust, lien or pledge.

Notwithstanding any of the provisions of the Resolution regarding Defeasance, no forward supply contract shall constitute a "Defeasance Obligation" or otherwise be used to refund all or any portion of Bonds which are insured as to the payment of principal and interest by an Insurer, without first obtaining the prior written consent of such Insurer.

SUMMARY OF PROVISIONS OF THE NOTE RESOLUTION

The following is a brief summary of certain provisions of the District's Subordinated Debt Resolution adopted by the District on April 26, 2010 (the "Resolution" or the "Subordinated Debt Resolution") and used in this Official Statement. The summary does not purport to be comprehensive or definitive. All references herein to the Resolution are qualified in their entirety by reference to such Resolution, a copy of which is available for review prior to the issuance and delivery of the Series 2020 Notes, at the office of the District and thereafter at the office of the Paying Agent. All references to the Series 2020 Notes are qualified in their entirety by reference to the definitive form thereof and the information with respect thereto included in the Resolution.

GENERAL COVENANTS OF THE DISTRICT.

Payment of Notes.

The District shall promptly pay when due the principal or purchase price of (whether at maturity, upon acceleration, call for redemption or purchase or otherwise) and premium, if any, and interest on each series of Notes at the places, on the dates and in the manner provided the Resolution and in such Notes according to the true intent and meaning thereof; provided, however, that such obligations are not general obligations of the District but are limited obligations payable solely from the revenues and receipts described in the Granting Clauses to the Resolution and the other Pledged Property, all of which are specifically pledged to such purposes in the manner and to the extent provided the Resolution. The Notes and interest thereon shall not be deemed to constitute a debt or a pledge of the faith and credit of the State or any political subdivision thereof, including the District. Neither the State nor any political subdivision thereof, including the District shall be obligated to pay the principal of or interest on the Notes or other costs incident thereto except from the revenues and receipts pledged therefor, and neither the faith and credit nor the taxing power of the State or any political subdivision thereof, including the District is pledged to the payment of the principal of or interest on the Notes or other costs incident thereto.

Covenants and Representations of District.

The District shall observe and perform all covenants, conditions and agreements on its part contained in the Resolution, in every Note executed, authenticated and delivered hereunder and in all of its proceedings pertaining thereto. The District represents (a) that it is duly authorized under the Constitution and laws of the State, including particularly and without limitation the Act, to issue the Notes and to execute the Resolution; to execute the Note Purchase Agreement; and to pledge the revenues, receipts and funds in the manner and to the extent set forth in the Resolution; (b) that all action on its part for the issuance of the Notes and the execution and delivery of the Resolution has been duly and effectively taken; and (c) that the Notes in the hands of the Holders thereof are and will be valid and enforceable obligations of the District according to the terms thereof except as limited by bankruptcy laws and usual equity principles.

Further Assurances.

The District shall do, execute, acknowledge and deliver, or cause to be done, executed, acknowledged and delivered, such supplemental resolutions and such further acts, instruments and transfers as the Paying Agent may reasonably require for the better assuring, transferring, conveying, pledging and assigning to the Paying Agent of all the rights assigned by the Resolution and the revenues and receipts pledged to the payment of the principal of, premium, if any, and interest on the Notes. The District shall cooperate with the Paying Agent and the Noteholders in protecting the rights and security of the Noteholders.

Inspection of Books and Project.

All books and documents in the District's possession relating to each Project and the revenues derived therefrom shall at all times be open to inspection by such agents as the Paying Agent or the Holders of 25% in aggregate principal amount of Notes then Outstanding may from time to time designate.

Priority of Notes.

The District warrants and covenants that the lien created under the Resolution with respect to any series of Notes shall be superior in priority to all revenue debt of the District, except for the Senior Debt.

Prohibited Activities.

The District shall not knowingly engage in any activities or take any action that might result in (a) the income of the District derived from each Project becoming taxable to it, (b) any Note becoming an "arbitrage bond" within the meaning of Section 148 of the Code and the regulations and rulings thereunder, or (c) any interest on the Notes otherwise becoming includable in the gross income of the recipients thereof under the federal income tax laws or becoming taxable under the laws of the State.

Anticipation of Issuance of Bonds.

The District covenants that each series of Notes issued under the Resolution is issued in anticipation of the issuance by the District, prior to the maturity of such Notes whether by acceleration, redemption, or otherwise, of Additional Bonds (within the meaning of the Bond Resolution) on a parity with the Senior Debt under the Bond Resolution and pursuant to the Act. The District further covenants to, in a timely fashion, do any and all things necessary for the issuance of such Additional Bonds on a parity with the Senior Debt, to the extent necessary to pay such Notes and to the extent permitted by law. To the extent that any Notes of a particular series issued hereunder are not paid from the Revenues of the District as described in the Resolution, including the proceeds of the Project for which such Notes were issued, such Notes shall be paid from the proceeds of such Senior Debt.

Tax Covenants.

The District covenants that within the meaning of Section 141 of the Code, [i] less than 10% of the proceeds of the Notes of any series, if any, will be applied for any private business use, and the payment of principal of or interest on less than 10% of the amount of the Notes of any series, if any, will be secured directly or indirectly by any interest in property used for a private business use, or payments in respect of such property, or will be derived from payments in respect of such property; [ii] at least 90% of the proceeds of the Notes of any series will be applied for a governmental use of the District; [iii] any private business use of the Project will be related to such governmental use of the District and will not be unrelated or disproportionate; and [iv] none of the proceeds of the Notes of any series will be used, directly or indirectly, to make or finance loans to private Persons; and the District covenants further that the Notes of any series will not be federally guaranteed within the meaning of Section 149(b) of the Code.

APPLICATION OF FUNDS.

"***Trust Moneys" Defined***.

All moneys received by the Paying Agent to be held and applied under the Resolution, or required to be paid to the Paying Agent and whose disposition is not elsewhere in the Resolution otherwise specifically provided for, including but not limited to the investment income of all Trust Funds held by the Paying Agent under the Resolution (all such moneys pending the expenditure thereof, including but not limited to the proceeds of Notes deposited in the Subordinated Debt Subaccounts of the Construction and Acquisition Fund and investment income thereon pending the expenditures thereof, and all proceeds of any such moneys pending the expenditure of such proceeds, being defined as the "Trust Moneys") shall be held by the Paying Agent as a part of the Pledged Property, and, upon the exercise by the Paying Agent of any remedy specified in the Resolution, such Trust Moneys shall be applied in accordance with the Resolution, except to the extent that the Paying Agent is holding in trust moneys and/or Government Obligations for the payment of any specified Notes which are no longer deemed to be Outstanding under the provisions of the Resolution, which moneys and/or Government Obligations shall be applied only as provided in said Article. Prior to the exercise of any such remedy, all or any part of the Trust Moneys shall be held, invested, withdrawn, paid or applied by the Paying Agent, from time to time.

NOTE ACCOUNT.

(a) A special trust fund is established under the Resolution with the Paying Agent and designated as the "Note Account." The Note Account constitutes a part of the Senior Subordinated Debt Fund of the District pursuant to the Bond Resolution, but is maintained as a separate special trust fund. Established within the Note Account is a General Subaccount.

There shall be credited to the General Subaccount in the Note Account, as and when received,

(i) each payment received by the Paying Agent under and pursuant to any of the provisions of the Resolution which is required, or which is accompanied by directions that such payment is, to be credited to the Note Account; and

(ii) all income derived from the investment of amounts described in clause as realized.

(b) The Paying Agent shall disburse, from time to time, sufficient moneys from the Note Account as specified below to pay the principal of, premium if any, and the interest on, the Notes as the same become due and payable.

(c) Funds for the payment of the principal of, premium, if any, and interest on the Notes shall be derived from the following sources:

(1) Funds for the payment of the principal of and premium, if any, on the Notes, at Maturity, shall be disbursed by the Paying Agent from the Note Account in the order of priority indicated below:

(i) Eligible Moneys in the General Subaccount in the Note Account;
and

(ii) all other amounts in the General Subaccount in the Note Account which were received by the Paying Agent under and pursuant to the Resolution from the District or from any other Person or Fund, and amounts derived from the investment of such amounts.

(2) Funds for the payment of interest on the Notes shall be derived from the following sources in the order of priority indicated below and in each case applied to interest on Notes:

(i) Eligible Moneys in the General Subaccount in the Note Account;
and

(ii) all other amounts in the General Subaccount in the Note Account which were received by the Paying Agent under and pursuant to the Resolution from the District or from any other Person or Fund, and amounts derived from the investment of such amounts.

(d) Upon the occurrence of an Event of Default described in clauses (d) of Section 8.1, the Paying Agent shall pay, to the extent moneys are available, to the Noteholders, in accordance with the provisions of Section 2.2 of the Resolution, in payment of the principal of and interest on the Notes, an amount equal to the principal of and interest on the Notes due upon the date of acceleration of the Notes as provided in Section 8.2 of the Resolution and to the extent of such payment, the obligations of the District under the Resolution and the Notes shall be deemed to have been satisfied.

(e) If any Note shall not be presented for payment at Maturity, provided moneys sufficient to pay such Note shall have been made available to the Paying Agent and are held in the Note Account for the benefit of the Holder thereof, all liability of the District to the Holder thereof for the payment of such Note shall forthwith cease, determine and be completely discharged, and thereupon it shall be the duty of the Paying Agent to hold such moneys in the Note Account, without liability to the Holder for interest thereon, for the benefit of the Holder of such Note, who shall thereafter be restricted exclusively to such moneys for any claim of whatever nature on the part of such Holder hereunder or on, or with respect to, such Note.

(f) All moneys paid over to the Paying Agent for the account of the Note Account shall be held in trust by the Paying Agent for the benefit of the Holders of the Notes as each is entitled to be paid therefrom. Any moneys remaining in the Note Account after any Interest Payment Date and after Payment of the Notes, and payment of the fees, charges and expenses of the Paying Agent which have accrued and which will accrue and all other items required to be paid hereunder, shall be paid to the District.

Payment Into Construction and Acquisition Fund; Use of Proceeds.

The proceeds of sale of each series of Notes shall be deposited in a separate subaccount in the Construction and Acquisition Fund (collectively, the "Subordinated Debt Subaccounts"), each of the Subordinated Debt Subaccounts to be designated in a manner which will distinguish it from all other subaccounts of the Construction and Acquisition Fund and to consist of Pledged Property on which the holders of such series of Notes shall have a first lien. The District shall use such proceeds of the Notes only to pay costs of a Project with respect to which at the time of use the District reasonably intends to issue Additional Bonds on a parity with the Prior Bonds to permanently finance the Project.

Trust Moneys; Reports.

All Trust Moneys shall be trust funds and shall not be subject to lien or attachment of any creditor of the District or the Paying Agent. Such Trust Moneys shall be held in trust and applied in accordance with the provisions of the Resolution. The Paying Agent shall furnish to the District on at least a semi-annual basis a statement of the moneys (including all investment activity) in each Trust Fund.

Arbitrage.

The District covenants and agrees that it will commit knowingly no act that would cause any Notes of any series to be "arbitrage bonds" within the meaning of Section 148(a) of the Code (including the applicable regulations thereunder). The Paying Agent covenants that it will comply with any instructions of the District regarding investment or other use of proceeds of the Notes so as to prevent the Notes from becoming "arbitrage bonds" but shall otherwise have no other liability or obligations with respect to preventing the Notes from becoming "arbitrage bonds." The Paying Agent shall file a copy of any applicable Opinion of Bond Counsel received by it with the District.

Rebate Requirements.

The District covenants and agrees to comply with any requirements to rebate moneys to the United States of America as may be required by law. Moneys in any rebate fund established for this purpose, including investment earnings thereon, if any, shall not be subject to the pledge of the Resolution and shall not constitute part of any of the Funds and Accounts held under the Resolution for the benefit and security of the Noteholders.

INVESTMENTS.

Investments.

Moneys held in any Accounts hereunder (other than Eligible Moneys) shall be invested and reinvested in Authorized Investments maturing or subject to redemption at the option of the Holder as needed as directed by the District in writing, or if orally, promptly confirmed in writing, or in such other manner as is acceptable to the Paying Agent. Eligible Moneys held in any Accounts hereunder shall be invested in Government Obligations maturing as needed as directed by the District in writing, or if orally, promptly confirmed in writing, or in such other manner as is acceptable to the Paying Agent. All such investments shall be held by or under the control of the Paying Agent except as may be otherwise permitted or authorized in the Resolution, and shall be deemed at all times a part of the fund or account in which the moneys so invested were originally held and the interest accruing thereon and any profit realized therefrom shall be credited to and held in such fund or account and any loss resulting therefrom shall be charged to such fund or account. The Paying Agent is directed to sell and convert to cash a sufficient amount of such investments in any fund whenever the cash held in such fund is insufficient for the purposes thereof Moneys held in the Subordinated Debt Subaccounts shall not be invested except as otherwise permitted in the Resolution or in the Bond Resolution for amounts on deposit in the Construction and Acquisition Fund.

Limitation of Liability.

(a) The Paying Agent shall not be responsible for any losses on investments or from the redemption, sale or maturity of any such investments made in accordance with the Resolution, and the District specifically holds the Paying Agent harmless and agrees to indemnify the Paying Agent for any claim resulting from any losses on investments made in accordance with the District's instructions.

(b) Notwithstanding any provision of the Resolution to the contrary, unless otherwise specifically agreed in a separate written agreement, the Paying Agent shall not be liable or responsible for any calculation or determination which may be required in connection with, or for the purpose of complying with, Section 148 of the Code, or any successor statute or any regulation, ruling or other judicial or administrative interpretation thereof, including, without limitation, the calculation of amounts required to be paid to the United States of America or the determination of the maximum amount which may be invested in nonpurpose obligations having a yield higher than the yield on the Notes, or the determination as to whether any investments are permissible under Section 148 of the Code, and the Paying Agent shall not be liable or responsible for monitoring the compliance by the District with any of the requirements of Section 148 of the Code or any judicial or administrative interpretation thereof; it being acknowledged and agreed that the sole obligation of the Paying Agent in this regard shall be to hold and invest monies received by it pursuant to the terms of the Resolution and in each case pursuant to the instructions of the District.

DISCHARGE OF LIEN.

Discharge of Lien and Security Interests.

If the District shall pay or cause to be paid in full the principal of and the interest on any series of Notes or if the District has deposited or caused to be deposited with the Paying Agent in trust cash and/or Government Obligations, which do not permit the redemption thereof at the option of the issuer thereof, the principal of, premium, if any, and interest on which when due (or upon the redemption thereof at the option of the Holder), will, without reinvestment, provide cash which, together with the cash, if any, deposited with the Paying Agent at the same time, shall be sufficient to pay and discharge the entire indebtedness on such series of Notes as the same become due not theretofore canceled by the Paying Agent or delivered to the Paying Agent for cancellation, for principal and interest (and premium, if any) which have become due and payable, or to the Maturity thereof or earlier Redemption Date and (a) has paid or made arrangements satisfactory with the Paying Agent to pay, all fees and expenses (including, without limitation, counsel's fees and expenses) of the Paying Agent respecting such series of Notes which have accrued or which the Paying Agent estimates will accrue prior to the final payment of such series of Notes in full, (b) has furnished to the Paying Agent an Opinion of Bond Counsel to the effect that the deposit of such cash and Government Obligations is in compliance with the provisions of the Resolution, will not adversely affect the exclusion of interest on such Notes from gross income for purposes of Federal income taxation and that payments to the owners of such Notes will not constitute a voidable transfer or preference under and pursuant to the Federal Bankruptcy Code as then in effect in the event of a bankruptcy proceeding thereunder by or against the District, and (c) has made arrangements satisfactory to the Paying Agent for the giving of notice of redemption, if any, then the lien of the Resolution, these presents and the security interests in the Resolution with respect to such series of Notes shall cease, determine and be void. Upon the discharge of the lien of the Resolution with respect to the applicable series of Notes, these presents and the security interests therein ceasing, determining and being void as provided in the preceding sentence, the Paying Agent shall, upon receipt of evidence satisfactory to it that all conditions precedent to the satisfaction and discharge of the Resolution with respect to such Notes have been complied with, cancel and discharge the Resolution with respect to such Notes and the security interests therein, execute and deliver to the District such instruments in writing as shall be required to cancel and discharge the Resolution with respect to such Notes and the security interests therein and apply any moneys and investments held in the Note Account with respect to such Notes in accordance with Sections 5.2, provided that all moneys then held in the Note Account for the purpose of paying such Notes of the applicable series which have not yet been presented for payment shall be held thereafter in trust solely for the Holders of such Notes pending the payment thereof to such Holders. If such Notes will not be redeemed in whole within 60 days of such discharge, the Paying Agent shall promptly give notice of such discharge, to all Noteholders of such Notes in the manner described in Section 3.6(a) for the giving of notices of redemption. If the lien and security interests of the Resolution with respect to all series of Notes are discharged, the Resolution, at the request of the District, shall be discharged and canceled.

Discharge of the Resolution.

Notwithstanding the fact that the lien of the Resolution upon the Pledged Property may have been discharged and canceled with respect to a series of Notes, the Resolution and the rights granted and duties imposed by the Resolution, to the extent not inconsistent with the fact that the lien upon the Pledged Property may have been discharged and canceled with respect to one or more series of Notes, shall nevertheless continue and subsist until the principal of, premium, if any, and the interest on, all of the Notes shall have actually been paid in full, all amounts owed by the District to the Paying Agent shall have been paid in full, and the Paying Agent shall have applied amounts in the Note Account and all funds theretofore held by the Paying Agent for payment of any Notes not theretofore presented for payment or purchase, as the case may be, which funds shall be held in trust solely for the Holders of such Notes pending their application in accordance herewith, until such funds have been applied in accordance herewith.

DEFAULT PROVISIONS AND REMEDIES.

Events of Default.

Each of the following events is defined as and declared to be and to constitute an "Event of Default" hereunder with respect to the Notes of a particular series:

(a) default in the due and punctual payment of any interest on any Note when the same shall become due and payable; or

(b) default in the due and punctual payment of the principal of or premium on any Note at its maturity or upon mandatory redemption; or

(c) the declaration of an Event of Default hereunder with regard to the Notes of any series; or

(d) the failure of the District to observe and perform any of the covenants, conditions, agreements, or provisions contained in the Resolution, or in the Notes, on the part of the District to be observed or performed and the continuation thereof for thirty days after written notice, specifying such default and requiring the same to be remedied, is given to the District by the Paying Agent.

Acceleration.

Upon the occurrence of any Event of Default described in subsection (a), (b) or (c) of Section 8.1 of the Resolution, the Paying Agent may or the Holders of more than fifty percent (50%) in aggregate principal amount of the Outstanding Notes of the particular series shall, and, upon the occurrence and continuance of an Event of Default described in subsection (d) of Section 8.1 of the Resolution, the Paying Agent shall by notice in writing delivered to the District declare the principal of all the Notes immediately due and payable as of the fifth Business Day following such date, whereupon the same shall become immediately due and payable. Upon any such acceleration, the Notes and the interest thereon shall forthwith be paid in accordance with the Resolution. Upon any declaration of acceleration hereunder, the Paying Agent shall immediately declare the payments required to be made by the District hereunder to be immediately due and payable.

Other Remedies.

Upon the occurrence of an Event of Default, the Paying Agent shall have the power to proceed with any right or remedy available at law or in equity or by statute, as it may deem best, including any suit, action or special proceeding in equity or at law for the collection of amounts due and to become due hereunder and under the Notes or the performance of any covenant or agreement contained in the Resolution or for the enforcement of any proper legal or equitable remedy as the Paying Agent shall deem most effectual to protect the rights aforesaid, insofar as such may be authorized by law.

No delay or omission to exercise any right or remedy accruing upon any Event of Default shall impair any such right or remedy or shall be construed to be a waiver of any such Event of Default or acquiescence therein; and every such right and remedy may be exercised from time to time and as often as may be deemed expedient.

No waiver of any Event of Default hereunder, whether by the Paying Agent or by the Noteholders, shall extend to or affect any subsequent or other Event of Default, or impair any rights or remedies consequent thereon.

Rights of Noteholders.

Upon the occurrence of an Event of Default and if requested so to do by the Holders of more than fifty percent (50%) in aggregate principal amount of the Notes then Outstanding and if indemnified, the Paying Agent shall be obligated to exercise such one or more of the rights and remedies conferred by the Resolution as the Paying Agent, being advised by Counsel, shall deem most expedient in the interests of the Noteholders.

Right of Noteholders to Direct Proceedings.

Except in the case of an Event of Default under Section 8.1(d) of the Resolution, the Holders of more than fifty percent (50%) in aggregate principal amount of the Notes then Outstanding shall have the right, at any time, by an instrument or instruments in writing executed and delivered to the Paying Agent, to direct (as between such Noteholders and the Paying Agent) the time, method and place of conducting all proceedings otherwise permitted to be taken in connection with the enforcement of the terms and conditions of the Resolution, or for the appointment of a receiver or any other proceedings, provided the Paying Agent is indemnified

Application of Moneys.

All moneys received by the Paying Agent pursuant to any right given or remedy or action taken under the provisions of the Resolution shall, after payment of all fees and expenses of the Paying Agent, including, without limitation, the costs and expenses of the proceedings resulting in the collection of such other moneys and of the related expenses, liabilities and advances incurred or made by the Paying Agent, be deposited in the General Subaccount in the Note Account. All such other moneys shall be applied by the Paying Agent as follows:

(a) Unless the principal of all the Notes shall have become or shall have been declared due and payable, all such moneys shall be applied:

First. to the payment to the Persons entitled thereto of all installments of interest then due on the Outstanding Notes (other than District Notes), in the order of the maturity of the installments of such interest and, if the amount available shall not be sufficient to pay in full any particular installment, then to the payment of such installment ratably, according to the amounts due on such installment, to the Persons entitled thereto, without any discrimination or privilege;

Second.to the payment to the Persons entitled thereto of the unpaid principal of any of the Outstanding Notes which shall have become due (other than District Notes), in the order of their due dates, with interest on such Notes at the rate last borne by the Notes from the respective dates upon which they became due and, if the amount available shall not be sufficient to pay in full the principal which became due on such Notes on any particular date, together with such interest, then to the payment thereof ratably, according to the amount of principal due on such date, to the Persons entitled thereto, without any discrimination or privilege;

Third. to the payment of the principal of and interest on the District Notes in the same order of priority as specified in the first and second clauses.

(b) If the principal of all the Notes shall have become due or shall have been declared due and payable, all such moneys shall be applied FIRST, to the payment of the principal and the interest then due and unpaid on the Outstanding Notes (other than District Notes), without preference or priority of principal over interest or of interest over principal, or of any installment of interest over any other installment of interest, or of any such Note over any other such Note, ratably, according to the amounts due respectively for principal and interest, to the persons entitled thereto without any discrimination or privilege, and SECOND to the payment of the principal of and interest on the District Notes in the same manner as specified in this first clause.

(c) If the principal of all such Notes shall have been declared due and payable, and if such declaration shall thereafter have been rescinded and annulled under the provisions of the Resolution, in the event that the principal of all the Notes shall later become due or be declared due and payable.

Such moneys shall be applied at such times, and from time to time, as the Paying Agent shall determine, having due regard to the amount of such moneys available for application and the likelihood of additional moneys becoming available for such application in the future. Whenever the Paying Agent shall apply such funds, it shall fix the date (which shall be an Interest Payment Date unless it shall deem another date more suitable or unless the principal of all of the Notes has been declared immediately due and payable, in which case application shall be made immediately) upon which such application is to be made and upon such date interest on the amount of principal to be paid on such dates shall cease to accrue provided that such amount of principal is in fact paid on such date. The Paying Agent shall give such notice to the Holders of the Notes as it may deem appropriate of the deposit with it of any such moneys and of the fixing of any such date, and shall not be required to make payment from such moneys to the Holder of any Notes until such Note shall be presented to the Paying Agent.

Whenever all Notes and the interest thereon have been paid in full and all expenses and charges of the Paying Agent have been paid, any balance remaining in the Note Account shall be disposed of in the manner provided in the Resolution.

Rights and Remedies Vested in Paying Agent.

All rights of action and remedies (including the right to file proofs of claim) hereunder or under any of the Notes may be enforced by the Paying Agent without the possession of any of the Notes or the production thereof in any trial or other proceedings relating thereto and any such suit or proceeding instituted by the Paying Agent shall be brought in its name as Paying Agent without the necessity of joining as plaintiffs or defendants any Holders of the Notes, and any recovery of judgment shall be for the equal benefit of the Holders of the Notes.

Rights and Remedies of Noteholders.

No Holder of any Note shall have any right to institute any suit, action or proceeding in equity or at law for the enforcement of the Resolution, for the execution of any trust or for the appointment of a receiver or to enforce any other right or remedy under the Resolution unless (a) a Default has occurred of which the Paying Agent has been notified as provided in subsection (e) of Section 9.1 of the Resolution, or of which by said subsection it is deemed to have notice, (b) such Default shall have become an Event of Default and the Holders of more than fifty percent (50%) in aggregate principal amount of Notes then Outstanding shall have made written request to the Paying Agent and shall have offered reasonable opportunity to the Paying Agent either to proceed to exercise the powers in the Resolution before granted or to institute such action, suit or proceeding in its own name, and (c) such Noteholders have offered to the Paying Agent indemnity and the Paying Agent shall thereafter fail or refuse to exercise the powers in the Resolution before granted, or to institute such action, suit or proceeding in its own name. Such notification, request and offer of indemnity are at the option of the Paying Agent to be conditions precedent to the execution of the powers and trusts, and to any action or cause of action for the enforcement of the Resolution, or for the appointment of a receiver or for any other right or remedy under the Resolution; it being understood and intended that no one or more Holders of the Notes shall have any right in any manner whatsoever to affect, disturb or prejudice the lien of the Resolution by its, his or their action or to enforce any right or remedy, and that all proceedings at law or in equity shall be instituted, had and maintained in the manner provided in the Resolution and for the benefit, first, of the Holders of all Notes other than District Notes and, second, of the Holders of District Notes. Nothing in the Resolution shall, however, affect or impair the right of any Noteholder to enforce the payment of the principal and redemption or purchase price of, and interest on, any Note at and after the date such payment is due, or the obligation of the District or the Paying Agent to pay the principal and redemption or purchase price of, and interest on, each of the Notes to the respective Holders thereof at the time, place, from the source and in the manner expressed in the Notes.

Termination of Proceedings.

If the Paying Agent shall have proceeded to enforce any right or remedy hereunder by any action at law or in equity, by the appointment of a receiver or otherwise, and such proceedings shall have been discontinued or abandoned for any reason, or shall have been determined adversely to the Paying Agent, then and in every such case the District, the Paying Agent and the Noteholders shall be restored to their former positions and rights hereunder, respectively, with respect to the Pledged Property, and all rights, remedies and powers of the Paying Agent and the Noteholders, respectively, shall continue as if no such proceedings had been taken.

Waivers of Events of Default.

(a) The Paying Agent shall waive any Event of Default hereunder and its consequences upon the written request of the Holders of more than fifty percent (50%) in aggregate principal amount of all Notes then Outstanding, provided, however, that except as permitted in subsection (b) below (relating to the rescission and annulment of declarations of acceleration of the Notes), there shall not be waived:

(1) any Event of Default pertaining to the payment of the principal or redemption or purchase price of any Note at its Maturity or Redemption Date; or

(2) any Event of Default pertaining to the payment when due of the interest on any Note unless prior to such waiver, all arrears of interest and all principal or redemption or purchase price payments in respect of which such Event of Default shall have occurred, with interest thereon (to the extent permitted by law) for the period from the occurrence of such Event of Default until paid in full at a rate per annum equal to the interest rate payable on the Notes from time to time during such period in accordance with the terms of the Notes, and all expenses of the Paying Agent in connection with such Event of Default, shall have been paid or provided for, and in case of any such waiver, or in case any proceeding taken by the Paying Agent on account of any such Event of Default shall have been discontinued or abandoned or for any reason, or shall have been determined adversely to the Paying Agent, then and in every such case the District, the Paying Agent and the Noteholders shall be restored to their former positions and rights hereunder, respectively, but no such waiver shall extend to or affect any subsequent or other Event of Default, or impair any rights or remedies consequent thereon.

The Paying Agent shall not have any discretion to waive any Event of Default hereunder and its consequences except in the manner and subject to the terms expressed above or in subsection (b) below.

(b) If a declaration of acceleration is made then and in every such case, the Paying Agent shall upon the written request of the Holders of more than fifty percent (50%) in principal amount of such Notes then Outstanding rescind and annul such declaration, and the consequences thereof, provided that at the time such declaration is rescinded and annulled:

(1) no judgment or decree has been entered for the payment of any moneys due pursuant to the Notes;

(2) all arrears of interest on all of the Notes and all other sums payable under the Notes (except as to principal of, and interest on, the Notes which have become due and payable by reason of such declaration) shall have been duly paid; and

(3) each and every Event of Default hereunder shall have been waived pursuant to the preceding paragraph or otherwise made good or cured;

and, provided further, that no such rescission and annulment shall extend to or affect any subsequent or other Event of Default or impair any rights or remedies consequent thereon. The Paying Agent shall not have any discretion to rescind and annul any declaration of acceleration and its consequences except in the manner and subject to the terms expressed in the Resolution.

SUPPLEMENTAL RESOLUTIONS.

Supplemental Resolutions Not Requiring Consent of Noteholders.

The District may adopt, effective upon filing of a copy thereof certified by the District with the Paying Agent and without the consent of, or notice to, any of the Noteholders, one or more supplemental resolutions for any one or more of the following purposes, provided that in the opinion of the District the change effected thereby is not to the prejudice of the interests of the Paying Agent or the Noteholders:

(a) to cure any ambiguity or formal defect or omission in the Resolution or between the terms and provisions of any other instrument or document executed in connection herewith or with the issuance of the Notes;

(b) to grant to or confer upon the Noteholders, the Paying Agent or for the benefit of the Noteholders or the Paying Agent any additional rights, remedies, powers or authorities that may lawfully be granted to or conferred upon the Noteholders or the Paying Agent;

(c) to subject to the lien and pledge of the Resolution, additional payments, revenues, properties or collateral including a lien, mortgage or security interest in a Project;

(d) to modify, amend or supplement the Resolution or any supplemental resolution in such manner as to permit the qualification under the Trust Indenture Act of 1939, as amended, or any similar Federal statute hereafter in effect or to permit the qualification of the Notes for sale under the securities laws of any of the states of the United States of America or the Securities Act of 1933, and, if it so determines, to add to any supplemental resolution such other terms, conditions and provisions as may be permitted by the Trust Indenture Act of 1939, as amended, or similar Federal statute;

(e) to evidence the appointment of a Co-Paying Agent or the succession of a new Paying Agent;

(f) to effect any other supplement to the Resolution which, in the judgment of the District, will not adversely affect the interests of the Noteholders; or

(g) to modify or supplement the Resolution in such manner as may be necessary, in the Opinion of Bond Counsel, to comply fully with all applicable rules, rulings, policies, procedures, regulations or other official statements promulgated or proposed by the Department of the Treasury or the Internal Revenue Service.

Supplemental Resolutions Requiring Consent of Noteholders.

(a) Exclusive of supplemental resolutions, and not otherwise, the Holders of not less than two-thirds (2/3) in aggregate principal amount of the Notes Outstanding shall have the right, from time to time, to consent to and approve the adoption by the District of such other supplemental resolution or resolutions as shall be deemed necessary and desirable by the District for the purpose of modifying, altering, amending, adding to or rescinding, in any particular, any of the terms or provisions contained in the Resolution or in any supplemental resolution; provided, however, that nothing in this Section contained shall permit, or be construed as permitting, (1) an extension of the maturity date on which the principal of or the interest on any Note is, or is to become, due and payable, (2) a reduction in the principal amount of any Note, premium, if any, or interest rate on any of the Notes, (3) the creation of a lien ranking prior to or on a parity with the lien of the Resolution on the property conveyed pursuant to the Resolution or the deprivation of such lien, (4) a privilege or priority of any Note or Notes over any other Note or Notes, (5) the elimination of any mandatory redemption or mandatory purchase of Notes, extension of the due date for the purchase of Notes or call for mandatory redemption or the reduction of the purchase price or Redemption Price for the Notes or (6) a reduction in the aggregate principal amount of the Notes required for consent to such supplemental resolution without the consent of all Noteholders.

(b) If the District shall notify in writing the Paying Agent of the desire of the District to adopt any such supplemental resolution for any of the purposes of this Section, the Paying Agent shall, upon being satisfactorily indemnified with respect to expenses, cause written notice of the proposed adoption of such supplemental resolution together with a copy of such proposed supplemental resolution to be given by first class mail, postage prepaid, to the Holders of the Notes at their addresses shown on the Paying Agent's books of registration. If, within 60 days following the mailing of such notice or such longer period as shall be prescribed by the District and specified in such notice, the Holders of not less than two-thirds (2/3) in aggregate principal amount of the Notes Outstanding shall have consented to and approved the adoption of such supplemental resolution as provided in the Resolution, no Holder of any Note shall have any right to object to any of the terms and provisions contained therein, or the operation thereof, or in any manner to question the propriety of the adoption thereof, or to enjoin or restrain the District from adopting the same or the District or the Paying Agent from taking any action pursuant to the provisions thereof. Upon the adoption of any such supplemental resolution as in this section permitted and provided, and effective upon filing of a copy thereof certified by the District with the Paying Agent, and subject to Section 10.4 of the Resolution, the Resolution shall be modified and amended in accordance therewith.

(c) The Resolution may not be amended, changed or modified except by the execution and delivery of a supplemental resolution entered into in accordance with the provisions of Article X of the Resolution.

APPENDIX B

AUDITED FINANCIAL STATEMENTS
FOR THE FISCAL YEAR ENDED JUNE 30, 2019

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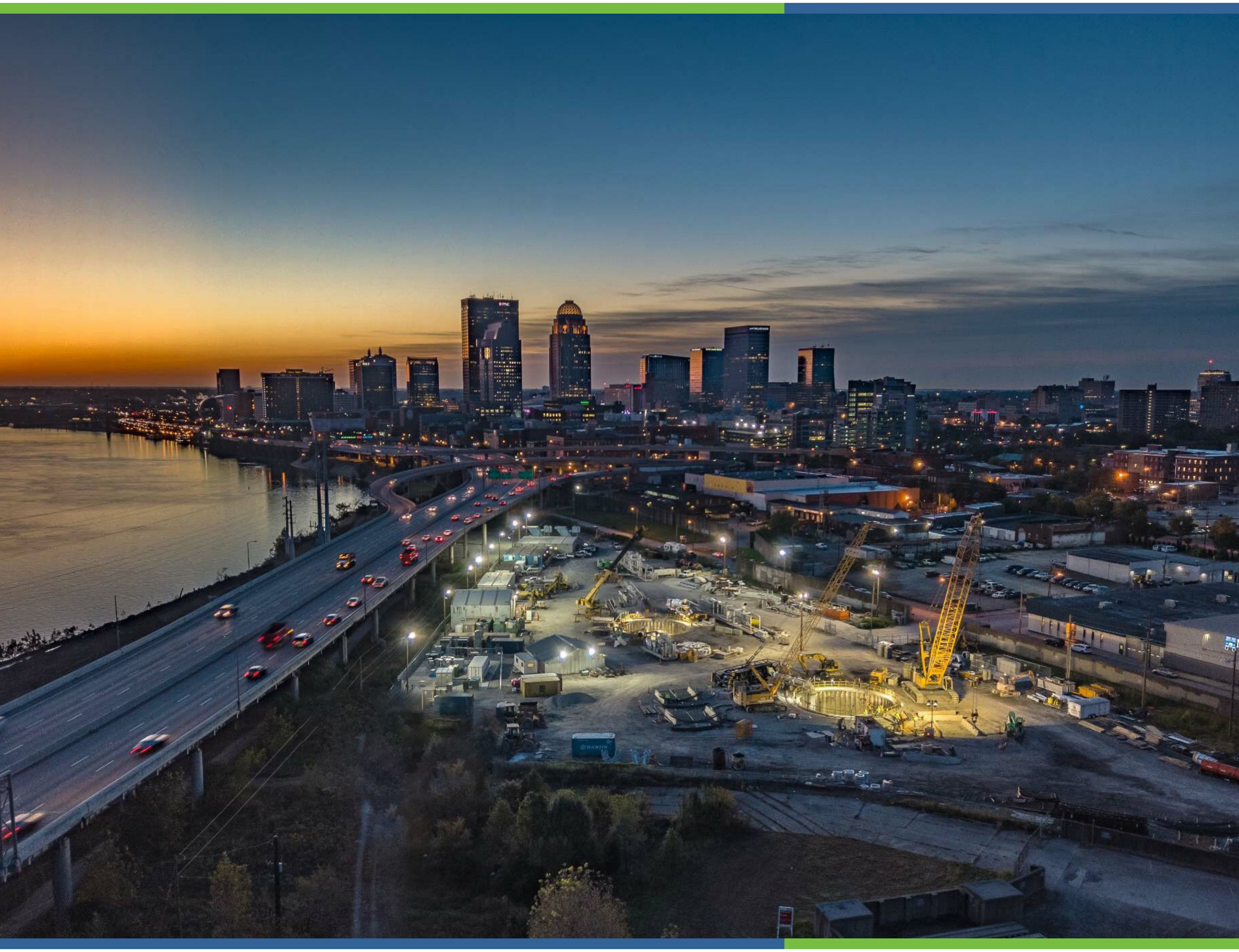
Louisville and Jefferson County
Metropolitan Sewer District

COMPREHENSIVE ANNUAL FINANCIAL REPORT

Fiscal Years Ended June 30, 2019 and 2018



Safe, clean waterways

COMPREHENSIVE ANNUAL FINANCIAL REPORT

Louisville/Jefferson County Metropolitan Sewer District
Louisville, Kentucky

A Component Unit of Louisville/Jefferson County Metro Government
Commonwealth of Kentucky

Fiscal Years Ended June 30, 2019 and 2018

Prepared by the Department of Finance, Louisville MSD
Chad Collier, CFO, Secretary/Treasurer
Brad Good, Interim Director of Budget and Finance

msd

Safe, clean waterways

TABLE OF CONTENTS

Introductory Section

Financial Section

Statistical Section

MSD's 20-million-gallon combined sewer overflow basin sits underneath the Great Lawn and this new pavilion, which was a community benefit of the project.

INTRODUCTORY SECTION

700 West Liberty Street | Louisville, KY 40203-1911
Phone: 502.540.6000 | LouisvilleMSD.org

October 31, 2019

Letter of Transmittal

To the customers and investors of Louisville and Jefferson County Metropolitan Sewer District,

As Interim Budget & Finance Director of Louisville and Jefferson County Metropolitan Sewer District (MSD) it is my pleasure to present the Comprehensive Annual Financial Report (CAFR) for the fiscal year ended June 30, 2019.

Responsibility for the accuracy, completeness and fairness of the data presented herein, including all disclosures, rests with MSD. To provide a reasonable basis for making these representations, the management of MSD has established a comprehensive internal control framework that is designed to both protect its assets from loss, theft, or misuse and to compile sufficient reliable information for the preparation of MSD's financial statements in conformity with Generally Accepted Accounting Principles (GAAP).

MSD's comprehensive framework of internal controls has been designed to provide reasonable rather than absolute assurance that the financial statements will be free from material misstatement. To the best of MSD's knowledge and belief, the accompanying data is accurate in all material respects and is reported in a manner designed to present fairly the financial position and results of the operations of MSD. All disclosures necessary to enable the reader to understand MSD's financial activities have been included. GAAP requires that management provide a narrative to accompany the basic financial statements in the form of Management's Discussion and Analysis which is found beginning on page 3. This letter of transmittal is intended to be read in conjunction with that analysis.

MSD was created in 1946 as a public body corporate and subdivision of the Commonwealth of Kentucky. MSD has complete control, possession and supervision of the sewer and drainage systems within the majority of Louisville Metro, which now comprises all of Jefferson County, Kentucky. Chapter 76 of the Kentucky Revised Statutes authorizes MSD to construct additions, betterments, and extensions within its service area and to recover the cost of its services in accordance with rate schedules adopted by its Board.

MSD is considered a component unit of the Louisville/Jefferson County Metro Government. The Louisville Metro Mayor appoints, with the approval of the Louisville Metro Council, the members to MSD's governing Board, its Executive Director, Chief Engineer and Secretary/Treasurer. The Board, which has statutory authority to enter into contracts and agreements for the management, regulation and financing of MSD, manages its business and activities. The Board has full statutory responsibility for approving and revising MSD's annual budgets, for financing deficits and for disposition of surplus funds. MSD has no special financial relationship with the Louisville Metro Government; however, effective July 1, 2006, MSD began providing free sewer and drainage services to the Metro government. The value of these services in fiscal year 2019 was $6.4 million.

MSD is required by law and by its Revenue Bond Resolution to undergo an annual independent audit of its financial statements. The goal of the independent audit is to provide reasonable assurance that the financial statements of MSD for the fiscal years ended June 30, 2019 and 2018 are free of material misstatement. The independent audit involved examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements; assessing the accounting principles used and significant estimates made by management; and evaluating the overall financial statement presentation. The independent auditor's report can be found at the beginning of the financial section of this report.

During fiscal year 2019 one new individual joined MSD's Board of Directors. On June 25, 2019 Metro Council confirmed Louisville Metro Mayor Greg Fischer's appointment of Ricky Mason to the MSD Board. Mason represents Senatorial District 35. Mason replaced John Phelps who resigned February 27, 2019. Mason's term expires July 31, 2022.

Customer Base:
MSD's revenue is derived from sewer and stormwater service charges collected from residential, commercial, and industrial customers. Sewer service charges are distributed to respective customer classes on the basis of actual costs incurred to collect and treat wastewater. For fiscal 2019, 57% of MSD's sewer service charge revenue came from residential customers, 32% came from commercial customers and 11% from industrial customers. MSD also bills for stormwater services using equivalent service units (ESUs). An ESU is defined by MSD as 2,500 square feet of impervious area. For fiscal 2019, 38% of MSD's stormwater service charge revenue came from residential customers, 56% came from commercial customers and 6% from industrial customers.

Local Economy:
A study by the University of Louisville Urban Studies Institute (USI) projects Jefferson County will grow by 131,135 people, or 18%, between 2010 and 2040. USI predicts an increase in population within MSD's service area of nearly 12%. This translates to an approximate increase in wastewater flows of 7% during the next 20 years although growth is not expected to be uniform. Population growth outside the core market area (generally defined as the areas surrounding downtown that were not part of the original City of Louisville) is projected to continue at a faster pace than growth inside the core. Jefferson County is projected to gain 65,425 households, a 21% increase, between 2010 and 2040.

Trade and transportation are central to the Louisville economy. Louisville sits at the crossroads of three major Interstate highways, I-64, I-65, and I-71 and is home to the UPS Worldport air hub.

The United States Department of Labor's Bureau of Labor Statistics listed the unemployment rate for Jefferson County as 4.3% in June 2019 which was higher than the United States overall unemployment rate of 3.7% for the same time period. The latest published U.S. Census Bureau statistics lists median household income in Jefferson County as $49,439 (2017 dollars). Additional information on demographic and economic conditions for Louisville can be found in the Statistical Section of this report.

Major Initiatives:

- *Consent Decree work:* Thirteen years ago MSD began a $1.15 billion effort to eliminate sanitary sewer overflows and reduce combined sewer overflows by 98% in a typical rainfall year. Because much of Louisville's sewer system was installed nearly 100 years ago, rainwater can mix with wastewater and overwhelm the pipes. Rain can cause a combination of wastewater and stormwater to overflow into the Ohio River and our local streams. MSD's Consent Decree work addresses this issue and will be complete by the end of 2024.

  Underground storage basins and the Waterway Protection Tunnel are part of MSD's solution to prevent sewage from overflowing into Louisville's waterways. The basins and tunnel are designed to capture rainwater and sewage which would otherwise overwhelm the sewer system during rain events and flow untreated into our waterways. These underground storage areas retain the mixture of rainwater and sewage until the rain subsides and system capacity is available. Water is then conveyed to one of MSD's Water Quality Treatment Centers, treated, and returned to our local streams or the Ohio River. When the storage basins and tunnel are complete MSD will have approximately 250 million gallons of storage capacity.

- *Rate Increase:* On July 25, 2018 the MSD Board approved a rate increase of 6.9 percent for wastewater, drainage and EPA surcharges fees on all bills effective August 1, 2018. The average monthly residential wastewater bill (based on 5,000 gallons per month) increased by $3.23 from $46.87 to $50.10. Monthly stormwater drainage fees increased by $0.64 from $9.26 to $9.90. On the same date the Board approved MSD's capital budget for fiscal 2019 of $190 million. This budget is scaled to meet MSD's Consent Decree requirements and address other infrastructure needs within the financial constraints of the current rate increase.

- *Regionalization:* In July 2018 amendments to the Kentucky Interlocal Cooperation Act, (KRS 65.210 et seq.), became effective allowing any public agency to enter into agreements with another public agency, or agencies, to acquire by purchase or lease, any real or personal property, or any interest, right, easement, or privilege therein, outside of its municipal or jurisdictional boundaries in connection with the acquisition, construction, operation, repair or maintenance of any sewage, wastewater, or storm water facilities. This legislative change paved the way for MSD to purchase the City of Crestwood sewer system on May 31, 2019. Under the terms of a 1996 interlocal agreement, all the sanitary sewage systems, equipment, and facilities owned by Crestwood were leased by Crestwood and Oldham County to MSD. The acquisition of the system by MSD allows to continue providing a high level of service to Crestwood while maintaining competitive rates for existing Crestwood customers. The acquisition also gives MSD the opportunity to provide wastewater service to potential development in the area and achieve greater economies of scale. The Crestwood system had approximately 1700 customers at the date of acquisition.

- *Supplier Diversity and Community Benefits Programs:* On February 25, 2019 the MSD Board approved an enhanced Supplier Diversity Program and new Community Benefits Program. Both programs take effect on July 1, 2019. The program changes are the result of a Disparity Study completed in July 2018 by Mason Tillman Associates, Ltd. The study was commissioned to analyze MSD's contracting practices through a five-year period to determine if a statistically significant disparity existed in the MSD awards of contracts to willing and qualified minority and women-owned business (M/WBE). The study found significant evidence of disparity in the award of prime and subcontracts among African-American, Asian-Indian and Caucasian females. Based on these findings, new supplier diversity goals were approved for construction and construction-related services valued at or above $150,000. In addition, the enhanced Supplier Diversity Program will include a ten percent bid discount applied to bids up to $500,000 with a maximum discount not to exceed $50,000 on bids submitted by M/WBE vendors.

  In addition to the enhanced Supplier Diversity Program, the board also approved a Community Benefits Program to leverage the economic and social impact MSD has in the community with our large-scale engineering projects. The program will provide specific opportunities in workforce development, skills-trade training, small business outreach and mentorship. This program will also expose youth to careers in the water sector. MSD's vendors will provide a financial contribution, volunteer hours or in-kind services to local non-profits and schools. No dollars from this effort will come to MSD.

- *Innovation:* MSD has identified innovation as a key priority in our Strategic Business plan. The idea of innovation includes continually improving the service we provide; but, it's also the foundation for new lines of business and revenue. On February 26, 2019 MSD named its first Chief Innovation Officer, Kim Reed. Reed will lead innovation efforts for both MSD and Louisville Waster Company under a One Water shared service agreement. Together we will look for opportunities that build on our core strengths, bring value, and create potential new lines of revenue. A focus on innovation is key in order for MSD to remain resilient and successful.

Financial Planning:

MSD is focused on continuously strengthening its financial position through planning and analysis in order to meet its short-term and long-term operational and infrastructure plans.

MSD's short-term plan looks forward five years at a time. Formalized budgets are developed and approved annually by the Board for operating and capital spending. Budgets are developed with an eye toward maintaining operational efficiency and achieving incremental improvement of MSD's critical debt service coverage and debt to operating ratios.

MSD's long term financial planning window is 20 years and is supported by the 20 year Critical Repair and Reinvestment Program and a 20 year comprehensive financial model. The financial model enables MSD to analyze alternative scenarios in order to optimize resources in the face of competing priorities. Rate adjustments are carefully considered in conjunction with bond issues and other financing options with an eye toward maintaining affordability for the ratepayer. Key long term considerations are debt service coverage, maintaining level debt service payments, and maintaining adequate cash reserves.

Awards

The Government Finance Officers Association of the United States and Canada (GFOA) awarded a Certificate of Achievement for Excellence in Financial Reporting to MSD for its comprehensive annual financial report (CAFR) for the fiscal year ended June 30, 2018. This was the 29th consecutive year that MSD has achieved this prestigious award. In order to be awarded a Certificate of Achievement, MSD must publish an easily readable and efficiently organized CAFR. This report must satisfy both generally accepted accounting principles and applicable legal requirements.

A Certificate of Achievement is valid for a period of one year only. We believe that our current CAFR continues to meet the Certificate of Achievement Program's requirements and we will submit it to GFOA to determine its eligibility for another certificate.

Acknowledgements
The Finance division of MSD has worked hard to produce the 2019 CAFR and I would like to thank them for their individual contributions. I would also like to take this opportunity to thank the MSD Board of Directors and the Executive Leadership Team for their continued support.

Respectfully Submitted,

Brad Good
Interim Director of Budget & Finance

Government Finance Officers Association

Certificate of Achievement for Excellence in Financial Reporting

Presented to

Louisville and Jefferson County

Metropolitan Sewer District, Kentucky

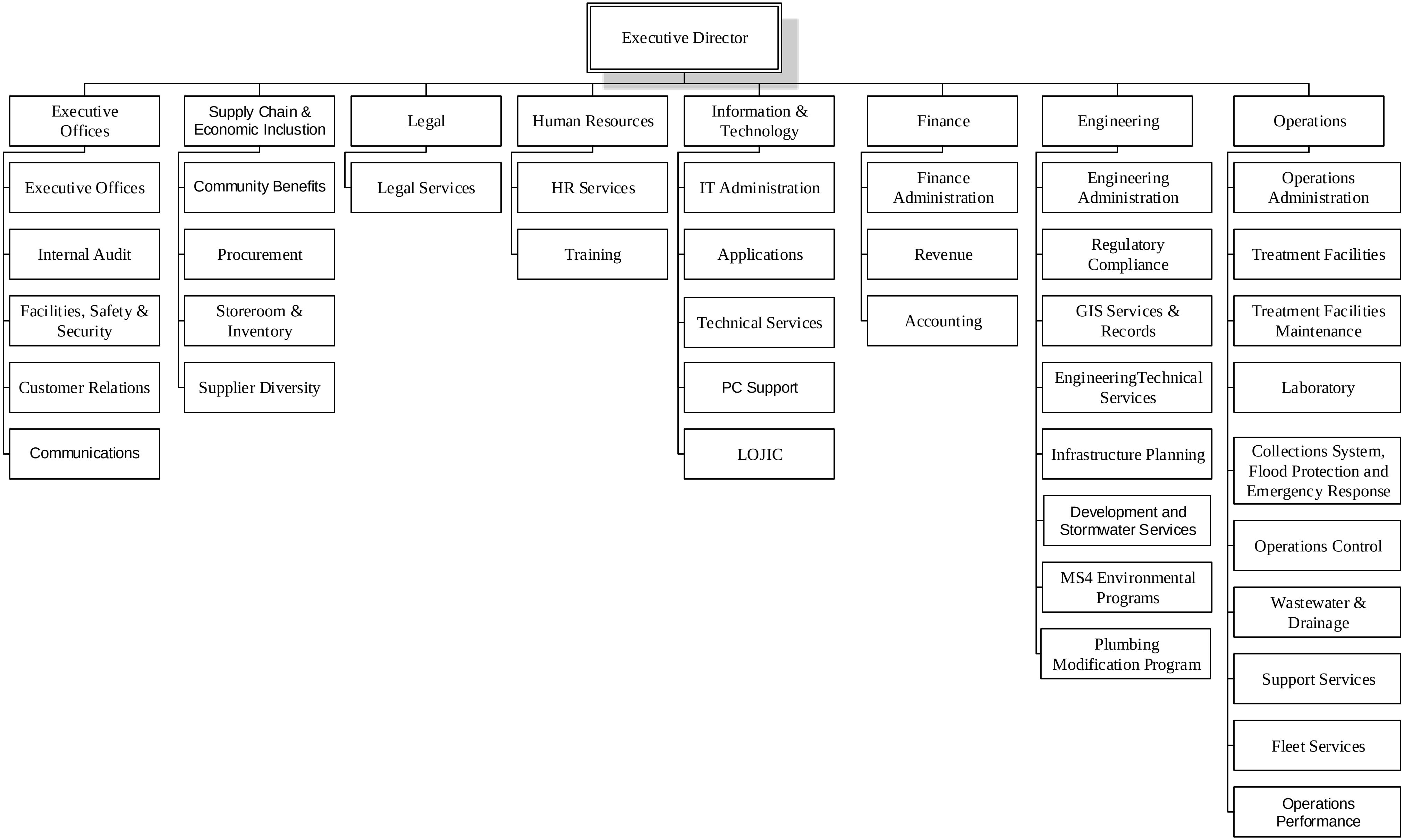
For its Comprehensive Annual
Financial Report
for the Fiscal Year Ended

June 30, 2018

Christopher P. Morrill

Executive Director/CEO

Louisville and Jefferson County
Metropolitan Sewer District
Organization Chart



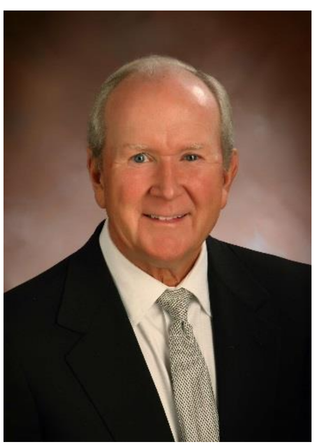
Cyndi Caudill
Chair

Dan Arbough
Vice Chair

Andrew Bailey

Keith Jackson

Ricky Mason



JT Sims

Jason Williams

Marita Willis

PRINCIPAL OFFICERS

James A. Parrott
Executive Director

Angela Akridge
Chief Engineer

Chad Collier
Chief Financial Officer
Secretary/Treasurer

Brian Bingham
Chief of Operations

Lynne Fleming
Human Resources Director

Paula Middleton Purifoy
General Counsel and
Legal Director

M. Tom Luckett
One Water
Chief Information Officer

Kimberly Reed
One Water
Chief Innovation Officer

Rene' Lindsay
One Water
Chief Procurement Officer

MSD's 4-mile Waterway Protection Tunnel will protect the community
and our waterways from combined sewer overflows.

Financial Section

Crowe LLP
Independent Member Crowe Global

INDEPENDENT AUDITOR'S REPORT

Board of Directors
Louisville and Jefferson County Metropolitan Sewer District
Louisville, Kentucky

Report on Financial Statements

We have audited the accompanying financial statements of the Louisville and Jefferson County Metropolitan Sewer District, a component unit of the Louisville-Jefferson County Metro Government, as of and for the years ended June 30, 2019 and 2018, and the related notes to the financial statements, which collectively comprise the Louisville and Jefferson County Metropolitan Sewer District's basic financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these 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 financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

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

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the 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 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 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 financial statements referred to above present fairly, in all material respects, the financial position of the Louisville and Jefferson County Metropolitan Sewer District, as of June 30, 2019 and 2018, and the changes in financial position and cash flows thereof for the years then ended in accordance with accounting principles generally accepted in the United States of America.

Other Matters

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 11, the Schedule of Proportionate Share of the Net Pension Liability on page 54, and the Schedule of Pension Contributions on page 56, the Schedule of Proportionate Share of the Net OPEB Liability on page 57, and the Schedule of OPEB Contributions on page 58 be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the basic 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 financial statements, and other knowledge we obtained during our audit of the basic 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.

Supplementary Information

Our audits were conducted for the purpose of forming an opinion on the financial statements that collectively comprise the Louisville and Jefferson County Metropolitan Sewer District's basic financial statements. The introductory and statistical sections are presented for purposes of additional analysis and are not a required part of the basic financial statements. The introductory and statistical sections have not been subjected to the auditing procedures applied in the audits of the basic financial statements, and accordingly, we do not express an opinion or provide any assurance on them.

Other Reporting Required by Governmental Auditing Standards

In accordance with *Government Auditing Standards,* we have also issued our report dated October 31, 2019 on our consideration of the Louisville and Jefferson County Metropolitan Sewer District's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts and grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the Louisville and Jefferson County Metropolitan Sewer District's internal control over financial reporting and compliance.

Crowe LLP

Crowe LLP

Louisville, Kentucky
October 31, 2019

The management of Louisville and Jefferson County Metropolitan Sewer District (MSD) present this Management's Discussion and Analysis (MD&A) for the fiscal year ended June 30, 2019 and 2018. This narrative provides the reader with condensed comparative financial data, an analysis of the results of our operations, a description of capital asset and long term debt activity, and a discussion of future economic factors that will impact our operations. This MD&A is intended to be read in conjunction with the financial statements immediately following this section.

FINANCIAL HIGHLIGHTS

- Total net position increased from fiscal 2018 to fiscal 2019 by $61.9 million, or 8.7%.
- Total assets and deferred outflows of resources increased $143.6 million, or 4.3%, from fiscal 2018 to fiscal 2019.
- MSD started a commercial paper program on July 10, 2018 to provide interim construction financing and provide additional liquidity support for the Bond Anticipation Note (BAN). This program saved MSD $1.6M in interest costs versus issuing a long-term revenue bond.
- Operating revenues increased in fiscal 2019 by $15.2 million, or 5.5% primarily due to a rate increase of 6.9% effective August 1, 2018.
- Operating expenses increased by $21.2 million, or 11.6% as a result of increases in depreciation and amortization expense of $9.9 million and service and administrative costs of $9.9 million over fiscal 2018.
- MSD maintained unrestricted cash and investments totaling $80.5 million as of June 30, 2019. This is equal to 283 days cash on hand compared to 293 days cash on hand at June 30, 2018.
- Total debt coverage was 1.54x for fiscal 2019 compared to 1.63x for fiscal 2018 while senior debt coverage was 1.81x for fiscal 2019 compared to 1.9x for fiscal 2018.

OVERVIEW OF THE FINANCIAL STATEMENTS

MSD uses the accrual basis of accounting to prepare its financial statements wherein revenues are recorded when earned and expenses are recorded at the time a liability is incurred. MD&A serves as a narrative introduction to the financial statements which consist of the following parts:

Statement of Net Position: This statement includes all of MSD's assets, liabilities and deferred outflow and inflow of resources. It provides information about the nature and amounts of investments in assets and the obligations to creditors. In addition, it provides the basis for computing rate of return, evaluating the capital structure of MSD and assessing the liquidity and financial flexibility of the organization.

Statement of Revenues, Expenses and Changes in Net Position: This statement identifies the revenues generated and expenses incurred during the fiscal year and helps the user to assess the financial efficiency of MSD during the time period for which the statement relates.

Statement of Cash Flows: This statement provides information related to MSD's cash receipts and cash expenditures during the fiscal year. It reports cash receipts, cash payments, and net changes in cash resulting from operations, investing, and financing activities.

Notes to the Financial Statements: The notes contain descriptions of the policies underlying the amounts displayed in the financial statements along with other information that is essential to a full understanding of the data provided in the financial statements.

Required Supplementary Information: Information is presented related to MSD's pension and Other Post-Employment Benefits (OPEB) including annual contributions made to the plans and annual investment returns.

Other supplemental information is presented for comparative analysis and is not part of the basic financial statements. Other supplemental information consists of:

Statistical Section: Ten years of financial statement information, operating indicators, and demographic information is presented for comparative analysis.

STATEMENT OF NET POSITION

FIGURE 1 - CONDENSED NET POSITION INFORMATION				2019-2018		2018-2017	
(amounts in thousands)	FY 2019	FY 2018	FY 2017	Increase (Decrease)	% Change	Increase (Decrease)	% Change
Unrestricted current assets	$ 116,928	$ 109,940	$ 83,085	$ 6,988	6.4%	$ 26,855	32.3%
Restricted current assets	52,520	29,987	42,129	22,533	75.1%	(12,142)	(28.8%)
Capital assets	3,118,659	2,925,982	2,742,037	192,677	6.6%	183,945	6.7%
Restricted non-current assets	76,678	152,438	124,192	(75,760)	(49.7%)	28,246	22.7%
Other non-current assets	31,644	32,221	32,768	(577)	(1.8%)	(547)	(1.7%)
Total assets	3,396,429	3,250,568	3,024,211	145,861	4.5%	226,357	7.5%
Deferred outflows of resources	52,018	54,267	35,911	(2,249)	(4.1%)	18,356	51.1%
Total assets and deferred outflows	3,448,447	3,304,835	3,060,122	143,612	4.3%	244,713	8.0%
Current liabilities	18,168	16,342	16,550	1,826	11.2%	(208)	(1.3%)
Current liabilities from restricted assets	95,537	108,978	82,654	(13,441)	(12.3%)	26,324	31.8%
Non-current liabilities	2,478,195	2,401,015	2,208,378	77,180	3.2%	192,637	8.7%
Total liabilities	2,591,900	2,526,335	2,307,582	65,565	2.6%	218,753	9.5%
Deferred inflows of resources	85,995	69,826	84,052	16,169	23.2%	(14,226)	(16.9%)
Total liabilities and deferred outflows	2,677,895	2,596,161	2,391,634	81,734	3.1%	204,527	8.6%
Net investment in capital assets	745,343	587,820	562,784	157,523	26.8%	25,036	4.4%
Restricted, net	81,207	156,425	150,386	(75,218)	(48.1%)	6,039	4.0%
Unrestricted	(55,998)	(35,571)	(44,682)	(20,427)	57.4%	9,111	(20.4%)
Total net position	770,552	708,674	668,488	61,878	8.7%	40,186	6.0%
Total liabilities , deferred inflows & net position	$ 3,448,447	$ 3,304,835	$ 3,060,122	$ 143,612	4.3%	$ 244,713	8.0%

Net Position: MSD's net position increased $61.9 million, or 8.7%, in fiscal 2019 and increased $40.2 million, or 6.0%, in fiscal 2018 (see Figure 1). Increases or decreases in net position serve as useful indicators of MSD's financial condition over time.

The largest portion of MSD's net position is its net investment in capital assets. Net investment in capital assets increased $157.5 million in fiscal 2019 and increased $25.0 million in fiscal 2018. Capital asset construction and acquisitions were funded in 2019 by $120 million of commercial paper notes[1], cash generated from operations, and contributions in aid of construction from developers. Capital asset construction and acquisitions were funded in 2018 by a $175 million revenue bond issue, cash generated from operations, and contributions in aid of construction from developers

Funds restricted for a specific purpose by bond covenants are classified as restricted net position. MSD is required to make monthly transfers to its debt service accounts sufficient to meet the semi-annual debt service payments on outstanding bonds. MSD also maintains debt reserve accounts and a $75 million Debt Service Reserve Surety policy equal to the maximum annual debt service requirements on its senior lien obligations. Restricted net position decreased $75.2 million from fiscal 2018 to fiscal 2019 as the remaining funds in the 2017 construction fund were spent and assets previously restricted for the debt reserve were freed up by the issuance of a Debt Service Reserve Surety policy were spent on construction. Restricted net position increased $6.0 million from fiscal 2017 to fiscal 2018 due to an increase in assets restricted for debt service.

[1] See Note 7 – Long-Term Debt

The remaining balance of MSD's net position is unrestricted and may be used for any allowable purpose. Unrestricted net position decreased $20.4 million from fiscal 2018 to fiscal 2019 as MSD's net investment [2]in capital assets increased. Unrestricted net position increased $9.1 million from fiscal 2017 to fiscal 2018 primarily from funds provided by operations.

Total assets and deferred outflows of resources increased by $143.6 million in fiscal 2019. This increase can be attributed primarily to additions to plant, lines and other facilities. Total assets and deferred outflows of resources increased by $244.7 million in fiscal 2018. This increase can be attributed primarily to additions to plant, lines and other facilities.

Total liabilities and deferred inflows of resources increased in 2019 by $81.7 million. Current liabilities decreased by $11.6 million. Noncurrent liabilities increased by $77.2 million as commercial paper issuances were offset by a reduction in bonds payable. Pension and OPEB obligations increased by $12.2 million. In fiscal 2018, total liabilities and deferred inflows of resources increased by $204.5 million due to the senior debt issued in fiscal 2018 and an increase in the net pension and OPEB liabilities.

STATEMENT OF REVENUES, EXPENSES AND CHANGES IN NET POSITION

FIGURE 2 - CONDENSED STATEMENT OF REVENUES, EXPENSES AND CHANGES IN NET POSITION INFORMATION

				2019-2018		2018-2017	
(amounts in thousands)	FY 2019	FY 2018	FY 2017	Increase (Decrease)	% Change	Increase (Decrease)	% Change
Operating revenues							
Service charges	$289,173	$274,504	$253,943	$ 14,669	5.3%	$ 20,561	8.1%
Other operating income	5,195	4,645	5,691	550	11.8%	(1,046)	(18.4%)
Total operating revenues	294,368	279,149	259,634	15,219	5.5%	19,515	7.5%
Non-operating revenues	18,692	16,529	14,273	2,163	13.1%	2,256	15.8%
Total revenues	313,060	295,678	273,907	17,382	5.9%	21,771	7.9%
Operating expenses							
Service and administrative costs	103,699	93,800	87,637	9,899	10.6%	6,163	7.0%
GASB 68/75 pension expense	12,243	10,852	2,512	1,391	12.8%	8,340	332.0%
Depreciation & amortization expense	87,882	77,954	77,156	9,928	12.7%	798	1.0%
Total operating expenses	203,824	182,606	167,305	21,218	11.6%	15,301	9.1%
Non-operating expenses							
Interest expense	96,214	90,779	88,286	5,435	6.0%	2,493	2.8%
Amortization of debt discount/premium	(11,527)	(12,051)	(10,631)	524	(4.3%)	(1,420)	13.4%
Change in fair value - swaps	13,597	(16,317)	(26,072)	29,914	(183.3%)	9,755	(37.4%)
Total non-operating expenses	98,284	62,411	51,583	35,873	57.5%	10,828	21.0%
Total expenses	302,108	245,017	218,888	57,091	23.3%	26,129	11.9%
Income before capital contributions	10,952	50,661	55,019	(39,709)	(78.4%)	(4,358)	(7.9%)
Capital contributions	50,926	12,726	12,889	38,200	300.2%	(163)	(1.3%)
Increase (decrease) in net position	61,878	63,387	67,908	(1,509)	(2.4%)	(4,521)	(6.7%)
Net position - begininng[2]	708,674	645,287	600,580	63,387	9.8%	44,707	7.4%
Net position - ending	$770,552	$708,674	$668,488	$ 61,878	8.7%	$ 40,186	6.0%

Operating Revenues: Operating revenues as of June 30, 2019 were $294.4 million (see Figure 2). This represents an increase of $15.2 million, or 5.5%, in fiscal 2019. The increase in operating revenues was driven by a Board-approved rate increase of 6.9% effective August 1, 2018. Wastewater service charges totaled $219.5 million which is an increase of $8.9 million, or 4.2%, from a year ago. Stormwater service charges were $69.7 million which represents an increase of $5.9 million, or 9.2%, from the same period one year ago. Other operating income was $5.2 million, which is $0.6 million more than one year ago.

[2] Net position as of July 1, 2018 was reduced by $23,201 related to the adoption of GASB Statement No. 75.

Operating revenues as of June 30, 2018 were $279.1 million. This represents an increase of $19.5 million, or 7.5%, in fiscal 2018. The increase in operating revenues was driven by a Board-approved rate increase of 6.9% effective August 1, 2017. Wastewater service charges totaled $210.6 million which is an increase of $15.7 million, or 8.0%, from fiscal 2017. Stormwater service charges were $63.8 million which represents an increase of $4.8 million, or 8.3%, from fiscal 2017. Other operating income was $4.6 million or $1.0 million less than fiscal 2017.

Non-operating Revenues: Non-operating revenues, which represent interest income earned on investments and the federal interest subsidy on MSD's Build America Bonds, increased $2.2 million in fiscal 2019 largely due to improved yields on the investment portfolio. Non-operating revenues increased $2.3 million in fiscal 2018 as the size of the investment portfolio increased.

Operating Expenses: Service and administrative costs increased by $9.9 million, or 10.6%, in fiscal 2019 from fiscal 2018. Salary and benefit costs increased $6.6 million to 49.8% of net service and administrative costs compared to 48.7% in fiscal 2018. This increase was made up of salary increases, workers compensation claim increases and higher CERS pension contributions. Utility expenses increased by $2.8 million due to higher peak-demand rates as a result of a February 2018 flooding event. Bad Debt expense totaled 1.29% of service charge revenue for fiscal 2019 compared to 1.43% for fiscal 2018.

Service and administrative costs increased by $6.2 million in fiscal 2018 from fiscal 2017. Labor costs increased $5.5 million, or 49.0% of net service and administrative costs compared to 49.5% in fiscal 2017. MSD incurred approximately $500 thousand in additional overtime expenses responding to a February 2018 flooding event. Merit increases and reorganizations account for the balance of the labor increase from fiscal 2017 to fiscal 2018. All of MSD's pump stations were placed in service for the flooding event which increased electrical expenses $2 million year over year and reset MSD's peak-demand electric rate. Bad Debt expense totaled 1.43% of service charge revenue for fiscal 2018 compared to 1.38% for fiscal 2017.

Non-operating Expenses: Non-operating expenses increased $35.9 million in fiscal 2019 from fiscal 2018. Net interest expense increased $5.4 million largely as a result of a decrease in capitalized interest expense due to a smaller construction in progress balance. The change in fair value of MSD's swap portfolio increased $29.9 million as interest rates increased. Non-operating expenses increased $10.8 million in fiscal 2018 from fiscal 2017. Net interest expense increased $2.5 million due to the issuance of the 2017A series revenue bonds. The change in fair value of MSD's swap portfolio increased $9.8 million as interest rates increased.

Capital Contributions: Capital contributions increased $38.2 million in fiscal 2019 from fiscal 2018. This increase was driven by an increase in contributions of stormwater infrastructure constructed by developers. In addition, MSD also received $3.3 million on its 2018 flood event property insurance claim. Capital contributions were essentially flat from fiscal 2017 to fiscal 2018, decreasing by $163 thousand. See Figure 3 below for additional information.

FIGURE 3 - CAPITAL CONTRIBUTIONS

				2019-2018		2018-2017	
(amounts in thousands)	FY 2019	FY 2018	FY 2017	Increase (Decrease)	% Change	Increase (Decrease)	% Change
Cash flows from:							
Developer's capital - stormwater	$ 29,286	$ -	$ -	$ 29,286	100.0%	$ -	0.0%
Developer's capital - wastewater	12,267	5,543	4,127	6,724	121.3%	1,416	34.3%
Federal grants	5,903	7,183	6,386	(1,280)	(17.8%)	797	12.5%
Capital recovery	156	-	-	156	100.0%	-	0.0%
Property owner assessments - capital	-	-	2,376	-	0.0%	(2,376)	(100.0%)
Miscellaneous claims recovery	3,314	-	-	3,314	100.0%	-	0.0%
Total capital contributions	$ 50,926	$ 12,726	$ 12,889	$ 38,200	300.2%	$ (163)	(1.3%)

STATEMENT OF CASH FLOWS

FIGURE 4 - CONDENDSED STATEMENT OF CASH FLOWS INFORMATION

(amounts in thousands)	FY 2019	FY 2018	FY 2017	2019-2018 Increase (Decrease)	2019-2018 % Change	2018-2017 Increase (Decrease)	2018-2017 % Change
Cash flows from:							
Operating activities	$189,618	$181,561	$173,755	$ 8,057	4.4%	$ 7,806	4.5%
Capital and related financing activities	(245,133)	(147,727)	(197,246)	(97,406)	65.9%	49,519	(25.1%)
Investing activities	40,666	(51,717)	18,941	92,383	(178.6%)	(70,658)	(373.0%)
Change in cash and temporary investments	(14,849)	(17,883)	(4,550)	3,034	(17.0%)	(13,333)	293.0%
Cash and temporary investments, Beginning of year	81,662	99,545	104,095	(17,883)	(18.0%)	(4,550)	(4.4%)
Cash and temporary investments, End of year	$ 66,813	$ 81,662	$ 99,545	$ (14,849)	(18.2%)	$ (17,883)	(18.0%)

Cash and cash equivalents were $66.8 million at the end of fiscal 2019 which is a decrease of $14.8 million from fiscal 2018 or 18.2% (see Figure 4). Cash flows from operating activities increased as revenue and customer receipts grew. Cash used by financing activities in fiscal 2019 decreased primarily as a result of a reduction in borrowing. Cash provided by investing activities in fiscal 2019 increased as several bonds in the investment portfolio were called and MSD liquidated its commercial paper holdings to finance construction.

Cash and cash equivalents were $81.7 million at the end of fiscal 2018 which is a decrease of $17.9 million from fiscal 2017 or 18.0%. Cash flows from operating activities increased as revenue and customer receipts grew. Cash used by financing activities in fiscal 2018 increased primarily as a result of higher proceeds from the bond issue and related bond premiums compared to fiscal 2017. Cash provided by investing activities in fiscal 2018 decreased as investments in in money market funds were reinvested in U.S. agency and treasury securities.

CAPITAL ASSETS

FIGURE 5 - CAPITAL ASSETS NET OF DEPRECIATION

(amounts in thousands)	FY 2019	FY 2018	Increase (Decrease) 2019-2018	FY 2017	Increase (Decrease) 2018-2017
Sewer lines	$ 1,292,272	$ 1,159,110	$ 133,162	$ 1,120,151	$ 38,959
Wastewater treatment facilities	222,196	229,950	(7,754)	244,482	(14,532)
Stormwater drainage facilities	651,346	410,390	240,956	401,729	8,661
Pumping and lift stations	159,063	111,902	47,161	103,085	8,817
Administrative facilities	11,869	11,827	42	13,411	(1,584)
Maintenance facilities	5,329	1,941	3,388	2,119	(178)
Machinery and equipment	28,188	10,015	18,173	7,580	2,435
Miscellaneous	2,074	2,357	(283)	4,150	(1,793)
Capitalized interest	285,821	276,835	8,986	264,108	12,727
Construction in progress	460,501	711,655	(251,154)	581,222	130,433
Total	$ 3,118,659	$ 2,925,982	$ 192,677	$ 2,742,037	$ 183,945

MSD's total capital assets net of depreciation increased by $192.7 million in fiscal 2019 (see Figure 5). Stormwater drainage facilities contained the biggest increase with $241 million of additions. For more detailed information, see Note 5, Capital Assets – Plant, Lines and Other Facilities, in the accompanying notes to the financial statements. Depreciation expense was $87.9 million or $9.9 million more than fiscal 2018.

MSD's total capital assets net of depreciation increased by $183.9 million in fiscal 2018 (see Figure 5). Construction in progress contained the biggest increase with $230.8 million of additions offset by $100.3 million of assets placed in service. Depreciation expense was $77.9 million or $797 thousand more than fiscal 2017.

DEBT ADMINISTRATION

FIGURE 6 - SCHEDULE OF BONDS AND OTHER FINANCING

(amounts in thousands)	FY 2019	FY 2018	Increase (Decrease) 2019-2018	FY 2017	Increase (Decrease) 2018-2017
Senior Revenue Bonds					
Series 2007A	$ -	$ -	$ -	$ 42,965	$ (42,965)
Series 2008A	-	-	-	65,520	(65,520)
Series 2009A	-	6,640	(6,640)	13,040	(6,400)
Series 2009B	35,155	52,975	(17,820)	69,725	(16,750)
Series 2009C	180,000	180,000	-	180,000	-
Series 2010A	330,000	330,000	-	330,000	-
Series 2011A	248,440	250,565	(2,125)	252,610	(2,045)
Series 2013A	115,790	115,790	-	115,790	-
Series 2013B	114,100	115,550	(1,450)	116,940	(1,390)
Series 2013C	99,375	99,500	(125)	99,625	(125)
Series 2014A	79,800	79,850	(50)	79,900	(50)
Series 2015A	173,360	173,735	(375)	174,280	(545)
Series 2015B	74,160	76,685	(2,525)	79,085	(2,400)
Series 2016A	149,530	149,760	(230)	150,000	(240)
Series 2016B	25,825	28,095	(2,270)	28,095	-
Series 2016C	67,685	67,685	-	67,685	-
Series 2017A	169,270	175,000	(5,730)	-	175,000
Series 2017B	33,670	34,520	(850)	-	34,520
Series 2018A	60,380	60,380	-	-	60,380
Bond Anticipation Notes					
Series 2016A	-	-	-	226,340	(226,340)
Series 2017A	-	226,340	(226,340)	-	226,340
Series 2018A	226,340	-	226,340	-	-
Other Subordinate Debt					
Commercial Paper Notes	120,000	-	120,000	-	-
Notes Payable - LOC	100	-	100	-	-
KIA Loan - A209-41	1,767	1,871	(104)	1,973	(102)
KIA Loan - A98-04	891	-	891	-	-
	$ 2,305,638	$2,224,941	$ 80,697	$2,093,573	$ 131,368

Excludes bond premiums/discounts

MSD ended fiscal 2019 with $2.3 billion in outstanding long-term debt compared to $2.2 billion in outstanding long-term debt at the end of fiscal 2018 (see Figure 6). Additional information on MSD's long-term debt can be found in Note 7 – Long-Term Debt. Short term debt outstanding payable from restricted assets at the end of fiscal 2019 totaled $95.5 million compared to $109.1 million at the end of fiscal 2018. Net interest expense totaled $84.7 million in fiscal 2019, an increase of $6.0 million from fiscal 2018.

MSD ended fiscal 2018 with $2.2 billion in outstanding long-term debt compared to $2.1 billion in outstanding long-term debt at the end of fiscal 2017. Short term debt outstanding payable from restricted assets at the end of fiscal 2018 totaled $108.9 million compared to $82.6 million at the end of fiscal 2017. Net interest expense totaled $78.7 million in fiscal 2018, an increase of $1.0 million from fiscal 2017.

FY2019 Significant Debt Transactions: On July 10, 2018 MSD introduced its Sewer and Drainage System Subordinated Program Notes Series 2018 Commercial Paper Sub-Series A-1 and A-2 totaling $500,000,000. During fiscal 2019 MSD issued $120 million in commercial paper notes all of which were used for capital improvement projects.

FY2018 Significant Debt Transactions: On August 22, 2017, MSD issued $175 million of revenue bonds, series 2017A. The proceeds of the series 2017A bonds were used to: (i) pay the costs of issuing the series 2017A bonds; (ii) make a deposit to the reserve account; and (iii) make a deposit to the construction and acquisition fund to pay the costs of improvements to MSD's sewer and drainage system.

On August 22, 2017, MSD issued $35.7 million of revenue refunding bonds, series 2017B. The proceeds of the series 2017B bonds, together with certain amounts in the reserve account, were used to: (i) currently refund $42.9 million of outstanding principal amount on MSD's sewer and drainage system revenue bonds, series 2007A, maturing May 15, 2018 through May 15, 2025, the proceeds of which were used to finance the costs of improvements to MSD's sewer and drainage system, and (ii) pay the cost of issuance of the series 2017B bonds. The refunding reduced debt service payments over the next 8 years by $9.5 million and resulted in a net present value savings of $7.8 million.

On May 31, 2018, MSD issued $60.3 million of revenue refunding bonds, series 2018A. The proceeds of the series 2018A bonds, together with certain amounts in the reserve account, were used to: (i) currently refund $63.3 million of outstanding principal amount on MSD's sewer and drainage system revenue bonds, series 2007A, maturing May 15, 2037 through May 15, 2038, the proceeds of which were used to finance the costs of improvements to MSD's sewer and drainage system, and (ii) pay the cost of issuance of the series 2018A bonds. The refunding reduced debt service payments over the next 20 years by $8.4 million and resulted in a net present value savings of $4.5 million.

Debt Service Ratio: Although net operating income is the most significant component of determining MSD's debt service coverage ratio, other sources, including investment income and current period payments of property owner assessments, are also included in "available revenues" and "net revenues" for purposes of demonstrating MSD's compliance with debt service ratio tests from the 1993 Sewer and Drainage System Revenue Bond Resolution.

The 1993 resolution and its supplements require MSD to provide available revenues sufficient to pay 110% of each year's aggregate net debt service on revenue bonds and 100% of operating expenses. Available revenues, as used for purposes of the resolution, means all revenues and other amounts received by MSD and pledged as security for payment of bonds issued pursuant to the resolution, but excludes interest income which is capitalized in accordance with generally accepted accounting principles.

Net operating expenses include all reasonable, ordinary, usual or necessary current expenses of maintenance, repair, and operation determined in accordance with generally accepted accounting principles and the enterprise basis of accounting. Operating expenses do not include reserves for extraordinary maintenance and repair or administrative and engineering expenses of MSD which are necessary or incidental to capital improvements for which debt has been issued and which may be paid from proceeds of such debt.

Aggregate net debt service is debt service on all bonds issued pursuant to the resolution including principal payments, excluding (i) interest expense which, in accordance with generally accepted accounting principles, is capitalized and which may be paid from the proceeds of debt and (ii) other amounts, if any, available or expected to be available in the ordinary course of business for payment of debt service.

MSD's debt service coverage ratio[3], calculated on the foregoing basis, was 181% in 2019, 190% in 2018 and 181% in 2017 (see Figure 7).

FIGURE 7 - DEBT SERVICE COVERAGE					
(amounts in thousands)	**FY 2019**	**FY 2018**	**Increase (Decrease) 2019-2018**	**FY 2017**	**Increase (Decrease) 2018-2017**
Total available revenues	$314,318	$296,912	5.9%	$275,282	7.9%
Total net operating expenses	103,699	93,800	10.6%	87,637	7.0%
Net revenue	210,619	203,112	3.7%	187,645	8.2%
Aggregate net debt service	$116,607	$107,088	8.9%	$103,699	3.3%
Debt service coverage ratio	181%	190%	(4.8%)	181%	4.8%

FUTURE ECONOMIC FACTORS

The MSD Board approved a 6.9% rate increase for wastewater and stormwater volume and service charges as well as optional and quality charge rates that are assessed to commercial and industrial wastewater customers effective August 1, 2019.

On September 6, 2019 Moody's Investors Service assigned its MIG 1 rating to MSD's $226.3 million sewer and drainage system subordinated Bond Anticipation notes, series 2019. Moody's maintained its Aa3 long-term rating and stable outlook on MSD's outstanding sewer and drainage system revenue bonds.

On September 6, 2019, S&P Global ratings assigned its SP-1+ rating to MSD's $226.3 million sewer and drainage system subordinated Bond Anticipation notes, series 2019. S&P maintained its AA long-term rating and stable outlook on MSD's outstanding sewer and drainage system revenue bonds and the A-1+ commercial paper program rating.

CONSENT DECREE

In April 2009, MSD agreed to enter into an amended Consent Decree with the Commonwealth of Kentucky's Environmental and Public Protection Cabinet (KEPPC) and the U.S. Environmental Protection Agency (EPA). The agreement calls for MSD to design and implement projects within specified deadlines that will eliminate sewer overflows in its service area. The cost of the projects is estimated to be $1.15 billion. MSD has submitted plans to finance the projects through additional bonds and future rate increases. In a letter dated June 6, 2014, MSD requested approval from the KEPPC and the EPA for the Integrated Overflow Abatement Plan (IOAP) 2012 Modifications, dated May 2014. The IOAP 2012 Modifications represents a revision to 28 separate projects set forth in the original IOAP, dated September 30, 2009. The IOAP modifications were approved and will supersede and replace the 2009 IOAP. To date, MSD has complied with all submittals and reports requirements contained in the amended Consent Decree. For additional information on the Consent Decree see Note 11 to the financial statements.

REQUESTS FOR ADDITIONAL INFORMATION

This report is intended to provide readers with a general overview of MSD's finances and to provide information regarding the receipts and uses of funds. If you need clarification regarding a statement(s) made in the report or need additional information, please contact the Louisville and Jefferson County Metropolitan Sewer District, 700 West Liberty Street, Louisville Kentucky 40203. You can also submit a request for additional information via MSD's website, www.msdlouky.org.

[3] Excludes GASB 68 pension expense and GASB 75 OPEB expense

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT
COMPARATIVE STATEMENT OF NET POSITION
AS OF JUNE 30,
DOLLARS IN THOUSANDS

	2019	2018
Current Assets		
Unrestricted Current Assets		
Cash and cash equivalents	$ 43,728	$ 50,276
Investments	36,744	25,080
Accounts receivable, less allowance for		
doubtful accounts of $959 (2019), $1,030 (2018)	27,915	26,332
Inventories	4,623	4,407
Accrued interest receivable	957	1,116
Prepaid expenses and other current assets	2,961	2,729
Total unrestricted current assets	116,928	109,940
Restricted Current Assets		
Cash and cash equivalents	22,348	29,987
Investments	30,172	-
Total restricted current assets	52,520	29,987
Total Current Assets	169,448	139,927
Noncurrent Assets		
Unrestricted Noncurrent Assets		
Accounts receivable, non-current	13,730	14,250
Restricted Noncurrent Assets:		
Cash and cash equivalents	737	1,399
Investments	75,941	151,039
Other non-current assets	17,914	17,971
Total restricted non-current assets	94,592	170,409
Capital Assets		
Utility plant in service	3,962,588	3,432,754
Less allowance for depreciation	(1,304,430)	(1,218,427)
	2,658,158	2,214,327
Construction in progress	460,501	711,655
Net capital assets	3,118,659	2,925,982
Total Non-current Assets	3,226,981	3,110,641
Total Assets	3,396,429	3,250,568
Deferred Outflow of Resources		
Deferred outflow - pension	26,931	27,541
Deferred outflow - OPEB	10,571	9,392
Unamortized loss on refunding	14,516	17,334
Total deferred outflow of resources	52,018	54,267
Total Assets and Deferred Outflow of Resources	**$ 3,448,447**	**$ 3,304,835**

See the accompanying notes to the financial statements.

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT
COMPARATIVE STATEMENT OF NET POSITION
AS OF JUNE 30,
DOLLARS IN THOUSANDS

	2019	2018
Current Liabilities		
Current Liabilities To Be Paid From Unrestricted Assets		
Accounts payable	$ 10,567	$ 10,426
Accrued salaries and related benefits	7,601	5,916
Total unrestricted current liabilities	18,168	16,342
Current Liabilities To Be Paid From Restricted Assets		
Accounts payable and accrued expenses (capital), includes contractor retainage of $12,190 (2019), $14,818 (2018)	31,945	47,472
Accrued interest payable	17,819	18,455
Refundable deposits	2,928	2,861
Revenue bonds payable	42,200	40,190
Bank notes	100	-
State revolving fund notes	545	105
Total restricted current liabilities	95,537	109,083
Total Current Liabilities	113,705	125,425
Noncurrent Liabilities		
Bonds payable, net	1,994,761	2,047,168
Bond anticipation note	226,340	226,340
Commercial paper notes	120,000	-
State revolving fund notes	2,113	1,766
Net pension liability	104,511	93,517
Net OPEB obligation	30,470	32,119
Total Noncurrent Liabilities	2,478,195	2,400,910
Total Liabilities	2,591,900	2,526,335
Deferred Inflow of Resources		
Interest rate swaps	73,040	59,443
Deferred inflow - pension	3,198	3,832
Deferred inflow - OPEB	5,780	1,682
Other deferred inflows	3,977	4,869
Total deferred inflow of resources	85,995	69,826
Total Liabilities and Deferred Inflow of Resources	**$ 2,677,895**	**$ 2,596,161**
Net Position		
Net investment in capital assets	$ 745,343	$ 587,820
Assets restricted for debt service	99,026	174,880
Liabilities associated with restricted debt service	(17,819)	(18,455)
Unrestricted	(55,998)	(35,571)
Total net position	770,552	708,674
Total Liabilities, Deferred Inflow of Resources and Net Position	**$ 3,448,447**	**$ 3,304,835**

See the accompanying notes to the financial statements.

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT
COMPARATIVE STATEMENT OF UES, EXPENSES, AND CHANGES IN NET POSITION
FOR THE YEARS ENDED JUNE 30,
DOLLARS IN THOUSANDS

	2019	2018
Operating Revenues		
Service charges	$ 289,173	$ 274,504
Other operating income	5,195	4,645
Total operating revenues	294,368	279,149
Operating Expenses		
Service and administrative costs	103,699	93,800
GASB 68 pension/GASB 75 OPEB actuarial expense	12,243	10,852
Depreciation and amortization	87,882	77,954
Total operating expenses	203,824	182,606
Income from Operations	90,544	96,543
Non-operating Revenue (Expenses)		
Investment income	8,353	6,280
Build America bond refund	10,339	10,249
Interest expense - bonds	(94,831)	(95,041)
Interest expense - swaps	(6,468)	(7,724)
Interest expense - other	(13,497)	(9,873)
Amortization of debt discount / premium	14,344	15,198
Amortization of loss on refunding	(2,817)	(3,147)
Capitalized interest	18,582	21,859
Change in fair value - swaps	(13,597)	16,317
Total non-operating revenue (expenses) - net	(79,592)	(45,882)
Income before capital contributions	10,952	50,661
Capital contributions	50,926	12,726
Increase in net position	61,878	63,387
Net position, beginning	708,674	645,287
Net position, ending	$ 770,552	$ 708,674

See the accompanying notes to the financial statements.

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT
COMPARATIVE STATEMENT OF CASH FLOWS
FOR THE YEARS ENDED JUNE 30,
DOLLARS IN THOUSANDS

	2019	2018
Cash Flows from Operating Activities		
Cash received from customers	$ 292,791	$ 276,711
Cash paid to suppliers	(55,816)	(49,429)
Cash paid to employees	(47,357)	(45,721)
Net Cash Provided by Operating Activities	189,618	181,561
Cash Flows from Capital and Related Financing Activities		
Proceeds from issuance of revenue bonds	-	188,083
Proceeds from issuance of bond anticipation note	230,334	235,151
Proceeds from issuance of commercial paper	319,212	-
Payments for retirement of revenue bonds	(40,190)	(36,954)
Payments for retirement of bond anticipation note	(226,340)	(226,340)
Payments for retirement of commercial paper	(200,000)	-
Payments for retirement of other subordinated debt	(317)	(101)
Payments for interest expense	(108,511)	(102,394)
Payments for interest on swaps	(6,468)	(7,724)
Build America bond interest subsidy	10,339	10,248
Proceeds from capital grants	9,373	7,183
Proceeds from sale of capital assets	15	3
Payments for capital assets	(233,360)	(216,503)
Proceeds from assessments	780	1,621
Net Cash Provided (Used) by Capital and Related Financing	(245,133)	(147,727)
Cash Flows from Investing Activities		
Purchase of investments	(45,576)	(137,176)
Maturity of investments	80,004	78,503
Investment income	6,238	6,956
Net Cash Provided (Used) by Investing Activities	40,666	(51,717)
Net Increase (Decrease) in Cash and Cash Equivalents	(14,849)	(17,883)
Cash and Cash Equivalents, Beginning of Year	81,662	99,545
Cash and Cash Equivalents, End of Year	$ 66,813	$ 81,662

See the accompanying notes to the financial statements.

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT
COMPARATIVE STATEMENT OF CASH FLOWS (continued)
FOR THE YEARS ENDED JUNE 30,
DOLLARS IN THOUSANDS

Reconciliation of Operating Income to Net Cash provided by Operating Activities		
Income from operations	$ 90,544	$ 96,543
Adjustments to reconcile operating income to net cash provided by operating activities		
Depreciation and amortization	87,882	77,954
Accounts receivable	(1,644)	(2,999)
Inventories	(216)	(223)
Prepaid expense	(1,084)	(918)
Accounts payable	141	123
Customer deposits	67	561
Accrued liabilities	1,685	(332)
Pension liability	10,971	9,646
OPEB liability	1,272	1,206
Net Cash Provided by Operating Activities	$ 189,618	$ 181,561
Non-Cash Capital Financing and Investing Activities		
Contribution of plant, lines and other facilities by developers and property owners	$ 41,554	$ 5,542
Construction costs in accounts payable	31,945	47,472
Change in fair value of investments	(600)	1,777
Decrease in interest rate swap deferred revenue	918	918
Change in fair value - swap agreements	(13,597)	16,317
Bonds issued for refunding of debt	-	94,900

See the accompanying notes to the financial statements.

NOTE 1 – SIGNIFICANT ACCOUNTING POLICIES

The financial statements of the Louisville and Jefferson County Metropolitan Sewer District (MSD), a discreetly presented component unit of Louisville/Jefferson County Metro Government, are prepared in conformity with accounting principles generally accepted in the United States of America as applied to government units. The Governmental Accounting Standards Board (GASB) is the accepted standard-setting body for establishing governmental accounting and financial reporting principles. MSD follows GASB Pronouncements as codified under GASB 62, including electing to report as a regulated operation. MSD uses proprietary fund accounting (enterprise fund). Due to the election as a regulated operation under GASB 62, to meet industry accounting standards and follow transactional intent, MSD uses, as applicable, ASC 980, Regulated Accounting.

Reporting Entity: MSD is a public body corporate, and political subdivision of the Commonwealth of Kentucky. MSD was created in 1946 pursuant to Chapter 76 of the Kentucky Revised Statutes, in the interest of the public health and for the purpose of providing adequate sewer and drainage facilities in the urbanized area of the Louisville Metropolitan Area. Pursuant to Chapter 76, MSD is governed by a Board which consists of eight members who are appointed by the Mayor of Louisville Metro Government, subject to approval of Louisville Metro Council. Not more than five Board members may be of the same political party. However, there is not a continuing supervisory relationship exercised by Louisville Metro Government over MSD with respect to MSD's statutory public functions.

Chapter 76 authorizes MSD to provide sewer and drainage facilities and services. MSD is further authorized by the statute to establish and collect service charges and to budget accordingly for operations and maintenance, capital outlays and debt service on obligations it is authorized by the statute to incur. No special financing relationship exists between Louisville Metro Government and MSD, nor is Louisville Metro Government empowered by law or custom to approve MSD’s operating or capital budgets; nor are they responsible for financing deficits or disposing of surplus funds.

MSD has complete control, possession and supervision of the sewer and drainage system in large portions of Jefferson County, and has statutory authority to construct additions, betterments and extensions within its service area. Additionally, MSD has statutory responsibility for approval of the design and proper construction of sewer and drainage facilities within the County's boundaries. There are cities within the County that, by statute, have the option of using MSD sewer services on a contractual basis. Third and fourth class cities also have the option of obtaining drainage services from MSD. MSD’s enterprise business activities are managed by its Board, which has statutory authority to elect officers, enact bylaws and enter into agreements and contracts for the management and regulation of MSD's affairs.

MSD's revenue is derived from sewer and drainage service charges which are collected from residential, commercial and industrial customers. MSD controls the collection of all revenue, disbursement of payables and title to all sewer and drainage assets. Sewer service charges are distributed among customer classes on the basis of actual costs incurred to collect and treat wastewater. Drainage service charges are distributed among customer classes on the basis of actual costs of drainage services per equivalent unit of impervious surface.

Changes in MSD's service charges are implemented by MSD's Board, but no change in the service charge schedule is final within the Louisville Metro area until approval by Louisville Metro Council. However, the statute provides that such approval may not be arbitrarily withheld and that the schedule shall be sufficient to provide revenues for the operation and maintenance of the system and for debt service. By ordinance, Louisville Metro Government has provided that MSD’s Board may amend its service charge schedule to maintain a debt service ratio of 1.10 for MSD’s sewer and drainage revenue bonds, and that such amendments will be effective within the metropolitan area when adopted by MSD's Board, so long as the amended rates do not generate additional revenue from service charges in excess of 7% during the twelve months succeeding the period in which the deficiency was identified.

Chapter 76 permits MSD to finance sewer and drainage system construction, acquisition and other capital improvements through the issuance of its revenue bonds and with the proceeds of governmental grants, property owner contributions in aid of construction and bonds and loans for which pledge of repayment is subordinated to the pledge of all revenues given by MSD for the security of its revenue bond holders. MSD indebtedness does not constitute indebtedness of Louisville Metro Government or the Commonwealth, but Louisville Metro Government must authorize by ordinance the issuance by MSD of revenue bonds to finance projects within the Metropolitan area.

Basis of Accounting: The sewer and drainage system owned and operated by MSD is accounted for using a flow of economic resources measurement focus. With this measurement focus, all assets and all liabilities associated with the operation of the system are included on the statement of net position. Total net position is segregated into net investment in capital assets, restricted for payment of bond principal and interest and unrestricted. Operating statements present increases (e.g., revenues) and decreases (e.g., expenses) in net position. MSD utilizes the accrual basis of accounting wherein revenues are recorded when earned and expenses are recorded at the time the liability is incurred.

Cash and Cash Equivalents: For purposes of the Statements of Cash Flows, MSD includes repurchase agreements and other investments with an original maturity of three months or less in cash and cash equivalents.

Restricted and Unrestricted Funds: Restricted funds are reserved for the purpose of bond debt service, funding of capital construction, cost of issuance, and debt service reserves. Unrestricted funds, generated from service fees and other operating income, are used to pay for operating expenses. When an expense or outlay is incurred for which both restricted and unrestricted net position is available, it is MSD's practice is to use revenue from operations to finance construction, then to reimburse from restricted net position for construction as it is needed.

Investment Securities*:* Investments are stated at fair value. Investment income consists of interest income and the change in fair value of investments[1]. Investment income is reduced by estimated federal arbitrage liability.[2]

Revenues, Expenses and Receivables: Operating revenues are those revenues that are generated directly from the primary activity of MSD. These revenues are wastewater and stormwater service charges and other operating income. The Louisville Water Company is responsible for the billing and collection of these charges on behalf of MSD on a monthly basis. Operating expenses are expenses incurred through the activities of operating and maintaining MSD facilities.

Non-operating revenues and expenses are comprised of investment and financing earnings and costs, changes in the fair value of derivatives, as well as contributions from outside sources.

Accounts receivable are stated at the amount management expects to collect from outstanding customer accounts. Accounts are considered past due 30 days from the invoice date. Management provides an allowance for doubtful account that is based on historical collection experience and a review of the current status of individual accounts. Accounts that remain outstanding after management has exerted reasonable collection efforts are written off through a charge to allowance for doubtful accounts and a credit to accounts receivable. The allowance for doubtful accounts was valued at June 30, 2019 and June 30, 2018 as $959,140 and $1,029,900, respectively.

Assessment receivables represent amounts billed to residents to have sewer lines installed in their neighborhood. Assessment receivables are considered past due once the balance is 90 days in arrears. Management considers all amounts collectible on the basis that liens are placed on properties at the time of assessment.

[1] See Note 2 – Deposits and Investments
[2] See Note 7 – Long-Term Debt

Inventory: Inventory is stated at cost. Inventory consists of supplies and parts used in the operation of MSD's treatment plants and for the maintenance of sewers, fleet vehicles and other related equipment. Inventory totaled $4,622,556 at June 30, 2019 and $4,407,450 at June 30, 2018.

Contributed Capital and Construction Grants: MSD finances construction of sewer and drainage plant, lines and other facilities, in part, through government grants and contributions from property owners and developers. Governmental grants in aid of construction represent the estimated portion of construction costs incurred for which grants are expected to be paid to MSD by the governmental grantor. These amounts are recorded as a receivable and revenues from contributions at the time the related expenditures are incurred. Revenues from contributions are part of the change in net position. Government grants in aid of construction and other recoveries at June 30, 2019 and June 30, 2018 were $9,372,512 and $7,183,167, respectively. Contributed capital in the form of sewer and drainage infrastructure constructed by developers at June 30, 2019 and June 30, 2018 were $41,553,937 and $5,542,366, respectively.

Capital Assets - Plant, Lines and Other Facilities: Plant, lines and other facilities are recorded at historical cost or, if contributed, at acquisition value as determined by engineering estimates on the date the contribution is received. It is MSD's policy to depreciate the costs of these assets over their estimated useful lives on a straight line basis[3].

Estimated useful lives on depreciable assets are as follows:

Buildings and other structures	30 - 50 years
Land improvements	10 - 30 years
Miscellaneous machinery	10 - 20 years
Vehicles	6 - 12 years
Equipment, heavy	15 - 30 years
Equipment, light	5 - 15 years
Sewer lines and drainage channels	20 - 80 years

Costs incurred for capital construction and acquisition are carried in construction in progress until disposition or completion of the related projects. The major components of construction in progress are sewer lines, wastewater treatment and stormwater facilities. Costs relating to projects not pursued are expensed, while costs relating to completed projects are capitalized as plant, lines and other facilities.

Capitalized Interest: Interest capitalized on projects funded from bond proceeds is recorded as the average cumulative expenditures multiplied by the weighted average borrowing rate.[4] Interest is not capitalized on project costs that are reimbursed by contributions of capital from government, property owners and developers.

Impairment of Capital Assets: In accordance with GASB Statement No. 42, *Accounting and Financial Reporting for Impairment of Capital Assets and for Insurance Recoveries*, management evaluates prominent events or changes in circumstances affecting capital assets to determine whether impairment of a capital asset has occurred. Such events or changes in circumstances that may be indicative of impairment include evidence of physical damage, enactment or approval of laws or regulations, other changes in environmental factors, technology changes or evidence of obsolescence, changes in the manor of duration of use of a capital asset, and construction stoppage. A capital asset is generally considered impaired if both (a) the decline in service utility of the capital asset is large in magnitude and (b) the event or change in circumstance is outside the normal life cycle of the capital asset. In fiscal 2019, MSD recognized an impairment loss of $3,209,647 which was the remaining book value of one of the four dryers that comprise the drum dryer asset at the Morris Forman Water Quality Treatment Center. The dryer is no longer in use.

[3] See Note 5 – Capital Assets – Plant, Lines, and Other Facilities
[4] See Note 6 – Capitalized Interest

The impairment loss was recognized as a component of depreciation expense. No impairment losses were recognized in fiscal 2018.

Bonds Payable: Bonds payable are recorded at the principal amount outstanding, net of any applicable premium or discount[5].

Bonds outstanding, which have been refunded and economically defeased, are not included in long-term debt. The related assets are not included in investments. Any loss on refunding, which is the difference between the reacquisition price and the net carrying amount of the old debt, is deferred outflow of resources and amortized as a component of interest expense over the shorter of either 1) the original life of the refunded debt or 2) the life of the refunding debt.

MSD enters into interest rate swap agreements to modify interest rates on outstanding debt. MSD records the net interest expenditures resulting from these agreements and amortizes gains/losses resulting from the termination of these agreements until the original termination date of the agreement. Derivative instruments are reported at fair value as deferred inflow of resources. Changes in fair value of derivative instruments are reported in non-operating revenue (expenses) on the Statement of Revenues, Expenses and Changes in Net Position.

Bond issue costs are capitalized and amortized over the life of the respective bond issue using the straight-line method, which approximates the effective interest method, pursuant to the election of regulatory operation under GASB 62, as they are deemed recoverable through future rates.

Original issue discounts and premiums on bonds are amortized as a component of interest expense using the straight-line method, which approximates the effective interest method, over the lives of the bonds to which they relate.

Compensated Absences: Vacation and personal pay benefits are accrued as accumulated and vested by MSD employees.

Allocation of Overhead: MSD allocates overhead costs to its core business processes: operations and maintenance; design, construction and acquisition of plant lines and other facilities; and subsidiary business enterprises.

Use of Estimates: The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make assumptions and estimates that affect the reported amounts of assets and liabilities and disclosure of contingent assets and 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.

Income Tax Status: MSD is exempt from federal income tax under the Internal Revenue Code as a political subdivision of the Commonwealth of Kentucky.

Adoption of New Accounting Pronouncements: Effective July 1, 2018, MSD adopted the following GASB pronouncements:

- Statement No. 83*: Certain Asset Retirement Obligations*
- Statement No. 88: *Certain Disclosures Related to Debt, Including Direct Borrowings and Direct Placements*

GASB Statement No. 83 does not have a material impact on MSD's financial reporting at this time.

Note 7 provides information about MSD's debt as required by GASB Statement No. 88.

[5] See Note 7 – Long-Term Debt

Recent Accounting Pronouncements: GASB has issued additional guidance that is not yet effective. MSD is currently reviewing the provisions of the following GASB Statements to determine the impact of implementation in future periods.

- Statement No. 84*: Fiduciary Activities (fiscal 2020)*
- Statement No. 87: *Leases (fiscal 2021)*
- Statement No. 89: *Accounting for Interest Cost Incurred Before The End of a Construction Period (fiscal 2020)*
- Statement No. 90: *Majority Equity Interests – An Amendment of GASB Statements No 14 and No. 61 (fiscal 2020)*
- Statement No. 91: *Conduit Debt Obligations (fiscal 2022)*

Reclassifications: Prior period financial statement amounts have been reclassified to conform to current period presentation. These reclassifications had no effect on the changes in net position or total net position.

NOTE 2 – CASH DEPOSITS AND INVESTMENTS

A reconciliation of cash, cash equivalents and investments as shown on the Comparative Statement of Net Position for MSD is as follows:

(dollars in thousands)	June 30, 2019	June 30, 2018
Reported in Statements of Net Position:		
Cash and cash equivalents		
Unrestricted	$ 43,728	$ 50,276
Restricted - current	22,348	29,987
Restricted - noncurrent	737	1,399
Total cash and cash equivalents	66,813	81,662
Investments		
Unrestricted	36,744	25,080
Restricted - current	30,172	-
Restricted - noncurrent	75,941	151,039
Total investments	142,857	176,119
Total Cash, Cash Equivalents and Investments	$ 209,670	$ 257,781

The following comparative schedule presents the cash, cash equivalents and investments in MSD's portfolio at fair value with investment maturities and credit risk ratings from Moody's Investors Service.

June 30, 2019 *(dollars in thousands)*	Reported Value		Weighted Average Maturity in Years	Credit Rating
U.S. treasuries	$	19,550	1.22	Aaa
U.S. agency securities		78,402	1.25	Aaa
Municipal bonds		44,805	13.47	Aa
Money market funds		27,688	0.08	Aaa
Repurchase agreement/cash		39,125		
Certificate of Deposit		100	0.00	
Total cash, cash equivalents and investments	$	209,670	4.27	
Accrued interest	$	957		

June 30, 2018 *(dollars in thousands)*	Reported Value		Weighted Average Maturity in Years	Credit Rating
U.S. treasuries	$	41,898	2.44	Aaa
U.S. agency securities		47,315	2.52	Aaa
Municipal bonds		61,826	16.12	Aa
Money market funds		34,303	0.03	Aaa
Commercial paper		49,908	0.14	Prime-1
Repurchase agreement/cash		22,431		
Certificate of Deposit		100	0.67	
Total cash, cash equivalents and investments	$	257,781	5.24	
Accrued interest	$	1,116		

Section 66.480 of the Kentucky Revised Statutes and MSD's bond resolutions authorize MSD to invest money subject to its control in, among other securities, (i) obligations of the United States and of its agencies and instrumentalities, including obligations subject to repurchase agreements, (ii) certificates of deposit or other interest-bearing accounts of any bank or savings and loan institution which are insured by the Federal Deposit Insurance Corporation or, to the extent not so insured, collateralized by obligations described in clause (i) above, (iii) securities issued by a state or local government, or any instrumentality or agency thereof, in the United States, and rated in either of the two highest categories by a nationally recognized rating agency, and (iv) money market mutual funds investing in any of the securities described above. MSD bond resolutions and covenants contain similar restrictions.

Investments are made based upon prevailing market conditions at the time of the transaction with the intent to hold the instrument until maturity. With this strategy, investments would be expected to reach maturity with limited realized gains or losses. If the yield of the portfolio can be improved upon by the sale of an investment, prior to its maturity, with the reinvestment of the proceeds, then this provision is also allowed.

Concentration of Credit Risk: MSD's Investment Policy (The Policy) requires that investments be diversified to eliminate the risk of loss resulting from over-concentration of assets in a specific maturity, a specific issuer, or a specific class of securities. Section 4.4.1 of The Policy limits the amount of money invested at any time in one or more categories of the investments authorized by KRS 66.480 1e, 1f, 1g, and 1i shall not exceed 20% of the total amount invested.

Interest Rate Risk: MSD minimizes interest rate risk by structuring the investment portfolio so that securities mature to meet cash requirements for ongoing operations, thereby avoiding the need to sell securities on the open market prior to maturity. The weighted average maturity in years represents the interest rate risk for MSD.

Custodial Credit Risk: This is the risk that, in the event of the failure of the counterparty, MSD would not be able to recover the value of its investments or collateral securities that are in the possession of an outside party. The collateral provided by financial institutions is considered adequate to cover all balances in excess of limits set forth by the Federal Deposit Insurance Corporation. All of MSD's investments are held by MSD or in the name of MSD by a Trustee.

Foreign Currency Risk: This risk relates to any potential adverse effects on the fair value of an investment from changes in exchange rates. MSD did not hold any foreign currency as of June 30, 2019 and 2018.

Fair Value Measurement: GASB 72 requires MSD to disclose how we measure the fair value of investments and the underlying valuation techniques. Debt and equity securities classified in Level 1 of the fair value hierarchy are valued using prices quoted in active markets for these securities or repurchase agreements. Debt securities classified in Level 2 of the fair value hierarchy are valued using a matrix pricing approach. Matrix pricing is used to value securities based on the securities' relationship to the benchmark quoted prices. A comparative statement of investments subject to fair value measurements and valuation techniques follows:

June 30, 2019 *(dollars in thousands)*	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Total
Investments by fair value level:				
U.S. treasuries	$ -	$ 19,550	$ -	$ 19,550
U.S. agencies	-	78,402	-	78,402
State and municipal obligations	-	44,805	-	44,805
Total investments by fair value level	$ -	$ 142,757	$ -	$ 142,757

June 30, 2018 *(dollars in thousands)*	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Total
Investments by fair value level:				
Commercial paper	$ -	$ 49,908	$ -	$ 49,908
U.S. treasuries	-	41,898	-	41,898
U.S. agencies	-	47,315	-	47,315
State and municipal obligations	-	61,826	-	61,826
Total investments by fair value level	$ -	$ 200,947	$ -	$ 200,947

NOTE 3 - RESTRICTED CASH, CASH EQUIVALENTS, AND INVESTMENTS

MSD's revenue bond resolution provides that MSD shall maintain in a debt service reserve account a balance equal to the maximum annual aggregate gross principal and interest due on all outstanding revenue bonds which is $151,136,081; or, in lieu of cash and investments in that amount, a letter of credit or policy of bond insurance payable in that amount. On June 26, 2019 MSD purchased a Debt Service Reserve Surety Policy (The Reserve Policy) from Build America Mutual Assurance Company with a maximum policy limit of $75,000,000. The Reserve Policy terminates on May 15, 2048 which is the date of the last principal payment on MSD's outstanding revenue bonds. Draws under The Reserve Policy may only be used to make payments of principal and interest on the bonds. Cash and investments in the debt service reserve funds shall be transferred to the debt service funds for payment of debt service on the bonds before any draw may be made on The Reserve Policy. Cash and investments restricted for debt service reserve at June 30, 2019 totaled $76,678,594. Total assets restricted for debt service were $99,026,252 which includes the debt service reserve and other debt service trust accounts of $22,347,658. Cash and investments restricted for debt service reserve at June 30, 2018 totaled $152,437,753. Total assets restricted for debt service were $174,879,768 which includes the debt service reserve and other debt service trust accounts of $22,442,015.

Cash, cash equivalents and investments segregated in accounts restricted for authorized construction include proceeds from issuance of MSD bonds at June 30, 2019 and 2018 totaled $30,171,774 and $7,545,439, respectively. Total restricted cash, cash equivalents, and investments at June 30, 2019 and 2018 totaled $129,198,026 and $182,425,207, respectively.

NOTE 4 - SCHEDULE OF NET POSITION

A comparative schedule of net position follows:

(dollars in thousands)	June 30, 2019	June 30, 2018
Net investment in capital assets:		
Plant, lines and other facilities net of depreciation	$ 3,118,659	$ 2,925,982
Outstanding debt that applies to plant, lines and other facilities	(2,386,059)	(2,315,569)
Unspent bond proceeds - construction	30,172	7,545
Accounts payable and accrued expenses (capital)	(31,945)	(47,472)
Deferred outflows and inflows of resources	14,516	17,334
Total	745,343	587,820
Restricted for:		
Assets restricted for debt service	99,026	174,880
Liabilities associated with restricted debt service	(17,819)	(18,455)
	81,207	156,425
Assets restricted for construction	30,172	7,545
Unspent bond proceeds - construction	(30,172)	(7,545)
	-	-
Net position, restricted	81,207	156,425
Unrestricted net position	(55,998)	(35,571)
Total net position	$ 770,552	$ 708,674

NOTE 5 - CAPITAL ASSETS - PLANT, LINES AND OTHER FACILITIES

A comparative schedule of plant, lines and other facilities follows:

June 30, 2019 *(dollars in thousands)*	Beginning Balance	Transfers In/ Additions	Retirements / Reclassifications	Ending Balance
Capital assets:				
Sewer lines	$ 1,497,090	$ 151,801	$ -	$ 1,648,891
Wastewater treatment facilities/goodwill	648,503	20,538	-	669,041
Stormwater drainage facilities	561,341	255,787	-	817,128
Pumping and lift stations	183,795	57,168	-	240,963
Administrative facilities	50,818	916	-	51,734
Maintenance facilities	8,504	3,570	-	12,074
Machinery and equipment	66,321	21,637	(705)	87,253
Miscellaneous	31,086	540	-	31,626
Capitalized interest	385,296	18,582	-	403,878
Total capital assets	3,432,754	530,539	(705)	3,962,588
Less accumulated depreciation and amortization:				
Sewer lines	(337,980)	(18,638)	-	(356,618)
Wastewater treatment facilities/goodwill	(418,553)	(28,214)	-	(446,767)
Stormwater drainage facilities	(150,951)	(14,831)	-	(165,782)
Pumping and lift stations	(71,893)	(10,008)	-	(81,901)
Administrative facilities	(38,991)	(875)	-	(39,866)
Maintenance facilities	(6,563)	(183)	-	(6,746)
Machinery and equipment	(56,306)	(3,152)	392	(59,066)
Miscellaneous	(28,729)	(823)	-	(29,552)
Capitalized interest	(108,461)	(9,671)	-	(118,132)
Total accumulated depreciation/amortization	(1,218,427)	(86,395)	392	(1,304,430)
Construction in progress	711,655	177,984	(429,138)	460,501
Net capital assets	$ 2,925,982	$ 622,128	$ (429,451)	$ 3,118,659

Capital assets include non-depreciable assets for land related to the facilities and pumping and lift stations. The carrying value was $16,577,077 and $16,337,982 at June 30, 2019 and 2018 respectively.

June 30, 2018 *(dollars in thousands)*	Beginning Balance	Transfers In/ Additions	Retirements / Reclassifications	Ending Balance
Capital assets:				
Sewer lines	$ 1,440,360	$ 5,785	$ 50,945	$ 1,497,090
Wastewater treatment facilities/goodwill	638,048	415	10,040	648,503
Stormwater drainage facilities	542,271	414	18,656	561,341
Pumping and lift stations	166,158	-	17,637	183,795
Administrative facilities	50,818	-	-	50,818
Maintenance facilities	8,504	-	-	8,504
Machinery and equipment	66,169	187	(35)	66,321
Miscellaneous	31,086	-	-	31,086
Capitalized interest	363,437	21,859	-	385,296
Total capital assets	3,306,851	28,660	97,243	3,432,754
Less accumulated depreciation and amortization:				
Sewer lines	(320,209)	(17,771)	-	(337,980)
Wastewater treatment facilities/goodwill	(393,566)	(24,987)	-	(418,553)
Stormwater drainage facilities	(140,542)	(10,409)	-	(150,951)
Pumping and lift stations	(63,073)	(8,820)	-	(71,893)
Administrative facilities	(37,407)	(1,584)	-	(38,991)
Maintenance facilities	(6,385)	(178)	-	(6,563)
Machinery and equipment	(58,589)	(1,993)	4,276	(56,306)
Miscellaneous	(26,936)	(1,793)	-	(28,729)
Capitalized interest	(99,329)	(9,132)	-	(108,461)
Total accumulated depreciation/amortization	(1,146,036)	(76,667)	4,276	(1,218,427)
Construction in progress	581,222	232,041	(101,608)	711,655
Net capital assets	$ 2,742,037	$ 184,034	$ (89)	$ 2,925,982

NOTE 6 - CAPITALIZED INTEREST

A comparative schedule of capitalized interest and net interest expense reported in non-operating expenses follows:

(dollars in thousands)	June 30, 2019	June 30, 2018
Interest incurred	$ 103,270	$ 100,587
Less interest capitalization	(18,582)	(21,859)
Interest expense, net	$ 84,688	$ 78,728

NOTE 7 - LONG-TERM DEBT

Revenue Bonds: MSD long-term revenue bonds are publicly issued to provide sufficient funding for sewer and drainage projects approved for construction. MSD has pledged all revenues to the payment of principal and interest on its outstanding revenue bonds.

Federal tax regulations generally require the periodic payment to the U.S. Treasury of investment earnings on the proceeds of an issue of tax-exempt municipal bonds to the extent those earnings exceed the yield on the bonds. Such payments, known as arbitrage rebate, are normally payable every fifth year following the issuance of a Series of bonds and upon the retirement of the bond issue. MSD has arbitrage calculations performed as needed by an independent third party to comply with these regulations. As of June 30, 2019 and 2018, MSD's accrued liability for arbitrage rebate was $483,905 and $369,019, respectively.

Fiscal Year 2019 Significant Debt Transactions: There were no revenue bond transactions in Fiscal Year 2019.

Fiscal Year 2018 Significant Debt Transactions: On May 31, 2018, MSD issued $60,380,000 of revenue refunding bonds, Series 2018A. The proceeds of the Series 2018A bonds, together with certain amounts in the reserve account, were used to: (i) currently refund $63,335,000 of outstanding principal amount on MSD's sewer and drainage system revenue bonds, Series 2007A, maturing May 15, 2037 through May 15, 2038, the proceeds of which were used to finance the costs of improvements to MSD's sewer and drainage system, and (ii) pay the cost of issuance of the Series 2018A bonds. The refunding reduced debt service payments over the next 20 years by $8,452,933 and resulted in a net present value savings of $4,514,627.

On August 22, 2017, MSD issued $175,000,000 of revenue bonds, Series 2017A. The proceeds of the Series 2017A bonds were used to: (i) pay the costs of issuing the Series 2017A bonds; (ii) make a deposit to the reserve account; and (iii) make a deposit to the construction and acquisition fund to pay the costs of improvements to MSD's sewer and drainage system.

On August 22, 2017, MSD issued $35,725,000 of revenue refunding bonds, Series 2017B. The proceeds of the Series 2017B bonds, together with certain amounts in the reserve account, were used to: (i) currently refund $42,965,000 of outstanding principal amount on MSD's sewer and drainage system revenue bonds, Series 2007A, maturing May 15, 2018 through May 15, 2025, the proceeds of which were used to finance the costs of improvements to MSD's sewer and drainage system, and (ii) pay the cost of issuance of the Series 2017B bonds. The refunding reduced debt service payments over the next 8 years by $9,570,028 and resulted in a net present value savings of $7,860,700.

Debt Service Covenant: A debt service coverage ratio covenant has been established under the 1993 Sewer and Drainage System Revenue Master Bond Resolution. MSD was in compliance with the ratio covenant as of June 30, 2019 and 2018.

MSD's Sewer and Drainage Revenue Bond Resolution adopted December 7, 1992 specifies that upon the occurrence of any event of default a Judge in the Circuit Court of Jefferson County can appoint a trustee to represent all Bondholders and the trustee may declare all bonds due and payable. MSD has remedies available under the Resolution to cure the event of default even after all bonds are declared due and payable.

Refunded Debt: The portion of the 2009B Series revenue bonds that were advance refunded with the 2016C Series revenue bonds are being paid from an escrow account. As of June 30, 2019, the amount outstanding on the Series 2009B is $50,665,000 maturing on November 15, 2019.

A comparative schedule of bonds payable at June 30, 2019 and 2018 follows:

(dollars in thousands)			Final		
	Original		Payment	Outstanding as of June 30:	
Revenue Bonds	Issue Amount	Interest Rates	In	2019	2018
2009A Series Revenue Bonds	76,275	5.00%	2022	-	6,640
2009B Series Revenue Bonds	225,770	2.00% - 5.00%	2023	35,155	52,975
2009C Series Revenue Bonds	180,000	5.98%	2040	180,000	180,000
2010A Series Revenue Bonds	330,000	6.25%	2043	330,000	330,000
2011A Series Revenue Bonds	263,360	3.00% - 5.00%	2034	248,440	250,565
2013A Series Revenue Bonds	115,790	4.00%	2036	115,790	115,790
2013B Series Revenue Bonds	119,515	4.00% - 5.00%	2038	114,100	115,550
2013C Series Revenue Bonds	100,000	3.00% - 5.00%	2044	99,375	99,500
2014A Series Revenue Bonds	80,000	4.00% - 5.00%	2045	79,800	79,850
2015A Series Revenue Bonds	175,000	3.125% - 5.00%	2046	173,360	173,735
2015B Series Revenue Bonds	81,750	2.65% - 5.00%	2038	74,160	76,685
2016A Series Revenue Bonds	150,000	3.00% - 5.00%	2047	149,530	149,760
2016B Series Revenue Bonds	28,315	2.00% - 5.00%	2036	25,825	28,095
2016C Series Revenue Bonds	67,685	5.00%	2023	67,685	67,685
2017A Series Revenue Bonds	175,000	3.00% - 5.00%	2048	169,270	175,000
2017B Series Revenue Bonds	35,725	5.00%	2025	33,670	34,520
2018A Series Revenue Bonds	60,380	4.00%	2038	60,380	60,380
Total bonds payable				1,956,540	1,996,730
Less: current maturities				(42,200)	(40,190)
Add : unamortized premium/discount				80,421	90,628
Total bonds payable, net				$ 1,994,761	$ 2,047,168

A schedule of future revenue bond debt service requirements after June 30, 2019 follows:

(dollars in thousands)	Revenue Bonds		
	Principal	Interest	Total
Year Ending June 30,			
2020	$ 42,200	$ 93,058	$ 135,258
2021	44,230	91,030	135,260
2022	46,435	88,821	135,256
2023	48,755	86,503	135,258
2024	46,740	84,067	130,807
2025-2029	276,530	383,085	659,615
2030-2034	207,245	327,158	534,403
2035-2039	493,830	257,486	751,316
2040-2044	538,640	121,625	660,265
2045-2049	211,935	16,867	228,802
	$ 1,956,540	$ 1,549,700	$ 3,506,240

A comparative summary of current and long-term revenue bond activity follows:

(dollars in thousands)	June 30,	
	2019	2018
Revenue bonds - beginning of year, net	$ 1,996,730	$ 1,865,260
Bonds issued	-	271,105
Principal paid on bonds and bond refunding	(40,190)	(139,635)
Revenue bonds - end of year, net	$ 1,956,540	$ 1,996,730

Commercial Paper Program: On July 10, 2018 MSD introduced its Sewer and Drainage System Subordinated Program Notes Series 2018 Commercial Paper sub-Series consisting of $250,000,000 Commercial Paper Notes, Series 2018A-1 and $250,000,000 Commercial Paper Notes Series 2018A-2. The commercial paper notes will be used for the purpose of (i) financing the cost of improvements or additions to the System and (ii) refinancing other Program Notes. Program Notes are issued as Senior Subordinated Debt of MSD, secured, on a parity with the Series 2018 Bond Anticipation Notes and any other outstanding or hereafter issued Senior Subordinated Debt of MSD, by a subordinate and junior lien on the Revenues of the System, subject to the prior and senior lien on such Revenues of all Bonds issued and outstanding under the Bond Resolution. Program Notes (both Commercial Paper Notes and Direct Purchase Notes) may be issued in an aggregate principal amount not to exceed $500,000,000 at any one time outstanding.

Commercial Paper Notes may be issued and sold, at public or private sale, as taxable or tax-exempt notes, maturing in 270 days or less (but in any event not later than July 1, 2021) as determined by MSD, and bearing interest at a rate or rates determined by MSD (not in excess of 12% per annum for taxable notes or 10% per annum for tax-exempt notes). Commercial Paper Notes are payable only from (i) proceeds of the sale of other Commercial Paper Notes issued under the Program Note Resolution and used to refund outstanding Commercial Paper Notes, (ii) the proceeds of Direct Purchase Notes or other loans from the Banks (as defined below) used to refund outstanding Commercial Paper Notes, and (iii) the proceeds of Bonds issued to pay outstanding Commercial Paper Notes.

Liquidity support for the Commercial Paper Series 2018A-1 is provided by Bank of America, N.A (BANA) pursuant to a 3-year Revolving Credit Agreement dated July 1, 2018. BANA has provided a commitment of $250,000,000 for the payment of the principal of and interest on the Commercial Paper Notes Series 2018A-1 which is the maximum amount available to be drawn under the BANA Revolving Credit Agreement. MSD and BANA entered into a Note Purchase Agreement dated July 1, 2018 providing for the purchase of Direct Purchase Notes by BANA up to the aggregate principal amount of $250,000,000. The BANA Revolving Credit Agreement and the BANA Note Purchase Agreement provided that the aggregate principal amount of Commercial Paper Notes Series 2018A-1 and the BANA Direct Purchase Notes shall not exceed $250,000,000. Merrill Lynch, Pierce, Fenner & Smith Inc. is acting as dealer for the Commercial Paper Notes Series 2018A-1.

Liquidity support for the Commercial Paper Series 2018A-2 is provided by JPMorgan Chase Bank (JPMCB) pursuant to a 3-year revolving credit agreement dated July 1, 2018. JPMCB has provided a commitment of $250,000,000 for the payment of the principal of and interest on the Commercial Paper Notes Series 2018A-1 which is the maximum amount available to be drawn under the JPMCB Revolving Credit Agreement. MSD and JPMCB entered into a Note Purchase Agreement dated July 1, 2018 providing for the purchase of Direct Purchase Notes by JPMCB up to the aggregate principal amount of $250,000,000. The JPMCB Revolving Credit Agreement and the JPMCB Note Purchase Agreement provided that the aggregate principal amount of Commercial Paper Notes Series 2018A-1 and the JPMCB Direct Purchase Notes shall not exceed $250,000,000. J.P. Morgan Securities is acting as dealer for the Commercial Paper Notes Series 2018A-2.

The issuance of commercial paper is further supported by an Issuing and Paying Agency Agreement with U.S. Bank National Association.

Upon the occurrence of any special event of default the commitment shall immediately terminate with respect to all Commercial Paper Notes and the bank shall have no obligation to make any loan or to fund any outstanding Commercial Paper Note.

Upon the occurrence of an event of default that is not a special event of default, the bank may, by notice to MSD, terminate the commitment, if any (except as provided below), deliver a notice of no-issuance to MSD and to the Issuing and Paying Agent directing the Issuing and Paying Agent to cease issuing all Commercial Paper Notes. The available commitment shall immediately be reduced to the then outstanding principal amount of Commercial Paper Notes plus the amount of interest to accrue on such notes and the available commitment shall be further reduced in a similar manner when such Commercial Paper Notes mature provided the commitment does not terminate, and the right of the bank to accelerate the maturity of the note and the loans shall not effect the obligation of the bank to make loans in aggregate principal amount equal to the commitment to the extent necessary for MSD to make required payment s of principal on the Commercial Paper Notes issued and sold prior to the date upon which the notice of no-issuance is received by the Issuing and Paying Agent; provided further that if any loans are made that would not have been made but for the application of the preceding provision, such loans shall be immediately due and payable on the date such loans are made.

Moody's Investors Service, Inc. and Standard and Poor's Ratings Services assigned ratings of P-1 and A-1+, respectively, to the Commercial Paper Notes on June 29, 2018.

Commercial paper notes of $120,000,000 were outstanding as of June 30, 2019 in accordance with the respective Revolving Credit Agreements. Interest rates on the notes outstanding range from 1.43% to 1.75% and maturities range from 1 to 80 days. The outstanding notes had an average rate of 1.62% and an average maturity of 31 days. MSD intends to reissue maturing commercial paper in accordance with the refinancing terms of the Revolving Credit Agreements and periodically refund such maturities with proceeds from the issuance of long-term revenue bonds. Consistent with this intent, and since MSD has the available $500,000,000 credit facility described above, MSD has classified all outstanding commercial paper notes as long-term debt.

A direct purchase note of $100,000 is outstanding as of June 30, 2019 in accordance with the terms of the JPMCB Note Purchase Agreement. This note has a maturity of June 30, 2020 and carries an interest rate of 2.67%.

Kentucky Infrastructure Authority State Revolving Fund (SRF) Loans: On May 31, 2019, MSD acquired the Crestwood Wastewater Collection system pursuant to the terms and conditions of an Interlocal Agreement dated April 9, 2019. The Wastewater Collection System, which consists of existing wastewater pumping stations, collector, trunk, and interceptor sewers and pipes, mains, laterals, manholes, and other facilities was acquired for a price of $2,157,807 on an "as is," "where-is" basis. The acquisition did not include any stormwater or drainage assets or facilities.

The purchase price was paid, in part, by MSD's assumption of a between Crestwood and the Kentucky Infrastructure Authority in the amount $1,103,340 and payment in full by MSD of the balance of the loan between Crestwood and PNC Bank in the amount of $755,736. The purchase price was paid by MSD, but shall be borne by customers and users of the Wastewater Collection System through collection by MSD of rates, rentals and charges from such customers and users of the system.

MSD's SRF loans are considered direct placement debt and carry interest rates ranging between 3% and 3.8%. Under the Assistance Agreements entered into with the Kentucky Infrastructure Authority, upon the occurrence and continuance of any event of default the Authority may declare all payments due at a default rate of 8%. At June 30, 2019 and 2018 MSD had the following SRF direct placement debt outstanding:

(dollars in thousands)	June 30, 2019	June 30, 2018
SRF debt - beginning of year	$ 1,871	$ 1,972
Debt incurred	1,104	-
Principal paid on debt	(317)	(101)
SRF debt - end of year	$ 2,658	$ 1,871

Derivatives: At June 30, 2019 and 2018 MSD had the following derivative instruments outstanding:

(dollars in thousands)

Item	Counter-Party	Initial Notional Amount	Current Notional Amount	MSD Payment Terms	Fair Value as of June 30 2019	Fair Value as of June 30 2018	Bond Issue to which Swap Relates	Change in Fair Value
A	Wells Fargo	$180,716	$180,716	4.4215%	$ (58,428)	$ (47,545)	BAN	$ (10,883)
B	Bank of America	56,433	45,284	4.4215%	(14,612)	(11,898)	BAN	(2,714)
	Total	$237,149	$226,000		$ (73,040)	$ (59,443)		$ (13,597)

Both swaps have termination dates of May 15, 2033. Payments are due on the fifteenth of each month. MSD receipt terms are 67% of the 30-day London Inter-Bank Offered Rate (LIBOR).

A comparative summary of the change in fair value of the swaps for the years ended June 30, 2019 and 2018 follows:

(dollars in thousands)	June 30, 2019	June 30, 2018
Fair value - beginning of year	$ (59,443)	$ (75,760)
Change in fair value	(13,597)	16,317
Fair value - end of year	$ (73,040)	$ (59,443)

MSD's swaps are measured at fair value using significant other observable inputs (level 2) with a mid-market derivative valuation using a 67% of LIBOR Fixed Payer Swap rate.

MSD originally entered into these interest rate swaps as a hedging derivative instrument in anticipation of refinancing the 1999 Series bonds at their call date. The swaps remain in the portfolio to lower interest rate risk associated with the Bond Anticipation Note (BAN). The total of investment derivatives is reported as interest rate swaps on the Statement of Net Position. All changes in fair value of the derivatives are recorded as a separate component of non-operating revenue (expense). MSD's two outstanding swaps are structured so that the notional amount of the swap decreases over time corresponding to the proposed payoff of the BAN.

MSD has implemented steps to safeguard it against the risks associated with the aforementioned swap transactions. If the counter-party does not maintain A1/A+ ratings from Moody's and Standard and Poor's, the swaps contain provisions that require them to be marked to market weekly with monthly statements sent to MSD and the value will be collateralized with U.S. Treasury and Agency securities with the securities held by a tri-party custodian approved by MSD.

All costs of collateralization will be borne by the downgraded party who must post the collateral. In addition, the swaps were awarded to multiple firms to further mitigate the credit risk associated with the transactions. The credit ratings as of June 30th, 2019 for the counter-parties are as follows:

	Credit Ratings	
	Moody's	**Standard & Poor's**
Bank of America, N.A.	P-1	A-1
Wells Fargo Bank, N.A.	P-1	A-1+

The agreements also provide for automatic termination if MSD's unenhanced bond rating is downgraded below BBB/Baa. MSD's obligations under all of its outstanding swap agreements are unsecured and subordinate to all bonds issued and outstanding. The positive and negative fair values of the swap agreements were provided by a third-party financial advisor. The net swap payments made in fiscal 2019 and fiscal 2018 were $6,468,589 and $7,724,335, respectively.

Swap Terminations: MSD entered into swaps and other derivative contracts to lock in long term rates in advance of issuing long term debt to create and manage variable rate exposure in its debt portfolio and to take advantage of market opportunities to hedge embedded interest rate risk and tax regulation risk that exists on its statement of net position.

Upon a termination of a swap, any termination receipt or payment is amortized into income or expense until the original expiration date of that swap. Any unamortized portion of the receipt or payment is recorded as a deferred debit or credit in long-term liabilities. MSD has swap agreement terminations with deferred inflow of resources balances accreting to non-operating revenue as follows:

- On January 24, 2001, MSD terminated a nineteen-year interest rate swap agreement for $100,000,000 of its fixed-rate 1999 Series sewer and drainage revenue bonds. The termination of this swap agreement resulted in the receipt of a payment in the amount of $7,935,000. This payment will be amortized annually into income until 2019, the original termination date on the agreement.

- In April 2006, MSD entered into a swap agreement with Deutsche Bank AG for an initial notional amount of $171,405,000 which provided that beginning May 15, 2006, a net payment will be made based on MSD paying 78.78% of the 3-month LIBOR index on the notional amount and receiving 73.45% of the 5-year LIBOR Index on the notional amount. On January 23, 2008, MSD terminated this swap agreement and received a termination payment of $4,170,000 that will be amortized until 2023, the original termination date of the agreement.

- On January 25, 2008, MSD terminated a twenty-seven year floating to floating (basis) interest rate swap agreement with a notional amount of $282,165,000. MSD entered into this agreement with Morgan Stanley in April 2006 and paid 67% of the 1-month LIBOR index and received 62.2% of the 5-year LIBOR index. The termination of this swap agreement resulted in the receipt of a payment in the amount of $5,756,000. This payment will be amortized annually into income until 2033, the original termination date of the agreement.

- In May and June of 2013, MSD terminated two floating to fixed interest rate swap agreements, two basis swap agreements and three reversal swap agreements. Additionally, MSD partially terminated two floating to fixed interest rate swap agreements. The termination value of all swap agreements resulted in a net payment by MSD of $152,000. This action will result in a savings of $13,500,000 over the next ten years.

Line of Credit: MSD secured an uncommitted $25,000,000 line of credit in October 2015. As of June 30, 2019 and 2018 MSD does not owe anything on its line of credit. There was no activity on the line of credit in fiscal Year 2019 or 2018.

NOTE 8 – BOND ANTICIPATION NOTES

On November 9, 2018 MSD issued $226,340,000 of sewer and drainage system subordinated bond anticipation notes (BAN), Series 2018, with a coupon rate of 4.0% and an effective interest rate of 2.08%. The proceeds of the notes were used to refinance the 2017 notes. The 2018 notes mature on November 1, 2019.

On November 14, 2017 MSD issued $226,340,000 of sewer and drainage system subordinated bond anticipation notes (BAN), Series 2017, with a coupon rate of 5.0% and an effective interest rate of 1.04%. The proceeds of the notes were used to refinance the 2016 notes. The 2017 notes matured on November 12, 2018.

Under GASB 62, the BAN is considered a noncurrent liability because MSD intends to replace the Series 2018 BAN with a new BAN in November 2019 which will extend the debt to October 2020. BAN are publicly offered and used to finance capital projects. Total BAN outstanding at June 30, 2019 and June 30, 2018 was $226,340,000 and $226,340,000, respectively.

MSD's Subordinated Bond Resolution adopted April 26, 2010 specifies upon the occurrence and continuance of any event of default the paying agent shall, by notice delivered to MSD, declare the principal and interest of all notes immediately due and payable. MSD has remedies under the resolution to cure the event of default and annul the declaration of acceleration.

NOTE 9 - RISK MANAGEMENT

MSD is exposed to various risks of loss related to torts; theft of, damage to and destruction of assets; errors and omissions; natural disasters; and injuries to MSD's employees. These risks are provided through the insurance programs described below.

Self-Insurance – Group Liability: MSD participates in the Louisville Area Governmental Self-Insurance Trust (LAGIT). LAGIT, which is certified by the Kentucky Department of Insurance to practice as a group liability self-insurance trust, was created on January 1, 1987. LAGIT members currently include Louisville Metro Government, six smaller cities, and six government agencies. LAGIT was formed to provide better risk protection and lower cost liability insurance by sharing the risk with all of its members. MSD's payments to LAGIT are reflected on the financial statements as an expense. LAGIT provides, after a $300,000 deductible, various liability coverages up to $5,000,000 per occurrence. Excess insurance may provide an additional $2,000,000 of coverage, above the LAGIT $5,000,000, to MSD. The amount of coverage available to MSD could be limited by the total assets of LAGIT and/or claims of other Members under the excess insurance policy. For fiscal 2019, LAGIT did not make any MSD claim payments.

MSD maintained additional excess liability coverage for fiscal 2019. Scottsdale Insurance Company (A+) provided $5,000,000 of excess liability coverage beyond the $7,000,000 provided through LAGIT. Gemini Insurance Company (A+) provided another $15,000,000 of excess liability coverage beyond $12,000,000. In total, MSD maintained liability coverage of $27,000,000.

For fiscal 2018, LAGIT provided, after a $300,000 deductible, various liability coverages up to $5,000,000 per occurrence. Excess insurance provided an additional $2,000,000 of coverage, above the LAGIT $5,000,000 to MSD. The amount of coverage available to MSD was limited by the total assets of LAGIT and/or claims of other Members under the excess insurance policy. For fiscal 2018, LAGIT did not make any MSD claim payments.

MSD maintained additional excess liability coverage for fiscal 2018. Hallmark Specialty Insurance Company (A-) provided $5,000,000 of excess liability coverage beyond the $7,000,000 provided through LAGIT. Gemini Insurance Company (A+) provided another $15,000,000 of excess liability coverage beyond $12,000,000. In total, MSD maintained liability coverage of $27,000,000.

Workers Compensation Insurance: MSD has chosen to self-insure the basic worker's compensation insurance. Claims administration is handled by a third-party administrator and includes claims monitoring check issuance, settlement negotiations and loss control services. Liabilities are reported when it is probable that a loss has occurred and the amount of the loss can be reasonably estimated. A separate insurance policy provides maximum coverage of $1,000,000 per occurrence and aggregate.

A roll forward of worker's compensation claims follows:

(dollars in thousands)		June 30,	
	2019	2018	2017
Liability - beginning of year	$ 1,557	$ 1,701	$ 1,270
Claims and changes in estimates	1,945	755	1,207
Payments	(1,176)	(899)	(776)
Liability - end of year	$ 2,326	$ 1,557	$ 1,701

Self-Insurance – Property: MSD joined the Louisville Area Governmental General Insurance Trust (LAGGIT) in September 2002. LAGGIT was created to provide lower cost to participants and broader coverage for property risks. MSD is responsible for covered property damage up to $100,000 except for flood and vehicle collision coverage, which have separate deductibles. LAGGIT provides coverage for the next $1,000,000 per occurrence, except for Flood Zone A locations. An excess insurance policy with a third-party carrier covers claims in excess of $1,100,000.

MSD was affected by Ohio River flooding in February of 2018 and made a claim on the LAGGIT policy that is currently reserved at $5,300,000. To date, MSD has received $3,120,154 on this claim.

NOTE 10 - DEFERRED COMPENSATION

MSD offers its employees deferred compensation plans created in accordance with Internal Revenue Service Code Sections 401(k) and 457. These plans, available to all MSD employees, permit them to defer the payment of a portion of their salary until future years. Participation in these plans is voluntary and MSD makes no contributions to these plans on behalf of the employee. The deferred compensation is not available to employees until termination, retirement, death, or unforeseen emergency. All amounts of compensation deferred, including the investments and earnings thereon, vest with the employee and are not subject to the claims of MSD's general creditors.

NOTE 11 - COMMITMENTS AND CONTINGENCIES

Sale of Sewer Assessments*:* MSD has entered into agreements to sell sanitary sewer assessments to a local bank. These assessments reflect the portion of the cost that residents pay to have sewer lines installed in their neighborhood. Residents are given the opportunity to pay the assessment in full or to finance it over a twenty-year period at 7% interest per annum. The original agreement called for the bank to accept up to $25,000,000 of outstanding assessments and for MSD to receive 104% of the face value of the assessments.

The subsequent agreement allows an additional $5,000,000 of assessments to be sold to the bank at face value. These agreements give the bank the option to place the assessments back with MSD if the property owner's payments are 90 days in arrears or the property owner does not respond to the bank's demand for payment within a 90-day period after the issuance of the assessment. Sales to the bank are net of any subsequent repurchases of warrants by MSD. The unpaid principal balance of loans held by the bank at June 30, 2019 and 2018 was $717,057 and $964,127, respectively.

EPA Consent Decree: In August 2005, MSD agreed to enter into a Consent Decree with the Commonwealth of Kentucky's Environmental and Public Protection Cabinet (The Cabinet) and the U.S. Environmental Protection Agency (EPA). The Consent Decree called for MSD to submit a final Long-Term Control Plan (LTCP) to The Cabinet/EPA for review and joint approval by December 31, 2008, which was completed. The final LTCP includes schedules, deadlines, and timetables for projects to be completed by December 31, 2020. In addition, a Sanitary Sewer Discharge Plan (SSDP) was due by December 31, 2008, which was completed. The SSDP includes schedules and deadlines for capital projects to be completed by the end of 2024. Also, MSD agreed to pay a civil penalty to the Commonwealth of Kentucky in the amount of $1,000,000 to resolve the violations alleged in The Cabinet's and EPA's complaints up through the date of entry of the Consent Decree. The agreement also calls for MSD to perform supplemental environmental projects (SEPS) at an amount of not less than $2,250,000. MSD neither admitted nor denied the alleged violations but acknowledged that discharges occurred and accepted the obligations imposed in the Consent Decree. The Consent Decree, as negotiated, was entered by the U.S. District Court Judge on August 12, 2005.

In April 2009, MSD agreed to enter into an Amended Consent Decree with the Commonwealth of Kentucky's Environmental and Public Protection Cabinet (KEPPC) and the EPA. The agreement called for MSD to design and implement projects within specified deadlines that will eliminate sewer overflows in its service area. In a letter dated June 6, 2014, MSD requested approval from the KEPPC and the EPA for the IOAP 2012 Modifications, dated May 2014. The IOAP 2012 Modifications represent a revision to 28 separate projects set forth in the original IOAP, dated September 30, 2009. The IOAP Modifications were approved and will supersede and replace the 2009 IOAP. To date, MSD has complied with all submittals and reports requirements contained in the Amended Consent Decree. The enforcement actions initiated by the EPA are not unique in the wastewater treatment industry. Several wastewater utilities have signed, or are in the process of signing, Consent Decrees. In the opinion of MSD, the resolution of any violations will not result in material adverse effect on the operation, property or finances of MSD. The cost of the capital improvements required to be completed under the Amended Consent Decree is currently estimated to be $1,149,000,000 of which MSD has spent $882,707,577 as of June 30, 2019. MSD continues to diligently monitor costs and does not expect further significant cost increases.

Claims and Litigation: MSD is a defendant in various lawsuits. Although the outcome of these lawsuits is not presently determinable, it is the opinion of the MSD's management that resolution of these matters will not have a material adverse effect on the financial statements of MSD.

Construction Commitments: The value of construction contracts signed where work has not yet been performed amounted to $168,225,446 at June 30, 2019 and was $164,846,843 at June 30, 2018.

NOTE 12 - SUBSEQUENT EVENTS

Rate Increase: On August 1, 2019, MSD's rates for wastewater and stormwater service charges increased by 6.9%.

Series 2019: On August 19, 2019, MSD issued $30,910,000 of revenue refunding bonds, Series 2019. The proceeds of the Series 2019 bonds, together with certain amounts in the debt service account, were used to: (i) currently refund $35,155,000 of outstanding principal amount on MSD's sewer and drainage system revenue bonds, Series 2009B, maturing May 15, 2020 through May 15, 2023, the proceeds of which were used to pay, or to refund earlier Series of bond and notes issued to pay, the costs of improvements to MSD's sewer and drainage system, and (ii) pay the cost of issuance of the Series 2019 bonds. The refunding reduced debt service payments over the next 4 years by $5,107,297 and resulted in a net present value savings of $2,573,449.

2019 BAN Sale: On September 19, 2019, MSD sold $226,340,000 of sewer and drainage system subordinated bond anticipation notes (BAN), Series 2019, with a coupon rate of 3.0% and an effective interest rate of 1.37%. The proceeds of the notes will be used to refund the 2018 notes that mature on November 1, 2019. The 2019 notes closed on September 26, 2019 and mature on October 23, 2020.

Oldham County Environmental Authority Acquisition – On September 30, 2019, the MSD Board approved an Interlocal Agreement (ILA) between the County of Oldham, Kentucky, Oldham County Environmental Authority (OCEA) and MSD for wastewater collection and treatment services and authorized the Executive Director to negotiate a purchase and sale of the OCEA wastewater system. MSD would assume approximately $28,000,000 in outstanding debt and acquire approximately 6,200 customers under the terms of the ILA.

Commercial Paper Program: Commercial paper notes of $120,000,000 are outstanding as of October 31, 2019 in accordance with the respective Revolving Credit Agreements. Interest rates on the notes outstanding range from 1.20% to 1.49% and maturities range from 5 to 77 days. MSD intends to reissue maturing commercial paper in accordance with the refinancing terms of the Revolving Credit Agreements and periodically refund such maturities with proceeds from the issuance of long-term revenue bonds.

Hite Creek SRF Loan: MSD has received a conditional commitment from the Kentucky Infrastructure Authority and the Kentucky Energy and Environment Cabinet for a state revolving fund loan in an amount not to exceed $24,200,000 to finance the rehabilitation of aging infrastructure at the MSD's Hite Creek Water Quality Treatment Center. The capacity of the treatment center will be expanded so as to eliminate sanitary sewer overflows upstream of the treatment center and allow for future growth. MSD plans to execute an Assistance Agreement for this project with the Authority in fiscal year 2020. Interest will be payable semiannually at a fixed rate of 2% per annum commencing after funds are first drawn on the loan. The loan will be repaid over a period not to exceed 20 years from the date the project is placed in operation.

Nightingale SRF Loan: MSD has received a conditional commitment from the Kentucky Infrastructure Authority and the Kentucky Energy and Environment Cabinet for a state revolving fund loan in an amount not to exceed $3,870,000 to finance the Nightingale Inflow & Infiltration Elimination project. Elimination of inflow and infiltration creates a more efficient treatment system and reduces capacity needs downstream. MSD plans to execute an Assistance Agreement for this project with the Authority in fiscal year 2020. Interest will be payable semiannually at a fixed rate of 2% per annum commencing after funds are first drawn on the loan. The loan will be repaid over a period not to exceed 20 years from the date the project is placed in operation.

NOTE 13 - DEFINED BENEFIT PENSION AND OTHER POSTEMPLOYMENT BENEFITS PLAN – COST SHARING - CERS

General Information about the Pension and OPEB Plan: All full-time and eligible part-time employees of MSD participate in County Employee Retirement System (CERS), a cost-sharing, multiple-employer defined benefit pension plan administered by the Kentucky Retirement System (KRS), an agency of the Commonwealth. Under the provisions of Kentucky Revised Statute Section 78.520, the Board of Trustees (the Board) of KRS administers CERS, Kentucky Employee Retirement System, and State Police Retirement System. Although the assets of the systems are invested as a whole, each system's assets are used only for the payment of benefits to members of that plan, and a pro rata share of administrative costs.

The plan provides for retirement, disability and death benefits to plan members. Retirement benefits may also be extended to beneficiaries of plan members under certain circumstances. Under the provisions of Kentucky Revised Statute Section 61.701, the Board of KRS also administers the Kentucky Retirement Systems Insurance Fund. The statutes provide for a single insurance fund to provide group hospital and medical benefits to retirees drawing a benefit from the three pension funds administered by KRS. The assets of the insurance fund are invested as a whole. KRS and the Commonwealth have statutory authority to determine Plan benefits and employer contributions.

KRS issues a publicly available financial report that includes financial statements and required supplementary information for CERS. The report may be obtained by writing to Kentucky Retirement System, Perimeter Park West, 1260 Louisville Road, Frankfort, Kentucky 40601, or it may be found at the KRS website at www.kyret.ky.gov.

Basis of Accounting: For purposes of measuring the net pension and other post-employment benefits plan (OPEB) liabilities, deferred outflow of resources and deferred inflow of resources related to pensions and OPEB, pension and OPEB expense, information about the fiduciary net position of CERS and additions to/deductions from CERS's fiduciary net position have been determined on the same basis as they are reported by CERS. For this purpose, benefit payments (including refunds of employee contributions) are recognized when due and payable in accordance with the benefit terms. Investments are reported at fair value.

Pension Benefits Provided:

The information below summarizes the major retirement benefit provisions of CERS-Nonhazardous. It is not intended to be, nor should it be interpreted as, a complete statement of all benefit provisions.

Members whose participation began before 8/1/2004:

Age and Service Requirement: Age 65 with at least one month of Nonhazardous duty service credit, or at any age with 27 or more years of service credit.

Benefit: If a member has at least 48 months of service, the monthly benefit is 2.20% times final average compensation times years of service depending on participation and retirement dates. Final compensation is calculated by taking the average of the highest five (5) fiscal years of salary. If the number of months of service credit during the five (5) year period is less than forty-eight (48), one (1) or more additional fiscal years shall be used. If a member has less than 48 months of service, the monthly benefit is the actuarial equivalent of two times the member's contributions with interest.

Members whose participation began on or after 8/1/2004, but before 9/1/2008:

Age and Service Requirement: Age 65 with at least one month of Nonhazardous duty service credit, or at any age with 27 or more years of service credit.

Benefit: If a member has at least 48 months of service, the monthly benefit is 2.00% multiplied by final average compensation, multiplied by years of service. Final compensation is calculated by taking the average of the highest five (5) fiscal years of salary. If the number of months of service credit during the five (5) year period is less than forty-eight (48), one (1) or more additional fiscal years shall be used. If a member has less than 48 months of service, the monthly benefit is the actuarial equivalent of two times the member's contributions with interest.

Members whose participation began on or after 9/1/2008, but before 1/1/2014:

Age and Service Requirement: Age 65 with 60 months of Nonhazardous duty service credit, or age 57 if age plus service equals at least 87.

Benefit: The monthly benefit is the following benefit factor based on service credit at retirement plus 2.00% for each year of service greater than 30 years, multiplied by final average compensation, multiplied by years of service.

Service Credit	Benefit Factor
10 years or less	1.10%
10+ - 20 years	1.30%
20+ - 26 years	1.50%
26+ - 30 years	1.75%

Final compensation is calculated by taking the average of the last (not highest) five (5) complete fiscal years of salary. Each fiscal year used to determine final compensation must contain twelve (12) months of service credit.

Members whose participation began on or after 1/1/2014:

Age and Service Requirement: Age 65 with 60 months of Nonhazardous duty service credit, or age 57 if age plus service equals at least 87.

Benefit: Each year that a member is an active contributing member to the System, the member contributes 5% of creditable compensation, and the member's employer contributes 4.00% of creditable compensation, which is a portion of the total employer contribution, into a hypothetical account. The hypothetical account will earn interest annually on both the member's and employer's contribution at a minimum rate of 4%. If the System's geometric average net investment return for the previous five years exceeds 4%, then the hypothetical account will be credited with an additional amount of interest equal to 75% of the amount of the return which exceeds 4%. All interest credits will be applied to the hypothetical account balance on June 30 based on the account balance as of June 30 of the previous year. Upon retirement the hypothetical account which includes member contributions, employer contributions and interest credits can be withdrawn from the System as a lump sum or annuitized into a single life annuity option.

OPEB Benefits Provided:

The information below summarizes the major retirement benefit provisions of CERS-Nonhazardous. It is not intended to be, nor should it be interpreted as, a complete statement of all benefit provisions.

Insurance Tier 1: Participation began before 7/1/2003

Benefit Eligibility**:** Recipient of a retirement allowance

Benefit: The percentage of member premiums paid by the retirement system are dependent on the number of years of service. Benefits also include duty disability retirements, duty death in service, non-duty death in service and surviving spouse of a retiree.

Insurance Tier 2: Participation began on or after 7/1/2003, but before 9/1/2008

Benefit Eligibility: Recipient of a retirement allowance with at least 120 months of service at retirement

Benefit: The system provides a monthly contribution subsidy of $10 for each year of earned service. The monthly contribution is increased by 1.5% each July 1. Benefits also include duty disability retirements, duty death in service and non-duty death in service.

Insurance Tier 3: Participation began on or after 9/1/2008

Benefit Eligibility: Recipient of a retirement allowance with at least 180 months of service at retirement

Benefit: The system provides a monthly contribution subsidy of $10 for each year of earned service. The monthly contribution is increased by 1.5% each July 1. Benefits also include duty disability retirements, duty death in service and non-duty death in service.

Contributions*:* MSD was required to contribute at an actuarially determined rate determined by Statute. Per Kentucky Revised Statute Section 78.545(33) normal contribution and past service contribution rates shall be determined by the KRS Board on the basis of an annual valuation last preceding July 1 of a new biennium. The KRS Board may amend contribution rates as of the first day of July of the second year of a biennium, if it is determined on the basis of a subsequent actuarial valuation that amended contribution rates are necessary to satisfy requirements determined in accordance with actuarial bases adopted by the KRS Board.

For the fiscal years ended June 30, 2019 and 2018, participating employers contributed 21.48% (16.22% allocated to pension and 5.26% allocated to OPEB) and 19.18% (14.48% allocated to pension and 4.70% allocated to OPEB) as set by KRS, respectively, of each Nonhazardous employee's creditable compensation. These percentages are inclusive of both pension and insurance payments for employers. Administrative costs of KRS are financed through employer contributions and investments earnings.

MSD has met 100% of the contribution funding requirement for the fiscal years ended June 30, 2019 and 2018. Total current year contributions recognized by the Plan were $9,976,816 ($7,533,704 related to pension and $2,443,112 related to OPEB) and $8,207,009 ($6,195,907 related to pension and $2,011,102 related to OPEB) for the years ended June 30, 2019 and 2018, respectively. The OPEB contribution amounts do not include the implicit subsidies reported in the amount of $491,549 and $392,546, respectively.

Members whose participation began before 9/1/2008:

Nonhazardous member contributions equal 5% of all creditable compensation. Interest paid on the members' accounts is currently 2.5%; and per statute shall not be less than 2.0%. Members are entitled to a full refund of contributions with interest.

Members whose participation began on or after 9/1/2008, but before 1/1/2014:
Nonhazardous member contributions equal to 6% of all creditable compensation, with 5% being credited to the member's account and 1% deposited to the KRS 401(h) Account. Interest paid on the members' accounts will be set at 2.5%. Members are entitled to a full refund of contributions and interest in their individual account, however, the 1% contributed to the insurance fund is non-refundable.

Members whose participation began on or after 1/1/2014

Nonhazardous member contributions equal to 6% of all creditable compensation, with 5% being credited to the member's account and 1% deposited to the KRS 401(h) Account. Members are entitled to a full refund of contributions and interest on the member's portion of the hypothetical account, however, the 1% contributed to the insurance fund is non-refundable.

<u>Pension Plan Information for June 30, 2019 Financial Statements:</u>

Total Pension Liability: The total pension liability was determined by an actuarial valuation as of June 30, 2017 with a roll forward to June 30, 2018. An expected total pension liability was determined at June 30, 2018 using standard roll forward techniques. The following actuarial assumptions were applied to all periods included in the measurement:

Price Inflation	2.30%
Salary increases	3.05%, average, including inflation
Investment rate of return	6.25%, net of pension plan investment expense, including inflation

The mortality table used for active members is RP-2000 Combined Mortality Table projected with Scale BB to 2013 (multiplied by 50% for males and 30% for females). For healthy retired members and beneficiaries, the mortality table used is the RP-2000 Combined Mortality Table projected with Scale BB to 2013 (set back 1 year for females). For disabled members, the RP-2000 Combined Disabled Mortality Table projected with Scale BB to 2013 (set back 4 years for males) is used for the period after disability retirement. There is some margin in the current mortality tables for possible future improvement in mortality rates and that margin will be reviewed again when the next experience investigation is conducted. The actuarial assumptions used in the June 30, 2017 valuation were based on the results of an actuarial experience study for the period July 1, 2008 – June 30, 2013.

Discount rate assumptions:

(a) Discount Rate: The discount rate used to measure the total pension liability was 6.25%.

(b) Projected Cash Flows: The projection of cash flows used to determine the discount rate assumed the local employers and plan members would contribute the statutorily determined contribution rate of projected compensation over the remaining 25-year amortization period of the unfunded actuarial accrued liability. The actuarial determined contribution rate is adjusted to reflect the phase-in of anticipated gains on actuarial value of assets over the first four years of the projection period.

(c) Long-Term Rate of Return: The long-term expected return on plan assets is reviewed as part of the regular experience studies prepared every five years for the System. The most recent analysis, performed for the period covering fiscal years 2008 through 2013 is outlined in a report dated April 30, 2014. However, the Board of KRS has the authority to review the assumptions on a more frequent basis and adopt new assumptions prior to the next scheduled experience study. The long-term expected rate of return was determined by using a building-block method in which best-estimate ranges of expected future real rate of returns are developed for each asset class. The ranges are combined by weighting the expected future real rate of return by the target asset allocation percentage.

(d) Municipal Bond Rate: The discount rate determination does not use a municipal bond rate.

(e) Periods of Projected Benefit Payments: The long-term assumed rate of return was applied to all periods of projected benefit payments to determine the total pension liability.

(f) Assumed Asset Allocation: The target asset allocation and best estimates of arithmetic real rates of return for each major asset class are summarized in the following table:

Asset Class	Target Allocation	Long Term Expected Real Rate of Return
US equity	**17.50%**	
US Large Cap	5.00%	4.50%
US Mid Cap	6.00%	4.50%
US Small Cap	6.50%	5.50%
Non US Equity	**17.50%**	
International Developed	12.50%	6.50%
Emerging Markets	5.00%	7.25%
Global Bonds	4.00%	3.00%
Credit Fixed	**24.00%**	
Global IG Credit	2.00%	3.75%
High Yield	7.00%	5.50%
EMD	5.00%	6.00%
Illiquid Private	10.00%	8.50%
Private equity	10.00%	6.50%
Real Estate	5.00%	9.00%
Absolute Return	10.00%	5.00%
Real Return	10.00%	7.00%
Cash	2.00%	1.50%
Total	**100.00%**	

The long-term expected rate of return on pension plan assets was established by the KRS Board of Trustees at 6.25% based on a blending of the factors described above.

(g) Sensitivity Analysis: This paragraph requires disclosure of the sensitivity of the net pension liability to changes in the discount rate. The following presents MSD's allocated portion of the net pension liability of the System, calculated using the discount rate of 6.25%, as well as what MSD's allocated portion of the net pension liability would be if it were calculated using a discount rate that is 1 percentage-point lower (5.25%) or 1 percentage-point higher (7.25%) than the current rate:

(dollars in thousands)	1% Decrease (5.25%)	Current Discount Rate (6.25%)	1% Increase (7.25%)
MSD's net pension liability	$ 131,569	$ 104,511	$ 81,842

Employer's Portion of the Collective Net Pension Liability: MSD's proportionate share of the net pension liability, as indicated in the prior table, is $104,511,092 or approximately 1.7%. The net pension liability was distributed based on 2018 actual employer contributions to the plan.

Measurement Date: June 30, 2017 is the actuarial valuation date and June 30, 2018 is the measurement date upon which the total pension liability is based.

Changes in Assumptions and Benefit Terms: Since the prior measurement date, the demographic and economic assumptions that affect the measurement of the total pension liability have not changed except during the 2018 legislative session, House Bill 185 was enacted, which updated the benefit provisions for active members who die in the line of duty. Benefits paid to the spouses of deceased members have been increased from 25% of the member's final rate of pay to 75% of the member's average pay. If the member does not have a surviving spouse, benefits paid to surviving dependent children have been increased from 10% of the member's final pay rate to 50% of average pay for one child, 65% of average pay for two children, or 75% of average pay for three children. The total pension liability as of June 30, 2018 was determined using these updated benefit provisions.

Changes Since Measurement Date: There were no changes between the measurement date of the collective net pension liability and the employer's reporting date.

Pension Expense: MSD was allocated pension expense of $18,467,215 related to the CERS for the year ending June 30, 2019.

Deferred Outflows and Deferred Inflows: Since certain expense items are amortized over closed periods each year, the deferred portions of these items must be tracked annually. If the amounts serve to reduce pension expense, they are labeled as deferred inflows. If they will increase pension expense, they are labeled deferred outflows. The amortization of these amounts is accomplished on a level dollar basis, with no interest included in the deferred amounts. Experience gains/losses and the impact of changes in actuarial assumptions, if any, are amortized over the average remaining service life of the active and inactive System members at the beginning of the fiscal year. Investment gains and losses are amortized over a fixed five-year period. Deferred inflows and outflows as of the Measurement Date include:

(dollars in thousands)	Deferred Outflow of Resources	Deferred Inflow of Resources
Difference between expected and actual experience	$ 3,409	$ 1,530
Change of assumptions	10,214	-
Changes in proportion and differences between employer contributions and proportionate shares of contributions	5,774	415
Differences between expected and actual investment earning on plan investments	-	1,253
	19,397	3,198
Contributions subsequent to the measurement date	7,534	-
Total	$ 26,931	$ 3,198

Deferred outflows of resources resulting from employer contributions subsequent to the measurement date of $7,533,704 will be recognized as a reduction of net pension liability in the year ending June 30, 2020. The remainder of the deferred outflows and deferred inflows of resources are amortized over three to five years with remaining amortization as follows:

(dollars in thousands)	
Year Ending June 30:	
2020	$ 10,791
2021	6,418
2022	(449)
2023	(561)
	$ 16,199

Pension Plan Fiduciary Net Position: Detailed information about the pension plans' fiduciary net position is available in the separately issued pension plan financial reports.

OPEB Information for June 30, 2019 Financial Statements:

Total OPEB Liability: The total other post-employment benefits plan (OPEB) was determined by an actuarial valuation as of June 30, 2017 rolled forward to 2018, using the following actuarial assumptions, applied to all periods included in the measurement:

Price inflation	2.30%
Payroll growth rate	2.00%
Salary increases	3.05%, average
Investment rate of return	6.25%
Healthcare trend rates	
Pre-65	Initial trend starting at 7.00% at January 1, 2020 and gradually decreasing to an ultimate trend rate of 4.05% over a period of 12 years.
Post-65	Initial trend starting at 5.00% at January 1, 2020 and gradually decreasing to an ultimate trend rate of 4.05% over a period of 10 years.

The mortality table used for active members is RP-2000 Combined Mortality Table projected with Scale BB to 2013 (multiplied by 50% for males and 30% for females). For healthy retired members and beneficiaries, the mortality table used is the RP-2000 Combined Mortality Table projected with Scale BB to 2013 (set back 1 year for females). For disabled members, the RP-2000 Combined Disabled Mortality Table projected with Scale BB to 2013 (set back 4 years for males) is used for the period after disability retirement. There is some margin in the current mortality tables for possible future improvement in mortality rates and that margin will be reviewed again when the next experience investigation is conducted. The actuarial assumptions used in the June 30, 2017 valuation were based on the results of an actuarial experience study for the period July 1, 2008 – June 30, 2013.

Discount rate assumptions:

(a) Discount Rate: The discount rate used to measure the total OPEB liability was 5.85%, which was increased from the 5.84% discount rate used in the prior year.

(b) Projected Cash Flows: The projection of cash flows used to determine the discount rate assumed the local employers and plan members would contribute the actuarially determined contribution rate of projected compensation over the remaining 25-year amortization period of the unfunded actuarial accrued liability.

(c) Long-Term Rate of Return: The long-term expected return on plan assets is reviewed as part of the regular experience studies prepared every five years for the System. The most recent analysis, performed for the period covering fiscal years 2008 through 2013 is outlined in a report dated April 30, 2014. However, the Board of KRS has the authority to review the assumptions on a more frequent basis and adopt new assumptions prior to the next scheduled experience study. The long-term expected rate of return was determined by using a building-block method in which best-estimate ranges of expected future real rate of returns are developed for each asset class. The ranges are combined by weighting the expected future real rate of return by the target asset allocation percentage.

(d) Municipal Bond Rate: The discount rate determination used a municipal bond rate of 3.62% as reported in Fidelity Index's "20 – Year Municipal GO AA Index" as of June 30, 2018.

(e) Period of Projected Benefit Payments: Current assets, future contributions, and investment earnings are projected to be sufficient to pay the projected benefit payments from the retirement system. However, the cost associated with the implicit employer subsidy is not currently being included in the calculation of the system's actuarial determined contributions, and it is the actuary's understanding that any cost associated with the implicit subsidy will not be paid out of the system's trust. Therefore, the municipal bond rate was applied to future expected benefit payments associated with the implicit subsidy.

(f) Assumed Asset Allocations: The target asset allocation and best estimates of arithmetic real rates of return for each major asset class are summarized in the following table:

Asset Class	Target Allocation	Long Term Expected Real Rate of Return
US equity	**17.50%**	
US Large Cap	5.00%	4.50%
US Mid Cap	6.00%	4.50%
US Small Cap	6.50%	5.50%
Non US Equity	**17.50%**	
International Developed	12.50%	6.50%
Emerging Markets	5.00%	7.25%
Global Bonds	4.00%	3.00%
Credit Fixed	**24.00%**	
Global IG Credit	2.00%	3.75%
High Yield	7.00%	5.50%
EMD	5.00%	6.00%
Illiquid Private	10.00%	8.50%
Private equity	10.00%	6.50%
Real Estate	5.00%	9.00%
Absolute Return	10.00%	5.00%
Real Return	10.00%	7.00%
Cash	2.00%	1.50%
Total	**100.00%**	

The long-term expected rate of return on pension plan assets was established by the KRS Board of Trustees at 6.25% based on a blending of the factors described above.

(g) Sensitivity Analysis: This paragraph requires disclosure of the sensitivity of the net OPEB liability to changes in the discount rate and changes in the healthcare cost trend rate.

The following presents MSD's allocated portion of the net OPEB liability of the System, calculated using the discount rate of 5.85%, as well as what the MSD's allocated portion of the System's net OPEB liability would be if it were calculated using a discount rate that is 1-percentage-point lower (4.85%) or 1-percentage-point higher (6.85%) than the current rate for Nonhazardous:

(dollars in thousands)	1% Decrease (4.85%)	Current Discount Rate (5.85%)	1% Increase (6.85%)
MSD's net OPEB liability	$ 39,576	$ 30,470	$ 22,714

The following presents the MSD's allocated portion of the net OPEB liability of the System, calculated using the healthcare cost trend rate of percent, as well as what the MSD's allocated portion of the System's net OPEB liability would be if it were calculated using a healthcare cost trend rate that is 1-percentage-point lower or 1-percentage-point higher than the current rate for Nonhazardous:

(dollars in thousands)	1% Decrease	Current Healthcare Cost Trend Rate	1% Increase
MSD's net OPEB liability	$ 22,685	$ 30,470	$ 39,646

Employer's Portion of the Collective OPEB Liability: MSD's proportionate share of the net OPEB liability, as indicated in the prior table, is $30,470,346 or approximately 1.7%. The net OPEB liability was distributed based on 2018 actual employer contributions to the plan.

Measurement Date: June 30, 2017 is the actuarial valuation date and June 30, 2018 is the measurement date upon which the total OPEB liability is based.

Changes in Assumptions and Benefit Terms: Since the prior measurement date, the demographic and economic assumptions that affect the measurement of the total OPEB liability have not changed except during the 2018 legislative session, House Bill 185 was enacted, which updated the benefit provisions for active members who die in the line of duty. The system shall now pay 100% of the insurance premium for spouses and children of all active members who die in the line of duty. The total OPEB liability as of June 30, 2018 was determined using these updated benefit provisions.

Changes Since Measurement Date: There were no changes between the measurement date of the collective net OPEB liability and the employer's reporting date.

OPEB Expense: MSD was allocated OPEB expense of $4,165,841 related to the CERS for the year ending June 30, 2019.

Deferred Outflows and Deferred Inflows: Since certain expense items are amortized over closed periods each year, the deferred portions of these items must be tracked annually. If the amounts serve to reduce OPEB expense they are labeled as deferred inflows. If they will increase OPEB expense they are labeled deferred outflows. The amortization of these amounts is accomplished on a level dollar basis, with no interest included in the deferred amounts. Experience gains/losses and the impact of changes in actuarial assumptions, if any, are amortized over the average remaining service life of the active and inactive System members at the beginning of the fiscal year. Investment gains and losses are amortized over a fixed five-year period. Deferred inflows and outflows as of the Measurement Date include:

(dollars in thousands)	Deferred Outflow of Resources	Deferred Inflow of Resources
Difference between expected and actual experience	$ -	$ 3,551
Change of assumptions	6,085	70
Changes in proportion and differences between employer contributions and proportionate shares of contributions	1,551	60
Differences between expected and actual investment earning on plan investments	-	2,099
	7,636	5,780
Contributions subsequent to the measurement date	2,935	-
Total	$ 10,571	$ 5,780

Deferred outflows of resources resulting from employer contributions subsequent to the measurement date of $2,934,661 which include the implicit subsidy reported of $491,549, will be recognized as a reduction of net OPEB liability in the year ending June 30, 2020. The remainder of the deferred outflows and deferred inflows of resources are amortized over three to five years with remaining amortization as follows:

(dollars in thousands)

Year Ending June 30:		
2020	$	387
2021		387
2022		387
2023		795
2024		13
Thereafter		(113)
	$	1,856

OPEB Plan Fiduciary Net Position: Detailed information about the OPEB plans' fiduciary net position is available in the separately issued OPEB plan financial reports.

Pension Plan Information for June 30, 2018 Financial Statements:

Total Pension Liability: The total pension liability was determined by an actuarial valuation as of June 30, 2017, using the following actuarial assumptions, applied to all periods included in the measurement:

Price Inflation	2.30%
Salary increases	3.05%, average, including inflation
Investment rate of return	6.25%, net of pension plan investment expense, including inflation

The mortality table used for active members is RP-2000 Combined Mortality Table projected with Scale BB to 2013 (multiplied by 50% for males and 30% for females). For healthy retired members and beneficiaries, the mortality table used is the RP-2000 Combined Mortality Table projected with Scale BB to 2013 (set back 1 year for females). For disabled members, the RP-2000 Combined Disabled Mortality Table projected with Scale BB to 2013 (set back 4 years for males) is used for the period after disability retirement. There is some margin in the current mortality tables for possible future improvement in mortality rates and that margin will be reviewed again when the next experience investigation is conducted. The actuarial assumptions used in the June 30, 2017 valuation were based on the results of an actuarial experience study for the period July 1, 2008 – June 30, 2013.

Discount rate assumptions:

(a) Discount Rate: The discount rate used to measure the total pension liability was 6.25%, which was reduced from the 7.50% discount rate used in the prior year.

(b) Projected Cash Flows: The projection of cash flows used to determine the discount rate assumed the local employers and plan members would contribute the statutorily determined contribution rate of projected compensation over the remaining 26-year amortization period of the unfunded actuarial accrued liability. The actuarial determined contribution rate is adjusted to reflect the phase-in of anticipated gains on actuarial value of assets over the first four years of the projection period.

(c) Long-Term Rate of Return: The long-term expected return on plan assets is reviewed as part of the regular experience studies prepared every five years for the System. The most recent analysis, performed for the period covering fiscal years 2008 through 2013 is outlined in a report dated April 30, 2014. However, the Board of KRS has the authority to review the assumptions on a more frequent basis and adopt new assumptions prior to the next scheduled experience study. The long-term expected rate of return was determined by using a building-block method in which best-estimate ranges of expected future real rate of returns are developed for each asset class. The ranges are combined by weighting the expected future real rate of return by the target asset allocation percentage.

(d) Municipal Bond Rate: The discount rate determination does not use a municipal bond rate.

(e) Periods of Projected Benefit Payments: The long-term assumed rate of return was applied to all periods of projected benefit payments to determine the total pension liability.

(f) Assumed Asset Allocation: The target asset allocation and best estimates of arithmetic real rates of return for each major asset class are summarized in the following table:

Asset Class	Target Allocation	Long Term Expected Real Rate of Return
US equity	17.50%	5.97%
International equity	17.50%	7.85%
Global bonds	4.00%	2.63%
Global credit	2.00%	3.63%
High yield	7.00%	5.75%
Emerging market debt	5.00%	5.50%
Private credit	10.00%	8.75%
Real estate	5.00%	7.63%
Absolute return	10.00%	5.63%
Real return	10.00%	6.13%
Private equity	10.00%	8.25%
Cash	2.00%	1.88%
	100.00%	

The long-term expected rate of return on pension plan assets was established by the KRS Board of Trustees at 6.25% based on a blending of the factors described above.

(g) Sensitivity Analysis: This paragraph requires disclosure of the sensitivity of the net pension liability to changes in the discount rate. The following presents MSD's allocated portion of the net pension liability of the System, calculated using the discount rate of 6.25%, as well as what MSD's allocated portion of the net pension liability would be if it were calculated using a discount rate that is 1 percentage-point lower (5.25%) or 1 percentage-point higher (7.25%) than the current rate:

(dollars in thousands)	1% Decrease (5.25%)	Current Discount Rate (6.25%)	1% Increase (7.25%)
MSD's net pension liability	$ 117,945	$ 93,517	$ 73,083

Employer's Portion of the Collective Net Pension Liability: MSD's proportionate share of the net pension liability, as indicated in the prior table, is $93,516,713 or approximately 1.6%. The net pension liability was distributed based on 2017 actual employer contributions to the plan.

Measurement Date: June 30, 2017 is the actuarial valuation date and measurement date upon which the total pension liability is based.

Changes in Assumptions and Benefit Terms: Since the prior measurement date, the demographic and economic assumptions that affect the measurement of the total pension liability have been updated as follows:

- The assumed investment rate of return was decreased from 7.50% to 6.25%.
- The assumed rate of inflation was reduced from 3.25% to 2.30%.
- Payroll growth assumption was reduced from 4.00% to 3.05%.

Changes Since Measurement Date: There were no changes between the measurement date of the collective net pension liability and the employer's reporting date.
Pension Expense: MSD was allocated pension expense of $15,988,493 related to the CERS for the year ending June 30, 2018.

Deferred Outflows and Deferred Inflows: Since certain expense items are amortized over closed periods each year, the deferred portions of these items must be tracked annually. If the amounts serve to reduce pension expense they are labeled as deferred inflows. If they will increase pension expense they are labeled deferred outflows. The amortization of these amounts is accomplished on a level dollar basis, with no interest included in the deferred amounts. Experience gains/losses and the impact of changes in actuarial assumptions, if any, are amortized over the average remaining service life of the active and inactive System members at the beginning of the fiscal year. Investment gains and losses are amortized over a fixed five-year period. Deferred inflows and outflows as of the Measurement Date include:

(dollars in thousands)	Deferred Outflow of Resources	Deferred Inflow of Resources
Difference between expected and actual experience	$ 116	$ 2,374
Change of assumptions	17,256	-
Changes in proportion and differences between employer contributions and proportionate shares of contributions	2,816	1,458
Differences between expected and actual investment earning on plan investments	1,157	-
	21,345	3,832
Contributions subsequent to the measurement date	6,196	-
Total	$ 27,541	$ 3,832

Deferred outflows of resources resulting from employer contributions subsequent to the measurement date of $6,195,907 will be recognized as a reduction of net pension liability in the year ending June 30, 2019. The remainder of the deferred outflows and deferred inflows of resources are amortized over three to five years with remaining amortization as follows:

(dollars in thousands)	
Year Ending June 30:	
2019	$ 7,232
2020	7,782
2021	3,700
2022	(1,201)
	$ 17,513

Pension Plan Fiduciary Net Position: Detailed information about the pension plans' fiduciary net position is available in the separately issued pension plan financial reports.

OPEB Information for June 30, 2018 Financial Statements:

Total OPEB Liability: The total OPEB plan was determined by an actuarial valuation as of June 30, 2017, using the following actuarial assumptions, applied to all periods included in the measurement:

Price inflation	2.30%
Payroll growth rate	2.00%
Salary increases	3.05%, average
Investment rate of return	6.25%
Healthcare trend rates	
Pre-65	Initial trend starting at 7.25% at January 1, 2019 and gradually decreasing to an ultimate trend rate of 4.05% over a period of 13 years.
Post-65	Initial trend starting at 5.10% at January 1, 2019 and gradually decreasing to an ultimate trend rate of 4.05% over a period of 11 years.

The mortality table used for active members is RP-2000 Combined Mortality Table projected with Scale BB to 2013 (multiplied by 50% for males and 30% for females). For healthy retired members and beneficiaries, the mortality table used is the RP-2000 Combined Mortality Table projected with Scale BB to 2013 (set back 1 year for females). For disabled members, the RP-2000 Combined Disabled Mortality Table projected with Scale BB to 2013 (set back 4 years for males) is used for the period after disability retirement. There is some margin in the current mortality tables for possible future improvement in mortality rates and that margin will be reviewed again when the next experience investigation is conducted. The actuarial assumptions used in the June 30, 2017 valuation were based on the results of an actuarial experience study for the period July 1, 2008 – June 30, 2013.

Discount rate assumptions:

(h) Discount Rate: The discount rate used to measure the total OPEB liability was 5.84%, which was reduced from the 6.89% discount rate used in the prior year.

(i) Projected Cash Flows: The projection of cash flows used to determine the discount rate assumed the local employers and plan members would contribute the actuarially determined contribution rate of projected compensation over the remaining 26-year amortization period of the unfunded actuarial accrued liability.

(j) Long-Term Rate of Return: The long-term expected return on plan assets is reviewed as part of the regular experience studies prepared every five years for the System. The most recent analysis, performed for the period covering fiscal years 2008 through 2013 is outlined in a report dated April 30, 2014. However, the Board of KRS has the authority to review the assumptions on a more frequent basis and adopt new assumptions prior to the next scheduled experience study. The long-term expected rate of return was determined by using a building-block method in which best-estimate ranges of expected future real rate of returns are developed for each asset class. The ranges are combined by weighting the expected future real rate of return by the target asset allocation percentage.

(k) Municipal Bond Rate: The discount rate determination used a municipal bond rate of 3.56% as reported in Fidelity Index's "20 – Year Municipal GO AA Index" as of June 30, 2017.

(l) Period of Projected Benefit Payments: Current assets, future contributions, and investment earnings are projected to be sufficient to pay the projected benefit payments from the retirement system. However, the cost associated with the implicit employer subsidy is not currently being included in the calculation of the system's actuarial determined contributions, and it is the actuary's understanding that any cost associated with the implicit subsidy will not be paid out of the system's trust. Therefore, the municipal bond rate was applied to future expected benefit payments associated with the implicit subsidy.

(m) Assumed Asset Allocations: The target asset allocation and best estimates of arithmetic real rates of return for each major asset class are summarized in the following table:

Asset Class	Target Allocation	Long Term Expected Real Rate of Return
US equity	17.50%	5.97%
International equity	17.50%	7.85%
Global bonds	4.00%	2.63%
Global credit	2.00%	3.63%
High yield	7.00%	5.75%
Emerging market debt	5.00%	5.50%
Private credit	10.00%	8.75%
Real estate	5.00%	7.63%
Absolute return	10.00%	5.63%
Real return	10.00%	6.13%
Private equity	10.00%	8.25%
Cash	2.00%	1.88%
	100.00%	

The long-term expected rate of return on pension plan assets was established by the KRS Board of Trustees at 6.25% based on a blending of the factors described above.

(n) Sensitivity Analysis: This paragraph requires disclosure of the sensitivity of the net OPEB liability to changes in the discount rate and changes in the healthcare cost trend rate.

The following presents MSD's allocated portion of the net OPEB liability of the System, calculated using the discount rate of 5.84%, as well as what the MSD's allocated portion of the System's net OPEB liability would be if it were calculated using a discount rate that is 1-percentage-point lower (4.84%) or 1-percentage-point higher (6.84%) than the current rate for Nonhazardous:

(dollars in thousands)	1% Decrease (4.84%)	Current Discount Rate (5.84%)	1% Increase (6.84%)
MSD's net OPEB liability	$ 40,869	$ 32,119	$ 24,387

The following presents the MSD's allocated portion of the net OPEB liability of the System, calculated using the healthcare cost trend rate of percent, as well as what the MSD's allocated portion of the System's net OPEB liability would be if it were calculated using a healthcare cost trend rate that is 1-percentage-point lower or 1-percentage-point higher than the current rate for Nonhazardous:

(dollars in thousands)	1% Decrease	Current Healthcare Cost Trend Rate	1% Increase
MSD's net OPEB liability	$ 24,637	$ 32,119	$ 41,845

Employer's Portion of the Collective OPEB Liability: MSD's proportionate share of the net OPEB liability, as indicated in the prior table, is $32,118,692 or approximately 1.6%. The net OPEB liability was distributed based on 2017 actual employer contributions to the plan.
Measurement Date: June 30, 2017 is the actuarial valuation date and measurement date upon which the total pension liability is based.

Changes in Assumptions and Benefit Terms: Since the prior measurement date, the demographic and economic assumptions that affect the measurement of the total OPEB liability have been updated as follows:

- The assumed investment rate of return was decreased from 7.50% to 6.25%.
- The assumed rate of inflation was reduced from 3.25% to 2.30%.
- Payroll growth assumption was reduced from 4.00% to 3.05%.

Changes Since Measurement Date: There were no changes between the measurement date of the collective net OPEB liability and the employer's reporting date.

OPEB Expense: MSD was allocated OPEB expense of $3,660,044 related to the CERS for the year ending June 30, 2018.

Deferred Outflows and Deferred Inflows: Since certain expense items are amortized over closed periods each year, the deferred portions of these items must be tracked annually. If the amounts serve to reduce OPEB expense they are labeled as deferred inflows. If they will increase OPEB expense they are labeled deferred outflows. The amortization of these amounts is accomplished on a level dollar basis, with no interest included in the deferred amounts. Experience gains/losses and the impact of changes in actuarial assumptions, if any, are amortized over the average remaining service life of the active and inactive System members at the beginning of the fiscal year. Investment gains and losses are amortized over a fixed five-year period. Deferred inflows and outflows as of the Measurement Date include:

(dollars in thousands)	Deferred Outflow of Resources	Deferred Inflow of Resources
Difference between expected and actual experience	$ -	$ 89
Change of assumptions	6,989	-
Changes in proportion and differences between employer contributions and proportionate shares of contributions	-	75
Differences between expected and actual investment earning on plan investments	-	1,518
	6,989	1,682
Contributions subsequent to the measurement date	2,404	-
Total	$ 9,393	$ 1,682

Deferred outflows of resources resulting from employer contributions subsequent to the measurement date of $2,403,648 which include the implicit subsidy reported of $392,546, will be recognized as a reduction of net OPEB liability in the year ending June 30, 2019. The remainder of the deferred outflows and deferred inflows of resources are amortized over three to five years with remaining amortization as follows:

(dollars in thousands)	
Year Ending June 30:	
2019	$ 913
2020	913
2021	913
2022	913
2023	1,293
Thereafter	362
	$ 5,307

OPEB Plan Fiduciary Net Position: Detailed information about the OPEB plans' fiduciary net position is available in the separately issued OPEB plan financial reports.

Louisville and Jefferson County Metropolitan Sewer District
Schedule of Proportionate Share of the Net Pension Liability
For the Years Ended June 30,
(dollars in thousands)

	2019	2018	2017	2016	2015
MSD's proportion of the net pension liability	1.72%	1.60%	1.51%	1.60%	1.60%
MSD's proportionate share of the net pension liability	$104,511	$93,517	$74,132	$68,653	$51,988
MSD's covered payroll	45,859	43,084	39,596	37,900	37,100
MSD's proportion of the net pension liability as a percentage of its covered payroll	227.9%	217.1%	187.2%	181.1%	140.1%
Plan fiduciary net postion as a percentage of the total pension liability	53.54%	53.32%	55.50%	59.97%	66.80%

Notes:

1) The amounts presented for each fiscal year were determined as of the prior year end.
2) This schedule is presented to illustrate the requirement to show information for 10 years. However, until a full 10-year trend is compiled, governments should present information for those years that information is available.

Changes in Assumptions and Benefit Terms:

2015: Since the prior measurement date, the demographic and economic assumptions that affect the measurement of the total pension liability have been updated as described in Schedule D of the CERS actuary report. The changes are noted below:

- The assumed investment rate of return was decreased from 7.75% to 7.50%.
- The assumed rate of inflation was reduced from 3.50% to 3.25%.
- The assumed rate of wage inflation was reduced from 1.00% to 0.75%.
- Payroll growth assumption was reduced from 4.50% to 4.00%.
- The mortality table used for active members is RP-2000 Combined Mortality Table projected with Scale BB to 2013 (multiplied by 50% for males and 30% for females).
- For healthy retired members and beneficiaries, the mortality table used is the RP-2000 Combined Mortality Table projected with Scale BB to 2013 (set back 1 year for females). For disabled members, the RP-2000 Combined Disabled Mortality Table projected with Scale BB to 2013 (set back 4 years for males) is used for the period after disability retirement. There is some margin in the current mortality tables for possible future improvement in mortality rates and that margin will be reviewed again when the next experience investigation is conducted.
- The assumed rates of Retirement, withdrawal and disability were updated to more accurately reflect experience.

2016: There were no changes in assumptions and benefit terms since the prior measurement date.

2017: Since the prior measurement date, the demographic and economic assumptions that affect the measurement of the total pension liability have been updated as follows:

- The assumed investment rate of return was decreased from 7.50% to 6.25%.
- The assumed rate of inflation was reduced from 3.25% to 2.30%.
- Payroll growth assumption was reduced form 4.00% to 3.05%.

2018: Since the prior measurement date, there have been no changes in actuarial assumptions. However, during the 2018 legislative session, House Bill 185 was enacted, which updated the benefit provisions for active members who die in the line of duty. Benefits paid to the spouses of deceased members have been increased from 25% of the member's final rate of pay to 75% of the member's average pay. If the member does not have a surviving spouse, benefits paid to surviving dependent children have been increased from 10% of the member's final pay rate to 50% of average pay for one child, 65% of average pay for two children, or 75% of average pay for three children. The total pension liability as of June 30, 2018 was determined using these updated benefit provisions.

Louisville and Jefferson County Metropolitan Sewer District
Schedule of Employer Contributions - Pension
For the Years Ended June 30,
(dollars in thousands)

	2019	2018	2017	2016	2015
Statutorily required contribution for pension	$ 7,534	$ 6,196	$ 5,279	$ 4,767	$ 4,576
Contribution in relation to the statutorily required contribution	(7,534)	(6,196)	(5,279)	(4,767)	(4,576)
Annual contribution deficiency (excess)	$ -	$ -	$ -	$ -	$ -
MSD contributions as a percentage of statutorily required contribution for pension	100%	100%	100%	100%	100%
MSD covered payroll	$ 48,391	$45,859	$43,084	$39,596	$37,900
Contributions as a percentage of MSD's covered payroll	15.57%	13.51%	12.25%	12.04%	12.07%

Notes:

1) This schedule is presented to illustrate the requirement to show information for 10 years. However, until a full 10-year trend is compiled, governments should present information for those years that information is available.

Louisville and Jefferson County Metropolitan Sewer District
Schedule of Proportionate Share of the Net OPEB Liability
For the Years Ended June 30,
(dollars in thousands)

	2019	2018
MSD's proportion of the net OPEB liability	1.72%	1.60%
MSD's proportionate share of the net OPEB liability	$30,470	$32,119
MSD's covered payroll	45,859	43,084
MSD's proportion of the net OPEB liability as a percentage of its covered payroll	66.44%	74.55%
Plan fiduciary net position as a percentage of the total OPEB liability	57.62%	52.39%

Notes:

1) This schedule is presented to illustrate the requirement to show information for 10 years. However, until a full 10-year trend is compiled, governments should present information for those years that information is available.

Changes in Assumptions and Benefit Terms:

2017: Since the prior measurement date, the demographic and economic assumptions that affect the measurement of the total OPEB liability have been updated as follows:

- The assumed rate of return was decreased form 7.5% to 6.25%.
- The assumed rate of inflation was reduced from 3.25% to 2.3%.
- Payroll growth assumption was reduced from 4.0% to 3.05%.

2018: Since the prior measurement date, there have been no changes in actuarial assumptions. However, during the 2018 legislative session, House Bill 185 was enacted, which updated the benefit provisions for active members who die in the line of duty. The system shall now pay 100% of the insurance premium for spouses and children of all active members who die in the line of duty. The total OPEB liability as of June 30, 2018 was determined using these updated benefit provisions.

Louisville and Jefferson County Metropolitan Sewer District
Schedule of Employer Contributions - OPEB
For the Years Ended June 30,
(dollars in thousands)

	2019	2018
Statutorily required contribution	$ 2,443	$ 2,011
Contributions in relation to the statutorily required contribution	(2,443)	(2,011)
Annual contribution deficiency (excess)	$ -	$ -
MSD contributions as a percentage of statutorily required contribution for OPEB	100%	100%
MSD covered payroll	$48,391	$45,859
Contributions as a percentage of MSD's covered paryoll	5.05%	4.39%

Notes:

1) This schedule is presented to illustrate the requirement to show information for 10 years. However, until a full 10-year trend is compiled, governments should present information for those years that information is available.

Protecting our city's waterways is our mission. A significant portion of that mission is the collection and proper treatment of wastewater before we release it back into our local waterways. Cedar Creek Water Quality Treatment Center, shown above, is one of five MSD wastewater treatment facilities.

STATISTICAL SECTION

This section of the Louisville & Jefferson County Metropolitan Sewer District's (MSD) Comprehensive Annual Financial Report presents detailed information as a supplement to the information presented in the financial statements and note disclosures to assist readers in assessing MSD's overall financial health.

This schedule presents information to help readers assess MSD's debt burden and MSD's ability to issue additional debt in the future.

These schedules contain trend information to help readers understand how MSD's financial performance and position have changed over time. The information presented includes changes in net assets, an analysis of revenues and expenses and a comparative statement of cash flows

This schedule contains information to help readers assess MSD's most significant revenue sources.

These schedules contain service and infrastructure data to help the reader understand how the information in MSD's financial report relates to the services that it provides. The information provided includes service and administration costs, project schedules, and water treatment capacity.

These schedules offer demographic and economic indicators to help readers understand the environment within which MSD operates.

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT
COMPARATIVE SCHEDULE OF DEBT SERVICE COVERAGE
YEARS ENDED JUNE 30
DOLLARS IN THOUSANDS

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Revenues:										
Service charges	$ 289,173	$ 274,504	$ 253,943	$ 238,480	$ 225,462	$ 214,056	$ 205,222	$ 190,482	$ 183,297	$ 168,610
Other operating income	5,195	4,645	5,691	4,810	4,407	2,576	4,823	1,756	2,379	2,980
Assessments	1,258	1,232	1,375	9,457	1,901	2,129	2,392	2,405	2,740	7,093
Investment income	18,692	16,531	14,273	17,278	17,623	20,330	20,119	40,687	33,700	36,045
Less: capitalized investment income	-	-	-	-	-	-	(3,817)	(1,851)	(12,134)	(5,990)
Total revenues	314,318	296,912	275,282	270,025	249,393	239,091	228,739	233,479	209,982	208,738
Operating expenses:										
Service and administrative costs[1]	142,082	131,948	119,586	117,671	106,301	108,814	108,041	108,325	107,307	101,068
Less: capitalized overhead	(38,383)	(38,148)	(31,949)	(30,516)	(30,056)	(33,568)	(33,110)	(33,200)	(30,308)	(28,129)
Capitalization Rate	27%	29%	27%	26%	28%	31%	31%	31%	28%	28%
Total operating expenses	103,699	93,800	87,637	87,155	76,245	75,246	74,931	75,125	76,999	72,939
Net revenues	210,619	203,112	187,645	182,870	173,148	163,845	153,808	158,354	132,983	135,799
Aggregate debt service:										
Current maturities of long-term debt	40,358	33,906	33,655	31,825	29,415	28,525	27,035	25,740	24,840	23,785
Interest expense - senior lien	94,831	95,041	90,117	86,818	83,404	80,613	92,616	89,243	78,954	69,949
Less: capitalized interest expense	(18,582)	(21,859)	(20,074)	(21,051)	(20,511)	(19,103)	(26,358)	(26,384)	(25,195)	(13,910)
Aggregate net debt service	$ 116,607	$ 107,088	$ 103,698	$ 97,592	$ 92,308	$ 90,035	$ 93,293	$ 88,599	$ 78,599	$ 79,824
Debt service coverage ratio[2]	181%	190%	181%	187%	188%	182%	165%	179%	169%	170%

[1]Excludes the actuarial portion of changes to GASB 68 pension expense and GASB 75 OPEB for the year

[2]Excludes the actuarial portion of changes to GASB 68 pension expense and GASB 75 OPEB for the year

This table has been prepared using the definitions of revenue, expense and debt service contained in MSD's 1993 Sewer & Drainage System Revenue Bond Resolution.

The 1993 Resolution and its supplements require MSD to provide "Available Revenues", as defined in the Resolution, sufficient to pay 110% of each fiscal year's "Aggregate Net Debt Service" on Revenue Bonds and 100% of "Operating Expenses". "Available Revenues", as used only for purposes of the Resolution, means all revenues and other amounts received by MSD and pledged as security for payment of Bonds issued pursuant to the Resolution, but excludes any interest income which is capitalized in accordance with generally accepted accounting principles. "Operating Expenses" includes all reasonable, ordinary, usual or necessary current expenses of maintenance, repair and operation determined in accordance with generally accepted accounting principles and the enterprise basis of accounting. "Operating Expenses" does not include reserves for extraordinary maintenance and repair, nor does it include administrative and engineering expenses of MSD which are necessary or incidental to capital improvements for which debt has been issued and which may be paid from the proceeds of such debt. "Aggregate Net Debt Service" is aggregate current principal and interest requirements on all Bonds issued pursuant to the Resolution, excluding (i) interest expense, which in accordance with generally accepted accounting principles, is capitalized and which may be paid from the proceeds of debt, and (ii) other amounts, if any, available, or expected to become available in the ordinary course for payment of principal and interest, and not included in "Available Revenues".

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT
COMPARATIVE STATEMENT OF NET POSITION
ASSETS AND DEFERRED OUTFLOW OF RESOURCES
YEARS ENDED JUNE 30
DOLLARS IN THOUSANDS

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Current Assets:										
Unrestricted cash and cash equivalents	$ 43,728	$ 50,276	$ 42,449	$ 69,481	$ 63,013	$ 84,780	$ 66,376	$ 12,040	$ 34,508	$ 24,700
Unrestricted investments	36,744	25,080	10,095	100	100	100	100	100	100	100
Restricted cash and cash equivalents	22,348	29,987	19,454	5,379	16,342	39,507	62,249	227,327	112,559	58,923
Restricted investments	30,172	-	22,675	14,999	-	-	90,574	94,639	294,868	394,880
Accounts receivable	27,915	26,332	23,480	26,696	23,787	21,809	18,465	16,666	17,789	15,779
Inventories	4,623	4,407	4,184	4,210	3,981	3,808	3,579	3,484	3,435	3,110
Prepaid expenses and other current assets	3,918	3,845	2,877	3,184	2,880	2,636	2,110	1,862	2,841	2,513
Total current assets	**169,448**	**139,927**	**125,214**	**124,049**	**110,103**	**152,640**	**243,453**	**356,118**	**466,100**	**500,005**
Plant, Lines and Other facilities:										
Completed projects	3,984,619	3,432,754	3,306,851	3,155,696	2,777,788	2,753,762	2,702,448	2,560,403	2,498,355	2,445,755
Less: Accumulated depreciation	(1,326,461)	(1,218,427)	(1,146,036)	(1,070,108)	(1,008,503)	(946,427)	(884,199)	(825,205)	(768,423)	(734,552)
	2,658,158	2,214,327	2,160,815	2,085,588	1,769,285	1,807,335	1,818,249	1,735,198	1,729,932	1,711,203
Construction in progress	460,501	711,655	581,222	487,674	623,181	463,167	371,816	370,350	272,850	140,134
Net plant, lines and other facilities	3,118,659	2,925,982	2,742,037	2,573,262	2,392,466	2,270,502	2,190,065	2,105,548	2,002,782	1,851,337
Other non-current assets	108,322	184,659	156,960	178,762	169,587	154,717	36,262	35,876	36,611	35,945
Total non-current assets	**3,226,981**	**3,110,641**	**2,898,997**	**2,752,024**	**2,562,053**	**2,425,219**	**2,226,327**	**2,141,424**	**2,039,393**	**1,887,282**
Total assets	**3,396,429**	**3,250,568**	**3,024,211**	**2,876,073**	**2,672,156**	**2,577,859**	**2,469,780**	**2,497,542**	**2,505,493**	**2,387,287**
Deferred outflow of resources	52,018	54,267	35,911	23,708	20,407	22,862	13,511	15,176	16,842	18,507
Total assets and deferred outflows	**$ 3,448,447**	**$ 3,304,835**	**$ 3,060,122**	**$ 2,899,781**	**$ 2,692,563**	**$ 2,600,721**	**$ 2,483,291**	**$ 2,512,718**	**$ 2,522,335**	**$ 2,405,794**

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT
COMPARATIVE STATEMENT OF NET POSITION
LIABILITIES, DEFERRED INFLOW OF RESOURCES AND NET POSITION
YEARS ENDED JUNE 30
DOLLARS IN THOUSANDS

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Liabilities:										
Current liabilities (payable from current assets):										
Accounts payable and accrued expenses	$ 18,168	$ 16,342	$ 16,550	$ 17,420	$ 14,936	$ 13,653	$ 12,693	$ 16,470	$ 15,732	$ 11,141
Total current liabilities (payable from current assets)	18,168	16,342	16,550	17,420	14,936	13,653	12,693	16,470	15,732	11,141
Current liabilities (payable from restricted assets):										
Accounts payable and accrued expenses	31,945	47,472	30,764	33,271	30,607	14,712	16,168	12,656	15,105	13,692
Accrued interest	17,819	18,455	15,935	17,533	13,036	12,834	12,458	13,959	12,360	14,701
Current maturities of bonds payable	42,200	40,190	33,655	31,825	29,415	28,525	27,035	25,740	24,840	23,785
Bank notes	100	-	-	-	-	-	-	-	-	-
State revolving fund notes	545	105	-	-	-	-	-	-	-	-
Refundable deposits	2,928	2,861	2,300	2,557	1,639	1,568	1,137	1,013	1,341	1,622
Total current liabilities (payable from restricted assets)	95,537	109,083	82,654	85,186	74,697	57,639	56,798	53,368	53,646	53,800
Non-current liabilities:										
Bonds payable	1,914,340	1,956,540	1,831,605	1,722,745	1,583,390	1,549,700	1,478,225	1,536,770	1,591,670	1,302,000
Bond anticiaption note	226,340	226,340	226,340	226,340	226,340	226,340	226,340	226,340	226,340	452,680
Commercial paper notes	120,000	-	-	-	-	-	-	-	-	-
State revolving fund notes	2,113	1,766	-	-	-	-	-	-	-	-
Other subordinated debt	-	-	1,973	2,072	2,168	2,261	2,351	-	-	-
Unamortized debt premium/discount	80,421	90,628	74,328	67,462	60,797	60,263	56,764	45,841	25,646	9,562
Net Pension liability and OPEB liability	134,981	125,636	74,132	68,653	51,988	58,825	-	-	-	-
Other long-term liabilities	-	-	-	690	944	761	973	5,663	5,561	1,630
Total long-term debt	2,478,195	2,400,910	2,208,378	2,087,962	1,925,627	1,898,150	1,764,653	1,814,614	1,849,217	1,765,872
Total liabilities	2,591,900	2,526,335	2,307,582	2,190,568	2,015,260	1,969,442	1,834,144	1,884,452	1,918,595	1,830,813
Deferred inflow of resources	85,995	69,826	84,052	108,633	92,233	82,293	82,233	119,680	67,948	82,185
Net position:										
Net investment in capital assets	745,343	587,820	562,784	501,675	506,187	418,784	365,225	313,575	363,334	450,753
Restricted, net	81,207	156,425	150,386	84,639	80,424	148,451	136,939	157,002	141,217	334,186
Unrestricted	(55,998)	(35,571)	(44,682)	14,266	(1,541)	(18,249)	64,750	38,009	31,241	(292,143)
Total net assets	770,552	708,674	668,488	600,580	585,070	548,986	566,914	508,586	535,792	492,796
Total liabilities, deferred inflows and net position	**$ 3,448,447**	**$ 3,304,835**	**$ 3,060,122**	**$ 2,899,781**	**$ 2,692,563**	**$ 2,600,721**	**$ 2,483,291**	**$ 2,512,718**	**$ 2,522,335**	**$ 2,405,794**

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT
COMPARATIVE STATEMENTS OF REVENUES, EXPENSES AND CHANGES IN NET POSITION
YEARS ENDED JUNE 30
DOLLARS IN THOUSANDS

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Operating revenue:										
Wastewater service charges	$ 219,467	$ 210,636	$ 194,965	$ 183,592	$ 173,895	$ 165,599	$ 159,791	$ 149,626	$ 145,880	$ 133,853
Stormwater service charges	69,706	63,868	58,978	54,888	51,567	48,457	45,431	40,856	37,417	34,757
Other operating income	5,195	4,645	5,691	4,810	4,407	2,576	4,823	1,756	2,379	2,980
Total operating revenue	294,368	279,149	259,634	243,290	229,869	216,632	210,045	192,238	185,676	171,590
Operating expenses:										
Service and administrative costs	154,325	142,711	122,098	121,674	106,174	108,814	108,041	108,326	107,307	101,068
Capitalization/recovery of cost	(38,383)	(38,147)	(31,949)	(30,516)	(30,056)	(33,568)	(32,200)	(30,860)	(30,472)	(28,129)
Capitalized overhead (over) under applied	-	88	-	-	-	-	(910)	(2,340)	164	(2,988)
Depreciation and amortization	87,882	77,954	77,156	62,820	63,321	63,516	60,335	60,527	58,741	58,513
Total operating expenses	203,824	182,606	167,305	153,978	139,439	138,762	135,266	135,653	135,740	128,464
Income (loss) from operations	90,544	96,543	92,329	89,312	90,430	77,870	74,779	56,585	49,936	43,126
Non-operating revenue (expense):										
Investment income	8,353	6,280	4,047	7,559	7,527	10,234	3,695	29,682	25,916	33,785
Build America bond refund	10,339	10,249	10,226	10,332	10,096	10,096	10,986	10,986	7,978	2,260
Interest expense - bonds	(94,831)	(95,041)	(90,117)	(86,818)	(83,404)	(80,613)	(92,616)	(89,243)	(78,954)	(69,949)
Interest expense - swaps	(6,468)	(7,724)	(8,926)	(9,514)	(9,737)	(9,733)	(10,200)	(11,235)	(11,627)	(8,815)
Interest expense - other	(13,497)	(9,873)	(9,317)	(8,601)	(4,611)	(4,629)	(4,829)	(6,595)	(4,896)	(6,819)
Amortization of debt discount/premium	14,344	15,198	13,701	12,052	7,887	7,296	6,735	7,032	3,063	3,096
Amoritzation of loss on refunding	(2,817)	(3,147)	(3,070)	(1,949)	(1,980)	(2,552)	-	-	-	-
Capitalized interest	18,582	21,859	20,074	21,051	20,511	19,103	26,358	26,384	25,195	13,910
Decrease upon hedge termination	-	-	-	-	-	-	-	-	-	(58,556)
Change in fair values - swaps	(13,597)	16,317	26,072	(22,951)	(5,240)	(1,222)	36,286	(52,897)	22,638	(19,889)
Total non-operating revenue (expenses), net	(79,592)	(45,882)	(37,310)	(78,839)	(58,951)	(52,020)	(23,585)	(85,886)	(10,687)	(110,977)
Net income / (loss) before contributions	10,952	50,661	55,019	10,473	31,479	25,850	51,194	(29,301)	39,249	(67,851)
Contributions										
Property owner assessments	-	-	2,376	-	-	-	-	-	334	(545)
All other	50,926	12,726	10,513	5,037	4,605	8,103	7,134	2,095	3,413	4,105
Increase (decrease) in net position	61,878	63,387	67,908	15,510	36,084	33,953	58,328	(27,206)	42,996	(64,291)
Net position, beginning of year	708,674	668,488	600,580	585,070	548,986	566,914	508,586	535,792	492,796	557,087
Restatement for GASB 68 implementation	-	-	-	-	-	(51,881)	-	-	-	-
Restatement for GASB 75 implementation	-	(23,201)	-	-	-	-	-	-	-	-
Net Position, beginning of year, as restated	708,674	645,287	600,580	585,070	548,986	515,033	508,586	535,792	492,796	557,087
Net position, end of year	$ 770,552	$ 708,674	$ 668,488	$ 600,580	$ 585,070	$ 548,986	$ 566,914	$ 508,586	$ 535,792	$ 492,796

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT
COMPARATIVE STATEMENTS OF CASH FLOWS
YEARS ENDED JUNE 30
DOLLARS IN THOUSANDS

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Cash flows from operating activities:										
Cash received from customers	$ 292,791	$ 276,711	$ 262,055	$ 240,202	$ 227,976	$ 213,215	$ 207,905	$ 193,446	$ 182,976	$ 171,641
Cash paid to suppliers and employees	(103,173)	(95,150)	(88,300)	(85,202)	(75,258)	(73,175)	(79,926)	(76,077)	(72,566)	(72,426)
Net cash provided by operating activities	189,618	181,561	173,755	155,000	152,718	140,040	127,979	117,369	110,410	99,215
Cash flows from capital and related financing activities:										
Proceeds from issuance of revenue bonds	-	175,000	150,000	175,000	80,000	100,000	115,790	263,360	330,000	405,770
Proceeds from subordinated debt	226,340	226,340	226,340	226,340	226,340	226,340	228,735	226,340	226,340	452,680
Proceeds from issuance of commercial paper	319,212	-	-	-	-	-	-	-	-	-
Premium from sale of bonds	3,994	21,894	15,715	16,887	-	-	-	-	-	-
Build America bond refund	10,339	10,248	10,226	10,332	10,096	10,096	10,986	10,986	7,978	2,260
Principal paid on debt	(266,847)	(263,395)	(271,064)	(255,291)	(271,853)	(253,465)	(399,424)	(543,700)	(491,955)	(488,275)
Payments for retirement of commercial paper	(200,000)	-	-	-	-	-	-	-	-	-
Interest and fees paid on debt	(108,511)	(102,394)	(103,919)	(92,246)	-	-	-	-	-	-
Interest paid on swaps	(6,468)	(7,724)	(8,926)	(9,514)	(9,737)	(9,733)	(10,200)	(11,235)	(11,627)	(8,832)
Proceeds from capital grants	9,373	7,183	6,386	91	-	-	-	-	-	-
Proceeds from sale of capital assets	15	3	10	614	-	-	-	-	-	-
Payments for capital assets	(233,360)	(216,503)	(220,892)	(213,996)	-	-	-	-	-	-
Proceeds from assessments	780	1,621	1,254	2,329	-	-	-	-	-	-
Assessments extended	-	-	(2,376)	-	-	-	-	-	-	-
Capital contributed by governments, property owners & developers	-	-	-	-	4,605	8,103	7,134	2,095	3,747	3,560
Assessments receivable	-	-	-	-	2,050	1,695	1,833	1,930	1,676	2,998
Interest income - assessments	-	-	-	-	340	687	731	852	994	1,588
Interest paid on revenue bonds	-	-	-	-	(87,813)	(91,719)	(98,944)	(94,240)	(86,191)	(70,192)
Acquisition and construction of capital assets	-	-	-	-	(147,842)	(121,237)	(113,144)	(119,988)	(167,816)	(86,590)
Acquisition of non-operating property	-	-	-	-	(247)	(211)	(223)	(213)	(221)	(484)
Net cash provided (used) by capital and related financing activities	(245,133)	(147,727)	(197,246)	(139,454)	(194,061)	(129,444)	(256,726)	(263,813)	(187,075)	214,483
Cash flows from investing activities:										
Change in investments	34,428	(56,798)	15,990	(15,047)	1,052	(30,642)	4,064	200,229	100,012	(325,944)
Investment income	6,238	5,081	2,951	5,626	13,974	15,708	13,941	38,515	40,097	37,329
Net cash provided (used) by investing activities	40,666	(51,717)	18,941	(9,421)	15,026	(14,934)	18,005	238,744	140,109	(288,615)
Net increase (decrease) in cash and cash equivalents	(14,849)	(17,883)	(4,550)	6,125	(26,317)	(4,338)	(110,742)	92,300	63,444	25,083
Cash and cash equivalents, beginning of year	81,662	99,545	104,095	97,970	124,287	128,625	239,367	147,067	83,623	58,540
Cash and cash equivalents, end of year	$ 66,813	$ 81,662	$ 99,545	$ 104,095	$ 97,970	$ 124,287	$ 128,625	$ 239,367	$ 147,067	$ 83,623

Presentation and classification of items in the Cash flows from capital and related financing activities section was changed to provide better clarity beginning with the 2017 CAFR. Prior years were not reclassified and are shown as originally presented.

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT
COMPARATIVE SUMMARIES OF OPERATING REVENUE
YEARS ENDED JUNE 30
DOLLARS IN THOUSANDS

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Service charges:										
Wastewater service charges:										
Residential	$ 122,830	$ 116,458	$ 108,809	$ 101,405	$ 96,563	$ 89,691	$ 86,409	$ 80,779	$ 78,552	$ 73,228
Commercial	71,054	66,651	61,860	58,343	62,257	58,812	57,192	53,116	46,598	42,741
Industrial	23,171	24,439	21,218	19,878	17,605	19,738	19,536	18,063	21,498	18,948
Other - net	6,803	7,517	6,853	8,186	2,806	2,611	2,267	2,219	1,847	1,756
Free sewer to Metro Government	(4,391)	(4,429)	(3,775)	(4,220)	(5,336)	(5,253)	(5,613)	(4,551)	(2,615)	(2,820)
Total wastewater service charges	219,467	210,636	194,965	183,592	173,895	165,599	159,791	149,626	145,880	133,853
Stormwater service charges:										
Residential	25,716	23,811	22,111	20,439	20,090	18,522	17,372	15,907	14,776	13,613
Commercial	38,775	35,778	35,372	32,971	28,936	27,910	26,123	23,017	20,862	19,433
Industrial	4,373	3,864	3,445	3,219	3,030	3,112	2,956	2,575	2,351	2,189
Other - net	2,834	2,533	-	-	-	-	-	-	-	-
Free drainage to Metro Government	(1,992)	(2,118)	(1,950)	(1,741)	(489)	(1,087)	(1,020)	(643)	(572)	(478)
Total stormwater service charges	69,706	63,868	58,978	54,888	51,567	48,457	45,431	40,856	37,417	34,757
Total service charges	289,173	274,504	253,943	238,480	225,462	214,056	205,222	190,482	183,297	168,610
Other operating income:										
Capacity charges	3,552	3,132	3,318	2,087	2,667	1,620	1,624	335	446	564
Connection fees	14	76	(723)	1,118	379	133	93	64	71	68
Regional facilities fees	-	-	-	16	34	-	-	-	-	-
Reserve capacity charges	-	-	-	-	-	-	64	-	-	11
Wastewater miscellaneous	1,629	1,437	3,096	1,589	1,327	823	2,984	1,299	1,804	2,279
Stormwater miscellaneous	-	-	-	-	-	-	58	58	58	58
Total other operating income	5,195	4,645	5,691	4,810	4,407	2,576	4,823	1,756	2,379	2,980
Total operating revenue	$ 294,368	$ 279,149	$ 259,634	$ 243,290	$ 229,869	$ 216,632	$ 210,045	$ 192,238	$ 185,676	$ 171,590

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT
COMPARATIVE SUMMARIES OF SERVICE AND ADMINISTRATIVE COSTS
YEARS ENDED JUNE 30
DOLLARS IN THOUSANDS

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Service and administrative costs:										
Labor	$ 71,379	$ 64,718	$ 59,183	$ 55,229	$ 54,378	$ 57,249	$ 55,028	$ 55,010	$ 56,358	$ 52,945
Utilities	19,520	16,640	14,427	18,256	13,817	14,563	12,821	14,555	13,853	11,879
Materials and supplies	8,639	8,647	7,976	4,183	9,706	8,151	8,990	8,972	9,043	9,031
Professional services	2,992	3,985	4,127	4,169	2,839	1,932	3,942	2,416	2,624	2,363
Maintenance and repairs	4,875	7,208	9,116	10,007	7,915	9,096	10,866	11,090	10,054	8,847
Billing and collections	5,868	5,755	5,467	4,853	4,327	4,095	4,904	4,309	4,318	4,461
Chemicals and fuel	6,154	5,706	6,375	5,697	5,297	5,143	5,907	5,714	5,702	6,099
Biosolids disposal	3,333	2,616	2,651	2,245	1,967	1,795	1,709	1,759	2,035	2,186
All other	20,435	17,665	11,142	13,960	6,520	7,238	4,369	4,901	3,694	3,638
Service and administrative costs[1]	143,195	132,940	120,464	118,599	106,766	109,262	108,536	108,726	107,681	101,449
Less: Recovery of cost										
Capitalized project cost	(38,383)	(38,147)	(31,949)	(30,516)	(30,056)	(33,568)	(33,110)	(33,200)	(30,472)	(28,129)
Revenue recoveries	(1,113)	(993)	(878)	(928)	(465)	(448)	(495)	(400)	(374)	(381)
Recovery of cost	(39,496)	(39,140)	(32,827)	(31,444)	(30,521)	(34,016)	(33,605)	(33,600)	(30,846)	(28,510)
Net service and administrative costs	$ 103,699	$ 93,800	$ 87,637	$ 87,155	$ 76,245	$ 75,246	$ 74,931	$ 75,126	$ 76,835	$ 72,939

[1]Excludes the actuarial portion of changes to GASB 68 pension expense and GASB 75 OPEB for the year

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT
COMPARATIVE SCHEDULES OF PLANT, LINES AND OTHER FACILITIES
YEARS ENDED JUNE 30
DOLLARS IN THOUSANDS

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Completed projects										
Sewer lines	$ 1,648,891	$ 1,497,090	$ 1,440,360	$ 1,379,153	$ 1,277,745	$ 1,274,180	$ 1,265,437	$ 1,179,685	$ 1,159,437	$ 1,134,637
Wastewater treatment facilities	669,041	648,503	637,166	629,083	489,292	489,289	479,998	479,226	471,190	470,527
Stormwater drainage facilities	839,159	561,341	542,271	515,898	448,853	448,899	443,577	437,139	434,943	427,431
Pumping and lift stations	240,963	183,795	166,158	139,651	96,812	96,819	89,503	73,023	71,122	70,643
Administrative facilities	51,734	50,818	50,817	49,342	49,342	49,342	49,317	46,068	46,078	45,561
Maintenance facilities	12,074	8,504	8,504	8,504	8,037	8,037	8,037	8,037	8,037	7,827
Machinery, equipment and other	118,879	97,407	98,138	90,702	85,395	85,395	83,882	77,068	71,923	93,240
Capitalized interest	403,878	385,296	363,437	343,363	322,312	301,800	282,697	260,157	235,624	222,564
Total completed projects	3,984,619	3,432,754	3,306,851	3,155,696	2,777,788	2,753,761	2,702,448	2,560,403	2,498,354	2,472,430
Less accumulated depreciation	(1,326,461)	(1,218,427)	(1,146,036)	(1,070,108)	(1,008,503)	(946,426)	(884,199)	(825,205)	(768,423)	(734,552)
Total completed projects - net	2,658,158	2,214,327	2,160,815	2,085,588	1,769,285	1,807,335	1,818,249	1,735,198	1,729,931	1,737,878
Total construction in progress	460,501	711,655	581,222	487,674	623,181	463,167	371,816	370,350	272,850	140,134
Total net plant, lines and other facilities	$ 3,118,659	$ 2,925,982	$ 2,742,037	$ 2,573,262	$ 2,392,466	$ 2,270,502	$ 2,190,065	$ 2,105,548	$ 2,002,781	$ 1,878,012

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT
MISCELLANEOUS OPERATING INDICATORS
YEARS ENDED JUNE 30

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Miscellaneous Operating Indicators										
Miles of sewers	3,348	3,463	3,322	3,293	3,240	3,263	3,240	3,332	3,200	3,207
Number of treatment plants	5	5	5	5	16	19	19	20	20	21
Number of service connections	285,156	283,936	280,489	280,063	253,462	240,174	239,334	235,136	230,240	228,580
Daily average treatment (MGD)	173	150	112	139	143	141	131	145	142	143
Daily treatment capacity (MGD)	200	200	170	170	177	177	177	173	173	174

MGD - millions of gallons per day

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT
WASTEWATER TREATMENT PLANT CAPACITY
2019

Plant	Design Capacity MGD	Avg Daily Flow MGD	Eventual Capacity MGD	Customer Base Residential	Customer Base Commercial	Customer Base Industrial	Customer Base Total	Year Built	Treatment Process
Morris Forman	120.0	100.6	120.0	131,528	15,757	383	147,668	1958	Secondary added in 1976.
Derek R. Guthrie*	60.0	55.9	60.0	66,216	4,101	36	70,353	1986	Secondary
Hite Creek	6.0	4.9	9.0	11,036	691	9	11,736	1970	Tertiary: sand filter
Cedar Creek	7.5	7.2	11.3	18,253	1,135	11	19,399	1995	Tertiary: sand filter
Floyd's Fork	6.5	4.8	9.8	9,429	536	4	9,969	2001	Tertiary: sand filter
Total treatment system	200.0	173.4	215.1	236,462	22,220	443	259,125		

*Formerly known as the West County WTP
Source: MSD Engineering Department

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT
GREATER LOUISVILLE, KENTUCKY / INDIANA
EMPLOYERS OF 1,000 EMPLOYEES OR MORE

	2019		2018		2017		2016		2015		2014		2013		2012		2011		2010			
Employers	Rank	Employees	Rank	Employees	Rank	Employees	Rank	Employees	Rank	Employees	Rank	Employees	Rank	Employees	Rank	Employees	Rank	Employees	Rank	Employees		Type of business
United Parcel Service, Inc.	1	23,533	1	21,233	1	22,354	1	22,080	1	22,189	1	20,931	1	20,047	1	20,117	1	20,388	1	20,125	P	Air cargo transport and distribution
Jefferson County, KY Public Schools	2	14,250	2	14,476	2	14,553	2	14,739	2	14,719	2	14,676	2	14,269	2	14,366	2	13,840	2	13,964	G	Primary and secondary education
Ford Motor Company	3	13,042	3	12,600	3	12,600	3	12,990	5	9,028	5	8,987	6	8,512	5	8,696	11	3,847	9	5,397	P	Vehicle manufacturing
Norton Healthcare (formerly Alliant Health)	4	12,579	4	12,247	5	11,944	5	11,389	4	10,739	4	10,245	4	9,666	4	9,658	4	9,421	4	8,698	N	Hospital and health care facilities
Humana, Inc.	5	12,000	5	12,000	4	12,500	4	12,500	3	12,900	3	12,371	3	11,235	3	11,000	3	10,017	3	9,400	P	Group health insurance/HMOs
The Kroger Company	6	9,235	12	3,079	12	3,079	11	4,626	10	4,892	10	5,417	10	5,152	-	-	-	-	-	-	P	Grocery Retailer
Baptist Healthcare System	7	8,143	9	6,159	7	6,786	10	4,995	9	5,116	11	5,339	11	4,854	11	4,219	12	3,752	12	3,889	N	Hospital and health care facilities
Walmart Inc.	8	6,650	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	Grocery Retailer
University of Louisville	9	6,394	6	6,933	6	7,065	7	6,375	6	6,264	7	6,161	7	6,187	6	6,273	6	5,746	5	6,352	G	Higher education
Kentucky One Health Inc (formerly Jewish Hosp)	10	6,000	10	6,000	10	6,000	9	6,000	7	6,000	9	5,602	5	8,893	7	5,898	5	5,819	6	5,782	N	Hospital and health care facilities
General Electric Company	10	6,000	10	6,000	10	6,000	9	6,000	7	6,000	6	6,230	8	6,000	9	5,000	10	3,988	11	4,100	P	Appliance manufacturing
Louisville-Jefferson County Metro Government	12	5,987	8	6,226	9	6,192	8	6,095	8	5,584	8	5,654	9	5,651	8	5,689	7	5,706	7	5,765	G	City/County Government
Amazon.com	13	5,700	7	6,500	8	6,500	6	6,500	7	6,000	-	-	-	-	-	-	-	-	-	-	P	Logistics & Customer Service
Spectrum (formerly Charter Communications)	14	2,330	13	2,400	15	2,400	33	1,200	35	1,131	34	1,200	-	-	-	-	-	-	-	-	P	Call Center
Oldham County Public Schools	15	2,325	24	1,567	23	1,638	24	1,604	15	2,300	23	1,576	22	1,602	19	1,690	21	1,689	28	1,500	G	Primary and secondary education
Manna Inc	16	2,300	14	2,300	14	2,600	12	3,120	13	2,400	16	2,250	-	-	-	-	-	-	-	-	P	Food service provider
LG&E and KU Energy (formerly EON)	17	2,208	16	2,162	17	2,201	18	2,211	18	1,993	18	2,178	16	2,131	16	2,066	19	1,976	19	1,976	P	Gas & Electric Utility
Roman Catholic Archdiocese of Louisville	18	2,202	15	2,252	13	2,660	17	2,263	17	2,237	14	2,260	14	2,345	13	2,352	15	2,416	17	2,142	N	Religious, educational, social services
Robley Rex VA Medical Center	19	1,876	18	1,816	21	1,800	21	1,900	19	1,800	20	1,703	18	1,799	18	1,728	22	1,671	24	1,596	N	Hospital and health care facilities
BrightSpring Health Services	20	1,800	17	1,948	19	1,948	14	2,435	28	1,312	35	1,054	-	-	-	-	-	-	-	-	P	Health care provider
Samtec Inc.	21	1,700	26	1,500	35	1,200	29	1,300	-	-	-	-	-	-	-	-	-	-	-	-	P	Electronic connectors & microelectronics products
U.S. Postal Service	22	1,691	20	1,691	20	1,896	23	1,659	12	2,401	13	2,546	13	2,509	-	-	14	2,653	18	1,991	G	Mail distribution
Bullitt County Public Schools	23	1,649	19	1,736	22	1,718	22	1,739	21	1,671	22	1,633	21	1,629	-	-	-	-	-	-	G	Primary and secondary education
Rawlings Group	24	1,520	29	1,440	28	1,332	30	1,211	-	-	-	-	-	-	-	-	-	-	-	-	P	Insurance subrogation
Churchill Downs Inc.	25	1,508	25	1,515	25	1,526	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	Racing, gaming and online entertainment
New Albany - Floyd County Schools	26	1,500	21	1,652	26	1,405	25	1,600	22	1,622	21	1,648	20	1,640	-	-	-	-	-	-	G	Primary and secondary education
Texas Roadhouse Inc.	26	1,500	26	1,500	29	1,320	35	1,179	-	-	-	-	-	-	-	-	-	-	-	-	P	Food service provider
Papa John's International	28	1,485	22	1,626	18	2,088	19	2,088	30	1,279	25	1,503	35	1,143	-	-	-	-	-	-	P	Quick service restaurant
US Census Bureau	29	1,330	33	1,209	38	1,185	38	1,037	-	-	-	-	-	-	-	-	-	-	-	-	N	Government
Anthem, Inc.	30	1,320	32	1,269	34	1,238	29	1,300	26	1,350	32	1,139	37	1,100	34	1,122	35	1,150	36	1,276	P	Health Insurance sales and services
Brown-Forman Corp.	31	1,300	30	1,300	31	1,304	29	1,300	31	1,266	31	1,256	32	1,244	31	1,196	34	1,184	37	1,240	P	Distilled spirits manufacturing
Centerstone of Kentucky (formerly Seven Counties)	32	1,266	31	1,284	27	1,340	36	1,165	34	1,168	33	1,129	36	1,111	30	1,215	32	1,202	40	1,187	N	Health care provider
Greater Clark County, IN School Corp.	33	1,251	28	1,447	32	1,295	32	1,247	24	1,447	24	1,303	30	1,357	27	1,346	28	1,364	30	1,395	G	Primary and secondary education
Kindred Healthcare (formerly Vencor Inc.)	34	1,246	23	1,571	16	2,216	16	2,381	16	2,244	17	2,249	17	2,130	15	2,252	18	2,297	16	2,224	P	Long-term health care, facilities
JBS USA	35	1,200	34	1,200	37	1,189	34	1,180	-	-	-	-	-	-	-	-	-	-	-	-	P	Pork Products
Faurecia	35	1,200	34	1,200	40	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	Exhaust systems, interiors & seat systems
Malone Workforce Solutions	37	1,182	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	Grocery Retailer
Horseshoe Southern IN (formerly Caesars')	38	1,135	38	1,160	33	1,239	31	1,252	29	1,303	29	1,404	26	1,418	25	1,437	31	1,244	26	1,540	P	Gaming and entertainment resort
Martinrea Heavy Stamping	39	1,100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	Grocery Retailer
Signature Healthcare	40	1,093	-	-	24	1,558	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	Post-acute and long-term care provider
Clark Memorial Hospital	41	1,011	39	1,060	-	-	33	1,225	33	1,225	30	1,270	-	-	-	-	-	-	-	-	P	Health care provider
ADP Inc.	42	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	Grocery Retailer
LSC Communications (formerly Publisher's Printing)	-	-	34	1,200	35	1,200	27	1,400	25	1,413	28	1,432	24	1,516	24	1,450	27	1,367	27	1,500	P	Trade, professional, special printing
PNC Bank	-	-	37	1,175	39	1,175	26	1,500	23	1,569	-	-	-	-	-	-	-	-	-	-	P	Financial Services
Mortenson Dental Partners	-	-	40	1,047	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	Dental Services
Commonwealth of Kentucky	-	-	-	-	-	-	13	2,514	11	3,794	12	4,042	12	4,161	10	4,232	9	4,488	10	4,361	G	General purpose government
U.S. Federal Government	-	-	-	-	-	-	15	2,406	14	2,397	15	2,252	15	2,191	12	2,676	13	2,855	13	3,575	G	General purpose government
Yum! Brands Inc. (formerly Tricon)	-	-	-	-	30	1,314	28	1,343	32	1,226	30	1,270	23	1,544	22	1,558	23	1,640	21	1,757	P	Food service provider
Floyd Memorial Hospital & Health Services	-	-	-	-	-	-	20	1,950	20	1,756	19	1,769	19	1,711	20	1,612	24	1,546	29	1,473	P	Hospital and health services provider
Securitas Security Services USA Inc.	-	-	-	-	-	-	-	-	27	1,328	26	1,476	25	-	21	1,598	33	1,191	41	1,150	P	Security Services
Shelby County Public Schools	-	-	-	-	40	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	G	Primary and secondary education
Al J Schneider Co	-	-	-	-	40	1,000	37	1,047	37	1,000	36	1,050	-	-	-	-	-	-	-	-	P	Hotel / Restaurants
American Commercial Lines	-	-	-	-	-	-	-	-	36	1,100	-	-	-	-	-	-	-	-	-	-	P	Marine Transportation Service
Total employees		173,741		156,680		162,558		164,045		155,163		144,205		134,747		120,446		114,457		115,355		

P=for-profit organization   N=not-for-profit organization   G=governmental organization
Source: Business First of Louisville, KY

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT
ROLE OF OUTSTANDING DEBT AND MISCELLANEOUS DEMOGRAPHIC INFORMATION

Fiscal Year	Debt *(In 000's)*	Population*	Personal Income***	Percentage of Personal Income	Unemployment Rate**	# of MSD Employees	# of MSD Service Connections	Miles of Sewer Line
2010	$ 1,786,633	742,324	$ 29,921,911	5.97%	9.8%	651	228,580	3,207
2011	$ 1,851,655	746,372	$ 31,154,544	5.94%	9.9%	655	230,240	3,200
2012	$ 1,834,691	750,828	$ 32,592,092	5.63%	8.4%	666	235,136	3,232
2013	$ 1,790,715	756,832	$ 33,314,513	5.38%	8.2%	649	239,334	3,240
2014	$ 1,867,089	760,026	$ 34,609,792	5.39%	6.4%	606	240,174	3,263
2015	$ 1,902,110	763,623	$ 34,575,582	5.50%	4.9%	591	253,462	3,288
2016	$ 2,050,444	764,378	$ 36,517,217	5.62%	4.6%	617	280,063	3,293
2017	$ 2,167,901	765,352	$ 37,813,140	5.73%	4.6%	626	280,489	3,322
2018	$ 2,315,569	770,517	N/A	N/A	4.3%	632	283,936	3,463
2019	$ 2,386,059	N/A	N/A	N/A	4.5%	645	285,156	3,348

*Source: U.S. Census Bureau (https://www.census.gov/quickfacts/fact/table/jeffersoncountykentucky/PST045216)
**Source: Workforce Kentucky Website (www.workforcekentucky.ky.gov) (https://kcews.ky.gov/KYLMI)
***Source: Bureau of Economic Analysis website (www.bea.gov)

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT
TOP 10 WASTEWATER AND STORMWATER CUSTOMERS

Rank	Customer Name		FY '19 Wastewater Billed	Percent Total Wastewater Revenue
1	Lubrizol Advanced Material**	$	2,624,019	1.20%
2	Heaven Hill Distilleries	$	2,534,543	1.15%
3	Swift Pork Co.	$	1,682,013	0.77%
4	Ford Motor Co.	$	936,605	0.43%
5	Haier US Appliance Solutions	$	905,940	0.41%
6	Early Times Distillery	$	904,479	0.41%
7	Ford Motor Co.	$	699,736	0.32%
8	Rohm & Haas	$	684,947	0.31%
9	UPS Air District	$	471,240	0.21%
10	Louisville Metro Housing Authority	$	439,959	0.20%
	Total	**$**	**11,883,482**	**5.41%**
	Total FY 19 Wastewater Revenue:	$	219,467,413	

Rank	Customer Name		FY '18 Wastewater Billed	Percent Total Wastewater Revenue
1	Heaven Hill Distilleries	$	5,291,401	2.41%
2	Swift Pork Co.	$	2,824,203	1.29%
3	Lubrizol Advanced Material**	$	2,335,162	1.06%
4	Early Times Distillery	$	998,464	0.45%
5	Ford Motor Co.	$	917,546	0.42%
6	Haier US Appliance Solutions	$	880,309	0.40%
7	Rohm & Haas	$	646,918	0.29%
8	Ford Motor Co.	$	643,713	0.29%
9	Louisville Metro Housing Authority	$	634,232	0.29%
10	Dean Milk	$	580,608	0.26%
	Total	**$**	**15,752,556**	**7.18%**
	Total FY 18 Wastewater Revenue:	$	210,635,803	

Rank	Customer Name		FY '19 Stormwater Billed	Percent Total Stormwater Revenue
1	Regional Airport Authority - Standiford	$	1,383,778	1.99%
2	United Parcel Service	$	647,327	0.93%
3	Ford Motor Co	$	380,467	0.55%
4	Lit Industrial Limited Partner	$	288,795	0.41%
5	Regional Airport Authority - Bowman	$	269,386	0.39%
6	Kentucky State Fair	$	268,485	0.39%
7	The U of L Campus	$	244,840	0.35%
8	Seaboard Systems	$	230,126	0.33%
9	Churchill Downs	$	222,877	0.32%
10	Lou Jeff County Redev Auth	$	206,864	0.30%
	Total	**$**	**4,142,945**	**5.94%**
	Total FY 19 Stormwater Revenue:	$	69,705,739	

Rank	Customer Name		FY '18 Stormwater Billed	Percent Total Stormwater Revenue
1	Regional Airport Authority - Standiford	$	1,258,666	1.81%
2	United Parcel Service	$	610,278	0.88%
3	Ford Motor Co	$	359,114	0.52%
4	Lit Industrial Limited Partner	$	275,407	0.40%
5	Regional Airport Authority - Bowman	$	251,264	0.36%
6	Kentucky State Fair	$	250,477	0.36%
7	The U of L Campus	$	230,236	0.33%
8	Seaboard Systems	$	217,057	0.31%
9	Churchill Downs	$	208,239	0.30%
10	Lou Jeff County Redev Auth	$	198,156	0.28%
	Total	**$**	**3,858,893**	**5.54%**
	Total FY 18 Stormwater Revenue:	$	63,868,122	

* LIT Industrial Limited was formerly known as Trammell Crow Co.
**Lubrizol Advanced Material was formerly known as Oxy Vinyls

On the front cover:
MSD's Waterway Protection Tunnel construction site and downtown Louisville glow in the setting sun.

Safe, clean waterways

700 West Liberty Street
Louisville, KY 40203-1911
LouisvilleMSD.org
Customer Relations
502.540.6000

A publication of MSD Finance Department.

APPENDIX C

PRELIMINARY AND UNAUDITED FINANCIAL STATEMENTS
FOR THE FISCAL YEAR ENDED JUNE 30, 2020

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LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT
COMPARATIVE STATEMENT OF NET POSITION - UNAUDITED
AS OF JUNE 30,
DOLLARS IN THOUSANDS

	2020	2019
Current Assets		
Unrestricted Current Assets		
Cash and cash equivalents	$ 99,973	$ 43,728
Investments	100	36,744
Accounts receivable, less allowance for		
doubtful accounts of $2,054 (2020), $959 (2019)	27,227	27,915
Inventories	4,977	4,623
Accrued interest receivable	186	957
Prepaid expenses and other current assets	3,961	2,961
Total unrestricted current assets	136,424	116,928
Restricted Current Assets		
Cash and cash equivalents	17,776	22,348
Investments	-	30,172
Total restricted current assets	17,776	52,520
Total Current Assets	154,200	169,448
Noncurrent Assets		
Unrestricted Noncurrent Assets		
Accounts receivable, non-current	12,776	13,730
Restricted Noncurrent Assets:		
Cash and cash equivalents	25,068	737
Investments	54,487	75,941
Other non-current assets	17,023	17,914
Total restricted non-current assets	96,578	94,592
Capital Assets		
Utility plant in service	4,114,641	3,962,588
Less allowance for depreciation	(1,349,897)	(1,304,430)
	2,764,744	2,658,158
Construction in progress	538,013	460,501
Net capital assets	3,302,757	3,118,659
Total Non-current Assets	3,412,111	3,226,981
Total Assets	3,566,311	3,396,429
Deferred Outflow of Resources		
Deferred outflow - pension	31,784	26,931
Deferred outflow - OPEB	14,331	10,571
Unamortized loss on refunding	12,830	14,516
Total deferred outflow of resources	58,945	52,018
Total Assets and Deferred Outflow of Resources	**$ 3,625,256**	**$ 3,448,447**

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT
COMPARATIVE STATEMENT OF NET POSITION - UNAUDITED (continued)
AS OF JUNE 30,
DOLLARS IN THOUSANDS

	2020	2019
Current Liabilities		
Current Liabilities To Be Paid From Unrestricted Assets		
Accounts payable	$ 14,689	$ 10,567
Accrued salaries and related benefits	9,487	7,601
Total unrestricted current liabilities	24,176	18,168
Current Liabilities To Be Paid From Restricted Assets		
Accounts payable and accrued expenses (capital), includes contractor retainage of $13,216 (2020), $12,190 (2019)	39,860	31,945
Accrued interest payable	16,910	17,819
Refundable deposits	2,954	2,928
Revenue bonds payable	43,460	42,200
Commercial paper notes	225,000	-
Bank notes	100	100
Other subordinate debt	2,167	545
Total restricted current liabilities	330,451	95,537
Total Current Liabilities	354,627	113,705
Noncurrent Liabilities		
Bonds payable, net	1,942,913	1,994,761
Bond anticipation note	226,340	226,340
Commercial paper notes	30,000	120,000
Other subordinate debt	28,284	2,113
Net pension liability	126,866	104,511
Net OPEB obligation	30,343	30,470
Total Noncurrent Liabilities	2,384,746	2,478,195
Total Liabilities	2,739,373	2,591,900
Deferred Inflow of Resources		
Interest rate swaps	93,485	73,040
Deferred inflow - pension	2,581	3,198
Deferred inflow - OPEB	10,609	5,780
Other deferred inflows	3,330	3,977
Total deferred inflow of resources	110,005	85,995
Total Liabilities and Deferred Inflow of Resources	**$ 2,849,378**	**$ 2,677,895**
Net Position		
Net investment in capital assets	$ 777,463	$ 745,343
Assets restricted for debt service	80,421	99,026
Liabilities associated with restricted debt service	0	(17,819)
Unrestricted	(82,006)	(55,998)
Total net position	775,878	770,552
Total Liabilities, Deferred Inflow of Resources and Net Position	**$ 3,625,256**	**$ 3,448,447**

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT
COMPARATIVE STATEMENT OF REVENUES, EXPENSES AND CHANGES IN NET POSITION - UNAUDITED
FOR THE YEARS ENDED JUNE 30,
DOLLARS IN THOUSANDS

	2020	2019
Operating Revenues		
Service charges	$ 312,859	$ 289,173
Other operating income	6,198	5,195
Total operating revenues	319,057	294,368
Operating Expenses		
Service and administrative costs	110,302	103,699
GASB 68 pension/GASB 75 OPEB actuarial expense	17,826	12,243
Depreciation and amortization	98,872	87,882
Total operating expenses	227,000	203,824
Income from Operations	92,057	90,544
Non-operating Revenue (Expenses)		
Gain/Loss disposal of assets	(15,008)	15
Investment income	5,275	8,338
Build America bond refund	10,325	10,339
Interest expense - bonds	(92,274)	(94,831)
Interest expense - swaps	(7,622)	(6,468)
Interest expense - other	(13,129)	(13,497)
Amortization of debt discount / premium	12,688	14,344
Amortization of loss on refunding	(2,404)	(2,817)
Capitalized interest	13,043	18,582
Change in fair value - swaps	(20,445)	(13,597)
Total non-operating revenue (expenses) - net	(109,551)	(79,592)
Income before capital contributions	(17,494)	10,952
Capital contributions	9,085	50,926
Increase in net position	(8,409)	61,878
Net position, beginning	770,552	708,674
Net position, OCEA merger	13,735	0
Net position, beginning of year, as adjusted	784,287	708,674
Net position, ending	$ 775,878	$ 770,552

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT
COMPARATIVE STATEMENT OF CASH FLOWS - UNAUDITED
FOR THE YEARS ENDED JUNE 30,
DOLLARS IN THOUSANDS

	2020	2019
Cash Flows from Operating Activities		
Cash received from customers	$ 319,701	$ 292,791
Cash paid to suppliers	(57,043)	(55,816)
Cash paid to employees	(48,606)	(47,357)
Net Cash Provided by Operating Activities	214,052	189,618
Cash Flows from Capital and Related Financing Activities		
Proceeds from issuance of revenue bonds	-	-
Proceeds from issuance of bond anticipation note	230,079	230,334
Proceeds from issuance of commercial paper	770,000	319,112
Proceeds from issuance of notes	90,200	100
Payments for retirement of revenue bonds	(43,120)	(40,190)
Payments for retirement of bond anticipation note	(226,340)	(226,340)
Payments for retirement of commercial paper	(635,000)	(200,000)
Payments for retirement of notes	(90,200)	0
Payments for retirement of other subordinated debt	(2,120)	(317)
Payments for interest expense	(106,312)	(108,511)
Payments for interest on swaps	(7,622)	(6,468)
Build America bond interest subsidy	10,326	10,339
Proceeds from capital grants	1,785	9,373
Proceeds from sale of capital assets	0	15
Payments for capital assets	(224,418)	(233,360)
Proceeds from assessments	1,168	780
Net Cash Provided (Used) by Capital and Related Financing	(231,574)	(245,133)
Cash Flows from Investing Activities		
Purchase of investments	(394,721)	(45,576)
Maturity of investments	481,382	80,004
Investment income	6,864	6,238
Net Cash Provided (Used) by Investing Activities	93,525	40,666
Net Increase (Decrease) in Cash and Cash Equivalents	76,003	(14,849)
Cash and Cash Equivalents, Beginning of Year	66,813	81,662
Cash and Cash Equivalents, End of Year	$ 142,816	$ 66,813

Reconciliation of Operating Income to Net Cash provided by Operating Activities		
Income from operations	$ 92,057	$ 90,544
Adjustments to reconcile operating income to net cash provided by operating activities		
Depreciation and amortization	98,871	87,882
Accounts receivable	618	(1,644)
Inventories	(354)	(216)
Prepaid expense	(1,001)	(1,084)
Accounts payable	4,122	141
Customer deposits	26	67
Accrued liabilities	1,887	1,685
Pension liability	16,885	10,971
OPEB liability	941	1,272
Net Cash Provided by Operating Activities	$ 214,052	$ 189,618
Non-Cash Capital Financing and Investing Activities		
Contribution of plant, lines and other facilities by developers and property owners	$ 4,586	$ 41,554
Construction costs in accounts payable	39,860	31,945
Change in fair value of investments	1,208	(600)
Decrease in interest rate swap deferred revenue	672	918
Change in fair value - swap agreements	(20,445)	(13,597)
Bonds issued for refunding of debt	30,910	-

APPENDIX D

FORM OF BOND COUNSEL OPINION

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October __, 2020

Louisville and Jefferson County
  Metropolitan Sewer
Louisville, Kentucky 40203

The Bank of New York Mellon
  Trust Company, N.A., as Registrar and Paying Agent
Louisville, Kentucky 40202

Re: $226,340,000 Louisville and Jefferson County Metropolitan Sewer District
Sewer and Drainage System Subordinated Bond Anticipation Notes, Series 2020

Ladies and Gentlemen:

As Bond Counsel, we have examined a copy of the transcript of proceedings relating to the original issuance by the Louisville and Jefferson County Metropolitan Sewer District (the "District"), a public body corporate and political subdivision of the Commonwealth of Kentucky (the "Commonwealth"), of the District's $226,340,000 aggregate principal amount of Sewer and Drainage System Subordinated Bond Anticipation Notes, Series 2020 (the "Notes"). The proceeds of the Notes will be used to pay and retire the outstanding Sewer and Drainage System Subordinated Bond Anticipation Notes, Series 2019 (the "Series 2019 Notes") at their maturity. To the extent proceeds of the Notes are received in excess of the amount required to pay the Series 2019 Notes, such additional proceeds will be used to pay the costs of improvements to the District's sewer and drainage system.

The Notes are being issued pursuant to [i] applicable provisions of Chapters 58, 65 and 76 and Section 56.513 of the Kentucky Revised Statutes, as amended (the "Act"), [ii] the Subordinated Debt Resolution adopted by the Board of the District on April 26, 2010, as amended by a Subordinated Debt Sale Resolution adopted on August 24, 2020 (the "Resolution"), and [iii] the Sewer and Drainage System Revenue Bond Resolution adopted by the Board of the District on December 7, 1992, as amended on March 4, 1993, June 30, 1993, December 14, 1994, January 25, 1996, and February 24, 2003 (the "Bond Resolution"). Capitalized terms that are used but not defined herein are defined in the Resolution or the Bond Resolution.

The Notes and the interest thereon do not constitute a general obligation or indebtedness of the District, the Louisville/Jefferson County Metro Government ("Metro Government"), the County of Jefferson, Kentucky (the "County") or the Commonwealth within the meaning of any applicable debt-limiting provisions of the Constitution and laws of the Commonwealth and are not a charge against the general credit or taxing power of Metro Government, the County, the Commonwealth or any other political subdivision of the Commonwealth.

The Notes are special and limited obligations of the District secured solely by and payable solely from the property and revenue pledged in the Resolution (collectively, the "Pledged Property"). The pledge of the Pledged Property securing the Notes is subordinate, however, to the District's pledge of its property and revenue securing the Bonds, as such terms are defined in the Resolution and the Bond Resolution.

In our capacity as Bond Counsel we have examined such documents and matters and conducted such research as we have deemed necessary to enable us to express the opinions set forth below. We have also relied upon an opinion dated as of even date herewith of Paula M. Purifoy, Esq., General Counsel to the District, with respect to the valid creation, organization and existence of the District and the due adoption by the Board of the District of the Resolution and the Bond Resolution. As to certain questions of fact, we have relied upon statements and certifications of certain of the officers, officials, directors, employees and agents of the District and other public officials.

In rendering our opinions set forth below, we have assumed the authenticity of all documents submitted to us as originals, the legal capacity of natural persons and the conformity to the originals of all documents submitted to us as copies. We have assumed that parties other than the District had the requisite power and authority to enter into and perform all obligations of all documents to which they are parties. We have assumed the due authorization by all requisite action, and the execution and delivery by such other parties of such documents, and the validity and binding effect thereof on such other parties. We have relied for purposes of the opinions set forth below on the representations and warranties made in such documents by all parties thereto.

Based on the foregoing, and in reliance thereon, and on the basis of our examination of such other matters of fact and questions of law as we have deemed relevant in the circumstances, it is our opinion that:

1. The District is a public body corporate and political subdivision of the Commonwealth, validly existing under the provisions of the Constitution and laws of the Commonwealth, including the Act.

2. The Resolution and the Bond Resolution have been duly adopted by the Board of the District and are in full force and effect.

3. The Resolution and the Bond Resolution are the valid and binding special limited obligations of the District enforceable in accordance with their respective terms.

4. The Notes have been duly executed and delivered by the District and are the valid and binding special limited obligations of the District, enforceable in accordance with their terms and entitled to the benefit and security of the Resolution and the Bond Resolution.

5. Under the laws of the Commonwealth as presently enacted and construed, the Notes are exempt from ad valorem taxation, and the interest thereon is exempt from income taxation, by the Commonwealth and all of its political subdivisions and taxing authorities.

6. Based upon existing laws, regulations and judicial decisions, and assuming the correctness and accuracy of certain representations and warranties of the District made in connection with the original issuance of the Notes, interest on the Notes is excluded from gross income for federal income tax purposes.

The opinion set forth in Paragraph 6 above is subject to the condition that the District comply with all requirements of the Internal Revenue Code that must be satisfied subsequent to the issuance of the Notes in order that interest thereon be and remain excluded from gross income for federal income tax purposes. Failure to comply with certain of such requirements could cause the interest on the Notes to be included in gross income retroactive to the date of issuance of the Notes. The District has covenanted in the Resolution and the Bond Resolution to comply with such requirements.

The foregoing opinions are qualified to the extent that the enforceability of the Notes, the Resolution and the Bond Resolution, including the rights and remedies thereunder, may be limited by equitable principles and by bankruptcy, insolvency, reorganization, moratorium or similar laws heretofore or hereafter enacted relating to or affecting the enforcement of creditors' rights or remedies. We also express no opinion as to the availability of equitable rights or remedies.

We are not expressing an opinion on the investment quality of the Notes. We are members of the Bar of the Commonwealth and do not purport to be experts on the laws of any jurisdiction other than the Commonwealth and the United States of America, and we express no opinion as to the laws of any jurisdiction other than those specified. Our opinion relates solely to the questions set out herein and does not consider other questions of law.

Sincerely,

WYATT, TARRANT & COMBS, LLP

APPENDIX E

BOOK-ENTRY ONLY SYSTEM

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BOOK ENTRY SYSTEM

THE INFORMATION PROVIDED BELOW IN THIS APPENDIX E HAS BEEN PROVIDED BY DTC. NO REPRESENTATION IS MADE BY THE BOARD AS TO THE ACCURACY OR ADEQUACY OF SUCH INFORMATION PROVIDED BY DTC OR AS TO THE ABSENCE OF MATERIAL ADVERSE CHANGES IN SUCH INFORMATION SUBSEQUENT TO THE DATE HEREOF.

1. The Depository Trust Company ("DTC"), New York, NY, will act as securities depository for the securities (the "Bonds"). The Bonds will be issued as fully-registered securities registered in the name of Cede & Co. (DTC's partnership nominee) or such other name as may be requested by an authorized representative of DTC. One fully-registered Bond certificate will be issued in the aggregate principal amount of each maturity of Bonds and will be deposited with DTC.

2. DTC, the world's largest securities depository, is a limited-purpose trust company organized under the New York Banking Law, a "banking organization" within the meaning of the New York Banking Law, a member of the Federal Reserve System, a "clearing corporation" within the meaning of the New York Uniform Commercial Code, and a "clearing agency" registered pursuant to the provisions of Section 17A of the Securities Exchange Act of 1934. DTC holds and provides asset servicing for over 3.5 million issues of U.S. and non-U.S. equity issues, corporate and municipal debt issues, and money market instruments (from over 100 countries) that DTC's participants ("Direct Participants") deposit with DTC. DTC also facilitates the post-trade settlement among Direct Participants of sales and other securities transactions in deposited securities, through electronic computerized book-entry transfers and pledges between Direct Participants' accounts. This eliminates the need for physical movement of securities certificates. Direct Participants include both U.S. and non-U.S. securities brokers and dealers, banks, trust companies, clearing corporations, and certain other organizations. DTC is a wholly-owned subsidiary of The Depository Trust & Clearing Corporation ("DTCC"). DTCC is the holding company for DTC, National Securities Clearing Corporation and Fixed Income Clearing Corporation, all of which are registered clearing agencies. DTCC is owned by the users of its regulated subsidiaries. Access to the DTC system is also available to others such as both U.S. and non-U.S. securities brokers and dealers, banks, trust companies, and clearing corporations that clear through or maintain a custodial relationship with a Direct Participant, either directly or indirectly ("Indirect Participants"). DTC has a Standard & Poor's rating of AA+. The DTC Rules applicable to its Participants are on file with the Securities and Exchange Commission. More information about DTC can be found at www.dtcc.com.

3. Purchases of Bonds under the DTC system must be made by or through Direct Participants, which will receive a credit for the Bonds on DTC's records. The ownership interest of each actual purchaser of each Bond ("Beneficial Owner") is in turn to be recorded on the Direct and Indirect Participants' records. Beneficial Owners will not receive written confirmation from DTC of their purchase. Beneficial Owners are, however, expected to receive written confirmations providing details of the transaction, as well as periodic statements of their holdings, from the Direct or Indirect Participant through which the Beneficial Owner entered into the transaction. Transfers of ownership interests in the Bonds are to be accomplished by entries made on the books of Direct and Indirect Participants acting on behalf of Beneficial Owners. Beneficial Owners will not receive certificates representing their ownership interests in Bonds, except in the event that use of the book-entry system for the Bonds is discontinued.

4. To facilitate subsequent transfers, all Bonds deposited by Direct Participants with DTC are registered in the name of DTC's partnership nominee, Cede & Co., or such other name as may be

requested by an authorized representative of DTC. The deposit of Bonds with DTC and their registration in the name of Cede & Co. or such other DTC nominee do not effect any change in beneficial ownership. DTC has no knowledge of the actual Beneficial Owners of the Bonds; DTC's records reflect only the identity of the Direct Participants to whose accounts such Bonds are credited, which may or may not be the Beneficial Owners. The Direct and Indirect Participants will remain responsible for keeping account of their holdings on behalf of their customers.

5. Conveyance of notices and other communications by DTC to Direct Participants, by Direct Participants to Indirect Participants, and by Direct Participants and Indirect Participants to Beneficial Owners will be governed by arrangements among them, subject to any statutory or regulatory requirements as may be in effect from time to time. Beneficial Owners of Bonds may wish to take certain steps to augment the transmission to them of notices of significant events with respect to the Bonds, such as redemptions, tenders, defaults, and proposed amendments to the Bond documents. For example, Beneficial Owners of Bonds may wish to ascertain that the nominee holding the Bonds for their benefit has agreed to obtain and transmit notices to Beneficial Owners. In the alternative, Beneficial Owners may wish to provide their names and addresses to the Bond Registrar and request that copies of the notices be provided directly to them.

6. Redemption notices shall be sent to DTC. If less than all of the Bonds within an issue are being redeemed, DTC's practice is to determine by lot the amount of the interest of each Direct Participant in such issue to be redeemed.

7. Neither DTC nor Cede & Co. (nor any other DTC nominee) will consent or vote with respect to the Bonds unless authorized by a Direct Participant in accordance with DTC's MMI Procedures. Under its usual procedures, DTC mails an Omnibus Proxy to Issuer as soon as possible after the record date. The Omnibus Proxy assigns Cede & Co.'s consenting or voting rights to those Direct Participants to whose accounts the Bonds are credited on the record date (identified in a listing attached to the Omnibus Proxy).

8. Redemption proceeds, distributions, and dividend payments on the Bonds will be made to Cede & Co., or such other nominee as may be requested by an authorized representative of DTC. DTC's practice is to credit Direct Participants' accounts upon DTC's receipt of funds and corresponding detail information from Issuer or Agent, on payable date in accordance with their respective holdings shown on DTC's records. Payments by Participants to Beneficial Owners will be governed by standing instructions and customary practices, as is the case with securities held for the accounts of customers in bearer form or registered in "street name," and will be the responsibility of such Participant and not of DTC, Agent, or Issuer, subject to any statutory or regulatory requirements as may be in effect from time to time. Payment of redemption proceeds, distributions, and dividend payments to Cede & Co. (or such other nominee as may be requested by an authorized representative of DTC) is the responsibility of Issuer or Agent, disbursement of such payments to Direct Participants will be the responsibility of DTC, and disbursement of such payments to the Beneficial Owners will be the responsibility of Direct and Indirect Participants.

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

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

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

APPENDIX F

CONSULTING ENGINEER’S REPORT

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2020 Engineer's Report for Sewer and Drainage System

Louisville and Jefferson County Metropolitan Sewer District

Sewer and Drainage System Revenue Bonds, Series 2020A

June 2020

In preparing this report, Jacobs has relied upon certain historical and projected performance data provided by the Louisville and Jefferson County Metropolitan Sewer District (MSD). Jacobs has not independently verified the detailed accuracy of such data. Additionally, the cost estimates presented for the FY 2021 CIP projects appear to be reasonable for the work to be performed. The proposed FY 2021 CIP and the 5-Year CIP are technically sound and are in accordance with generally accepted engineering practice.

Clay Bostic, P.E.
Professional Engineer No. 27317

Leisha L. Pica
Enterprise Program Manager

Table of Contents

List of Tables

List of Figures

Acronyms & Abbreviations

AADF	Annual Average Daily Flow
ADF	Average Daily Flow
BG	Billions of Gallons
BMP	Best Management Practices
CAP	Corrective Action Plan
cBOD	Chemical Biochemical Oxygen Demand
CIP	Capital Improvement Plan
CMOM	Capacity, Management, Operation & Maintenance
CRRP	Critical Repair and Reinvestment Plan
CPE-CCP	Comprehensive Performance Evaluation – Composite Correction Plan
CRS	Community Rating System
CSO	Combined Sewer Overflow
DOJ	U.S Department of Justice
DRI	Drainage Response Initiative
ESU	Equivalent Service Unit
FEMA	Federal Emergency Management Agency
FM	Force Main
FOG	Fats, Oils and Grease
FPS	Flood Pump Station
FY	Fiscal Year
GI	Green Infrastructure
GIS	Geographical Information System
ILA	Interlocal Agreement
IOAP	Integrated Overflow Abatement Plan
IT	Information Technology
KDEP	Kentucky Department of Environmental Protection
LOJIC	Louisville Jefferson County Information Consortium
KPDES	Kentucky Pollution Discharge Elimination System
KRS	Kentucky Revised Statutes
lb/d	Pounds per Day
LF	Linear Feet
LTCP	Long Term Control Plan
mg/l	Milligram per Liter
MG	Millions of Gallons
MGD	Millions of Gallons per Day
mL	Milliliters
MS4	Municipal Separate Storm Sewer System
MSD	Louisville & Jefferson County Metropolitan Sewer District
NMC	Nine Minimum Controls
NPDES	National Pollution Discharge Elimination System

ORFPS	Ohio River Flood Protection System
ORSANCO	Ohio River Valley Water Sanitation Commission
RTC	Real Time Control
SCADA	Supervisory Control and Data Acquisition
SCAP	Sewer Capacity Assurance Plan
SORP	Sewer Overflow Response Plan
SSDP	Sanitary Sewer Discharge Plan
SSO	Sanitary Sewer Overflow
THP	Thermal Hydrolysis Process
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UV	Ultraviolet Disinfection
WIFIA	Water Infrastructure Finance and Investment Act
WQTC	Water Quality Treatment Center
WWTF	Wet Weather Treatment Facility
WWTP	Wastewater Treatment Plant

1. Introduction

This report was prepared in connection with the issuance by the Louisville and Jefferson County Metropolitan Sewer District (the "District" or "MSD") of its Sewer and Drainage Revenue Bonds, Series 2020A (the "2020A Bonds") being issued in the estimated principal amount of approximately $247,500,000 for the purpose of paying at maturity, redeeming, and refunding MSD's Program Notes issued and outstanding as Senior Subordinated Debt under MSD's General Bond Resolution and under MSD's Program Note Resolution.

MSD utilizes a sewer and drainage system ("System"), which includes the collection, transmission, treatment and effluent disposal of wastewater; processing, management, and disposal of biosolids; the collection, transmission of stormwater within the City and adjacent areas; and operations and maintenance of the Ohio River flood protection system infrastructure. Also included in the sewer and drainage system are the existing properties and assets, real and personal, tangible and intangible, owned or operated by MSD that are used or useful for the aforementioned purposes and all properties and assets constructed or acquired as additions, improvements and betterments to the sewer and drainage system and extensions thereof.

Portions of MSD's sewer and drainage system have been in service since the late 1800's and have/are reaching the end of their useful life. MSD is implementing an industry-standard asset management program to coordinate repair and replacement of existing assets in a timely and cost-effective manner. Current work activities related to MSD's asset management program includes upgrading tools, training staff, determining asset condition, calculating remaining useful life, and developing protocols for prioritizing capital needs. In addition to improving existing assets, MSD is investing in new infrastructure in accordance with a federally mandated Consent Decree to address sewer overflows and unauthorized discharges.

This report (i) provides an overview of MSD's infrastructure, (ii) describes the sewer and drainage system improvements made since the District's last public bond issuance in 2017, and (iii) provides an overview of MSD's 5-year Capital Improvement Plan (CIP).

1.1 History of MSD

Beginning at or around 1850, the first sewers were constructed in Louisville and the first combined storm and sanitary sewers were constructed in 1860. MSD was formed in 1946 as a public body corporate and subdivision of the Commonwealth of Kentucky. MSD was created to 1) operate and maintain the existing City of Louisville sewer and drainage system and 2) to expand the system throughout Jefferson County.

In 1986, an Interlocal Agreement (ILA) was executed between MSD, the City of Louisville, and Jefferson County[1] to improve and enhance flood control and stormwater drainage services. The ILA transferred all drainage and flood control facilities and property to the custodianship of MSD and mandated MSD be the responsible agency for providing flood and stormwater drainage services. The communities of Anchorage,

[1] The City of Louisville and Jefferson County subsequently merged to form Louisville Metro.

Jeffersontown, Shively, and St. Matthews own and operate the drainage systems serving their communities. However, MSD continues to provide flood protection services that benefit these communities through the Ohio River flood protection system floodwalls, levees, and flood pump stations. These communities are co-permittees under the stormwater management program that MSD administers.

1.2 Background of Capital Priorities

MSD is responsible for the operation of the sewer and drainage system serving most of Louisville Metro, which encompasses the City of Louisville and all of Jefferson County. MSD is authorized by Chapter 76 of the Kentucky Revised Statues (KRS) to construct additions, betterments, and extensions within its service area and to recover the cost of its services in accordance with rate schedules adopted by the MSD Board. Like many utilities throughout the country, MSD is faced with maintaining its existing utility assets in a fit-for-purpose condition while balancing changing environmental conditions that have started to impact its infrastructure.

1.2.1 2005 Consent Decree & 2009 Amended Consent Decree

On August 12, 2005, MSD entered into a Consent Decree with the Kentucky Energy and Environment Cabinet, Division of Water of the Kentucky Department of Environmental Protection (KDEP), U.S. Environmental Protection Agency (USEPA), and the U.S. Department of Justice (DOJ) (collectively referred to as "the Regulators"). The Consent Decree was in response to an enforcement action taken by USEPA and KDEP alleging violations of the Clean Water Act, primarily related to sewer overflows and unauthorized discharges. The enforcement actions initiated by the USEPA are not unique in the wastewater treatment industry. The Consent Decree created the framework for a long-term capital program to manage and mitigate combined sewer overflows (CSOs) and eliminate sanitary sewer overflows (SSOs) up to a certain storm event.

The Consent Decree called for MSD to submit a final Long-Term Control Plan (LTCP) that included schedules, deadlines, and timetables for projects to be completed by December 31, 2020. In addition, a Sanitary Sewer Discharge Plan (SSDP) was required that included schedules and deadlines for capital projects to be completed by the end of 2024. Both plans (LTCP and SSDP) were subsequently consolidated into the Integrated Overflow Abatement Plan (IOAP). The IOAP is expected to improve water quality in Beargrass Creek and the Ohio River.

On April 10, 2009, the Consent Decree was amended to address recordkeeping and Water Quality Treatment Center (WQTC) bypasses and treatment performance. The amendment called for MSD to implement projects to upgrade the separate sewer system, combined sewer system, and the WQTCs to adequately address SSOs and CSOs from locations identified in the Morris Forman WQTC Kentucky Pollution Discharge Elimination System (KPDES) permit. The first submittal of the IOAP was approved with the Amended Consent Decree.

1.2.2 2012 IOAP Modification

MSD's Wet Weather Team, which includes a broad range of community stakeholders, MSD staff, and consultants identified the need for modifications to the IOAP to incorporate through an adaptive management process additional information developed from continued flow monitoring, enhanced hydraulic modeling, and a detailed review of the project types, size, location and schedule. Modifications represented a revision to 28 separate projects set forth in the original IOAP, dated September 30, 2009. The IOAP Modifications were approved on June 19, 2014; and superseded and replaced the 2009 IOAP.

The following highlights the projects incorporated into the IOAP Modification to control CSOs:

- 3 sewer separation projects
- 14 storage basin projects including in-line storage/real-time control and off-line storage (250 MG)
- 1 project to replace and expand the Nightingale Sanitary Pump Station
- 2 conveyance expansion projects
- 1 additional green infrastructure project
- 1 high rate wet weather treatment facility (WWTF)

The following highlights the projects incorporated into the IOAP Modification to control SSOs:

- 19 conveyance capacity upgrades and interceptor relief projects
- 9 storage projects (in-line and off-line)
- 13 pump station upgrades or replacements
- 12 pump station eliminations
- 7 small WQTC eliminations

Over the past 10 years, MSD's CIP has been focused on implementing the projects required to comply with a federally mandated Consent Decree and subsequent IOAP. Since 2005, MSD has focused $1.01 billion of its resources toward mitigating and reducing unauthorized discharges and has made great progress in that effort as highlighted below.

- **Engaged Stakeholders:** In 2006, MSD initiated a Wet Weather Team Stakeholder Group which is still in existence and active today.

- **Mitigated CSOs**: MSD certified completion of 38 CSO LTCP projects to date, 4 remain. Overflows to local waterways have been reduced by approximately 5 billion gallons per typical year.

- **Eliminated SSOs**: MSD certified completion of 48 SSO SSDP projects to date, 18 remain. SSOs have been reduced approximately 61% by location and approximately 70% by volume.

- **Eliminated Facilities**: MSD certified completion of the required Comprehensive Performance Evaluation – Composite Correction Plan (CPE-CCP) projects, which included elimination of 6 WQTCs. Five regional wastewater treatment facilities remain.

- **Improved Ohio River Water Quality**: MSD received ORSANCO sampling data on the Ohio River indicating significant reductions in median fecal coliform levels downstream of Louisville, Kentucky.

- **Verifying Results**: MSD initiated a post construction compliance monitoring program on completed projects to proactively ensure satisfactory achievement of the design level of control as approved.

- **Fulfilled Amended Consent Decree Programmatic Elements**: Early Action Plan projects completed; Nine Minimum Controls (NMC) Program approved and ongoing; Capacity, Management, Operation, and Maintenance (CMOM) Program approved and ongoing; community input, outreach and notification program approved and ongoing; Sewer Overflow Response Protocol (SORP) approved and ongoing; Sewer Capacity Assurance Plan (SCAP) approved and ongoing; and certified completion of the required supplemental environmental projects.

- **Realized Additional Improvements for Our Community**: MSD exceeded the original commitments made to the community by spending 35% more for community benefits including: expanded system monitoring and rain gage networks to improve model calibration and discharge reporting; increased system storage capacity over original commitments by 25%; increased sanitary pump station capacity over original commitments by 50%; and improved community engagement and created neighborhood green spaces.

In order to fund the new infrastructure, MSD had to continue deferring critical existing infrastructure needs for piping, pumps, treatment plants, and flood gates. In 2019, MSD initiated discussions with the Regulators to reprioritize funding for critical infrastructure needs in lieu of some of the remaining SSDP projects included in the 5-year CIP. These discussions were slowed due to the COVID19 pandemic.

1.2.3 2017 Critical Repair and Reinvestment Plan

While MSD was implementing the Amended Consent Decree, it conducted a comprehensive assessment of its major infrastructure to assess long-term investment needs. In June 2017, the District published its *20-Year Comprehensive Facility Plan, Critical Repair and Reinvestment Plan* (CRRP)[2]. The CRRP estimated MSD needs to invest approximately $4.3 billion over a 20-year period to address all wastewater ($1.85 billion); stormwater ($2.34 billion) and support systems ($124.5 million) needs.

1.2.4 2018 Agreed Order for Morris Forman WQTC

On May 3, 2018, MSD entered into an Agreed Order with KDEP addressing improvements necessary to recover from a mechanical failure due to a lightning strike resulting with a power outage at Morris Forman WQTC that occurred April 8, 2015. Extensive damage was experienced to the primary treatment, secondary treatment, and electrical systems causing the plant to be out of compliance with effluent discharge limits established in Permit KY0022411. MSD is working diligently to restore the Morris Forman WQTC to its full

[2] 20-Year Comprehensive Facility Plan, Critical Repair and Reinvestment Plan, June 2017

operational capacity. MSD invested $37 million in this facility since 2016 and developed a draft Corrective Action Plan (CAP) for additional improvements necessary to:

- Assist with reduction effluent Biochemical Oxygen Demand (BOD)
- Assist with reduction effluent Total Suspended Solids (TSS)
- Allow continued operation of critical systems
- Prevent catastrophic failure at the plant
- Address safety issues/concerns.

The proposed CAP remains under discussion with KDEP.

1.2.5 2019 Reprioritization Discussions

Some deferred infrastructure has continued to deteriorate to the level that immediate investment is required for sustained regulatory compliance and protection of public health and community safety. In 2019, MSD updated its conceptual 30-year CIP forecast inclusive of all capital needs (approximately $4.6 billion) in conjunction with discussions with the Regulators. This forecast includes the projects identified in the CRRP, current regulatory requirements, additional planning evaluations, regionalization discussions, and partial funding for replacement of the Morris Forman WQTC. More information regarding these capital programs is presented throughout this report.

1.3 Purpose of the 2020A Bonds

Program Notes were issued by the District to finance on a short-term basis capital additions and improvements to the System pending the permanent refinancing of the Program Notes by the issuance of the District's bonds under its General Bond Resolution. An overview of the additions/improvements financed over the past couple years is provided in Table 1-1. More details regarding specific projects is provided in subsequent sections of this report.

Table 1-1: Overview of Capital Work Performed Since Last Bond Issue

CIP Program	Projects Finishing Design		Projects Finishing Construction	
	Number of Projects	Lifetime Actuals	Number of Projects	Lifetime Actuals
Consent Decree	0	$ -	5	$ 152,466,921
Facilities	1	$ 157,209	3	$ 3,769,146
Flood Protection	5	$ 1,481,044	8	$ 2,503,644
Stormwater	1	$ 18,866	7	$ 7,109,421
Wastewater Collection	7	$ 8,167,250	7	$ 20,981,312
Wastewater Treatment	8	$ 8,164,405	12	$ 57,343,141
TOTAL	**22**	**$ 17,988,774**	**42**	**$ 244,173,584**

This report does not discuss financial considerations. All information regarding rates, revenues, debt, and other financial considerations are discussed in the Official Statement.

2. MSD Organization

An eight-member citizen Board appointed by the Louisville Metro Mayor governs MSD's budget, rates, policies and initiatives. These members serve three-year overlapping terms and are eligible for reappointment. Each member represents a different state senatorial district in Louisville Metro. No more than five board members can belong to the same political party. The Board holds one regular meeting on the fourth Monday of each month, and committees meet as necessary. The current MSD Board Members are listed in Figure 2-1.

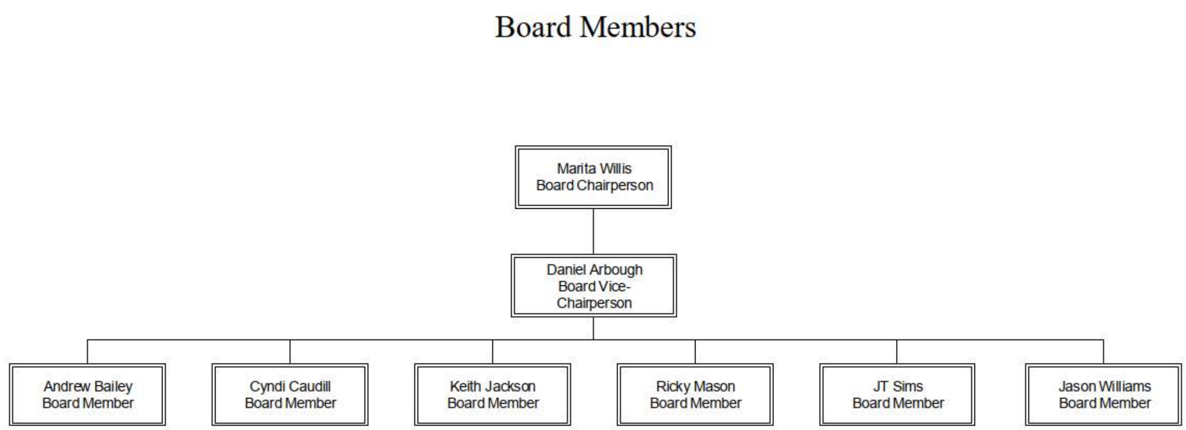

Figure 2-1: MSD's Board Members

The Board has delegated and placed the conduct of the day-to-day business affairs of the District under the direction of an Executive Director. The current Executive Director of MSD is James A. "Tony" Parrott. Mr. Parrott has been the full time MSD Executive Director since September 2015. Mr. Parrott leads an executive leadership team comprised of Division heads from eight divisions (refer to Figure 2-2):

- Executive Offices Division
- Supplier Diversity & Economic Inclusion Division
- Legal Division
- Human Resources Division
- Information Technology Division
- Finance Division
- Engineering Division
- Operations Division

MSD currently employs approximately 640 staff throughout the eight divisions. A brief description of each division is provided herein.

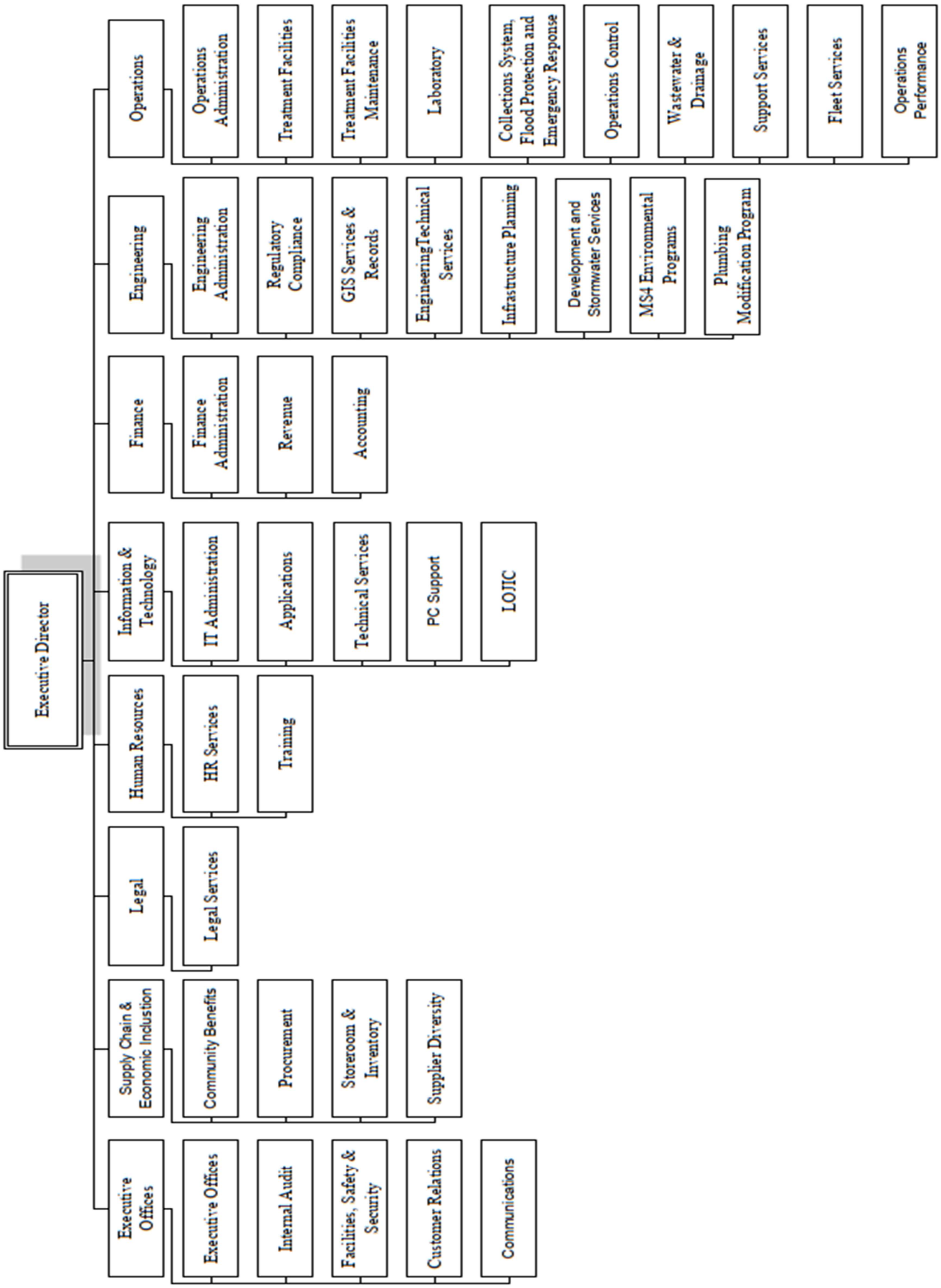

Figure 2-2: MSD's Organizational Chart

2.1 Executive Offices Division

The Executive Offices Division includes 13 executive positions; 18 customer relations and communications positions; and 21.5 facilities, safety, and security positions. The executive positions are comprised of Chief and Director level staff who provide leadership for the various Divisions. The customer relations and communication staff are part of the One Water Shared Services. One Water is organizational unit that operates in conjunction with the Louisville Water Company. This initiative is designed to provide consistent, high quality support services between the utilities, as well as to lower overall support costs for both MSD and the Water Company. The facilities staff provides support for keeping buildings operational for MSD's staff. The health and safety staff provide training for all MSD staff. Security staff provide on-site security services and investigate events as needed.

2.2 Supply Chain and Economic Inclusion Division

This One Water Division has 23 positions and is led by the One Water Chief Procurement Officer. The Division provides procurement buying services; management of the storeroom and materials; management and enforcement of the supplier diversity program; and services focused on community benefits.

2.3 Legal Division

The Legal Division includes 10 positions including the General Counsel/MSD Legal Director and Deputy General Counsel. Services provided by the Legal Division include contract reviews; claims and disputes; regulatory agreements; and interpretation of documents and terms of conditions.

2.4 Human Resources Division

The Human Resources Division includes 18 positions led by MSD's Human Resources Director. The Division provides organizational development, staff training, performance analytics, benefits and payroll administration, employee relations, and complete human resources support.

2.5 Information Technology Division

The Information Technology (IT) Division includes 32 positions led by the One Water Chief Information Officer. The Division manages IT hardware (servers, networks, computers, mobile phones); provides cybersecurity and staff technical support; oversees and supports software applications; and administers and manages the Louisville – Jefferson County Information Consortium (LOJIC) Program.

2.6 Finance Division

The Finance Division includes 29 positions led by MSD's Chief Financial Officer. A new Chief Financial Officer was selected in 2020. In May 2020, some job functions and roles within the Division were realigned to better support MSD with advancing regionalization and financial reporting. Services provided by the Finance Division include budget development and management; revenue and collections management; accounting; records management; and information governance.

2.7 Engineering Division

The Engineering Division includes 94 positions led by MSD's Chief Engineer. A new Chief Engineer was selected in 2020. Services provided by the Engineering Division include regulatory compliance; geographical information system (GIS) administration; engineering technical services (35.5 positions); and development and stormwater services (44 positions).

- **Regulatory Compliance**: leads the organization in process improvement activities that improve communication, documentation and efficiency required to maintain compliance with permits and regulations and advance the asset management program. Additionally, the team manages and coordinates Consent Decree-mandated activities including sewer overflow response, discharge and overflow reporting activities, and periodic reporting to regulators, and provides support to implement business requirements in information systems like IPS® and Telog®.

- **GIS Services**: supports MSD's mission by building and maintaining an accurate and detailed database model, generate high quality maps, perform spatial analysis, and serve as a support network to all departments within MSD. Additionally, the GIS Team provides support and information not only to MSD, but to outside customers and agencies as well.

- **Engineering Technical Services:** provides planning, design oversight, and construction management of all capital projects related to wastewater, stormwater, drainage, flood protection, and facility improvements. This group also administers the Drainage Response Initiative Program (DRI) to address localized drainage problems ranging from structural flooding to minor standing water problems.

- **Development Services:** responsible for review and permitting of development projects throughout Louisville Metro including proposed land disturbing activities on behalf of the community to advocate for public health, safety and protection in accordance with Louisville MSD's mission and the Louisville and Jefferson County Erosion Prevention and Sediment Control and Floodplain Ordinances. This group also provides construction field inspection services to confirm assets are built in accordance with MSD's standards and administers the plumbing modification program to prevent rain-related sewer backups into basements.

- **Stormwater Services:** manages and administers the Municipal Separate Storm Sewer System (MS4) and Floodplain Management Programs. The MS4 Program addresses drainage related issues related to pollution, erosion, water quality monitoring, and construction site management. The Floodplain Management Program coordinates grants from the Federal Emergency Management Agency (FEMA) to purchase homes located in flood prone areas.

2.8 Operations Division

The Operations Division includes 342 positions led by MSD's Chief of Operations. Operations staff are spread across five working groups including: treatment facilities (130 positions); collections, flood protection, and emergency response (77 positions); wastewater and drainage; (194 positions); operations support services (36 positions); and the One Water Fleet Services (19 positions).

- **Treatment Facilities Services**: responsible for operation and maintenance of the five water quality treatment centers 24 hours per day, 7 days per week including all electrical and mechanical components; performance analytics; and laboratory services. This group actively participates in the Operator-in-Training program to grow the next generation of staff.

- **Collections, Flood Protection, & Emergency Response Services**: responsible for operation and maintenance of all sanitary pump stations, sanitary and combined sewer systems; real time control facilities; SCADA system; and flood protection system (floodwall, levee, gates, and flood pump stations). This group provides emergency response for sewer force main breaks and pump station overflows and updates the Emergency Preparedness Plan required for the Flood Protection System per the U.S. Army Corps of Engineers (USACE).

- **Wastewater & Drainage Services**: responsible for operation and maintenance of the stormwater drainage network including field inspection of customer complaints. Wastewater services provided by this group include televising sewer systems and performing standard routine maintenance related to root control, cleaning, condition assessment, debris removal, and response to cave-ins.

- **Operational Support Services**: responsible for management and administration of industrial programs related to industrial pretreatment, grease management, hazardous materials, and industrial stormwater discharges. This group provides water quality sampling and performance analysis and tracking for all operating groups.

- **One Water Fleet Services**: provides full service maintenance for MSD's fleet vehicles and heavy equipment

3. Stormwater Drainage and Management

MSD is responsible for the operation, maintenance, replacement, improvements and additions to the public stormwater facilities. Runoff during rain events is collected and either stored, retained, and/or conveyed to sewers, rivers, streams, creeks, channels, and ditches for eventual discharge to the Ohio River, either directly or through one of its tributaries. The drainage system includes the following infrastructure that is operated by MSD (or through a combination of MSD staff and contractors).

- 3,616 miles of channels, ditches, and culverts
- 1,080 miles of storm sewers pipe (including culverts under roads)
- 870 miles of inland streams (both natural and improved)

MSD's combined sewer system provides storage, conveyance, and treatment of both sanitary sewage and stormwater. During dry weather, the system carries only sanitary sewage to the Morris Forman WQTC for treatment and discharge. During wet weather events, the combined sewers also convey urban runoff in the same pipe system. The boundaries of the combined sewer system are shown in Figure 3-1.

In April 2017, MSD published the *Louisville MSD Watershed Mater Plan* to help effectively manage present and future regional stormwater drainage in Louisville Metro. The basis of this Plan was MSD's original Watershed Master Plan, which was created in 1988 as part of the *Stormwater Drainage Master Plan*, and the *2010 Stormwater Management Master Plan*, which was the most recent update of that plan.

MSD is working on a comprehensive update to the *Stormwater Drainage Master Plan* which, after public participation and approvals by local governments, will be used by the District for implementing improvements and extensions to the existing drainage facilities. It is currently anticipated the first working draft of the *Stormwater Drainage Master Plan* will be published in 2025. Over the next few years, a significant effort will continue to inventory and document the condition of existing drainage system assets.

3.1 Stormwater Service Area

Louisville Metro is a river city located along the Ohio River. The area is drained by two major drainage systems: the Ohio River and the Salt River[3]. The Ohio River receives discharges from Mill Creek, Beargrass Creek, Goose Creek, Harrods Creek, and the combined sewer system. Cedar Creek and Pennsylvania Run discharge into Floyds Fork, which in turn, discharges in the Salt River. The Salt River also receives discharge from Pond Creek near its confluence with the Ohio River.

The challenges still facing MSD with regard to stormwater are exacerbated by the County's geography. Some areas are previous swampland with little slope, while other areas are very hilly. As such, if not properly

[3] April 2017 Louisville MSD Watershed Master Plan

controlled, development could lead to excessive streamflow and erosion. Much of the area within the old Louisville city limits is in the combined sewer system. When the system reaches capacity, many places in this highly developed urban area flood despite not being next to an open stream. This occurs because the combined sewer system took the place of the original streams and ditches.

The District through ILAs with the City of Louisville and Jefferson County assumed responsibility for stormwater management in 1987 for all of Jefferson County, except for the Cities of Anchorage, Jeffersontown, Shively, and St. Matthews. Those cities provide most of those services within their borders, and partner with MSD on other aspects including review of new development plans and water quality reporting.

The District serves a population of approximately 650,000 and bills for stormwater services using equivalent service units (ESUs). The District currently has approximately 6,956,000 ESUs, in total, from residential, commercial, industrial, and city-owned properties.

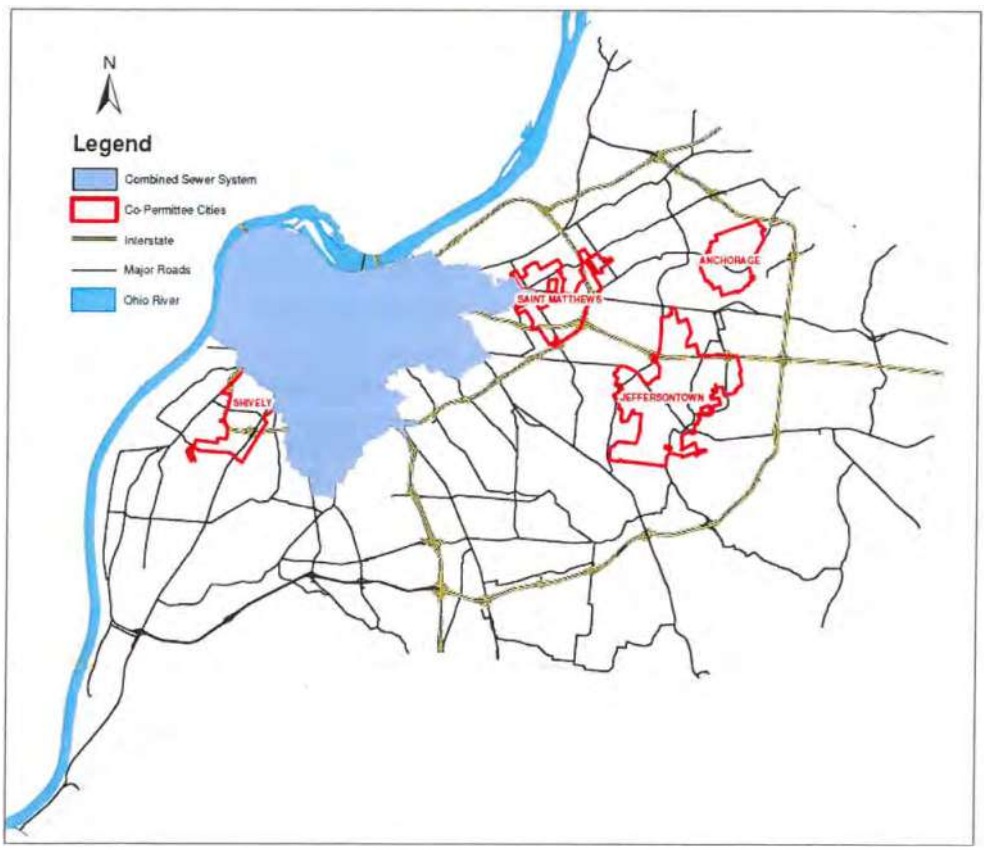

Figure 3-1: Stormwater and MS4 Service Areas

3.2 Stormwater & Drainage Regulatory Requirements

MSD is required to comply with the Federal and State Regulations related to stormwater management listed in Table 3-1.

Table 3-1: Federal and State Stormwater Management Regulations

Reference	Title	Description
401 KAR 5:060 Section 12	Municipal Separate Storm Sewer Systems	Establishes procedures for permitting Phase I and II municipal separate storm sewer systems (MS4s).
401 KAR 4:200; 33 US Code, Title 33, Chapter 26, Section 1341	Section 401 Application for Water Quality Certification	Establishes the requirements for permitting discharges to streams in the KDEP jurisdiction.
33 US Code, Title 33, Chapter 26, Section 1342	National Pollutant Discharge Elimination System (NPDES)	Establishes procedures for permitting discharges that may affect floodplains or navigable waters.
33 US Code, Title 33, Chapter 26, Section 1344	Section 404 Nationwide Permit	Establishes the requirements for permitting discharges of soil, sand, gravel, or dredged material into streams under USACE jurisdiction.
401 KAR 5:005	KPDES for the Morris Forman WQTC	Establishes procedures and permits for operation of the combined sewer system and its associated storage and treatment facilities

3.2.1 Metro Government Local Ordinances Related to Stormwater

MSD is required to comply with the following local regulations related to the stormwater system.

- Drainage Master Plan. Louisville Metro Government Code of Ordinances, Title V, Chapter 50.67
- Comprehensive Storm Water Drainage Authority. Louisville Metro Government Code of Ordinances, Title V, Chapter 50.55-99.
- Floodplain Management. Louisville Metro Government Code of Ordinances, Title XV, Chapter 157.
- Erosion Prevention and Sediment Control. Louisville Metro Government Code of Ordinances, Title XV, Chapter 159.
- Engineering Standards. Louisville and Jefferson County MSD Design Manual

3.2.2 Municipal Separate Storm Sewer System (MS4) Program

The permit to operate a drainage system and discharge stormwater to waterways is administered by the KDEP. Management of stormwater in the District outside the combined sewer area is regulated through a Municipal Separate Storm Sewer System (MS4) permit, which requires periodic reporting on water quality in area streams. The Louisville MS4 Permit includes over 100 activities and is organized into several program elements including:

- Illicit Discharge Detection and Elimination
- Construction Site Runoff Controls (Erosion Prevention and Sediment Control)
- Post Construction Site Runoff Controls (Long-term Water Quality Control)
- Public Involvement and Outreach Programs
- Monitoring
- Reporting and Assessment

3.3 Stormwater Drainage Programs

Stormwater management is a vital component of MSD's system, because it directly impacts the health and safety of all Louisville and Jefferson County residents. Inland drainage systems include the infrastructure to collect and convey drainage across the County via pipes, ditches, streams, and channels to the Ohio River. The flood protection system is described in Section 4. The combined sewer system is described in Section 5.

The CRRP included a number of programs related to drainage and floodplain management. A summary of the Stormwater Drainage Programs included in the 5-year CIP forecast is provided below.

- **Community Rating System Program**: The National Flood Insurance Program Community Rating System (CRS) is a voluntary incentive program encouraging community floodplain management activities that exceed the minimum requirements. Communities taking part in this program are awarded points for participating in public information, mapping and regulation, flood damage reduction, and flood preparedness. Through MSD's participation in the program, Louisville Metro is a Class 3 community, granting the community a 35-percent discount on flood insurance premiums. The Class 3 rating saves the Louisville Metro community approximately $2 million each year in flood insurance premiums.

- **Municipal Separate Storm Sewer System Program (MS4):** The MS4 Program is a drainage-related program to improve the quality of surface waters through controls on stormwater runoff quality in Jefferson County and to protect the public health, safety, and welfare by reducing the introduction of harmful materials into the MS4s that discharge into community streams. The CRRP identified several large stormwater retention basins with the potential for conversion of all or part of the basin to provide infiltration of stormwater.

- **Drainage Response Initiative Program (DRI)**: Since 2003, MSD has been implementing an aggressive program to address a wide variety of drainage issues that are pointed out by customers to address problems ranging from structural flooding to alleviating minor standing water problems. MSD has invested nearly $200 million in stormwater improvements through the DRI Program.

- **Floodplain Management Program**: Since 1997, MSD has purchased homes located in flood prone areas through federal grant programs. Following a number of spring flooding events in 2015, the Mayor formed a multiagency Flood Mitigation Workgroup to address impacted residents who were unable, for a variety of reasons, to get back in their homes after the floodwaters receded. The Flood Mitigation Workgroup recommended several mitigation approaches, including establishment of a "quick-buy" program to allow property owners to sell flood-impacted property in a much shorter time than would typically be possible. The Workgroup recommended annual fund be established to provide timely relief to property owners impacted by future extreme storm events. The projects continue to be advanced but are not part of the CIP due to the reimbursement portion of the program.

- **Stormwater Master Plan Implementation Program:** MSD has begun an extensive 5-year stormwater asset inventory project. Following this effort, the *Stormwater Master Plan* will be updated to prioritize stormwater needs throughout the District. The CRRP estimated approximately $600 million would be required to address the stormwater needs. Implementation of the *Stormwater Master Plan* will occur after the 5-year CIP.

3.4 Stormwater & Drainage Capital Projects

MSD continues to fund stormwater and drainage projects with its annual CIP. Projects are generally a combination of discrete local improvements and appropriations for District-wide needs/services.

3.4.1 Projects Funded from Program Notes

The projects completed since 2017 have primarily been focused on construction of green infrastructure (refer to Table 3-2). The green infrastructure program was included in the Amended Consent Order. MSD has invested more than $40 million in green infrastructure projects over the past 10 years.

Table 3-2: Stormwater Projects Completing Design/Construction Since 2017

Program	Budget ID	Project	Task Name	Finish	Lifetime Actuals
Stormwater & Drainage Improvements	H20164	346 S Peterson Ave Stream Restoration	Design Finish	4/21/2020	$18,866
	H19249	Stormwater Drainage Early Action Planning	Construction Finish	6/30/2019	$84,000
Green Infrastructure Projects	H20144	Churchill Downs East Side Improvements GI	Construction Finish	3/4/2020	$1,200,000
	H20168	Louisville FC Stadium Green Infrastructure	Construction Finish	12/31/2019	$250,000
	H13099	Spalding University Green Infrastructure	Construction Finish	11/22/2019	$539,826
	H19059	Churchill Downs Green Infrastructure Ph 2	Construction Finish	11/15/2018	$2,960,819
	H18332	Botanical Garden Biofilter Upgrades	Construction Finish	9/28/2018	$61,509
	H18195	Churchill Downs Green Infrastructure Ph 1	Construction Finish	8/23/2018	$2,013,267
				TOTAL STORMWATER PROJECTS	**$7,128,287**

In addition to these projects, MSD funds the following appropriations annually in support of activities related to the stormwater and drainage system:

- **Environmental Data Collection**: MSD collects over 3 million individual water quality records each year. This monitoring program provides a detailed picture of the health of streams in Jefferson County. Monitoring results are summarized on an annual basis in the *Stormwater MS4 Annual Report*. The data are provided electronically annually to the Kentucky Division of Water. MSD budgets approximately $875,000 per year to support this effort.

- **Tree Program**: MSD's Urban Reforestation Program plants 1,000 trees annually by working with local businesses, municipal organizations and neighborhood associations. The program replenishes and expands the tree canopy throughout Jefferson County. These trees redirect an average of 1.35 million gallons of stormwater away from the sewer system every year, which decreases sewer overflows into waterways. MSD budgets approximately $150,000 per year to support the program.

- **MS4 Program**: MSD budgets approximately $600,000 per year to manage and administer the MS4 Program. Work performed includes but is not limited to: public education and outreach; pollution prevention program; performance assessment and reporting; recreational monitoring for bacteria levels between May 1st and October 31st; and wet weather monitoring during storm events.

- **USGS Stream Monitoring**: In 1988, MSD and the United States Geological Survey (USGS) began monitoring water quality and stream flow throughout the Jefferson County area. The Long-Term

Monitoring Network has changed over the years and currently includes 27 monitoring sites. The monitoring sites were selected to represent streams in each of eleven watersheds. Each monitoring site is sampled four times per year and is analyzed for a variety of parameters including fertilizers, sediment, and metals. MSD budgets approximately $400,000 per year to support this effort.

3.4.2 5-Year CIP for Stormwater & Drainage System

During the 5-year CIP, the following stormwater and drainage projects will be partially or wholly budgeted.

Table 3-3: Overview of 5-Year Forecasted Spending for Stormwater

Stormwater Priorities		5-Year CIP Forecasted Spending
Stormwater & Drainage Improvements	Local Drainage Improvements	**Stormwater $6.9 million**
	3-Forks Beargrass Creek USACE General Investigation	
	Stormwater Master Plan	
MS4 Program	Environmental Data Collection	**MS4 $9.5 million**
	MS4 Program Support	
	Tree Program	
	USGS Stream Monitoring	
Drainage Response Initiative (DRI)	DRI Projects	**DRI $13 million**
	DRI Field Inspections	
Green Infrastructure (GI) Projects	GI Projects with Signed Agreements	**GI $2.3 million**
	Future GI Projects	
Land Use Planning	Maple Street Land Use Planning	**Land Use $60,000**
	Other Future Projects	
	Total 5-Year CIP Forecast for Stormwater & Drainage	**$31.8 million**

4. Flood Protection System

Louisville's flood problems originate from the Ohio River as it rises above its normal pool depth, as well as contributing creeks, storm sewers, and major drainage systems. After devastating floods on the Ohio River in 1937, the U.S. Army Corps of Engineers (USACE) was given authority by Congress to construct flood damage reduction projects under the Flood Control Act of 1936. Under this authority, the USACE built the Ohio River Flood Protection System (ORFPS) that stretches from Butchertown to the southwestern part of Jefferson County near West Point, Kentucky. The original 13.9 mile section of the floodwall was constructed along the Ohio River between 1946 and 1956 (Louisville Reach) and turned over to MSD as functional pieces were completed in 1953, 1954, and 1957. The USACE constructed the 12.6 mile southwestern Jefferson County floodwall extension (Southwestern Jefferson County Reach) between 1973 and 1989.

When the elevation of the Ohio River rises, MSD's service area is protected from flooding through levees and floodwalls. The 185 street crossings, pipe openings, and gates that allow creeks to pass through are sealed and the river is held back. With the creeks and storm sewer system prevented from discharging into the Ohio River, MSD relies on the 16 flood pump stations to pump drainage over the floodwall and levee to prevent stormwater from backing up and causing flooding within the area. It is important to understand that the operation of the flood pumping stations is intermittent and infrequent, only occurring when both the Ohio River is in flood stage and there is a rain event within the drainage system. Many of the pumping stations operate only once every few years. The existing system is more than 60 years old and most components are original parts. In many cases, the original equipment is no longer available for replacement.

MSD is responsible for ensuring all components of the ORFPS are fully operational when they are needed. Today, the ORFPS protects 240,000 people and $60 billion of property within the levee area and includes the following components (refer to Figure 4-1):

- 22.2 miles of earthen levee
- 3.9 miles of concrete wall
- 16 flood pump stations (total of 73 pumps)
- 152 gates
- 97 closures (21 permanently sealed)

4.1 Service Area

A large portion of Jefferson County lies within the broad floodplain of the Ohio River. Approximately 17,600 acres of this floodplain (extending from Beargrass Creek to Pond Creek) are protected by the ORFPS.

Figure 4-1: Ohio River Flood Protection System

Several flood pump stations have watersheds and sewersheds that extend across the Metro area and into eastern Jefferson County. Four distinct topographic regions exist throughout MSD's service area as shown in Figure 4-2 and described below[4].

Figure 4-2: MSD's Topographic Regions

- **Flood Plain**: A strip of land bordering one-half to five miles wide along the Ohio River. The Flood Plain extends from the Salt River in the southwest, north to downtown Louisville, and continues northeast to the Oldham County line. The area is best characterized as flat to gently rolling and with very flat sloped stream beds. Mill Creek and the combined sewer system drain the majority of this region.

- **Knobs**: A triangular area in the southwestern portion of the county bounded approximately by Iroquois Park on the north, South Park Hills on this southeast, and the Southern Railroad on the southwest. The hills in this region have been highly dissected by stream erosion. Most streams in this area drain to Pond Creek.

- **Central Basin**: The west central portion of the county, bounded approximately by I-264 on the north, Shepherdsville Road on the east, and the "Knobs" region on the south and west, is the "Central Basin. Various improvements to the Northern and Southern Ditch systems have helped alleviate the lack of natural drainage in the region.

[4] 2016 Louisville Metro Hazard Mitigation Plan

- **Eastern Uplands**: The remainder and largest portion of the county. This region is characterized by gently rolling to hilly plains to moderate to very steep valleys. Goose Creek, Harrods Creek, Floyds Fork, and the Beargrass Creek system drain this region.

4.2 Regulatory Requirements

As previously noted, the interior drainage system is regulated by MSD's MS4 permit. The Ohio River flood-protection system is not regulated by a single agency or permit. A series of requirements and standards established by multiple state and federal agencies such as FEMA and USACE regulate the flood protection system.

Table 4-1: Federal and State Flood Protection Regulations

Reference	Title	Description
40 CFR, Chapter 1, Part 230, Section 230.30	Threatened and Endangered Species	Identifies endangered or threatened species likely to become endangered in the foreseeable future.
44 CFR, Chapter 1, Part 73	National Flood Insurance Program Flood Insurance Manual, Appendix F, Community Rating Systems	The CRS offers NFIP policy premium discounts in communities that develop and execute extra measures beyond minimum floodplain management requirements to provide protection from flooding.
44 CFR Chapter 1, Part 79	Flood Mitigation Grants	Establishes procedures and requirements for grant programs to mitigate losses from flooding.
44 CFR, Chapter 1, Part 207	Disaster Mitigation Act of 2000	Provides information for state and local governments to identify and mitigate natural hazards.
16 US Code, Title 16, Chapter 84, Section 6514	National Environmental Policy Act Environmental Assessment	Establishes criteria to determine whether an impact significantly affects the quality of the human environment.
33 US Code, Title 33, Chapter 15, Section 701b-12	Floodplain Management Requirements	Established following construction, the non-federal sponsor (MSD) has full legal responsibility for replacing, repairing, and rehabilitating the flood protection facilities.
33 US Code, Title 33, Chapter 46, Section 3301	USACE Regulations regarding Operations and Maintenance of flood damage and reduction facilities	Established guidelines for maintenance and operation of levees, floodwalls, drainage structure, closures, pumping stations, channels and floodways.
42 US Code, Title 42, Chapter 68, Section 5165	Mitigation Planning	Provides information on the policies and procedures for mitigation planning as required by the provisions of section 322 of the Stafford Act, 42 U.S.C. 5165.

4.2.1 Metro Government Local Ordinances Related to Flood Protection

MSD is required to comply with the following local regulations related to the flood protection system.

- **Engineering Standards**. Louisville and Jefferson County MSD Design Manual

4.3 Flood Protection System Evaluation

As noted, the USACE inspect the ORFPS components every two years to ensure it remains fit for purpose. A more comprehensive evaluation was completed in 2019.

4.3.1 2019 USACE ORFPS Reliability Improvements Evaluation

The most recent condition assessment for MSD's ORFPS components was performed by the USACE in 2018-2019. The following conclusions were made[5]:

- The National Flood Insurance Program Levee System Evaluation determined the floodwall and levee features are in an acceptable condition.
- The 2019 Periodic Inspection rated the overall system as "minimally acceptable".
- The 2019 Semi-Quantitative Risk Assessment performed by USACE identified features with a performance issue to lessen likelihood or consequences of failure in accordance with Tolerable Risk Guidelines.
- MSD's CRRP recommended rehabilitation/expansion for 15 of the 16 aging flood pump stations to have sufficient capacity forecasted through 2065.

In 2019, the USACE completed its Feasibility Study and recommended projects needed to ensure flood protection levels meet today's standards. These projects may be eligible for federal dollars through USACE construction appropriation. The improvements are restricted for RELIABLITY purposes and exclude any capacity upgrades. The study indicated the following flood protection system needs:

- **Levee System**: Well maintained and has not had any significant performance issues during high water events, but no event has significantly loaded the levee system.
- **Mechanical/Electrical**: The systems are aging, and mechanical and electrical components are requiring regular and often significant maintenance each year.

[5] USACE Louisville Metro Flood Protection System, Emergency Supplemental Reconstruction Feasibility Study with Integrated Environmental Assessment, Volume 1, 2019.

- **Pumps & Motors**: Approximately 75% of the pumps and motors need rebuilt or replaced. The original pumps, motors, and ancillary systems are still in service and have not had a major rebuild since they were originally installed.

- **Control Systems**: 80% of the controls systems at the flood pump stations are outdated. The control systems are rudimentary by today's standards, requiring the station to be fully staffed at all times during flood pumping operations.

- **Transformers & Motor Control Centers**: 88% of the electrical components need to be replaced. The electrical system is original equipment, which cannot be repaired with currently available components.

- **Gates and Floodwalls**: 25% of the system needs to be replaced or refurbished: 15 new actuators, 13 new gates, and 10 gates to be refurbished. Most of the 152 gates are 65 years old.

The USACE identified $167 million of improvements needed to increase the reliability of the Flood Pump Stations (FPS) along the Ohio River as well as other components, such as gates and flood walls. The USACE will contribute approximately $109 million and MSD will contribute approximately $58 million toward the total cost. MSD does not have any control regarding the timing of projects completed by USACE. Therefore, MSD must be ready with its cost share portion at the USACE's schedule. Preliminary discussions have indicated design for the FPS Reliability Improvements Projects could begin in FY21 with construction advancing FY23 through FY 25.

In addition to these reliability improvements, the CRRP completed multiple evaluations of the 16 flood pump stations and identified additional needs that will not be addressed by the USACE's Reliability Improvements Program. A preliminary breakdown of the projects qualifying for the USACE Reliability Improvements Program and other CRRP projects not covered by USACE are listed in the table below. The 5-Year CIP includes MSD's full share of the USACE Reliability Improvements Program.

Table 4-2: Summary of Flood Protection System CIP Needs

Flood Protection System Project	Estimated USACE Participation for Reliability Improvements	Estimated MSD Participation for Reliability Improvements	CRRP FPS Improvements Not Included in Reliability Program
Paddy's Run FPS Improvements	$12,194,300	$6,566,000	$44,260,000
10th Street FPS Improvements	$2,131,200	$1,147,600	$750,000
17th Street FPS Improvements	$1,368,400	$736,800	$4,313,200
27th Street FPS Improvements	$3,701,300	$1,993,000	$10,027,000
34th Street FPS Improvements	$1,827,700	$984,200	$1,020,000

Flood Protection System Project	Estimated USACE Participation for Reliability Improvements	Estimated MSD Participation for Reliability Improvements	CRRP FPS Improvements Not Included in Reliability Program
4th Street FPS Improvements	$0	$0	$12,920,000
5th Street FPS Improvements	$1,403,800	$755,900	$700,000
Beargrass Creek FPS Improvements	$16,009,000	$8,620,200	$88,259,800
Bingham Way FPS Improvements	$0	$0	$6,590,000
Lower Mill Creek FPS Improvements	$3,481,000	$1,874,400	$11,575,700
Pond Creek FPS Improvements	$15,434,200	$8,310,700	$9,750,000
Riverport FPS Improvements	$1,358,200	$731,300	$5,378,700
Shawnee Park FPS Improvements	$7,832,600	$4,217,500	$38,512,500
Starkey FPS Improvements	$3,500,00	$1,885,100	$4,360,000
Upper Middle Creek FPS Improvements	$7,647,400	$4,117,900	$44,922,200
Western Parkway FPS Improvements	$1,183,300	$637,200	$21,832,900
Levees, Floodwalls, Gates & Closures	$19,846,400	$8,201,500	$1,049,700
Cultural Mitigation & Engineering	$13,529,200	$7,885,000	$0
TOTAL	**$108,948,000**	**$58,664,300**	**$306,221,700**

Note: The projects and preliminary costs presented in this table are for informational purposes only and are subject to change as discussions continue between MSD and the USACE. They represent a level of capital investment for each location. However, the actual costs are likely to vary from these preliminary values as projects are further planned and vetted.

4.4 Flood Protection Capital Projects

The projects completed since 2017 have primarily been focused on replacing aging assets (refer to Table 4-3). The 5-year CIP includes several projects that will increase the capacity of the flood pump stations and improve the overall system reliability.

4.4.1 Projects Funded from Program Notes

Minimal investment has been focused on the flood protection system due to the requirements of the Amended Consent Decree and other MSD priorities. MSD completed repairs for valves, gates, pump, and motors at six of the flood pump stations.

Table 4-3: Flood Protection Projects Completing Design/Construction Since 2017

Program	Budget ID	Project	Task Name	Finish	Lifetime Actuals
Flood Pump Station Improvements	F20265	Beargrass Creek Bay Gate 4 Repairs	Construction Finish	1/10/2020	$109,652
	F19277	Beargrass Creek FPS Wetwell Relief Gate	Design Finish	12/12/2019	$41,530
	F20013	Beargrass FPS Pump 8	Design Finish	12/3/2019	$491
	F19276	FPS Auto Grease Systems Upgrades	Design Finish	12/3/2019	$43,997
	F20240	Shawnee Park FPS Motor No 3 Emergency Repairs	Construction Finish	10/14/2019	$112,130
	F18295	Starkey Check Valve Replacement	Construction Finish	7/31/2019	$190,998
	F18302	Paddy's Run FPS Pumps 1, 2 and 6 Rehab	Design Finish	4/18/2019	$1,288,560
	F19269	Upper Mill Creek Emergency Pump Repairs	Construction Finish	4/17/2019	$1,092,856
	F18279	Paddys Run FPS Access Road	Construction Finish	11/30/2018	$293,034
	F18296	5th Street FPS Roof Replacement	Construction Finish	11/9/2018	$57,517
Levee, Floodwall, and Gate Improvements	F19245	Flood Gate 1 Replacement	Design Finish	9/24/2019	$106,466
	F16021	Gates 136 and 145 Floodwall Actuator Replacement	Construction Finish	4/11/2019	$592,816
	F19218	Flood Gate 110 and 111 Elimination	Construction Finish	2/21/2019	$54,641
TOTAL FLOOD PROTECTION PROJECTS					**$3,984,688**

4.4.2 5-Year CIP for Flood Protection System

MSD is forecasting to spend $153 million of the $306 million of flood protection needs during the 5-year CIP. These projects are not part of the USACE Reliability Improvements Program. The ORFPS is a critical component for public protection and as such has become a priority for the capital program. During the 5-year CIP, the following Flood Pump Station Capacity Upgrades projects will be partially or wholly budgeted. These projects were identified and estimated in the CRRP.

Table 4-4: Summary of 5-Year CIP Forecasted Spending for ORFPS

CIP Program	Project	5-Year CIP Forecasted Spending
Capacity or Electrical Improvements	10th Street FPS - Generator Improvements	**$99.7 million**
	17th Street FPS - Capacity and Generator Improvements	
	27th Street FPS - Capacity and Generator Improvements	
	34th Street FPS - Generator Improvements	
	4th Street FPS - Capacity and Electrical Service Improvements	
	5th Street FPS - Generator Improvements	
	Bingham Way FPS - Capacity and Generator Improvements	
	Paddys Run FPS Capacity Upgrade	
	Pond Creek FPS - Electrical Service Improvements	
	Starkey FPS Transformer Replacement and Generator	
	Upper Mill Creek FPS Transformer Replacement	
Asset Management Improvements	Beargrass Creek FPS Wetwell Relief Gate	**$53.5 million**
	Beargrass FPS Pump 8	
	Flood Gate 1 Replacement	
	FPS Auto Grease System Upgrades	
	Flood Structures & Flood Pump Station Equipment R&R	
	Gate 102 Replacement	
	Paddy's Run FPS Pumps 1, 2, and 6 Rehab	
	Pond Creek Emergency Pump Repairs	
	Canal Street Floodwall	
	Total 5-Year CIP Forecast	**$153.2 million**

Note: These projects exclude MSD's $58 million participation in the USACE Reliability Improvements Program

- **Paddy's Run FPS Capacity Improvements**: The $79 million Paddy's Run Flood Protection Station Capacity Improvements project is MSD's highest ranked capital priority to mitigate flood pump station public health protection risk. MSD completed an Alternatives Analysis for increasing the capacity of the station to 975 mgd. The CRRP recommended two equally important project phases for the Paddy's Run FPS. The first phase will improve the reliability of the existing Paddy's Run FPS (originally constructed in 1953) by removing, inspecting, and rehabilitating or replacing the station's existing pumps and motors to maintain the station's current total pumping capacity of 925 mgd. The reliability improvements will be implemented through the USACE Program. MSD must construct the capacity improvements project independent of the USACE project.

As noted in Table 4-3, MSD funds the following appropriations annually in support of activities related to the flood protection system:

- **Flood Pump Station Equipment Repair & Replacement**: This annual appropriation is intended to better facilitate key equipment replacements. Funds are budgeted to replace pumps, motors, electrical switchgear, generators, and other critical equipment. MSD budgets approximately $1 million per year to support this effort.

- **Flood Structures Repair & Replacement**: MSD maintains a proactive maintenance program to assure the integrity of the levee and floodwall system. Worked performed using these funds includes: repair and/or replacement of trusses, sheeting, and closure walkways; corrugated metal pipe replacement; toe drain access repairs; trail repairs and unwanted vegetation removal; level gate repair or automation; painting; floodwall joint repair; and floodwall concrete sealing and surface crack repairs. MSD budgets approximately $2 million per year to support the program.

5. Wastewater Collection System

Like many cities developing in the 19th century, Louisville's sewers were constructed many decades prior to the construction of the treatment facilities. MSD's first sewers were installed before 1850 and routed directly to the Ohio River. By the end of the 19th century, the collection system had expanded to almost 100 miles of clay, brick, and timber-lined sewers. Today, MSD has over 3,200 miles of sewers, approximately 500 miles being over 100 years old. The oldest sewers in the system are primarily in the combined sewer system built between the 1860s to the 1950s. Beginning in 1955, all of the sewer systems built in the Louisville Metro area have been separate sanitary sewers. MSD's first Sewer Master Plan was developed in 1964.

MSD serves approximately 243,000 customer accounts and 650,000 people. The collection system operated and maintained by MSD includes:

- 256 wastewater pump stations
- ≈79,000 manholes
- ≈2,500 miles of sanitary sewers
- ≈700 miles of combined sewers (24,000 acres)
- ≈160 miles of force mains
- ≈1,400 miles of lateral connections to buildings
- Real Time Control facilities to reduce overflows 48%
- In-Line Storage Systems
- Waterway Protection Tunnel for wet weather management (currently under construction)

A breakdown of the major collection components by sewershed is presented in Table 5-1.

Table 5-1: Inventory of Wastewater Collection System by Sewershed

WQTC SEWERSHED	MANHOLES	GRAVITY SEWERS (FT)	PUMP STATIONS	FORCE MAINS (FT)
Morris Forman	41,315	9,055,643	94	325,109
Derek R. Guthrie	21,184	4,777,509	41	75,831
Hite Creek	5,089	963,949	51	190,596
Floyds Fork	5,256	966,863	34	125,576
Cedar Creek	5,998	1,114,183	36	136,648
Total	**78,842**	**16,878,147**	**256**	**853,760**

5.1 Wet Weather Storage

Under the Amended Consent Decree, MSD constructed the wet weather storage facilities listed in Table 5.2. These systems are consistent with the USEPA's Nine Minimum Controls (NMC) Program that requires utilities to maximize storage within the collection system. Many of MSD's wet weather storage facilities are operated using real-time control (RTC) to optimize available flow and storage capacities within the wastewater collection system.

A summary of MSD's wet weather storage systems is presented in Table 5-2. These systems are preventing billions of gallons of sewer overflows from occurring. In FY19 nearly 2 billion gallons of flow was stored in the system and later treated – in lieu of resulting in unauthorized discharges. In FY20, through March 31st, nearly 1.3 billion gallons have been stored and subsequently treated. These systems are proving to be very effective with managing wet weather flows.

Table 5-2: Wet Weather Storage Systems

Wet Weather Storage and Real Time Control	Capacity (MG)	Date Storage On-line	FY19 Volume Stored (MG)	FY20 Volume Stored* (MG)
Southwestern Pump Station Sluice Gates Chamber (SWSG)	14.25	2006	484.85	267.65
Southwest Outfall Retention Basin #2 (SWOR2)	4.1	12/31/2008	151.75	67.65
Brady Lake & Executive Inn Storage Basin (Upper Dry Run Trunk System)	21.5	2006	278.85	221.15
Ashland In-Line Storage Facility	1.0	2008 Upgraded 2019	361.45	15.8
Southern Outfall In-Line Storage @43rd Street (SOR1)	14.05	11/30/2018	29.75	272.85
Ohio River Interceptor (MDS)	1.8	2008	205.85	69.25
Sneads Branch In-Line Storage	2.5	9/30/2006	56.85	19.65
Logan & Breckinridge Street CSO Basin	17	12/20/2017	317.55	234.3
Nightingale Pump Station Replacement & Storage (NGPS)	8.0	6/30/2017	11.4	21.85
Clifton Heights CSO Storage Basin	6.9	12/21/2018	13.6	44
Southwestern Parkway Storage Basin	17.5	3/29/2019	0	45
Portland CSO Basin	6.7	8/30/2019	0	0
Total	**115.3**		**1,911.9**	**1,279.15**
Waterway Protection Tunnel	52.2	Future	0	0
Idlewood Inline Storage	TBD	Future	0	0

**FY20 Volume Stored July 1, 2019 through March 31, 2020.*

5.2 Service Area

By Kentucky state statute, MSD is authorized to provide wastewater collection, treatment, and disposal services in Jefferson County. Through interlocal agreements, MSD also provides these services to portions of Oldham County and small parts of Bullitt County (refer to Figure 5-1). This area includes approximately 270 square miles and serves approximately 243,000 customers.

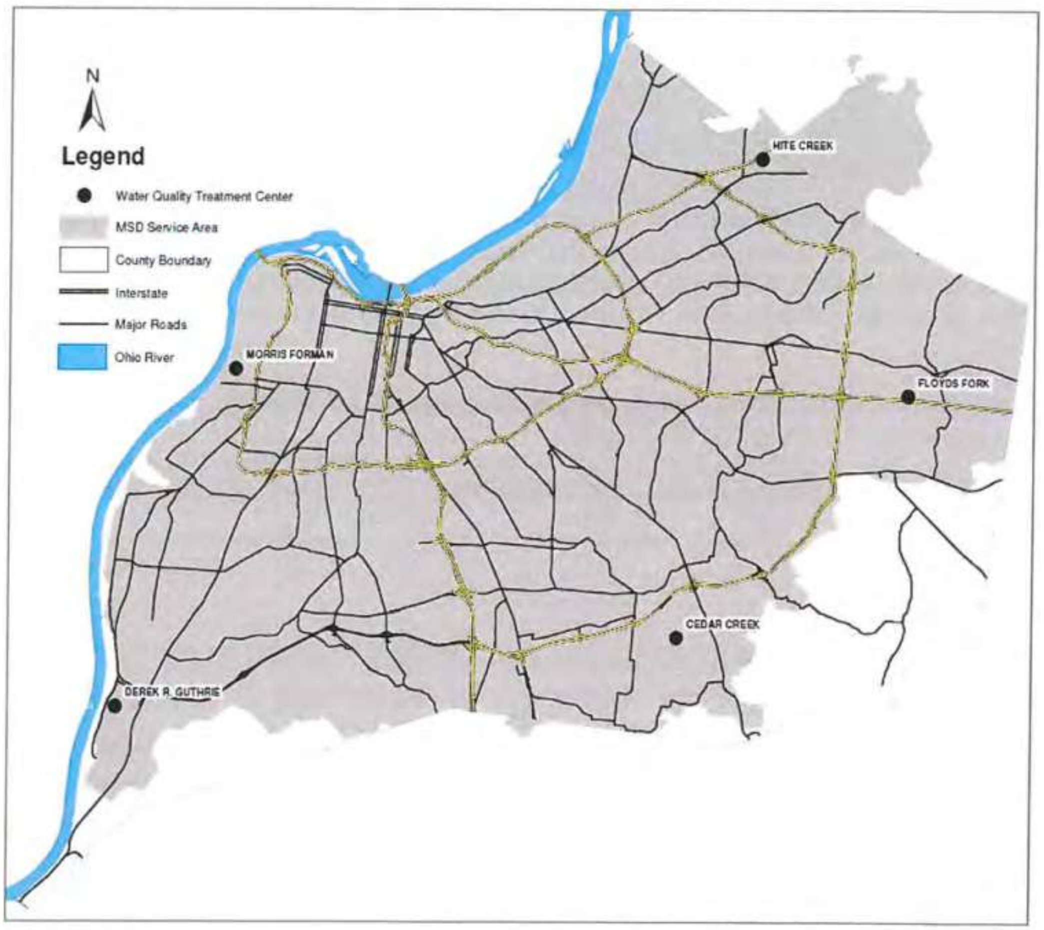

Figure 5-1: MSD's Wastewater Service Area

5.3 Regulatory Requirements

MSD is required to comply with the regulations listed in Table 5-3 related to wastewater systems as referenced in the Kentucky Revised Statutes (KRS).

Table 5-3: Federal and State Applicable Wastewater Regulations

Reference	Title	Description
401 KAR 5:050, 5:060; 5:065 KRS 224.16-050	Permits and Planned Changes	Establishes fees and procedures to obtain a permit and criteria for alterations or additions that must obtain a permit.
401 KAR 5:005	Permits to construct, modify or operate a facility	Establishes when permits are required for construction, of sewer line extensions & defines application submittals and fees.
401 KAR 5:006	Wastewater Regional Planning Requirements	Defines requirements for Regional Facility Plan to construct new infrastructure to serve 30% more of the population.
401 KAR 5:010 401 KAR 11:030 KRS 224.73-110	Operation of Wastewater Systems by Certified Operators	Establishes requirements for certification of collection system operations staff. Specifies Operator in Training Program requirements.
401 KAR 5:015	Releases to be Reported	Establishes reporting requirements for certain releases, spills, and bypasses of pollutants into the environment.
401 KAR 5:065 KRS 224.99-010	Monitoring & Records	Establishes information retainage requirements for monitoring and performance records.
401 KAR 5:055 KRS 224.70-110 40 CFR Part 403	Pretreatment Requirements	Establishes pretreatment requirements as part of the Kentucky Pollutant Discharge Elimination System (KPDES). Provides for the protection of domestic wastewater facilities from pass through or interference from pollutants contributed by industrial users of the domestic wastewater facility.
401 KAR 5:320	Wastewater Laboratory Certification Program	Defines the minimum laboratory quality assurance, methodological and reporting requirements.
KRS 224.73-120	Monitor/Report Introduction of Incompatible Pollutants	Authorizes application of monitoring, record keeping, and reporting requirements of pollutants which interfere with, pass through, or are otherwise incompatible with WQTC.

5.3.1 Metro Government Local Ordinances Related to Wastewater Collection

MSD is required to comply with the following local regulations related to the wastewater collection system.

- **Sewerage Plan Review and Inspection**. Louisville Metro Government Code of Ordinances, Title V, Chapter 50.06
- **Capacity Charge**. Louisville Metro Government Code of Ordinances, Title V, Chapter 50.45-48.
- **Engineering Standards**. Louisville and Jefferson County MSD Design Manual.

5.3.2 IOAP/Consent Decree Work

As has been noted throughout this report, much of MSD's annual capital program has been focused on the Consent Decree Requirements. The following projects were completed since the 2017 bonds were issued. The Waterway Protection Tunnel was under construction and has required significant capital investment to-date.

Table 5-4: Consent Decree Projects Completing Design/Construction Since 2017

Program	Budget ID	Project	Task Name	Finish	Lifetime Actuals
Sewer Separation Projects	H20215	Camp Taylor 2A SSR - Union St Sewers	Construction Finish	2/16/2020	$41,676
Wet Weather Storage Capacity & Real Time Control Projects	H09125	Portland CSO Basin	Construction Finish	8/9/2019	$37,829,646
	D17047	MF Brady Lake and Executive Inn Gate Study	Study Finish	7/25/2019	$37,992
	H09132	Southwestern Parkway Storage Basin	Construction Finish	5/10/2019	$80,623,143
	H09123	Clifton Heights Storage Basin	Construction Finish	11/15/2018	$33,934,464
	H09133	Waterway Protection Tunnel	Construction In-Progress		$113,500,000
TOTAL CONSENT DECREE PROJECTS					**$265,966,921**

5.3.3 Remaining IOAP/Consent Decree Work

The cost of the capital improvements required to be completed under the Amended Consent Decree is currently estimated to be $1.5 billion of which MSD has spent $1.01 billion as of April 30, 2020.

During the 5-year CIP, construction for the Waterway Protection Tunnel will be completed. The remaining SSDP projects will be phased over time. The specific timing for each remaining project is currently under discussion with the federal and state Regulators. The remaining Consent Decree work to be completed includes the following projects.

- **Waterway Protection Tunnel ($55 million remaining):** The last Long-Term Control Plan project (Waterway Protection Tunnel) remains under construction with an estimated completion date in FY22. The following LTCP projects are nearly completed:
    - I-64 and Grinstead CSO Interceptor
    - Lexington and Payne CSO Interceptor
    - Rowan Pump Station & Downtown CSO Interceptor

- **Sanitary Sewer Discharge Plan (SSDP) Projects ($144 million remaining):** MSD must complete several remaining projects identified in the SSDP. The schedule for completion of these projects is currently under discussion with the Regulators given other urgent needs that have developed over the past few years related to Biosolids Management and the Ohio River Flood Protection System. The following SSDP projects have yet to be completed:

  - ***Sewer Projects***
    - Little Cedar Creek Interceptor Improvements
    - Dell Road and Charlaine Parkway Interceptor Improvements
    - Sutherland Interceptor

  - ***Storage Projects***
    - Idlewood Inline Storage
    - Gunpowder Pump Station In-Line Storage
    - Lucas Lane Pump Station Inline Storage
    - Goose Creek Pump Station Storage

  - ***Pump Station Projects***
    - Raintree Court & Marian Court Pump Station Eliminations Phase 1A
    - Bardstown Road Pump Station Improvements
    - Cinderella Pump Station Elimination
    - Kavanaugh Road Pump Station Improvements
    - Leven Pump Station Elimination
    - Monticello Pump Station Elimination
    - Mellwood System Pump Station Eliminations
    - Upper Middle Fork Pump Station

- **Upper Middle Fork Pump Station ($86 million remaining):** The largest remaining SSDP project is the Upper Middle Fork bundle. This project includes replacement of the existing Upper Middle Fork Pump Station, which has a current capacity of 9 mgd, with a new efficient 30 mgd pump station. A relief interceptor will convey flows in excess of the current interceptor capacity, and a diversion gate will be installed on the existing interceptor to force flows into the pump station. This timing for completing this project is under discussion with the Regulators.

- **IOAP Support Projects (approximately $2 million per year):** Annual support for post construction compliance monitoring and external resources to assist with IOAP modifications is included in this investment.

5.4 Wastewater Collection System Programs

MSD administers and manages several programs related to the wastewater collection system. The key programs are summarized herein.

5.4.1 Capacity, Management, Operations and Maintenance (CMOM) Program

MSD's Consent Decree requires implementation of a CMOM Program including major renewal and replacement projects at the Hite Creek, Floyds Fork, Cedar Creek, and Derek R. Guthrie WQTCs to ensure MSD can maintain effective wastewater collection, transmission, and treatment. The CMOM Program provides proactive asset management of sewers, pump stations, and major interceptors that make up most of MSD's collection system. CMOM compliance is required as a component in each WQTC's KPDES permit with the following stated comprehensive CMOM Program goals:

- To better manage, operate, and maintain the collection system
- Investigate capacity constrained areas of the collection system
- Proactively prevent or minimize SSOs
- Respond to SSO events
- Proactively prevent or minimize the potential for release of pollutants

5.4.2 Industrial Pretreatment Program

MSD is the administering agency for the Metro Louisville Hazardous Materials Ordinance (HMO) and the approval authority for Hazardous Material Spill Prevention and Control (HMPC) Plans mandated by this ordinance. This ordinance was created for the protection of public health and safety in Louisville Metro, through the prevention and control of hazardous materials incidents and releases and the timely reporting of releases. The ordinance has been incorporated into MSD's Industrial Pretreatment Program which has the following objectives:

- Protect the Water Quality Treatment Centers and sewer collection system
- Protect the health and safety of MSD workers and general public
- Protect the waterways
- Prevent violations of permits
- Enhance biosolids reuse and water reclamation

The Industrial Pretreatment Program is subdivided into the following programmatic areas:

- **Fats, Oils and Grease (FOG) Program**: MSD's FOG Management Policy requires Food Service Establishments to use grease traps and/or grease interceptors to prevent FOG clogs. These devices must be certified annually by an MSD approved Certified Grease Waste Hauler or Plumber.

- **Dental Amalgam Program**: designed to reduce the amount of toxic metals entering the sanitary sewer system. MSD requires all dental facilities that discharge into the sanitary sewer system to complete a one-time compliance report for dental dischargers.

- **Unusual Discharge Request (UDR) Program**: Any short-term one-time discharge to the sewer system requires approval through MSD's UDR Program. The program gives MSD control over the type and characteristics of the wastewater being discharged to ensure that contaminants that might cause problems at the treatment plants are not allowed to enter the sewer system.

- **Pretreatment Requirements Review and Modification**: The Nine Minimum Control Program reviews and modifies business and industry wastewater pretreatment requirements in order to minimize the impacts of non-domestic dischargers on CSOs.

5.4.3 Nine Minimum Controls Program

MSD's Consent Decree requires compliance with the USEPA NMC Program that was initially developed as part of the Clean Water Act CSO Policy to address combined sewer system best management practices that do not require significant construction. NMC projects tend to be technology based. NMC programmatic compliance is required in the Morris Forman WQTC KPDES Permit. The 20-year CRRP includes projects focused on NMC including 1) real-time control (RTC) of assets in the combined sewer system and 2) capacity upgrades for WQTCs to maximize the flow able to be received and processes at the treatment plants.

The 5-year CIP includes projects for NMC including: annual as-needed appropriations for NMC improvements, CSO inspection cameras, and RTC refinements.

NMC #3 – Maximize Collection System Storage

- SGC RTC Enhancements Project
- NMC RTC Support, $2.4 million (as-needed annual appropriations)
- NMC Program Support, $690,000 (as-needed annual appropriations)

NMC # 4 – Maximize Flow to WQTC

- CCWQTC Expansion
- HCWQTC Expansion

NMC # 9 – Monitor CSO Controls

- NMC CSO Inspection Cameras, $445,000 (as-needed annual appropriations)

5.4.4 Sewer Asset Management Program

Asset management programs are required to ensure assets perform as intended and are available when needed. While the Consent Decree focused on constructing new assets to address wet weather and mitigate resulting overflows, asset management focuses on minimizing the risk of failure for existing assets. USEPA recognizes the importance of asset management and requires utilities to comply with programs intended to keep existing infrastructure fit for purpose.

Sewers represent some of the oldest components of the wastewater system. Some of MSD's sewers are 150 years old. MSD utilizes an industry-standard risk scoring system for the sewers. In total MSD estimates $2.2 billion is needed to address all sewer rehabilitation and known structural deficiencies.

MSD is focusing on large diameter interceptors for rehabilitation. Significant major interceptor failure has occurred in the past two years due to severe deterioration of large pipe segments. USEPA noted in its 2019 Inspection Report[6] that MSD had 12 major pipe collapses in a 15-month period. In addition to the Large Diameter Interceptor Rehabilitation Program, MSD continues to improve sewers and pump stations throughout the District.

5.4.5 Planning Initiatives

The 5-year CIP includes the following planning initiatives related to the wastewater collection system. These plans will be utilized to implement a comprehensive asset management program, prioritize capital needs, and update the CRRP.

- Odor Management Plan, $250,000
- SCADA Master Plan, $796,000
- Wastewater Pump Stations Facility Asset Management Plan, $750,000

5.5 Wastewater Collection System Capital Projects

MSD continues to fund wastewater collection projects with its annual CIP. Projects are generally a combination of discrete local improvements and appropriations for District-wide needs/services.

5.5.1 Projects Funded from Program Notes

Projects completed since the 2017 bond issuance have addressed both sewer and pump station needs. The largest project, the Ohio River Interceptor Structural Rehabilitation Project, necessitated expensive sewer repairs and replacement for portions of the major interceptor that failed in downtown Louisville.

[6] United States Environmental Protection Agency, Region 4, Water Protection Division, NPDES Permitting and Enforcement Branch, Compliance Evaluation Inspection Report, Louisville & Jefferson County Metropolitan Sewer District, June 25, 2019.

Table 5-5: Wastewater Collection Projects Completing Design/Construction Since 2017

Program	Budget ID	Project	Task Name	Finish	Lifetime Actuals
Real Time Control Facilities	F16003	Ashland RTC Facility Upgrades	Construction Finish	6/25/2019	$469,839
Pump Stations	H20153	SWPS Flood Repair	Design Finish	1/14/2020	$79,852
	E15033	Shively Pump Station Generator Replacement	Construction Finish	10/30/2019	$1,723,284
	D19275	MDS Downstream Flow Meter	Design Finish	9/17/2019	$251,121
	H19288	Terra Crossing Pump Station Upgrades	Construction Finish	6/30/2019	$13,361
	G18326	Catalpa Farms PS Odor Control Evaluation	Evaluation Finish	3/8/2019	$22,009
	F19234	Breakwater PS Electrical Modifications	Construction Finish	12/27/2018	$15,717
	A18324	Oreland Mill Pump Station Elimination	Construction Finish	5/2/2019	$294,952
Sewers	D18285	ORFM Odor and Corrosion Control	Design Finish	3/3/2020	$289,231
	H19142	Upper Floyds Fork Interceptor	Design Finish	2/4/2020	$232,887
	H16074	Nightingale Rehab	Design Finish	10/8/2019	$427,268
	A16073	Mud Lane Interceptor	Design Finish	8/6/2019	$1,490,854
	H19247	I-64 and Grinstead CSO Interceptor	Design Finish	4/2/2019	$5,396,037
	A18353	Ohio River Interceptor Structural Rehabilitation	Construction Finish	12/15/2018	$18,442,150
TOTAL WASTEWATER COLLECTION PROJECTS					**$29,148,562**

5.5.2 5-Year CIP for Wastewater Collection System

The following priorities are forecasted in the 5-year CIP to address deficiencies and mitigate risks for the wastewater collection system totaling $182 million. A breakdown of the projects is provided in Figure 5-2 and Table 5-6.

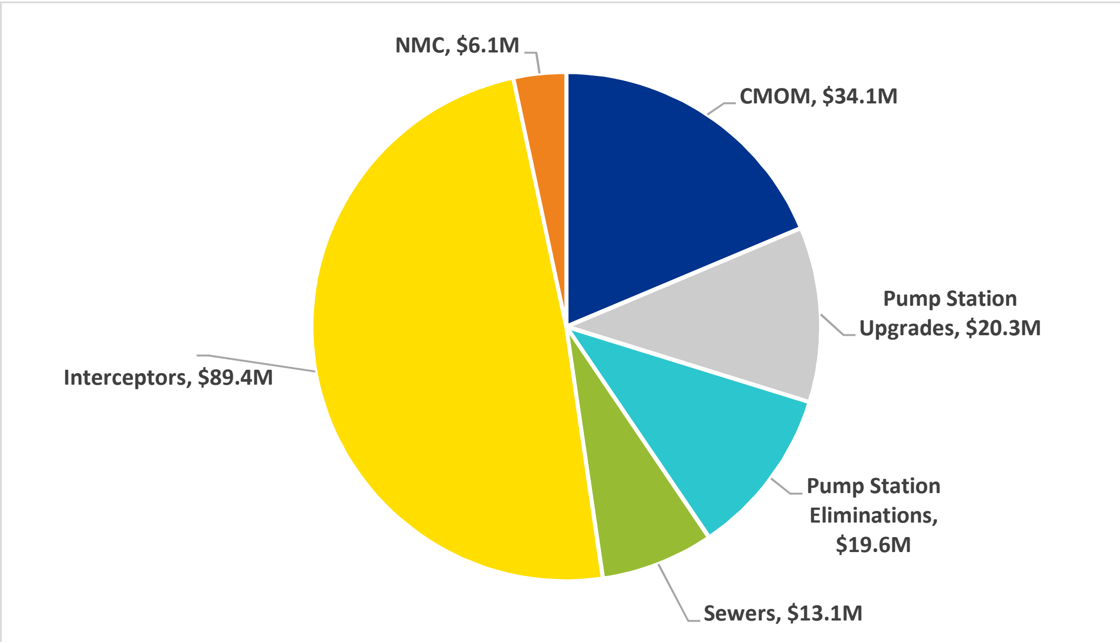

Figure 5-2: Summary of 5-Year CIP for Wastewater Collection System

Table 5-6: Overview of 5-Year Forecasted Spending for Wastewater Collection System

<table>
<tr><th colspan="2">Wastewater Collection System Priorities</th><th>5-Year CIP Forecasted Spending</th></tr>
<tr><td rowspan="15">Pump Station Projects</td><td>Enhanced Odor Control for Pump Stations</td><td rowspan="8">CMOM Program Pump Stations $18.8 million</td></tr>
<tr><td>Back-Up Power for Critical Pump Stations</td></tr>
<tr><td>Inventory for Critical Pump Stations</td></tr>
<tr><td>Upgrade Critical Pump Stations with</td></tr>
<tr><td>CMOM Collection System Pump R&R</td></tr>
<tr><td>CMOM Grinder R&R</td></tr>
<tr><td>CMOM I&C Implementation</td></tr>
<tr><td>CMOM Pump Station Generator Upgrades</td></tr>
<tr><td>Asset Management Pump Stations R&R</td><td rowspan="7">Pump Station Improvements $20.3 million</td></tr>
<tr><td>PS Replacement or Overhaul Projects</td></tr>
<tr><td>Northern Ditch Pump Station Replacement & Odor Control</td></tr>
<tr><td>Prospect Phase II PS Rehabilitation</td></tr>
<tr><td>Shively Area Suite PS Upgrades</td></tr>
<tr><td>Sneads Branch Pump Replacement</td></tr>
<tr><td>Southwestern Pump Station Improvements</td></tr>
</table>

Wastewater Collection System Priorities		5-Year CIP Forecasted Spending
	Bluegrass Fields PS Renovation	
	Admiral Way PS Foundation Repairs	
Sewer Projects	Gravity Line Cleaning and Inspection	**CMOM Program Sewers $15.3 million**
	Program Management Assistance	
	CMOM SCAP, AAM, & FOG Programs	
	Operations R&R	
	Broadfern Pump Station Elimination	**Pump Station Eliminations $19.6 million**
	Gorham Way Pump Station Elimination	
	Kirby Lane Pump Station Elimination	
	Lake Forest Pump Station Eliminations	
	Lea Ann Way Pump Station Eliminations	
	Modesto Pump Station Elimination	
	Pirogue Pump Station Elimination	
	Shady Villa Pump Station Elimination	
	Shively Area Suite Pump Station Eliminations	
	Rehl Road East SSES	**Sewer Projects $13.1 million**
	Harrods Creek Force Main Repair	
	KTC Greenwood Road Assessment	
	Middle Fork Beargrass Creek SSR Phase 1	
	ORFM Odor and Corrosion Control	
Large Diameter Interceptor Projects	Broadway Interceptor Rehabilitation	**Interceptor Rehabilitation Projects $89.4 million**
	Buechel Branch Interceptor Rehabilitation	
	I-64 and Grinstead Interceptor Rehabilitation	
	Interceptors Rehabilitation and Replacement	
	Western Outfall Infrastructure Rehabilitation	
	Large Diameter Interceptor Rehabilitation Program	
	Nightingale Interceptor Rehabilitation	
	Rudd Avenue Sewer Rehabilitation	
Nine Minimum Control Projects	CSO Inspection Cameras	**NMC Projects $6.2 million**
	RTC Support Services	
	SGC RTC Enhancements	
	Total 5-Year CIP Forecast for Wastewater Collection System	**$182.7 million**

Note: excludes projects listed in the Consent Decree

6. Wastewater Treatment

MSD was formed in 1946, and the first treatment plant went into operation in 1958. MSD's Southwestern Outfall Pump Station went online in 1959 and pumped wastewater from the system's largest sewer to the first wastewater plant (Morris Forman). Although the 1964 Countywide Sewer Master Plan specified new treatment plants, a lack of financing for large treatment plants and their associated trunk sewers delayed their construction. As such septic systems and package treatment plants were constructed and/or installed by land developers and homeowners through the mid-1970s. By mid-1972, there were more than 300 small treatment plants in Jefferson County. In 2016, MSD decommissioned the final remaining package treatment facility leaving five regional water quality treatment centers (WQTC) to serve all of Louisville and Jefferson County. Elimination of these facilities in conjunction with removing 40,000 septic systems has helped improve the quality of local streams and the Ohio River. A summary of MSD's existing treatment facilities provided below.

- **Cedar Creek WQTC**: The Cedar Creek WQTC was originally constructed in 1995 with a capacity of 2.2 mgd. In 2005, the plant capacity was expanded to 7.5 mgd average daily flow (ADF). Today, approximately 5 mgd of flows are treated and disinfected (UV) before being released into Cedar Creek.

- **Derek R. Guthrie WQTC**: The original facilities at the Derek R. Guthrie WQTC site consisted of a screening chamber and a raw sewage pump station brought online in 1979. The secondary treatment facilities were brought online in 1986 when the WQTC was known as the West County Wastewater Treatment Plant. The WQTC had a capacity of 15 mgd with peak flow of 30 mgd. Plants expansions in 2001 and 2004 increased the ADF capacity to 30 mgd. In 2012 additional facilities enabled the WQTC to treat up to 200 mgd of wet weather flow using a modified contact stabilization process. Further improvements have since been constructed to increase plant capacity to 60 mgd ADF and 300 mgd peak (for short durations). MSD began construction of a new dewatering facility in 2019 to receive biosolids from all the regional WQTCs. Construction is scheduled for completion in FY22. Today approximately 40 mgd of flows are treated and disinfected (sodium hypochlorite) before being released into the Ohio River.

- **Floyds Fork WQTC**: The Floyds Fork WQTC was originally constructed in 2001 at a capacity of 3.25 mgd. In 2012, a major plant expansion increased capacity and added sludge holding tanks. Today approximately 3.5 mgd of flows are treated and disinfected (UV) before being released into Floyds Fork.

- **Hite Creek WQTC**: The Hite Creek WQTC was originally constructed in 1970 with a capacity of 2.2 mgd to serve the Ford truck assembly plant and its surrounding neighborhoods. The capacity of the treatment center was expanded to 6.6 mgd to eliminate sanitary sewer overflows upstream of the treatment center and allow for future growth. The WQTC is under construction to expand its capacity to 9 mgd ADF and 24 mgd peak flow. Construction is scheduled for completion in FY22. Today approximately 4.4 mgd of flows are treated and disinfected (UV) before being released into Hite Creek.

- **Morris Forman WQTC**: The Morris Forman WQTC was originally constructed in 1956 for preliminary and primary treatment and was referred to as the Fort Southworth Plant. It was designed to receive a maximum daily flow of 105 mgd and peak hour flow of 338 mgd. Secondary treatment facilities were installed in the 1970s in accordance with federal regulations. The plant was named after MSD's retired executive director. Plant upgrades in late 1990s and early 2000s improved performance and increased treatment capacity to its current level of 120 mgd with peak flow capacity of 350 mgd. Today approximately 100 mgd of flows are treated before being released into the Ohio River. The Morris Forman WQTC is the largest facility in Kentucky and treats over 70% of the wastewater generated in MSD's service area; including the entire combined sewered area.

- **Bells Lane WWTF**: The Bells Lane WWTF was brought online in 2017. The project converted an existing 105 mgd dry-pit pump station to a 160 mgd submersible pump station and added 1) screening and grit facilities; 2) 50 mgd high rate treatment basin to provide chemically-enhanced primary sedimentation; 3) disinfection/dechlorination; and 4) 25 MG equalization basin.

6.1 Service Area

As noted, MSD owns five WQTCs and one WWTF as shown in Figure 6-1.

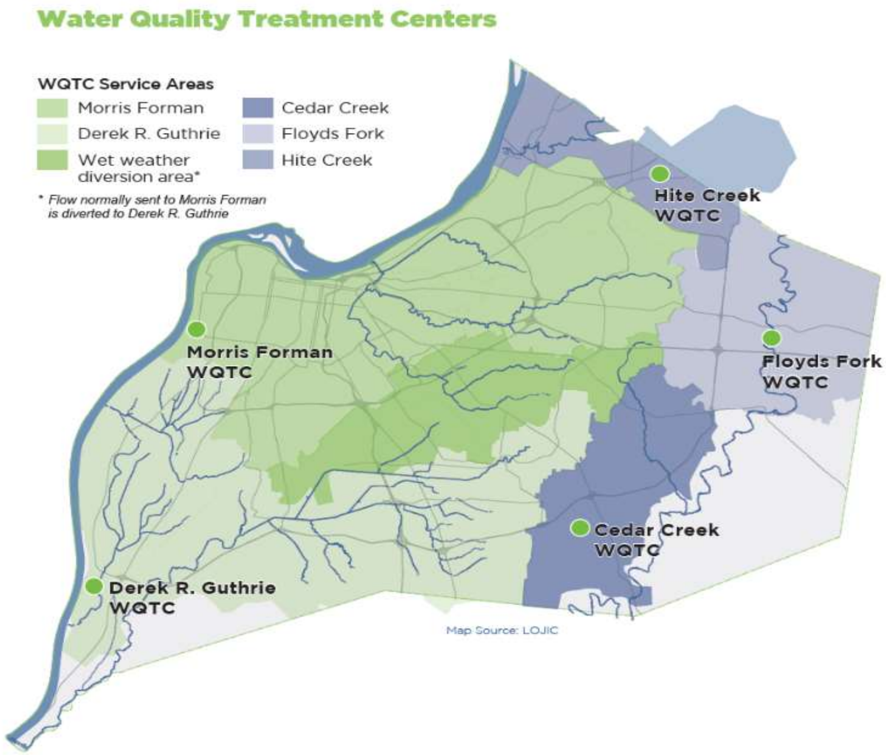

Figure 6-1: MSD's Water Quality Treatment Centers Service Areas

6.2 Regulatory Requirements

The District is required to comply with the regulations listed in Table 6-1 related to wastewater treatment systems as referenced in the Kentucky Revised Statutes (KRS).

Table 6-1: Federal and State Applicable Wastewater Treatment Regulations

Reference	Title	Description
KRS 224.16-050	Permits and Planned Changes	Establishes fees and procedures to obtain a permit and criteria for alterations or additions that must obtain a permit.
KRS 224.70-130 **401 KAR 5:080**	Criteria & Standards for KPDES	Establishes criteria and fees for permit to discharge into waters of the Commonwealth.
401 KAR 5:005	Permits to construct, modify or operate a facility	Establishes when permits are required for construction, of sewer line extensions, WQTC improvements, or new discharges & defines application submittals and fees.

Reference	Title	Description
401 KAR 5:006	Wastewater Regional Planning Requirements	Defines requirements for Regional Facility Plan to construct new WQTC, expand existing WQTC by 30%, or serve 30% more of the population.
401 KAR 5:010 **401 KAR 11:030** **KRS 224.73-110**	Operation of Wastewater Systems by Certified Operators	Establishes requirements for certification of domestic wastewater treatment plant and collection system operations staff. Specifies Operator in Training Program requirements.
401 KAR 5:015	Releases to be Reported	Establishes reporting requirements for certain releases, spills, and bypasses of pollutants into the environment.
401 KAR 5:026	Designated Uses of Surface Waters	Establishes surface water designations of creeks and rivers and the associated water quality criteria.
401 KAR 5:029 **401 KAR 5:031** **401 KAR 10:030**	Antidegradation Policy Surface Water Standards	Establishes water quality criteria.
401 KAR 5:035 **401 KAR 5:045** **401 KAR 5:060**	Treatment Requirements and Compliance	Establishes minimum treatment requirements for domestic wastewater facilities and associated water quality sampling frequency.
401 KAR 5:065 **KRS 224.99-010**	Monitoring & Records	Establishes information retainage requirements for monitoring and performance records.
401 KAR 5:055 **KRS 224.70-110** **40 CFR Part 403**	Pretreatment Requirements	Establishes pretreatment requirements as part of the Kentucky Pollutant Discharge Elimination System (KPDES). Provides for the protection of domestic wastewater facilities from pass through or interference from pollutants contributed by industrial users of the domestic wastewater facility.
401 KAR 5:320	Wastewater Laboratory Certification Program	Defines the minimum laboratory quality assurance, methodological and reporting requirements.
KRS 224.73-120	Monitor/Report Introduction of Incompatible Pollutants	Authorizes application of monitoring, record keeping, and reporting requirements of pollutants which interfere with, pass through, or are otherwise incompatible with WQTC.
401 KAR 45 **40 CFR 503**	Sludge Disposal	Establishes procedures and requirements for disposal of biosolids.
401 KAR 52:020	Title V Air Permits	Establishes requirements for air contaminant sources located in Kentucky that are required to obtain a Title V permit.

6.2.1 Metro Government Local Ordinances Related to Wastewater Treatment

MSD is required to comply with the following local regulations related to the wastewater treatment:

- **Engineering Standards**. Louisville and Jefferson County MSD Design Manual.

6.2.2 Morris Forman WQTC Agreed Order

The Morris Forman WQTC experienced multiple non-compliance events due in part to 1)a lightning strike and 2) accelerated deterioration of the biosolids system. MSD is working with the KDEP to develop/execute a Corrective Action Plan (CAP) to address the deficiencies at the plant that are contributing or have the potential to contribute to permit exceedances. The projects included in the 5-Year CIP that have been suggested as candidates for the CAP are listed in Table 6-2.

Table 6-2: MFWQTC Projects Under Agreed Order CAP Consideration

MFWQTC Treatment Process	Morris Forman Agreed Order Projects	Estimated Completion Date
Primary Treatment	D17042 | MFWQTC Sedimentation Basin Rehabilitation	June 30, 2024
	D19227 | MFWQTC Primary Sludge Line Replacement	July 31, 2020
	New_BD096 | MFWQTC Primary Sludge Line Replacement Phase 2	June 30, 2022
Secondary Treatment	D18160 | MFWQTC Secondary Clarifiers Structural Repairs	June 30, 2024
	D20229 | MFWQTC Clarifier Floor Repairs	January 31, 2021
Disinfection	D18159 | MFWQTC HPO Tanks Structural Repairs	June 30, 2024
	D18161 | MFWQTC Chlorine Contact Tanks Structural Repairs	June 30, 2024
Final Effluent Pump Station (FEPS)	D18130 | MFWQTC FEPS MCC Replacement	June 30, 2021
	D18162 | MFWQTC FEPS Structural Repairs	June 30, 2024
	D19307 | MFWQTC FEPS VFD Replacement	Sept 30, 2020
	Multiple | MFWQTC FEPS Pump and Motor Repair	June 30, 2024
Biosolids	D18158 | MFWQTC Digester Control Building Structural Repairs	June 30, 2024
	D19045 | MFWQTC Sodium Hypochlorite Building Relocation	Dec 31, 2022
	D20228 | MFWQTC Centrifuge Replacement/Rehabilitation	August 31, 2020
	D20285 | MFWQTC LG Dryer Replacements	November 5, 2021
	D20284 | DRGWQTC Dewatering	October 5, 2021
	D20249 | District-Wide Biosolids Master Plan	Completed
	H14126 | HCWQTC Dewatering Improvements	January 21, 2022
	D20291 | DRGWQTC Phase 1 Dewatering	January 4, 2021
Other	New_BD106 | MFWQTC Asset Management Plan	Dec 31, 2021
Electrical	D18156 | MFWQTC Service & Blower Building Structural Repairs	June 30, 2022
	D20167 | MFWQTC East Headworks HVAC	October 29, 2020

6.3 WQTC Performance

The primary driver for capital improvements at the WQTCs is having the ability to reliably comply with permitted requirements. The following information summarizes the performance of MSD's WQTCs.

6.3.1 WQTC Permitted Capacity

MSD's active WQTC permits are listed in Table 6-3. The Morris Forman WQTC has been operating under the 2004 KPDES permit via an Administrative Order. All other WQTC permits have been updated.

Table 6-3: Water Quality Treatment Center Capacities

WQTC Facility	Average Day Capacity (MGD)	Peak Hour Capacity (MGD)	KPDES Permit Number	Permit Expiration Date	Receiving Water
Cedar Creek WQTC	7.5	N/A	KY0098540	August 31, 2020*	Cedar Creek
Derek R. Guthrie WQTC	60	300	KY0078956	April 30, 2023	Ohio River
Floyds Fork WQTC	6.5	N/A	KY0102784	August 31, 2020*	Floyds Fork
Hite Creek WQTC	6	16	KY0022420	March 31, 2023	Hite Creek
Morris Forman WQTC	120	350	KY0022411	September 30, 2004	Ohio River
Total	**200**	**666**			

*MSD submitted permit renewal applications for the Cedar Creek WQTC and Floyds Fork WQTC to KDEP on March 31, 2020. Both submittals have been approved as administrative complete by the Division of Water.

6.3.2 WQTC Permitted Effluent Quality

All five wastewater plants use similar treatment processes to meet the discharge requirements established for the waterways adjacent to each WQTC. The effluent requirements are presented in Table 6-4.

Table 6-4: WQTCs Permitted Effluent Limitations

Parameter	CCWQTC		DRGWQTC		FFWQTC		HCWQTC		MFWQTC	
	Monthly Average	Max Week Avg	Monthly Average	Max Week Avg	Monthly Average	Max Week Avg	Monthly Average	Max Week Avg	Monthly Average	Max Week Avg
$CBOD_5$, mg/L	10	15	N/A	N/A	6	9	N/A	N/A	N/A	N/A
BOD_5, mg/L	N/A	N/A	30	45	N/A	N/A	10	15	30	45
TSS, mg/L	30	45	30	45	30	45	30	45	30	45
Ammonia, mg/L May-Oct	4	6	20	30	1	1.5	2	3	20	30
Ammonia, mg/L Nov-Apr	10	15	20	30	3	4.5	5	7.5	20	30
E. Coli, #/100 ml[1]	130	240	130	240	130	240	N/A	N/A	N/A	N/A
Total Phos. mg/L, May-Oct	1.0	1.5	N/A	N/A	0.5	0.75	1.0	1.5	N/A	N/A
Total Phos. mg/L, Nov-Apr	2.0	3.0	N/A	N/A	0.5	0.75	2.0	3.0	N/A	N/A
Total Residual Chlorine, mg/L	N/A	N/A	0.019	0.019	N/A	N/A	N/A	N/A	N/A	0.019
Fecal Coliform #/100	N/A	N/A	N/A	N/A	N/A	N/A	200	400	200	400

1. *Expressed as 30-day geometric mean and 7-day geometric mean*
2. *pH limits are 6.0 minimum and 9.0 maximum*

6.3.3 Historical Wastewater Flows

The amount of flow processed at the WQTCs is dependent upon the volume of stormwater entering the combined sewer system. Over the past five years, MSD has processed an average of 150 mgd collectively through all the WQTCs. MSD treated more than 281 billion gallons of flow during 2015-2019.

Table 6-5: Historical Wastewater Flows

WQTC	2015 Flow		2016 Flow		2017 Flow		2018 Flow		2019 Flow	
	Monthly Average (mgd)	Total Flow Treated (MG)	Monthly Average (mgd)	Total Flow Treated (MG)	Monthly Average (mgd)	Total Flow Treated (MG)	Monthly Average (mgd)	Total Flow Treated (MG)	Monthly Average (mgd)	Total Flow Treated (MG)
CCWQTC	4.4	1,477	5.2	1,896	5.2	1,899	6.4	2,332	7.0	2,562
DRGWQTC	42.3	15,482	35.0	12,758	35.4	13,048	49.5	17,946	46.0	16,698
FFWQTC	2.9	1,069	3.1	1,112	3.2	1,179	4.1	1,473	4.6	1,673
HCWQTC	4.8	1,552	4.8	1,773	4.4	1,587	4.7	1,701	4.6	1,655
MFWQTC	99.8	36,471	90.1	32,908	87.6	31,937	113.1	40,948	106.4	38,002
	154.2	**56,052**	**138.2**	**50,446**	**135.8**	**49,650**	**177.8**	**64,399**	**168.6**	**60,590**

Values represent calendar years (not fiscal years) taken from Discharge Monitoring Reports submitted to KDEP.

The impact of weather on the collective total WQTC flows is demonstrated in Figure 6-2. Daily maximum flows can be 2.5 times higher than the monthly average flow.

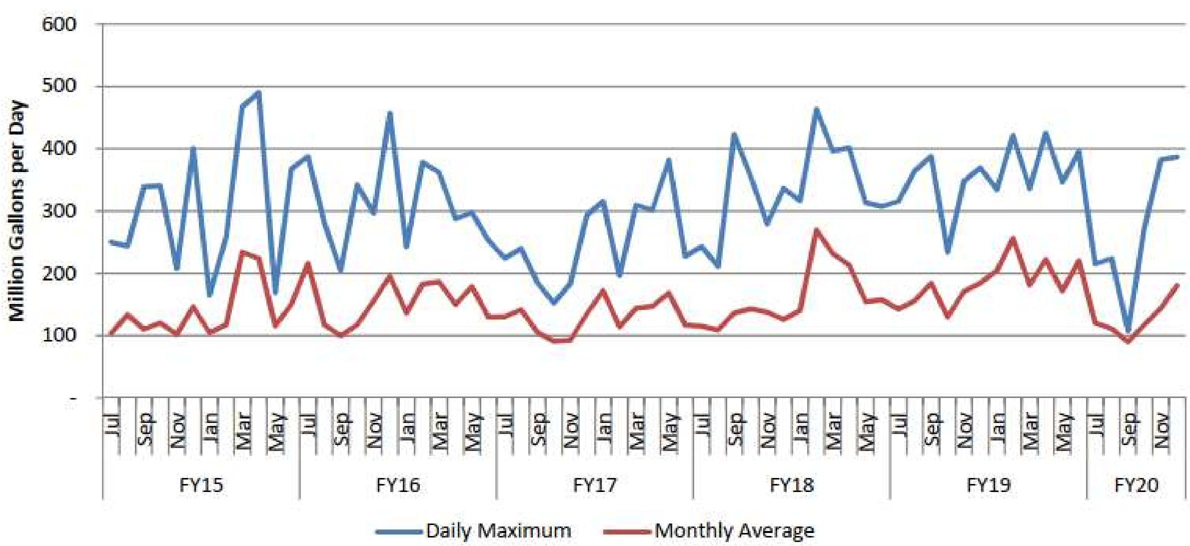

Figure 6-2: Historical Collective Flows from All WQTCs

Given the Derek R. Guthrie and Morris Forman WQTCs receive flow from the combined sewer system, they are most susceptible to high peak flows due to wet weather. The "wet season" impact is more clearly demonstrated for the Morris Forman WQTC in Figure 6-3.

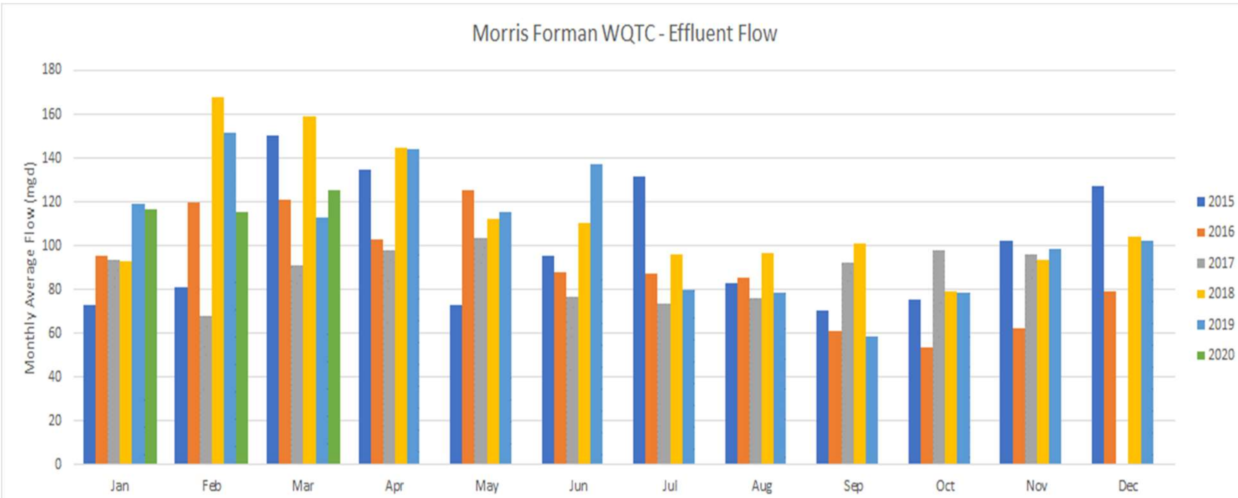

Figure 6-3: Comparison of Monthly Flow from 2015 – 2020 for Morris Forman WQTC

6.3.4 Historical Wastewater Loads

As shown in Table 6-6, excluding the Morris Forman WQTC, MSD has successfully met permit conditions for its WQTCs. In September 2018, there was an exceedance of the maximum weekly average BOD concentration.

Table 6-6: Historical Wastewater Loads – Annual Average BOD

WQTC	Permit Limits (Monthly Average, Max Weekly Average)	2015 BOD		2016 BOD		2017 BOD		2018 BOD		2019 BOD	
		Monthly Average (mg/L)	Max Weekly Average (mg/L)	Monthly Average (mg/L)	Max Weekly Average (mg/L)	Monthly Average (mg/L)	Max Weekly Average (mg/L)	Monthly Average (mg/L)	Max Weekly Average (mg/L)	Monthly Average (mg/L)	Max Weekly Average (mg/L)
CCWQTC	(10 mg/L, 15 mg/L)	2.7	6	2.6	5	2.8	5	2.9	10	3.0	6
DRGWQTC	(30 mg/L, 45 mg/L)	10.3	24	8.4	17	11.2	23	13.0	25	11.3	27
FFWQTC	(6 mg/L, 9 mg/L)	2.8	7	2.7	5	3.6	7	3.5	**21**	3.0	7
HCWQTC	(10 mg/L, 15 mg/L)	3.3	6	5.3	12	6.0	12	6.1	15	5.8	11
MFWQTC	(30 mg/L, 45 mg/L)	**31.3**	**140**	**36**	**126**	**34**	**107**	**54**	**194**	**61**	**201**
		50.4	**183**	**54.8**	**165**	**57.4**	**154**	**79.4**	**265**	**84.0**	**252**

Exceedances are shown in red.

As noted in Table 6-6, the Morris Forman WQTC has continued to experience permit exceedances for BOD and TSS since the 2014 lightning strike incident. The primary reason for these exceedances is failure of biosolids equipment (dryers, centrifuges, etc) which limited the plant's ability to reduce these pollutants. A historical perspective of effluent BOD for the Morris Forman WQTC is presented in Figure 6-4.

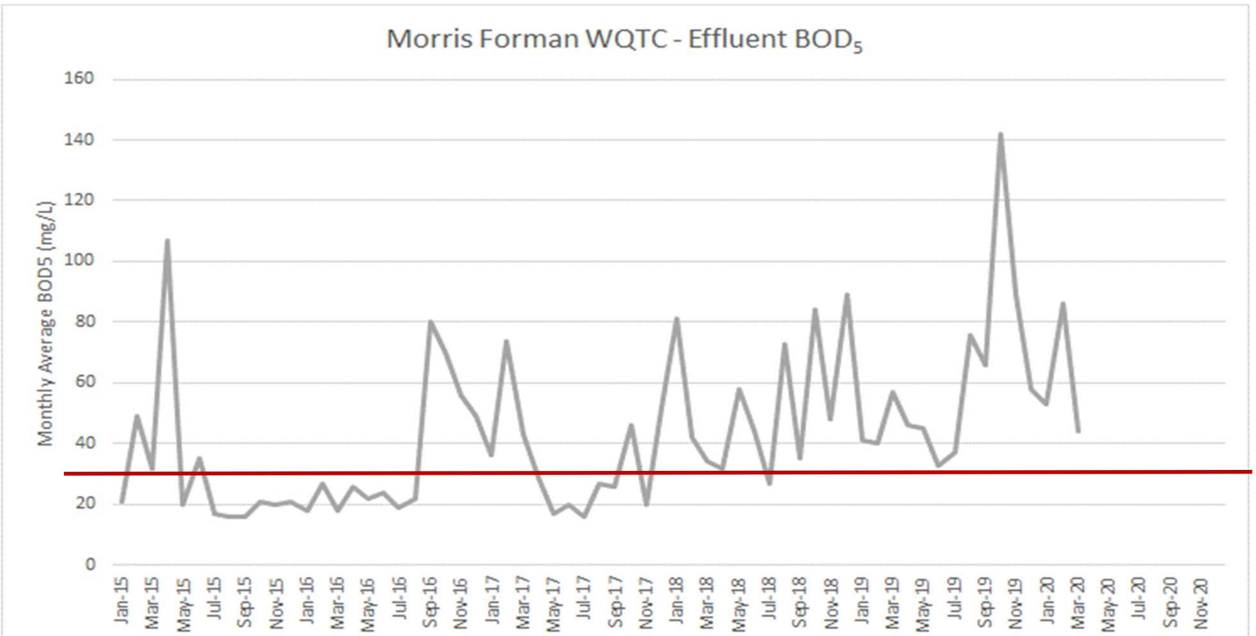

Figure 6-4: Effluent Quality from Morris Forman WQTC

6.4 Wastewater Treatment Programs

Most of MSD's investment at the wastewater treatment plants has been for asset management needs resulting from aging and deteriorating assets. In addition to asset management needs, MSD is in the process for addressing biosolids facilities and expanding one WQTC.

6.4.1 District-Wide Biosolids Management

The Morris Forman Water WQTC processes, markets (Louisville Green), and disposes of biosolids generated from all of MSD 's wastewater treatment facilities. The existing dewatering and drying equipment have reached the end of their useful life. Replacement of the biosolids infrastructure with a modern facility has been reviewed by two independent consulting engineers. MSD is ready to proceed with design-build procurement for the $198M project.

Due to the cost of the project, in 2018 MSD submitted a Letter of Interest to USEPA's Water Infrastructure Finance and Innovation Act Program (WIFIA) to request participation in a low-interest loan program for the

Morris Forman New Biosolids Facility. The project was accepted and the WIFIA loan closing date is scheduled for the summer of 2020.

In the meantime, the biosolids facilities have continued to deteriorate at an escalated rate. This has resulted in a situation in which MSD is able to process only 35% of the biosolids. In turn, the Morris Forman WQTC effluent permit limits for total dissolved solids (TSS) and biochemical oxygen demand (BOD_5) are not consistently met. In order to meet effluent permit water quality, MSD needs to process fewer biosolids at the Morris Forman WQTC. This challenge will continue until the new Biosolids Facility is operational in approximately five years.

In 2019, MSD commissioned Black & Veatch to prepare a District-Wide Biosolids Master Plan. The Master Plan confirmed the new Biosolids Facility to be constructed via the WIFIA loan program is the recommended long-term solution. The Master Plan identified short-term improvements that would help MSD achieve permit compliance and support construction of the new facility. The short-term improvements include replacing outdated equipment at Morris Forman (centrifuges and dryers) and offloading regional biosolids. All six centrifuges were sent to the manufacturer for refurbishment in a phased approach. An emergency certification project was issued in 2019 to replace the Morris Forman dryers.

To sufficiently offload regional biosolids from the Morris Forman WQTC, the Biosolids Master Plan recommended MSD construct dewatering facilities for the regional WQTCs. This approach will significantly increase MSD's reliability for processing biosolids. Staff and Black & Veatch confirmed the Derek R. Guthrie WQTC has adequate space to accommodate construction and operation of a regional dewatering facility. An emergency certification project was issued in 2019 to expedite off-loading the regional biosolids from Morris Forman by constructing a dewatering facility at the Derek R. Guthrie WQTC.

Brief descriptions of the major biosolids projects included in the 5-Year CIP are listed below.

- **New Biosolids Facility ($198M)**: This project will construct a modern biosolids processing facility at the Morris Forman WQTC that utilizes a thermal hydrolysis process (THP) to create a useable biogas. Benefits of the new facility include improved effluent quality; production of 4 MW of power; decreased consumption of natural gas; and reduced landfill utilization capacity.

- **Drying of Morris Forman WQTC Biosolids ($48M):** The dryers at the Morris Forman WQTC have been systematically failing over the past few years. In 2019, the last dryer failed and significantly impaired MSD's ability to process biosolids. Under an emergency certification, MSD is demolishing the outdated drying systems and replacing them with two state-of-the art dryers. This investment will ensure continuous biosolids processing during construction of the new Biosolids Facility and will provide added future system reliability. Additionally, the dryers will remain part of the biosolids management strategy going forward. Construction began in 2019 and will be fully completed in 2022.

- **Dewatering of Regional Biosolids ($50M):** Under an emergency certification, MSD is constructing a dewatering facility at the Derek R. Guthrie WQTC to process biosolids from all the regional WQTCs. The project includes an interim and permanent solution so regional biosolids could be immediately off-loaded from the Morris Forman WQTC. The dewatered biosolids are being landfilled in lieu of being pumped/hauled to the Morris Forman WQTC. Construction began in 2019 and will be fully completed in 2022. Regional biosolids were offloaded from the Morris Forman WQTC in February 2020.

6.4.2 WQTC Expansions

The only facility currently undergoing a plant expansion is the Hite Creek WQTC. The Hite Creek WQTC Expansion Project will increase the plant capacity from 6.0 to 9.0 mgd average daily flow. The increase in capacity will reduce sanitary sewer overflows upstream of the facility and allow for future growth demands. Rehabilitation at the facility will include the replacement of bar screens, existing ultraviolet system, and sludge holding tank blowers. The addition of aeration capacity/nutrient removal, aeration tank blower expansion and new tertiary disc filtration will increase treatment capacity. This project will provide the ability to dewater sludge on-site, thus eliminating over 400 truckloads of sludge per month being trucked to the Morris Forman WQTC.

6.4.3 Planning Initiatives

The 5-year CIP includes the following planning initiatives related to the WQTCs. These plans will be utilized to implement a comprehensive asset management program, prioritize capital needs, and update the CRRP.

- Bells Lane Asset Management Plan, $330,000
- CCWQTC Asset Management Plan, $330,000
- Comprehensive Facility Plan – Five Year Update, $450,000
- DRGWQTC Asset Management Plan, $530,000
- FFWQTC Asset Management Plan, $320,000
- Floyds Fork Regional Facilities Plan Update, $300,000
- HCWQTC Asset Management Plan, $500,000
- High Strength Waste Market Evaluation, $260,000
- MFWQTC Asset Management Plan, $1.5 million
- Odor Management Plan, $250,000
- SCADA Master Plan, $796,000

6.5 Wastewater Treatment Capital Projects

MSD continues to fund wastewater treatment projects with its annual CIP. Projects are generally a combination of discrete local improvements and appropriations for as-needed asset replacements.

6.5.1 Projects Funded from Program Notes

The two largest wastewater treatment projects completed since the last bond issuance are 1) the Bells Lane Wet Weather Treatment Facility and 2) expansion of the Hite Creek WQTC. A list of representative projects is provided in Table 6-7.

Table 6-7: WQTC Projects Completing Design/Construction Since 2017

Facility	Budget ID	Project	Task Name	Finish	Lifetime Actuals
Bells Lane WWTF	D20222	Bells Lane Grit Classifier Drain Line	Design Finish	12/5/2019	$3,871
	H09124	Bells Lane Wet Weather Treatment Facility	Construction Finish	7/31/2018	$51,760,788
	H18333	Bells Lane WWTF EQ Basin Modifications	Construction Finish	11/28/2018	$3,448,992
Cedar Creek WQTC	D19038	CCWQTC Hydraulics Study	Study Finish	2/22/2019	$54,590
	D16272	CCWQTC Influent PS MCC Upgrades	Design Finish	2/20/2020	$180,028
	D19268	CCWQTC Safety Items	Construction Finish	12/5/2018	$16,451
	D19248	CCWQTC Solids Study	Study Finish	2/28/2019	$34,711
Derek R. Guthrie WQTC	D18292	DRGWQTC Clarifier Grout Repair and RAS Gate Replacement	Design Finish	8/14/2019	$318,113
	F14156	DRGWQTC RAS 1 and 4 Pump Replacement	Construction Finish	3/6/2019	$1,502,673
	D18225	DRGWQTC WWPS Finite Element Analysis	Study Finish	7/27/2018	$40,663
Floyds Fork	D20227	FFWQTC Filter Evaluation	Study Finish	3/13/2020	$19,350
Hite Creek	H14126	HCWQTC Expansion	Design Finish	6/11/2019	$6,540,474
Morris Forman WQTC	D15020	MFWQTC Cake Pump Phase II	Design Finish	8/1/2019	$296,471
	D20167	MFWQTC East Headworks HVAC	Design Finish	10/17/2019	$101,900
	F14182	MFWQTC FEPS Pump Repair and Motor	Construction Finish	9/30/2019	$148,077
	D19046	MFWQTC Ground Water Well 10 Replacement	Construction Finish	3/6/2020	$178,428
	D19227	MFWQTC Primary Sludge Line Replacement	Design Finish	4/30/2019	$663,835
	D19044	MFWQTC Primary Sludge Pump Compressor	Construction Finish	5/31/2019	$83,498
	D18129	MFWQTC Secondary Electrical MCC Replacement Study	Study Finish	1/31/2019	$54,920
	D18118	MFWQTC Truck Unloading Station Pavement Repair	Design Finish	10/10/2019	$59,714
				TOTAL WQTC PROJECTS	**$65,507,546**

6.5.2 5-Year CIP for Wastewater Treatment System

MSD will continue spending on the biosolids emergency certification projects started in 2019 and completing in 2022. The majority of the 5-Year CIP related to biosolids is for the New Biosolids Facility to be located at the Morris Forman WQTC. Additional placeholder projects have been added to incorporate dewatering processes at the Cedar Creek and Floyds Fork WQTCs.

Annual capital investments are required to mitigate operator safety risks; maintain reliable system operations; and upgrade to new more energy efficient technologies. During the 5-year CIP, the following WQTC projects totaling $104 million will be partially or wholly budgeted for the regional WQTCs.

Table 6-8: Overview of 5-Year Forecasted Spending for Regional WQTCs

Wastewater Treatment Priorities		5-Year CIP Forecasted Spending
Bells Lane Wet Weather Facility	Bells Lane Grit System Improvements	**Bells Lane $1.4 million**
	Bells Lane WWTF Chemical Feed System Improvements	
	Bells Lane WWTF General R&R	
Cedar Creek WQTC	CCWQTC Admin Building Expansion & Painting	**CCWQTC $17.4 million**
	CCWQTC Power & MCC Upgrades	
	CCWQTC Oxidation Ditch Mods	
	CCWQTC Chemical Feed System Improvements	
	CCWQTC Effluent Parshall Flume Upgrade	
	CCWQTC Tertiary Filtration	
	CCWQTC WAS Improvements & Dewatering Facility	
	CCWQTC Expansion Project	
	CCWQTC General R&R	
Derek R. Guthrie WQTC	DRGWQTC Artificial Intelligence Pilot	**DRGWQTC $47.5 million**
	DRGWQTC Clarifier Replacements & Grout Repair	
	DRGWQTC Disinfection Upgrades	
	DRGWQTC Substation U-13 Modifications	
	DRGWQTC Alternate Outfall	
	DRGWQTC Dewatering Facility	
	DRGWQTC General R&R	
Floyds Fork WQTC	FFWQTC Chemical Feed System Improvements	**FFWQTC $3.5 million**
	FFWQTC Dewatering Facility	
	FFWQTC General R&R	
	FFWQTC Enhanced Biological Phosphorous Removal Study	
Hite Creek WQTC	HCWQTC Chemical Feed System Improvements	**HCWQTC $21.9 million**
	HCWQTC General R&R	

	Wastewater Treatment Priorities	5-Year CIP Forecasted Spending
	HCWQTC Expansion Project	
General WQTCs	WQTC Elevator Repairs	$12.6 million
	WQTC General R&R/	
	Total 5-Year CIP Forecast for Regional WQTCs	**$104.3 million**

The following projects totaling $245 million are forecasted for the Morris Forman WQTC in the 5-Year CIP. The largest project is replacement of the biosolids facility.

Table 6-9: Overview of 5-Year Forecasted Spending for Morris Forman WQTC

Treatment Process	Morris Forman WQTC Priorities	5-Year CIP Forecasted Spending
Primary Treatment	MFWQTC Sedimentation Basin Rehabilitation*	$4.4 million
	MFWQTC Primary Sludge Line Replacement*	
	MFWQTC Primary Sludge Line Replacement Phase 2*	
	MFWQTC Daft Rehab & TWAS Piping Replacement	
	MFWQTC Primary Sludge Pump Station Structural Repairs	
Secondary Treatment	MFWQTC Secondary Clarifiers Structural Repairs*	$0.3 million
	MFWQTC Clarifier Floor Repairs*	
Disinfection	MFWQTC HPO Tanks Structural Repairs*	$0.5 million
	MFWQTC Chlorine Contact Tanks Structural Repairs*	
Final Effluent Pump Station (FEPS)	MFWQTC FEPS MCC Replacement*	$1.7 million
	MFWQTC FEPS Structural Repairs*	
	MFWQTC FEPS VFD Replacement*	
	MFWQTC FEPS Pump and Motor Repair*	
Biosolids	MFWQTC Digester Control Building Structural Repairs*	$206.3 million
	MFWQTC Sodium Hypochlorite Building Relocation*	
	MFWQTC Centrifuge Replacement/Rehabilitation*	
	MFWQTC LG Dryer Replacements*	
	MFWQTC New Biosolids Facility	
	MFWQTC Cake Pump Phase 2	
Other	MFWQTC General R&R	$30.9 million
	MFWQTC Radio Repeater	
	MFWQTC Sewer and Manhole Rehabilitation	
	MFWQTC OGA PTO & Chlorine Rail Car Demolition	

Treatment Process	Morris Forman WQTC Priorities	5-Year CIP Forecasted Spending
	MFWQTC Process Water Pump & VFD	
	MFWQTC Facility Repairs	
	MFWQTC Service & Blower Building Structural Repairs*	
Electrical	MFWQTC Chiller Replacement	$1.5 million
	MFWQTC Upgrade PLCs	
	MFWQTC East Headworks HVAC*	
Total 5-Year CIP Forecast for Morris Forman WQTC		**$245.6 million**

*project under consideration as part of the Agreed Order CAP.

7. Support Systems

MSD owns a large inventory of rolling stock, information technology systems, and above-ground facilities that support MSD's operation of wastewater, stormwater, and flood protection systems. This equipment is critical to MSD's ability to complete preventative and corrective maintenance activities required to provide sustainable and reliable wastewater, stormwater, and flood protection services.

MSD maintains an extensive inventory of IT hardware and software that is essential to overall agency operations. This includes the MSD intranet system that is the backbone of electronic communication and digital data generation, communication and storage, and regulatory reporting. This hardware and software are responsible for supplying the internet connection to MSD's Supervisory control and data acquisition (SCADA) system that controls more than 300 pump stations and control gates. This equipment is subject to periodic upgrade and replacement - like other MSD assets. The CRRP included projects and appropriations for upgrading MSD's facilities, fleet, and IT systems.

7.1 Support Systems Capital Projects

The CRRP recommended a series of corrective actions following comprehensive condition assessments of more than 200 buildings. MSD continues to address facility needs with each annual CIP. Projects are created as a need become known. MSD also includes as-needed appropriations into the annual CIP that address the following types of needs:

- HVAC Systems
- Roof Inspections, Repairs, and Replacement
- Paving Improvements
- Security Upgrades
- Information Technology (IT) Hardware & Software
- Fleet and Large Equipment

7.1.1 Projects Funded from Program Notes

A summary of the facility-type projects completed since the last bond issuance is presented in Table 7-1.

Table 7-1: Facilities Projects Completing Design/Construction Since 2017

Program	Budget ID	Project	Task Name	Finish	Lifetime Actuals
Building Improvements	N16071	Main Office Data Center Reconfiguration	Construction Finish	3/18/2020	$10,191
	G17027	CMF Roof	Construction Finish	11/27/2019	$3,321,990
	G18303	CMF Cooling Tower	Construction Finish	5/24/2019	$436,965
	G09535	CMF Parking Surface	Design Finish	12/11/2018	$157,209
				Total Facilities Projects	**$3,926,355**

7.1.2 5-Year CIP for Support Systems

During the 5-year CIP, improvements will continue to be phased for MSD's existing buildings including but not limited to: elevator upgrades, roof replacements, paving, and security enhancements. IT budgets will continue to be requested annually for assets related to system reconfiguration, cable management, network server upgrades, network switch replacements, desktop computers, and software programs needed to better manage MSD's assets and systems. Capital equipment budgets for updating MSD's fleet vehicles, heavy construction equipment, and portable equipment used by multiple working groups will be vetted annually. During the 5-year CIP, the following facilities improvement projects will be partially or wholly budgeted.

Table 7-2: Overview of 5-Year Forecasted Spending for Facilities

Facilities Priorities		5-Year CIP Forecasted Spending
Facilities Improvements	Building Improvements	**$17.1 million**
	Paving Improvements	
	Security Enhancements	
	Roof Inspections, Repairs and Replacements	
Information Technology	Hardware Related Projects	**$16.7 million**
	Software Related Projects	
Equipment	Fleet Vehicles	**$14.1 million**
	Large Equipment	
	Total 5-Year CIP Forecast for Facilities	**$47.9 million**

7.2 Support Services

Implementing a capital program of this size and complexity requires support services. Support services are generally contracted resources that provide specialized expertise; address program specific deliverables; supplement field staff; or support MSD staff as-needed. The following types capital support appropriations are included in the 5-year CIP.

- CIP Task Assistance
- Construction Inspection
- Emergency Preparedness Plan
- FOG Program Support
- Hydraulic Modeling
- WQTC Engineering Support

8. Regionalization & Economic Development

Economic development and expanding the area MSD provides utility services are opportunities for 1) generating additional revenue, 2) optimizing regional resources, and 3) further improving local water quality.

8.1 Jefferson County Development

Portions of Jefferson County remain unsewered. Over the past ten years, MSD has extended sewer service to many areas and eliminated hundreds of small package treatment plants and more than 40,000 septic tanks. The primary driver for eliminating these systems is to improve water quality of local rivers, creeks, and streams.

8.1.1 5-Year CIP for Development Program

Current development patterns suggest private investment is picking up in the Floyds Fork sewershed. MSD continues to coordinate with developers to streamline how to incorporate new assets and additional flows into its existing sewer network. It is important to coordinate these new developments to ensure consistency of construction and reliable service.

The CRRP recommended projects to ensure adequate conveyance and treatment capacity is available in advance of development and population growth. This program is particularly important for preventing a situation in which community development initiatives face moratoriums due to capacity constraints at the WQTCs. The development program includes a combination of phased WQTC capacity upgrades and under capacity sewers and pump stations. The following development related projects have been partially or fully budgeted in MSD's 5-year CIP.

- Cedar Creek Collection Systems
- Floyds Fork Collection Systems
- Floyds Fork Interceptor
- Fairmount Road Force Main Pump Station Improvements
- As-Needed Development Coordination

8.2 Regionalization to Adjacent Counties

The CRRP also identified potential regionalization corridors where MSD can further extend sewers to improve surface water quality and add new sewer customers. The CRRP recommended projects that included new interceptors, new gravity sewer collection systems, and a new treatment plant for accommodating future regionalization and/or growth.

In 2016, high profile failures of "package" treatment plants led to the passage of Kentucky House Joint Resolution 56, to initiate a study of regionalization opportunities to limit the risk of future failures. As a result of this Joint Resolution, a study was performed in 2017 to provide an inventory of small "package" facilities and emergency risk mitigation.

During the 2018 Legislative Session in Kentucky, Senate Bill 151 (SB151) was filed to enable utility ownership of sewer assets outside of jurisdictional boundaries through inter-local agreements. House Bill 513 (HB513) was filed to require additional insurance, as well as regulatory and financial accountability for small "package" treatment facility operators/builders. These two bills were combined and passed under HB513 and signed by the Governor on April 25, 2018.

This legislation has facilitated extending MSD's programmatic approach for eliminating package treatment plants beyond Jefferson County. During FY21 MSD will complete the Floyds Fork WQTC Regional Facilities Plan Update. This project will assist MSD with addressing how regionalization initiatives with Bullitt and Oldham Counties will interconnect with MSD's assets. Depending on the timing of system improvements needed in these areas for public health protection, capital projects required to interconnect with MSD's wastewater system may need to be accelerated to the 5-year CIP.

- **Bullitt County**: In 2019, Bullitt County Sanitation District and Bullitt County Fiscal Court requested a proposal from MSD for acquisition and regional solutions. This proposal is currently in the due diligence phase.

- **Oldham County**: The City of Crestwood lobbied for enabling legislation, to allow MSD to acquire their system. This was accomplished in early 2019. Subsequent to the Crestwood acquisition, Oldham County Environmental Authority and Oldham County Fiscal Court requested MSD to submit a proposal to acquire this system. This acquisition is scheduled to close on June 30, 2020.

8.2.1 Oldham County

MSD has worked with Oldham County staff to develop a preliminary 5-year CIP to address known and immediate system capital needs. The FY21 CIP includes $3.64 million for the following needs:

- Facility Plan Update
- Collection System Inspection, Cleaning, Rehab, Modeling
- Gravity Sewer & Pump Station Rehab/Repair
- Pump Station Eliminations & Interceptor Projects
- WQTC R&R & Eliminations
- SCADA System & Rain Gauge Expansion

During the 5-year CIP, the following Oldham County projects will be partially or wholly budgeted.

Table 8-1: Overview of 5-Year Forecasted Spending for Oldham County

Oldham County Capital Priorities		5-Year CIP Forecasted Spending
Collection System Sewer Improvements	Sewer Inspection & Cleaning	**$5.9 million**
	Gravity Sewer Rehabilitation	
	Ash Avenue Interceptor	
	Collection System Modeling	
Collection System Pump Station Improvements	Pump Station R&R	**$4.5 million**
	Pump Elimination Project	
	SCADA System, Rain Gauge Expansion	
WQTC Improvements	WWTP Elimination Project	**$1.4 million**
	WQTC R&R	
System-Wide	Unplanned R&R	**$1.5 million**
	Facility Plan Update	
	Total 5-Year CIP Forecast for Oldham County	**$13.3 million**

9. Conclusions

The Engineer provides the following conclusions related to MSD's sewer and drainage system.

9.1.1 Wastewater Systems

- MSD is currently working to comply with mandates from Consent Orders issued by USEPA and KDEP related to unauthorized discharges from its wastewater system. MSD has met all required deadlines to-date and remains on schedule to complete the remaining Amended Consent Order requirements. To-date, MSD has spent $1.01 billion on Consent Decree projects of the total $1.5 billion estimate. MSD, USEPA, and KDEP are discussing a reprioritization schedule to complete the remaining work while addressing other higher system priorities.

- MSD certified completion of 38 CSO LTCP projects to date, 4 remain. Overflows to local waterways have been reduced by approximately 5 billion gallons per typical year. MSD certified completion of 48 SSO SSDP projects to date, 18 remain. SSOs have been reduced approximately 61% by location and approximately 70% by volume. MSD's wet weather storage systems are preventing nearly 2 billion gallons of sewer overflows from occurring by storing flow then sending it to treatment after storm events have passed.

- On May 3, 2018, MSD entered into an Agreed Order with KDEP addressing improvements necessary to recover from a mechanical failure due to a lightning strike resulting with a power outage at Morris Forman WQTC that occurred April 8, 2015. Extensive damage was experienced to the primary treatment, secondary treatment, and electrical systems causing the plant to be out of compliance with effluent discharge limits established in Permit KY0022411. MSD is working diligently to restore the Morris Forman WQTC to its full operational capacity. MSD invested $37 million in this facility since 2016 and developed a draft Corrective Action Plan (CAP) for additional improvement.

- MSD has operated the wastewater system for decades and is sufficiently organized and staffed to continue to operate, maintain, administer, and plan the wastewater infrastructure. In FY21 MSD will conduct a staffing evaluation to confirm sufficient positions and skill sets are in place or developed to operate and maintain the new assets being constructed under the Amended Consent Order.

- MSD is advancing multiple projects to improve District-wide biosolids management including constructing dewatering facilities at the regional WQTCs and building a new biosolids facility at the Morris Forman WQTC. These investments, while costly will enable MSD to meet KPDES permit requirements, improve efficiencies, and generate power.

- MSD is advancing some of the projects identified in the CRRP. Due to the Consent Decree mandates, many projects continue to be deferred. As such, emergencies are increasing in frequency and severity. MSD's annual CIP includes appropriations to address as-needed improvements related to repair, rehabilitation, or replacement of aging assets and emergencies.

9.1.2 **Stormwater System**

- The District through ILAs with the City of Louisville and Jefferson County assumed responsibility for stormwater management in 1987 for all of Jefferson County, except for the Cities of Anchorage, Jeffersontown, Shively, and St. Matthews. Those cities provide most of those services within their borders, and partner with MSD on other aspects including review of new development plans and water quality reporting.

- The District bills for stormwater services using equivalent service units (ESUs). The District currently has approximately 6,956,000 ESUs, in total, from residential, commercial, industrial, and city-owned properties.

- MSD maintains and operates its stormwater collection and transmission system in accordance with industry-standard best management practices. MSD has operated the stormwater system for decades and is sufficiently organized and staffed to continue to operate, maintain, administer, and plan the stormwater infrastructure.

- MSD is working on a comprehensive update to the Stormwater Drainage Master Plan which, after public participation and approvals by local governments, will be used by the District for implementing improvements and extensions to the existing drainage facilities. It is currently anticipated the first working draft of the Stormwater Drainage Master Plan will be published in 2025. Over the next few years, a significant effort will continue to inventory and document the condition of existing drainage system assets.

- MSD collects over 3 million individual water quality records each year. This monitoring program provides a detailed picture of the health of streams in Jefferson County. Monitoring results are summarized on an annual basis in the Stormwater MS4 Annual Report.

- MSD's Urban Reforestation Program plants 1,000 trees annually by working with local businesses, municipal organizations and neighborhood associations. The program replenishes and expands the tree canopy throughout Jefferson County. These trees redirect an average of 1.35 million gallons of stormwater away from the sewer system every year, which decreases sewer overflows into waterways.

- In 1988, MSD and the United States Geological Survey (USGS) began monitoring water quality and stream flow throughout the Jefferson County area. The Long-Term Monitoring Network has changed over the years and currently includes 27 monitoring sites. The monitoring sites were selected to represent streams in each of eleven watersheds. Each monitoring site is sampled four times per year and is analyzed for a variety of parameters including fertilizers, sediment, and metals.

9.1.3 Flood Protection System

- MSD maintains and operates the flood protection system in accordance with industry-standard best management practices. MSD has operated the flood protection system for decades and is sufficiently organized and staffed to continue to operate, maintain, administer, and plan the Ohio River Flood Protection System infrastructure.

- MSD maintains a proactive maintenance program to assure the integrity of the levee and floodwall system. Worked performed using these funds includes: repair and/or replacement of trusses, sheeting, and closure walkways; corrugated metal pipe replacement; toe drain access repairs; trail repairs and unwanted vegetation removal; level gate repair or automation; painting; floodwall joint repair; and floodwall concrete sealing and surface crack repairs.

- MSD is actively engaged with the USACE to advance $167 million of improvements to improve the reliability of the flood protection system. These improvements will replace and update original equipment that was installed in the 1950s and 1970s. These projects were included in the CRRP. This partnership represents a significant investment with improving flood protection.

- The Paddy's Run Flood Protection Station Capacity Improvements Project is MSD's highest ranked capital priority to mitigate flood pump station public health protection risk. MSD completed an Alternatives Analysis for increasing the capacity of the station to 975 mgd. The CRRP recommended two equally important project phases for the Paddy's Run FPS. The first phase will improve the reliability of the existing Paddy's Run FPS (originally constructed in 1953) by removing, inspecting, and rehabilitating or replacing the station's existing pumps and motors to maintain the station's current total pumping capacity of 925 mgd. The reliability improvements will be implemented through the USACE Program. MSD must construct the capacity improvements project independent of the USACE project.

END OF REPORT