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June 28, 2024

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Re: Metropolitan Sewer District of Greater Cincinnati ("MSD") Wet Weather Improvement Program ("WWIP") Phase 2B Plan and Schedule of Work;
U.S., et al v. Board of County Commissioners of Hamilton County, OH, et al., Case No. 1:02CV107, U.S. District Court, Southern District of Ohio

Dear Reviewers:

Per the requirements of the Consent Decree on Combined Sewer Overflows, Wastewater Treatment Plants and Implementation of Capacity Assurance Program Plan for Sanitary Sewer

Overflows ("Consent Decree") entered by the U.S. District Court for the Southern District of Ohio on June 9, 2004, the Final WWIP initially approved in August 2010 and subsequently revised, and the agreement made with the approval of the Phase 2A Plan and Schedule of Work, the Board of County Commissioners for Hamilton County ("Board"), submits the enclosed WWIP Phase 2B Plan and Schedule of Work.

In accordance with Section 16 of the Consent Decree, I hereby submit the following certification for this submission:

> *I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering such information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*

Sincerely,

/s/ Jeff Aluotto

Jeff Aluotto
Administrator
Hamilton County, Ohio

Enclosure: WWIP Phase 2B Plan and Schedule of Work

cc (with enclosure) (via US Mail):
Marilyn Wall – Sierra Club
Diana Christy – MSD Director
Emily Woerner - City Solicitor, City of Cincinnati Law Department

cc (without enclosure) (via US Mail or Hand Delivery):
Alicia Reece – Commissioner
Denise Driehaus – Commissioner
Stephanie Summerow Dumas – Commissioner
The Honorable Michael R. Barrett

BOARD OF COUNTY COMMISSIONERS OF HAMILTON COUNTY, OHIO
PHASE 2B WET WEATHER IMPROVEMENT PROGRAM (WWIP) SUBMISSION

JUNE 28, 2024

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

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I. Introduction

This document is the Hamilton County Board of Commissioners' (County) submission of a Phase 2B Plan for the Wet Weather Improvement Program (WWIP) implemented under the Global Consent Decree (Consent Decree) approved in Case No. 1:02-CV-107 in the U.S. District Court of the Southern District of Ohio, Western Division. The County is the owner and principal of the County Sewer District known as the Metropolitan Sewer District of Greater Cincinnati (MSD), which is operated by the City of Cincinnati (City or Cincinnati) as agent for the County (hereafter, the County, City and MSD are collectively referred to as the Defendants). MSD serves over 830,000 people with critical wastewater services. MSD operates seven treatment plants and over 3000 miles of collections system pipes. The system includes assets that are many decades old, some older than a century, that require sustained reinvestment in addition to the mandated improvements of the Consent Decree.

The WWIP identifies Consent Decree projects and terms of program and project implementation. The Consent Decree requires projects in the WWIP to be implemented as expeditiously as practicable and guided by community affordability and other considerations. The WWIP is being implemented in multiple phases. Phase 1 of the WWIP ended December 31, 2018. A "Bridge" phase of additional projects was then implemented after Phase 1 and prior to the start of Phase 2A. The County submitted a Phase 2A Plan which the Ohio EPA, US EPA, and ORSANCO (Regulators) approved on August 29, 2023. Phase 2A is scheduled to be substantially completed by December 31, 2024. As part of the Phase 2A agreement, the County agreed to submit a Phase 2B Plan by June 30, 2024, which would consist of a subset of the remaining WWIP projects.

The County's Phase 2B Plan begins on January 1, 2025 and lasts ten years until December 31, 2034. It consists of major projects that will remove an estimated 1.46 billion gallons of untreated overflows. The current estimated capital cost of Phase 2B is $1.82B (2023$)[1] ($1.08B 2006$).[2] There is also an additional $82M (2023$) budgeted for the Sewer Backup Program (SBU), a WWIP requirement, that is funded by MSD's operating budget. These costs and this schedule are comparable to Phase 1, and both reflect community affordability, MSD capacity, and constructability concerns. This Phase 2B Plan also sets the stage to assure continuity of work in Phase 2C. The County will submit a Phase 2C Plan by June 30, 2034.

In addition to the schedule of work, this Phase 2B Plan includes necessary revisions to the WWIP that provide the Defendants with the ability to continue WWIP implementation and Consent

[1] The $1.82 billion (2025-2034) is part of the $1.97 billion (2024-2034) cash-flow total, which includes $160.9 million for 2024, used in the financial capability assessment. Refer to Enclosure 2 for the full financial capability assessment.
[2] The WWIP refers to all costs in 2006$. This requires current day and future cost be converted back to 2006$ using a deflationary factor. For consistency and to better understand the impact of the Phase 2B Plan, all costs herein are presented in both 2023 and 2006 dollars. Capital costs projected for the Phase 2B Plan are expressed in nominal dollars (incorporating inflation).

Decree compliance in a manner that is as expeditious as practicable, while protecting MSD ratepayers from excessive rate increases. A proposed Amended Final WWIP and the related project information is included as Enclosure 1.

II. WWIP Progress and Accomplishments

Sewer Overflows Reduced – Projects to date have reduced sewer overflows by over 55% -- from 14.4 billion gallons to 6.6 billion gallons during a typical year. Activations at SSO 700, MSD's largest SSO, have been cut from 47 to zero activations during the typical year. Mill Creek, once previously known for its challenges, has seen dramatic water quality improvements and is now home to an expansive fish population and active fly-fishing community.

Phase 1 – MSD completed 115 construction projects and 61 planning and design projects, included in Attachment 1B, during Phase 1. Phase 1 began in 2006 with "early action projects", and the last project was substantially completed in January 2020. Phase 1 WWIP spending totaled approximately $1.62B (2023$) ($960M (2006$)).

Bridge - The April 2018 modifications to the WWIP included a "Bridge Schedule." These projects represented an interim phase or a "bridge" between Phase 1 and Phase 2. The bridge included 25 projects representing $106M (2023$) ($62.9M (2006$)) in expenditures.

Phase 2A - Phase 2A was approved on August 29, 2023. It includes the construction of three projects (Mill Creek WWTP Diversion Chamber, CSO 402-406 Regulator Improvements, and the Little Miami WWTP Standby Power) as well as the design of the Mill Creek Pump Station and the development of a Business Case Evaluation report (BCE) for the East Branch Muddy Creek Interceptor. Phase 2A will cost approximately $70.1M (2023$) ($41.6M (2006$)). Phase 2A ends December 2024.

Additional WWIP Capital Spending – After Phase 1 and prior to and during the development of the Phase 2B Plan, MSD completed important and expensive wet weather improvement projects and expended significant funds on WWIP Allowances and other WWIP implementation activities. These funds represent approximately $70.5M (2023$) ($41.8M (2006$)).

Thus far, the MSD's capital expenditures are approximately $1.8B (2023$) ($1.1B (2006$)) to implement the WWIP (Phase 1, Bridge, Phase 2A, and Additional WWIP spending).

Sewer Back-Up Program (SBU) - MSD has spent approximately $162 million on its SBU Program (formerly known as the Water-in-Basement Program) since its 2004 inception. Approximately 80,000 inspection work orders have been completed resulting in about 11,500 properties being cleaned and/or repaired, and approximately 1,400 properties protected with backup prevention devices. Extreme weather events since 2016, including significant rainfall

events in April 2024, present a significant liability for MSD. The SBU program continues to pose a significant financial and administrative demand on MSD. SBU spending is funded from MSD's operating budget as opposed to its capital budget, though both operating and capital budgets rely on the same ratepayer revenue. The Phase 2B Plan includes a budget of $11 million per year for the SBU program.

III. Phase 2B Planning Considerations

Phase 2B is planned based on a schedule that is as "expeditious as practicable" while subject to important financial considerations and lessons learned over many years implementing the WWIP. In addition to ensuring compliance with the Consent Decree, the Defendants focused on the following as key considerations and lessons learned: (1) ratepayer affordability; (2) construction market and project delivery constraints; (3) constructability and operational concerns; (4) length of schedule; and (5) contingency planning. Each is discussed below:

a. Ratepayer Affordability:

The WWIP provides that the US EPA 1997 Financial Capability Assessment Guidance ("1997 Guidance") should be used to assess affordability. US EPA recently replaced the 1997 Guidance in February 2023 ("2023 Guidance"). Both guidance documents strongly urge communities to assess and provide additional information and data beyond matrix calculations in order to explain local economic conditions, including information about the more vulnerable lower income communities, as well as to justify a compliance schedule. As a result, the Defendants considered the 1997 Guidance, as required by the WWIP, the 2023 Guidance, and the unique local economic conditions. The 1997 Guidance establishes that the entire remaining Phase 2 Program would impose a high burden, just as the Court found in its August 10, 2010 order approving the WWIP and its phased approach. In addition, an assessment of unique local conditions (as called for in the 1997 and 2023 Guidance), indicates that significant economic burdens exist for MSD ratepayers, especially among certain communities within the MSD Service Area.

The Defendants developed an affordability approach for Phase 2B that accurately acknowledges the existence of large economically disadvantaged communities within the MSD Service Area. The approach relies on a cash flow forecasting model, as outlined under Alternative 2 of the 2023 Guidance, with an additional analysis of ratepayer burden using socioeconomic indicators that consider potential impacts to disadvantaged communities. Cincinnati, which is the largest and the most economically important jurisdiction in the MSD Service Area, serves as a reliable proxy for these economically disadvantaged communities and is compared to the Service Area Residential Indicator calculations. Doing so provides a much more accurate evaluation of the true affordability impacts to vulnerable ratepayers. The approach also allows for Consent Decree compliance under a schedule that is as expeditious as practicable.

i. Financial Capability Assessment

The WWIP requires the completion of a Financial Capability Assessment (FCA), as outlined in Paragraph B.3 of the WWIP using the EPA's "Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development" (1997 Guidance). The 1997 Guidance, with expansions made in the 2012 Integrated Planning Framework and clarifications provided in the 2014 FCA Framework, uses a two-step matrix approach to evaluate a permittee's financial capability to complete a consent decree program. In summary, Step 1 measures the impact of the program costs on individual households (Residential Indicator, or RI) and Step 2 measures the debt, socioeconomic and financial conditions of a permittee (Financial Capability Indicators, or FCIs).

US EPA issued proposed revisions to the 1997 Guidance: one in 2020 and another in 2022. The 2022 proposed revision withdrew the 2020 proposal and significantly pared down the 2020 proposal's emphasis on analyzing the impacts to lower income households within a service area. The 2022 proposal was finalized in February 2023 (2023 Guidance) and replaces the 1997 Guidance. The 2023 Guidance maintained the matrix approach of the 1997 Guidance with the addition of a third step using a Poverty Prevalence Indicator. It also provides an alternative option (Alternative 2) to the matrix approach, which enables a permittee to create and use financial and rate model analyses to develop an appropriate capital project schedule.

To comply with the terms of the WWIP, the Defendants completed an FCA analysis under both the 1997 Guidance and the 2023 Guidance, Alternative 2. The FCA analysis is included here as Enclosure 2.

ii. Unique Local Circumstances

The 1997 Guidance explicitly states that a permittee can submit information on "its unique financial conditions" when it believes that there are unique [local] circumstances that would affect the conclusion of this guidance…" The 2023 Guidance repeats this directive. Further, US EPA's actions after its issuance of the 1997 Guidance emphasize that additional and more localized considerations are necessary for determining affordability and financial capability of a CSO/SSO permittee. The Defendants agree with US EPA that it is necessary to assess the complete picture of local socio-economic conditions beyond just the mechanical matrix calculations in order to begin to understand the affordability implications to those communities (geographically and demographically) that are economically disadvantaged within the MSD Service Area.

The Defendants analyzed socioeconomic and demographic data of Hamilton County, its political subdivisions, and the MSD Service Area. The analysis shows that ratepayers from the

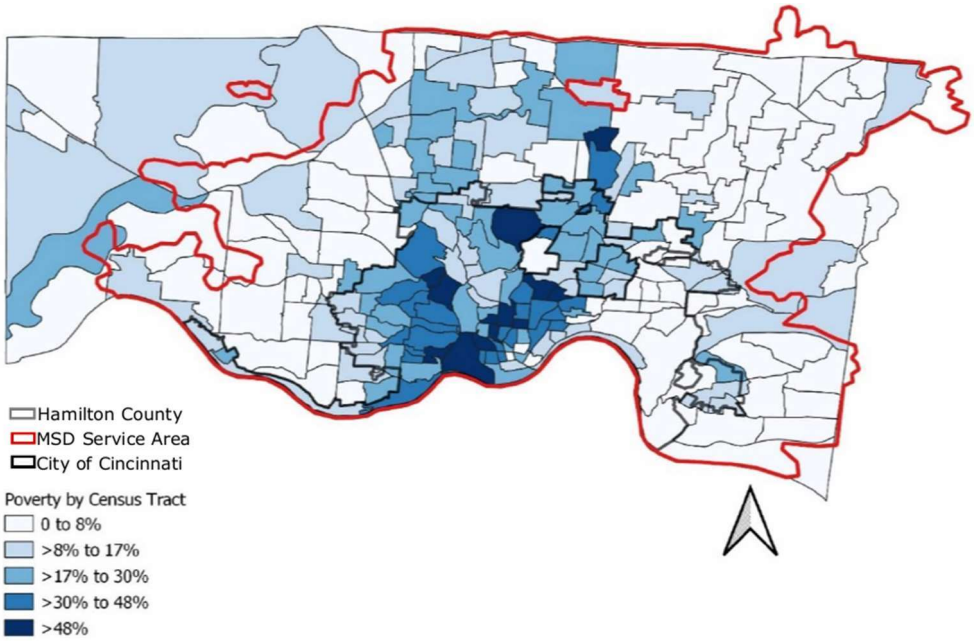
economically disadvantaged communities in the MSD Service Area will be negatively impacted by even modest MSD rate increases, which underscores the reasons why the size and pace of Phase 2B cannot make wastewater services unaffordable for a significant portion of MSD's customers.[3] This analysis also provides the foundation for the Defendants' assessment of affordability from the perspective of Cincinnati as a proxy for the economically disadvantaged communities within the MSD Service Area. Key findings on some of the additional socioeconomic indicators included in the analysis are summarized below.

1. Poverty Levels

Poverty rates in Hamilton County, Cincinnati and the MSD Service Area all exceed the national rate. Poverty in the MSD Service Area is approximately 23% higher than the national rate, while Cincinnati's poverty rate is an astonishing 90% higher than the national rate. It is critical to understand that the MSD Service Area neither serves nor receives revenue from ratepayers from several of the most affluent areas and municipalities within Hamilton County. Therefore "Hamilton County" socio-economic and demographic data is not the same as "MSD Service Area" data. In short, data from the communities that are not served by MSD cannot be a factor in considering the economic impact of projects and fees on those within the MSD Service Area. Further, many local communities within the MSD Service Area have significantly higher poverty rates than the MSD Service Area as a whole. These communities extend out from the urban core of Cincinnati and into the Hamilton County suburbs. Nearly 30% of the municipalities within the MSD Service Area have poverty rates higher than Hamilton County with the highest being Lincoln Heights at 60% of its population living in poverty. Others include Lockland Village (35.6%), Elmwood Place Village (32.7%), North College Hill (24.6%), Addyston Village (29.1%) and Norwood (20.6%). Figure 1 below shows the concentration of poverty within the MSD Service Area.

[3] With minor exceptions, state law requires MSD to charge the same rate to all residential customers, regardless of any existing economic or financial disparities.

Figure 1: Hamilton County Poverty Rates, by Census Tract, 2020



Source: American Community Survey, 5-Year Estimates.

Additionally, Hamilton County's population experiences significant poverty disparities among communities by racial identity and age. The Black/African American (27.3%) and Hispanic/Latino (27.7%) communities experience poverty at rates approximately three times greater than Caucasian communities (9.6%) and nearly double the rate of the County as a whole (14.8%). Children living in the MSD Service Area also suffer from poverty at rates higher than the national average. In Cincinnati, the largest municipality in Hamilton County, more than one third of children were living in poverty in 2020.

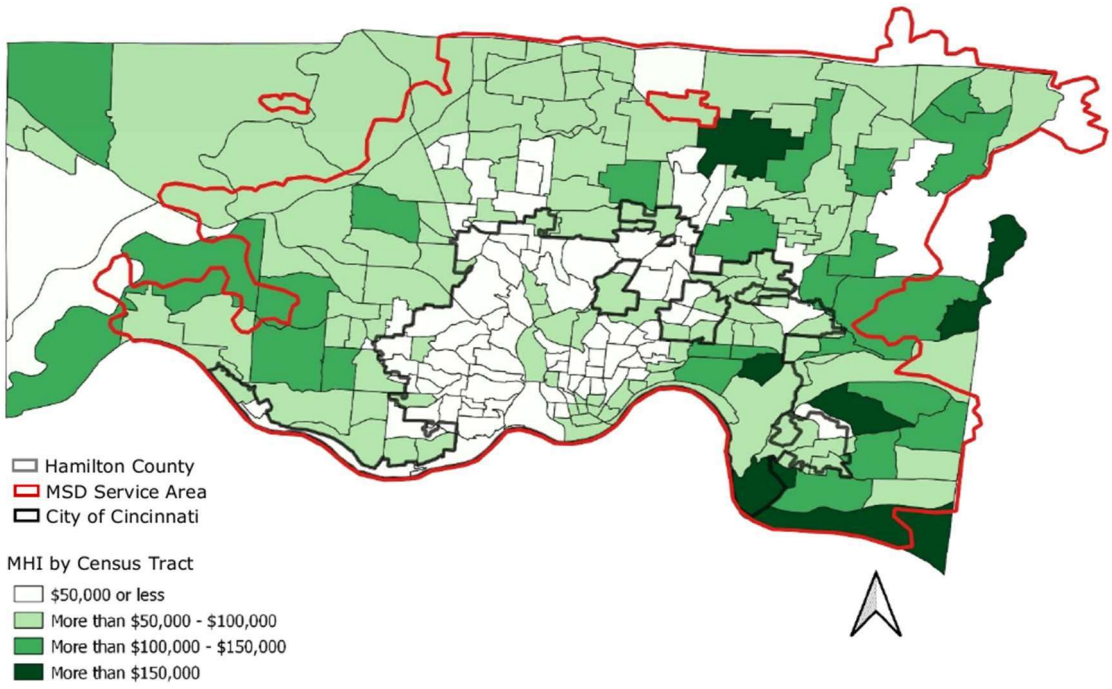
2. Household Income Levels

Similar to the difference in poverty rates between local communities and the United States, Cincinnati ($42,663) and the MSD Service Area ($58,311) lag significantly behind the national ($64,994) median household income (MHI) level. Even though modest MHI growth has recently occurred for the MSD Service Area, the proportion of MHI relative to the United States' MHI actually decreased during that period, indicating that the MSD Service Area continues to fall further behind the rest of the United States as the household income gap continues to widen over time.

Several communities in the MSD Service Area suffer from even lower MHI levels. In Lincoln Heights, for example, the MHI is the lowest at $15,417 per year. Other disadvantaged communities

with distressed MHI levels include Elmwood Place Village ($31,011), Lockland Village ($32,067), Mount Healthy ($41,847) and Norwood ($45,541). Mirroring the poverty trends shown above, disadvantaged communities also tend to be concentrated within the City of Cincinnati and extend outward into its suburbs, comprising a large portion of the MSD Service Area. Figure 2 below shows darker shades of green indicating higher MHI and the lightest shade indicating MHI below $50,000. Note the darker green areas within Hamilton County but outside the MSD Service Area.

Figure 2: Hamilton County Median Household Income, by Census Tract, 2020



Source: American Community Survey, 2020 5-Year Estimates.

b. Construction Market and Project Delivery Constraints

Challenges facing execution of this Phase 2B Plan include market capacity for contractors to design the projects, construct the projects, and assist MSD in managing the projects. Hamilton County and Southwest Ohio are also currently experiencing a significant amount of capital investment, which will severely tax the capacity of the construction industry to adequately respond to this demand. This increased demand could significantly increase the costs and schedule of Phase 2B beyond the current estimates, as several major capital projects in Hamilton County and southwest Ohio will tax the capacity of the local and regional construction industry. Locally, in addition to the Phase 2B capital program, the Brent Spence Bridge Corridor Project, the largest infrastructure project in Hamilton County's history, is estimated to cost $3.6 billion and will be delivered concurrently with Phase 2B. Other major local projects include the Western Hills

Viaduct bridge replacement (estimated to cost about $355 million) and the Duke Energy Convention Center renovation (budgeted at $200 million). Further, construction capacity specifically for sewer work is also stressed by other nearby urban communities implementing their own major consent decree programs including Columbus, Cleveland, Indianapolis, Lexington, and Louisville.

Phase 2B includes seven projects estimated to each cost anywhere from $64M to $200M (2023$). Four of the seven projects are to use an alternative project delivery method that is relatively new to MSD. The difficulties in managing such large and complex projects with new procurement and delivery methods justify a reasonable schedule. In fact, these four projects represent more than $776 million (2023$) in total project costs. Each of these seven projects, individually, is notably larger than any project delivered by MSD in the last 20 years. Additionally, current cost estimates are only "planning" or "early design" phase estimates. There is a risk that the final costs of these projects will be significantly higher than the current estimates, which must be considered in developing project milestone dates.

c. High-Rate Treatment (HRT) Facility Construction and Operational Concerns

The Defendants' Phase 2B (and future phases) approach—to which the Regulators have expressed support and have generally mirrored in their own approach—is centered on the construction of large HRT facilities at MSD's three main WWTPs.[4] The benefits of the centralized HRT approach can be maximized, and costs controlled, by also removing stormwater from the combined system through green infrastructure, separation, and other projects upstream of the WWTPs and HRT facilities. While the Defendants and the Regulators believe this combined approach is the best approach for expeditiously complying with the Consent Decree and Clean Water Act, it does raise several technical and operational concerns.

The HRT approach involves multiple complex facets of technology selection, large scale construction and post-construction operation that need to be perfected in a step-by-step approach. The goal is to build one major HRT after thorough technology evaluation using a design/build delivery method that is relatively new to MSD, and then follow that template for the construction of the second and third major HRT facilities after Phase 2B. This approach requires critical decisions to be made, which includes the selection of (a) the project delivery method[5] and (b) the proper size and best technology of each HRT. Part of this Phase 2B process is identifying the proper (and efficient) method of operation once construction is completed, as HRT facilities are highly dynamic systems. MSD has evaluated multiple different HRT technologies and contracting methods. However, efficiencies of scale in long-term HRT operations may be achieved if similar

[4] Indeed, the County's approach is consistent with Regulator-County/MSD discussions over the past eight years and is a change from the original WWIP's focus on two deep tunnels and multiple smaller HRT facilities in remote locations.

[5] This includes the following options: Design-Bid Build, Design-Build, and Progressive Design-Build.

technologies can be used in multiple HRT facilities. The choice of technology for each HRT will continue to be evaluated as future project planning/design continues. For these reasons, the most sensible path is to construct one HRT in Phase 2B, perfect the many facets described above, and then construct and operate the other two HRT facilities as guided by the lessons learned in Phase 2B. The Little Miami WWTP HRT Bundle is selected for Phase 2B because it offers clear and significant advantages. It provides by far the largest reduction in untreated overflows among the three potential HRT facilities, features the most efficient cost per gallon of overflow reduction, and possesses significant asset management value. The successful contracting, design, construction, and operation of this HRT will establish a strong precedent, which the remaining two HRT facilities can follow.

d. Length of Schedule

Insofar as completion of the entire remaining Phase 2 program within ten years is impracticable and would impose untenable burdens on MSD ratepayers, a ten-year schedule for the projects selected for Phase 2B is warranted, although this length of schedule carries significant risks. This is evident by the lessons learned since 2009 during which a substantial number of projects identified in the original WWIP have proven to be far more costly than originally estimated, have been deemed unnecessary due to new information, or relied on technology that is outdated and/or no longer preferred or applicable. Longer schedules carry planning risk because prior assumptions and foundational information can become dated or even obsolete over time, which underscores the need for economic reopeners. Project selections may be obsolete if better technology, newer data, regulatory changes, or lessons learned suggest better alternatives. History has also demonstrated that individual project cost estimates beyond ten years can be grossly underestimated. Even if estimates remain accurate, economic assumptions prove less reliable over time. A ten-year Phase 2B is a long enough period of time to bear the rate-increase risks of uncertain economic and project cost assumptions, which fall entirely on local citizens.

The Defendants know these risks are real and not just hypothetical. The HRT cost estimates originally included in the 2009 WWIP are drastically lower than 2023 estimates for those same projects. Significant modeling updates have also improved MSD's understanding of the sewer system and therefore the appropriate scope for projects to achieve overflow reduction targets. This experience warrants the consideration of economic reopeners.

e. Contingency Planning

i. Cost Contingencies

Accounting for unknown conditions and uncertainties, in the form of cost contingencies, is critical to proper fiscal management of a large scale and complex capital program that spans a decade. The Phase 2B Plan uses the following contingency elements to adjust estimated costs:

Project Contingency: This is a project specific contingency included in the estimated costs developed for the project in accordance with the MSD's Project Costing Manual (Rev 2). An appropriate amount of design contingency is included to address the accuracy of the estimate class. Several of the costliest projects currently have a Class 5 project cost estimate with a -50% to +100% accuracy range. Others have a Class 4 project cost estimate (-30% to +50%). This means that the actual, final costs have a very high degree of uncertainty.

Programmatic Contingency: This contingency element is required to fund change management needs for Professional Services Agreements and Construction contracts. Programmatic Contingency will be calculated annually based on the target annual budget less the cost of allowances and Progressive Design-Build projects (this contingency is already included in the PDB projects) calculated at 7.5%.

Risk Contingency: The Phase 2B Plan includes a risk contingency needed to address future uncertainty in inflation rates, supply chain issues, market capacity, future project unknowns, regulatory changes, etc. This allowance category will include contingency at program level calculated based on:

• Nominated Projects	25%	Any project that has not achieved a BCE
• Planning Phase Projects	20%	Any project that has achieved a BCE
• Design Phase Projects	15%	Any project that has achieved 30/60/90%
• Bid Ready & Construction	10%	Any project that has achieved 100% or Bid

Contingency will be used as a managed reserve. MSD is also evaluating the use of Quantitative Cost Risk Analysis (QCRA) in order to closely manage project cost and schedule variances.

ii. Economic Reopener

Even with the above cost contingencies, completion of the Phase 2B Plan still carries significant risks of project delays and cost overruns that are not within the County or MSD's control. In addition to the pressures on the local and regional construction market described above, related pressures caused by worker shortages, supply chain issues, and other economic changes risk

delaying or significantly increasing the cost of the Phase 2B Plan. MSD faces the continuing risk that its aging infrastructure may succumb to unexpected failures, requiring expensive immediate action. Further, potentially expensive new investments to meet evolving regulatory requirements, such as those relating to PFAS, nutrient control and climate change, create significant threats to financial capability. These risks warrant revisions of the WWIP to include an economic reopener provision. Such a provision would allow the Defendants to adapt a project schedule during implementation of the Phase 2B Plan. Proposed language for an economic reopener provision is included in the proposed Amended Final WWIP included as Enclosure 1.

IV. Phase 2B Plan

The most noteworthy aspect of the Phase 2B Plan that reflects a significant variation from Attachment 2 in the 2010 Final WWIP, is the advancement of HRT facilities at MSD's three large WWTPs. This approach to CSO control, which has been closely vetted with and supported by the Regulators, represents a significant change from the original WWIP as approved in 2010.

a. Project Descriptions, Milestone Schedules and Cost Estimates

The Phase 2B Plan will achieve a significant amount of overflow reduction of about 1.46 BG in a typical year (TY). Approximately two-thirds of the total cost for Phase 2B will be for WWIP projects. Asset management investment for the Plan is substantial and can hopefully be increased, but it is currently tempered by WWIP investment, capacity, and affordability concerns. Individual project fact sheets are available at the end of this document.

i. Little Miami Wastewater Treatment Plant (LMWWTP) High Rate Treatment (HRT) Bundle.

The LMWWTP HRT Bundle will achieve 1.3 BG (TY) of overflow reduction which will lead to improvements in water quality and environment and public health in the Ohio River and the Little Miami River watershed. The overflow reduction of 1.3 BG is 70% of the estimated 1.87 BG (TY) of overflow reduction from all three anticipated future major HRTs. It provides important HRT construction and operations experience before the other two HRTs are constructed at the Mill Creek and Muddy Creek plants in future phases.

The bundle includes the following:

- The LMWWTP High-Rate Treatment Facility. This project is being considered for a Progressive Design Build delivery approach. Once completed, the project will provide a treatment capacity of 115 MGD, and it will upgrade the existing treatment plant influent pumping and screening systems to deliver flow to both the HRT and the upgraded

secondary (100 MGD) process for a total wet weather treatment capacity of 215 MGD. Additionally, the disinfection system will be upgraded to match the expanded treatment capacity. The BCE identified cloth media filtration as a viable HRT technology. As the design progresses and coordination with other concurrent projects occurs, other HRT technologies such as chemically enhanced primary treatment, and compressible media filtration may be revisited and implemented, as appropriate.

- LMWWTP Electrical, Primary, and Secondary Improvements. This project includes upgrades at primary and secondary treatment processes to support increased treatment capacity from 55 MGD to 100 MGD through secondary treatment. This project also includes replacement of electrical equipment that is beyond its useful life, in a manner that anticipates requirements of the HRT.

- LMWWTP High-Rate Treatment Preparation. In preparation for the HRT construction, this project includes demolition of the existing Incineration, Sludge Receiving, Sludge Disposal, and Odor Control buildings, all of which are decommissioned or will have been decommissioned by the time of this project. Plant maintenance facilities must be relocated via this project. Additional assets and structures in nearby buildings will be demolished or preserved as needed, and this project will also include the construction of an electrical building for the HRT. Significant coordination with other projects will be required during design and construction.

- LMWWTP Solids Disposal and Odor Control. This Progressive Design-Build project will address critical solids handling, disposal and odor control needs at Little Miami WWTP. The project includes the following improvements: a new anaerobic digestion facility that will generate Class A biosolids; sludge receiving, pretreatment and storage facilities for imported sludges from Polk Run WWTP and Sycamore Creek WWTP; sludge thickening facilities; digester gas conditioning and facilities to use the digester gas onsite for power generation; sludge dewatering facilities; facilities for loading sludge into vehicles for off-site land application; improvements for the mitigation of struvite deposition; odor control and treatment; a levee around the new facilities for flood protection; site improvements, electrical system improvements, instrumentation & controls improvements, and other supporting systems; and integration with remaining facilities at the Little Miami WWTP. The relocation of these facilities frees up space for the construction of the HRT.

ii. Mill Creek Wastewater Treatment Plant (MCWWTP) High Rate Treatment (HRT) Pump Station Bundle.

This bundle completes necessary projects for the eventual construction of the MCWWTP HRT in a subsequent phase of the WWIP. The bundle consists of:

- MCWWTP High-Rate Treatment Pump Station. This is the second of three construction projects at the Mill Creek WWTP meant to address WWIP Index 248, via adaptive management. The first project, the Diversion Chamber, has been completed. The current project will construct a new pump station, connecting the recently constructed Diversion Chamber structure to the treatment plant. The third, future project, consists of construction of an HRT to treat peak wet weather flows. In addition to providing interim influent pumping capacity for the treatment plant of up to 430 MGD, the project will provide up to 700 MGD in total pumping capacity. The project will also provide an upgraded disinfection system for the treatment plant.

- MCWWTP Dewatering Building Improvements. This project will upgrade the Mill Creek dewatering process by constructing a new dewatering building on a site prepared for this purpose during the construction of the fluidized bed incinerators during Phase 1 of the WWIP. The facility will be designed to process all solids generated at Mill Creek WWTP, with or without the additional solids that will be generated from the proposed Mill Creek HRT. The facility will be designed with odor control, and with the ability to feed either the existing incineration process and its eventual replacement, i.e., an upgraded incineration process or alternative solids disposal process.

- East Branch Ohio River Interceptor Project. This project consists of new stormwater conveyance infrastructure and reconfiguration of existing sewer system assets, including the McClean Avenue Sewer and the East Branch Ohio River Interceptor, to remove stormwater from the combined sewer system. Overflows will be eliminated or reduced at CSO's 430, 431, 432, and 489. The project includes a dynamic underflow control system to maximize underflow to the interceptor, and remaining overflow will be consolidated at CSO 666. This effort will involve design and construction coordination with ODOT on their upcoming project, HAM 75 113361 (Brent Spence Bridge), but MSD is responsible for and in control of the design and construction of the outfall. About 142.4 MG (TY) of overflow reduction will be achieved by the East Branch Ohio River Interceptor Project.

The Phase 2B Plan also includes funding of $99.9M (2023$) ($59.3M (2006$)) for development and execution of currently unknown WWIP and asset management projects whose need will be recognized during Phase 2B. These projects will set the stage to assure continuity of work from Phase 2B to Phase 2C.

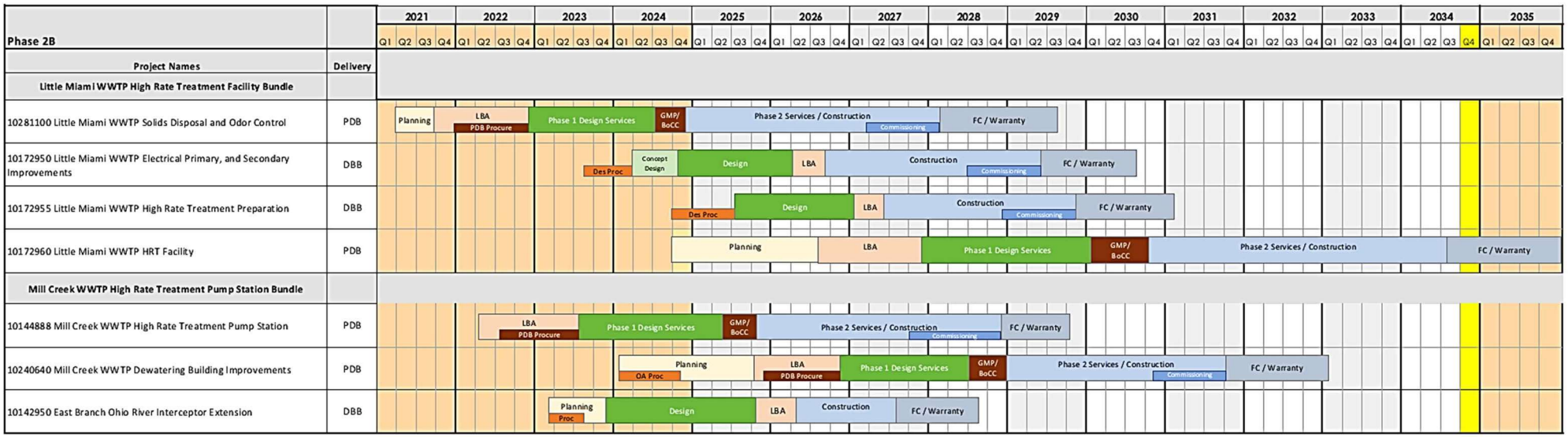
The following two pages contain Table 1 and Figure 3. Table 1 shows the major project bundles with their milestone dates, cost estimates, and overflow reduction estimates. Figure 3 shows the schedule for the Phase 2B projects.

Table 1: Phase 2B Major Project Bundles

WWIP Index	Project Bundle	Milestone Date	Milestone	Bundle Cost (Million - 2023$)[1]	Bundle Cost (Million - 2006$)[1]	Estimated Overflow Volume Reduction (MG/Typ. Yr.)
195 – 206 (adaptive)	Little Miami WWTP HRT Bundle LMWWTP Electrical, Primary, and Secondary Improvements + LMWWTP High Rate Treatment Preparation + LMWWTP Solids Disposal and Odor Control + LMWWTP HRT Facility	12/31/34	Construction Substantial Completion	$541.4	$321.3	1,316
248 (adaptive), 395A (adaptive for 394, 395, 396, 417, and 452)	Mill Creek WWTP HRT Pump Station Bundle MCWWTP Pump Station + MCWWTP Dewatering Building Improvements + East Branch Ohio River Interceptor Extension	12/31/34	Construction Substantial Completion	$495.2	$293.9	142.4

[1] 2025 – 2034 Estimated Cashflow

Figure 3: Phase 2B Plan Schedule of Major Projects



Notes:

1. Pre-Phase 2B and Post Phase 2B
2. End of Phase 2B
3. PDB = Progressive Design Build; DBB = Design Bid Build

b. WWIP Allowances

WWIP Section C.6 lists eight subject matter programs referred to as "Allowances." Of the eight WWIP Allowances, five are currently planned for Phase 2B and are listed below. Use of the remaining three Allowances has been reduced to the point where specific funding has been minimal or zero, and the work is instead addressed in specific, larger projects. The Phase 2B Plan does not currently include planned funds for these three Allowances but this does not prevent the Defendants from doing so as needed during Phase 2B. Additional information on each Allowance is provided in the WWIP:

- Sewer Back Up (SBU) Program (funded from operating budget, as described above)
- Main Sewer Renewal Program
- Manhole Renewal Program
- Home Sewage Treatment System (HSTS) Elimination Program
- Urgent Capacity Response (UCR) Program.

WWIP related allowance costs included in this Phase 2B Plan total $176.6M (2023$) ($104.8M (2006$)). This total includes MSD allowance accounts related to WWIP implementation that are not specified in the WWIP.

c. Asset Management

WWIP Section C.5. defines "Asset Management" as generally referring to "a comprehensive and structured approach to the long-term management of assets as tools for the efficient and effective delivery of services. For purposes of this WWIP, the term "Asset Management" means those capital expenditures by MSD that are not formally considered WWIP Projects or WWIP Allowance expenditures."

Asset Management investment is critical to ensuring MSD can continue to provide reliable and effective service to its customers. The extensive MSD system has an estimated replacement value of several billion dollars. This requires an appropriate level of investment to maintain the reliable, safe, and efficient operation of these assets. Where assets are run to failure, repair of failed infrastructure is typically 3 to 5 times more expensive than preventative maintenance or planned repair. Reduced investment jeopardizes NPDES compliance, increases overall costs of system maintenance, degrades stakeholder trust, and increases risk of liability. Because of the affordability realities facing MSD and the massive spending required by the WWIP, it was imperative for MSD to use a risk-based prioritization approach for Asset Management. This ensured the most critical needs were identified and investments prioritized appropriately so that they are incorporated into the Phase 2B Plan. MSD completed extensive analysis and prioritization for asset reinvestment to

identify the most critical expenditures of limited capital funds. This prioritization will be continually assessed during Phase 2B.

The drivers for advancing Asset Management projects are, consistent with WWIP priorities, to achieve the greatest public health and environmental benefit from limited public funds. Both categories of projects are intended to address capacity, regulatory compliance, operational optimization, risk mitigation and protection of human health and the environment. For a system as large and complex as MSD's, Asset Management also produces wet weather benefits. If infrastructure is allowed to deteriorate then it will lead to additional or increased overflows. In terms of public health and environmental benefit, the difference between a defined WWIP project and a defined Asset Management project can be indistinguishable.

Asset Management estimated costs included in this Phase 2B total $594.8M (2023$) (($353.0M (2006$)) and are based on the above considerations and priorities as well as historic asset management spending by MSD.

V. Public Participation

The Board held a public meeting specifically to discuss its Phase 2B Plan and obtain input from stakeholders. The Board invited stakeholders to submit written comments on the Phase 2B Plan.[6] The Board will maintain channels of communication with stakeholders.

VI. Conclusion

The Phase 2B projects will lead to significant sewer overflow reductions and achieve substantial human health and environmental benefits. However, the Plan comes with major challenges. There is no doubt that Phase 2B's schedule and projected costs will impose a new burden for MSD ratepayers (*i.e.,* those within the MSD Service Area). This burden will be especially hard on the economically disadvantaged ratepayers with low-income levels (especially relative to national standards), of whom a significant portion are minorities. The pace and size of the large construction projects will also stretch MSD's capabilities and run the significant risk of cost exceedances due to uncertain current cost estimates and competing local and regional construction projects. As a result, flexibility to reopen the project schedules is absolutely necessary. Finally, Phase 2B will lay the groundwork for future major HRT and other projects as well as modification of the WWIP to eliminate projects conceived over two decades ago that will no longer be needed.

[6] Sierra Club submitted comments following the public meeting. Sierra Club's public comments largely mirror Sierra Club's Response in Opposition to the United States' Motion for Entry of the Revised Material Modifications to the Consent Decrees' Wet Weather Improvement Program filed with the Court on June 4, 2024. Defendants will submit a reply brief in support of the United States' Motion for Entry of the Revised Material Modifications to the Consent Decrees' Wet Weather Improvement Program.

10172950 - LMWWTP Electrical, Primary, and Secondary Improvements
Project Fact Sheet

Project Identifiers		Project Location		Project Status:	
Project Type:	Treatment Facility	**WWTP Basin:**	Little Miami	**Current Project Phase:**	Design
CIP Category:	WWIP	**Watershed:**	Lower Duck Creek	**Project Delivery Method:**	DBB
WWIP Index #:	Multiple (see below)	**Municipality:**	City of Cincinnati	**Hydraulic Model Latest Version:**	System (2021-Q2)
Sanitary Sewer #:	n/a	**Neighborhood:**	East End	**Funding:**	WPCLF

Project Need and Problem Statement

At the Little Miami WWTP, all wet weather flow above 55 million gallons per day (MGD) is screened, pumped, and then discharged to the Ohio River without further treatment. In 2022, the Little Miami WWTP HRT and Bundle Update Business Case Evaluation (BCE) was completed. This BCE recommended the construction of a 115 million gallon per day (MGD) high-rate treatment facility (HRT) and various upgrades to the WWTP to increase biological secondary treatment capacity from 55 MGD to 100 MGD. This project will result in an upgrade to the secondary process and it includes other work necessary to allow for construction of the HRT.

Project Description

This project is included as part of the LMWWTP HRT Project Bundle. The Bundle, inclusive of previously completed projects, is an adaptive management approach to WWIP Indices 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, and 206.

The LMWWTP Electrical, Primary, and Secondary Improvements project includes upgrades at primary and secondary treatment processes to support increased treatment capacity from 55 MGD to 100 MGD through secondary. This project also includes replacement of electrical equipment that is beyond its useful life, in a manner that anticipates requirements of the HRT. Pumping modifications that are required to deliver increased flow to secondary will be completed as a part of the HRT project.

ROW/Acquisition Needs	Project Permitting Needs	Interagency Coordination
None required - all improvements will be made to existing structures	Project requires revisions to the WWTP NPDES Permit. Project requires standard construction project approvals and permits.	Project requires coordination with Duke Energy, Lunken Airport, and the Columbia-Tusculum Community Council

Project Risks

- Project Design and Construction Risks TBD.
- Project Costs are based on opinion of cost prepared by Arcadis, AACE Estimate Class 5 (-50% to +100% Accuracy).

Regulatory

WWIP Compliance Date	12/31/2034
Adaptive Management	Yes
Regulatory Approval Status	Approval in Ph 2B
Benefited CSOs	N/A
Benefited SSOs	N/A
Benefited PSOs	N/A

Project Schedule (Dates Actual/Forecasted)

Project Nomination(SG1)	*07/06/2022*
Planning Phase	
Planning NTP	*N/A*
BCE Approved (SG2)	*06/15/2022*
Design Phase	
Design NTP	*03/11/2024*
60% Design (SG3)	*07/23/2025*
Submit for PTI	*06/01/2025*
100% Design (SG4)	*04/01/2026*
Const. Funding (BoCC)	*04/30/2026*
Construction Phase	
Construction NTP	*08/11/2026*
Subst. Completion (SC1)	*04/27/2029*
Final Completion	*06/26/2029*

Related Projects

multiple	multiple LMWWTP improvement projects	Predecessor
10172955	LMWWTP High Rate Treatment Preparation	Successor
10172960	LMWWTP HRT Facility	Successor
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Project Cost Disclaimers

(1) All costs presented are in 3Q23$. All costs are expressed to a degree of accuracy of no more than three significant digits, as per MSD Project Costing Manual v3. (2) All project related data contained herein reflects best available status as of March 2024. Changes in scope, cost estimates, and schedules are anticipated as part of the normal project delivery cycle. (3) Costs for full-time on-site construction management and inspection have not been included pending finalization of the Phase 2B project portfolio, project delivery methods, and Phase 2B Schedule to determine needs for outsourced versus in-house resources. (4) Programmatic Contingency for change management during design and construction is included in the MSD Allowance "Programmatic Contingency" and will be calculated at 7.5% of the OPCC. (5) Risk Contingency will be determined on a project specific basis once project design is authorized. Costs are not included herein.

Project Cost Estimate: $ 59,700,000

10172955 - LMWWTP High Rate Treatment Preparation
Project Fact Sheet

Project Identifiers		Project Location		Project Status:	
Project Type:	Treatment Facility	**WWTP Basin:**	Little Miami	**Current Project Phase:**	Planning
CIP Category:	WWIP	**Watershed:**	Lower Duck Creek	**Project Delivery Method:**	DBB
WWIP Index #:	Multiple (see below)	**Municipality:**	City of Cincinnati	**Hydraulic Model Latest Version:**	System (2021-Q2)
Sanitary Sewer #:	n/a	**Neighborhood:**	East End	**Funding:**	WPCLF

Project Need and Problem Statement

At the Little Miami WWTP, all wet weather flow above 55 million gallons per day (MGD) is screened, pumped, and then discharged to the Ohio River without further treatment. In 2021, the Little Miami WWTP HRT and Bundle Update Business Case Evaluation (BCE) was completed. This BCE recommended the construction of a 115 MGD high-rate treatment facility (HRT) and various upgrades to the WWTP to increase biological secondary treatment capacity from 55 MGD to 100 MGD. This project was identified in the BCE as a necessary precursor to the HRT project.

The LMWWTP site has limited available space and this project will prepare a space for the new HRT while also making efficient use of time through coordination with other projects. Preparation for the HRT construction requires demolition of the decommissioned incineration building, the maintenance building, and the soon-to-be decommissioned solids handling buildings.

Project Description

This project is included as part of the LMWWTP HRT Project Bundle. The Bundle, inclusive of previously completed projects, is an adaptive management approach to WWIP Indices 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, and 206.

This project includes site work required to prepare for the construction of the HRT, which may include demolition of decommissioned buildings and facilities, relocation of utilities, creation of laydown areas, geotechnical work, and environmental remediation work, as needed. Additionally, the scope of this project contains the construction of an electrical building for the HRT. Significant coordination with other projects (LMWWTP Solids Disposal with Odor Control; LMWWTP Electrical, Primary, and Secondary Improvements; and LMWWTP HRT Facility) will be required during design and construction.

ROW/Acquisition Needs	Project Permitting Needs	Interagency Coordination
None required - all improvements will be made within the property of the existing treatment plant.	Project requires standard construction project approvals and permits.	Project requires coordination with Duke Energy, Lunken Airport, and the Columbia-Tusculum Community Council

Project Risks

- Project Design and Construction Risks TBD.
- Project Costs are based on opinion of cost prepared by Arcadis, AACE Estimate Class 5 (-50% to +100% Accuracy).

Regulatory

WWIP Compliance Date	12/31/2034
Adaptive Management	Yes
Regulatory Approval Status	Approval in Ph 2B
Benefited CSOs	N/A
Benefited SSOs	N/A
Benefited PSOs	N/A

Project Schedule (Dates Actual/Forecasted)

Project Nomination(SG1)	*07/06/2022*
Planning Phase	
Planning NTP	*N/A*
BCE Approved (SG2)	*06/15/2022*
Design Phase	
Design NTP	*07/28/2025*
60% Design (SG3)	*06/10/2026*
Submit for PTI	*04/21/2026*
100% Design (SG4)	*01/20/2027*
Const. Funding (BoCC)	*02/25/2027*
Construction Phase	
Construction NTP	*06/04/2027*
Subst. Completion (SC1)	*11/20/2029*
Final Completion	*02/18/2030*

Related Projects

multiple	multiple LMWWTP improvement projects	Predecessor
10172955	LMWWTP Electrical, Primary, and Secondary Improvements	Predecessor
10172960	LMWWTP HRT Facility	Successor
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Project Cost Disclaimers

Project Cost Estimate: $ 43,500,000

(1) All costs presented are in 3Q23$. All costs are expressed to a degree of accuracy of no more than three significant digits, as per MSD Project Costing Manual v3. (2) All project related data contained herein reflects best available status as of March 2024. Changes in scope, cost estimates, and schedules are anticipated as part of the normal project delivery cycle. (3) Costs for full-time on-site construction management and inspection have not been included pending finalization of the Phase 2B project portfolio, project delivery methods, and Phase 2B Schedule to determine needs for outsourced versus in-house resources. (4) Programmatic Contingency for change management during design and construction is included in the MSD Allowance "Programmatic Contingency" and will be calculated at 7.5% of the OPCC. (5) Risk Contingency will be determined on a project specific basis once project design is authorized. Costs are not included herein.

10281100 - LMWWTP Solids Disposal With Odor Control
Project Fact Sheet

Project Identifiers		Project Location		Project Status:	
Project Type:	Treatment Facility	**WWTP Basin:**	Little Miami	**Current Project Phase:**	Design
CIP Category:	WWIP	**Watershed:**	Lower Duck Creek	**Project Delivery Method:**	PDB
WWIP Index #:	Multiple (see below)	**Municipality:**	City of Cincinnati	**Hydraulic Model Latest Version:**	System (2021-Q2)
Sanitary Sewer #:	N/A	**Neighborhood:**	East End	**Funding:**	WPCLF

Project Need and Problem Statement

Since the decommissioning of the fluidized bed incinerator at the Little Miami wastewater treatment plant in 2016, all sludge processed at Little Miami has been transported to the landfill for disposal. Comprehensive engineering planning identified anaerobic digestion as the most appropriate replacement solids disposal method and noted that continuation of landfilling was not a long-term option from a perspective of risk, cost, and sustainability.

Project Description

This project is included as part of the LMWWTP HRT Project Bundle. The Bundle, inclusive of previously completed projects, is an adaptive management approach to WWIP Indices 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, and 206.

This project will install digesters and upgrade solids processing facilities, including thickening, dewatering and odor control, to all the treatment plant to produce a biosolids product for beneficial re-use. Clean energy in the form of biogas will be recovered for productive onsite use, partially offsetting the treatment plant's reliance on grid energy.

ROW/Acquisition Needs	Project Permitting Needs	Interagency Coordination
Due to the site constraints of the existing Little Miami WWTP, the optimal location for the new solids handling and disposal facilities is proposed on the west side of the existing parcel. No easements are required for this location. This area is owned by the City of Cincinnati; however, portions of this area are not controlled by MSD and are controlled by other City departments. MSD is requesting control of this area.	- Project requires standard construction project approvals and permits. - Extension of the flood protection levee will required permitting through USACE, FEMA, and the City of Cincinnati Floodplain Manager. - An air permit may be required depending on the final design solution for biogas reuse. - Class A land application permit may required if land application is utilized.	This project will require coordination with USACE, FEMA, OEPA, Regional Air Pollution Control Agency (RAPCA), ODOT, Cincinnati Fire, Building, & Water Departments, City of Cincinnati Department of Transportation and Engineering, Cincinnati Park Board, Lunken Airport, and Federal Aviation Administration (FAA). Non-governmental agency coordination includes Duke Energy.

Project Risks

-Challenging schedule considerations with respect to the renewable energy Investment Tax Credit (ITC) deadlines will require an early work package, and may require the pre-purchase of equipment

-The identification of contamination on the proposed site has resulted in the need for remediation of the impacted soils and will require a modified site layout. The cost of this remediation is being finalized by the PDB Team, but is estimated at $15M, which has been reflected in this updated cost estimate.

Regulatory

WWIP Compliance Date	12/31/2034
Adaptive Management	Yes
Regulatory Approval Status	Approval in Ph 2B
Benefited CSOs	N/A
Benefited SSOs	N/A
Benefited PSOs	N/A

Project Schedule (Dates Actual/Forecasted)

Project Nomination(SG1)	*TBD*
Planning Phase	
Planning NTP	*06/04/2020*
BCE Approved (SG2)	*11/04/2021*
Design Phase	
Design NTP	*12/20/2022*
60% Design (SG3)	*08/21/2024*
Submit for PTI	*08/01/2024*
100% Design (SG4)	*08/01/2025*
Const. Funding (BoCC)	*10/18/2024*
Construction Phase	
Construction NTP	*11/18/2024*
Subst. Completion (SC1)	*02/17/2028*
Final Completion	*03/08/2029*

Related Projects

10172955	LMWWTP High Rate Treatment Preparation	Successor
10172960	LMWWTP HRT Facility	Successor
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Project Cost Disclaimers

Project Cost Estimate: $ 207,000,000

(1) All costs presented are in 3Q23$. All costs are expressed to a degree of accuracy of no more than three significant digits, as per MSD Project Costing Manual v3. (2) All project related data contained herein reflects best available status as of March 2024. Changes in scope, cost estimates, and schedules are anticipated as part of the normal project delivery cycle. (3) Costs for full-time on-site construction management and inspection have not been included pending finalization of the Phase 2B project portfolio, project delivery methods, and Phase 2B Schedule to determine needs for outsourced versus in-house resources. (4) Programmatic Contingency for change management during design and construction is included in the MSD Allowance "Programmatic Contingency" and will be calculated at 7.5% of the OPCC. (5) Risk Contingency will be determined on a project specific basis once project design is authorized. Costs are not included herein.

10172960 - LMWWTP HRT Facility
Project Fact Sheet

Project Identifiers		Project Location		Project Status:	
Project Type:	Treatment Facility	**WWTP Basin:**	Little Miami	**Current Project Phase:**	Planning
CIP Category:	WWIP	**Watershed:**	Lower Duck Creek	**Project Delivery Method:**	PDB or DBB
WWIP Index #:	Multiple (see below)	**Municipality:**	City of Cincinnati	**Hydraulic Model Latest Version:**	System (2021-Q2)
Sanitary Sewer #:	n/a	**Neighborhood:**	East End	**Funding:**	WPCLF

Project Need and Problem Statement

At the Little Miami WWTP, all wet weather flow above 55 million gallons per day (MGD) is screened, pumped, and then discharged to the Ohio River without further treatment. In 2021, the Little Miami WWTP HRT and Bundle Update Business Case Evaluation (BCE) was completed. This BCE recommended the construction of a 115 MGD high-rate treatment facility (HRT) and various upgrades to the WWTP to increase biological secondary treatment capacity from 55 MGD to 100 MGD. This project will construct a 115 MGD HRT facility and provide necessary modifications to the existing plant influent pumping stations (Four-Mile Pump Station and Little Miami Pump Station) to ensure successful treatment operation at peak flows of up to 215 MGD.

Project Description

This project is included as part of the LMWWTP HRT Project Bundle. The Bundle, inclusive of previously completed projects, is an adaptive management approach to WWIP Indices 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, and 206.

This project will construct an HRT facility with a capacity of 115 MGD, and it will upgrade the existing treatment plant influent pumping and screening systems to deliver flow to both the HRT and the upgraded secondary (100 MGD) process. Additionally, the disinfection system will be upgraded to match the expanded treatment capacity. The BCE identified cloth media filtration as a viable HRT technology. As the design progresses and coordination with other concurrent projects occurs, other HRT technologies such as chemically enhanced primary treatment, ballasted flocculation, and compressible media filtration, may be revisited and implemented if appropriate.

ROW/Acquisition Needs	Project Permitting Needs	Interagency Coordination
The new outfall for the HRT will require acquisition of new easements between the treatment plant property and the Ohio River.	Project requires revisions to the WWTP NPDES Permit. Project requires standard construction project approvals and permits. Project requires USACE Nationwide Permits for construction of the outfall.	Project requires coordination with Duke Energy, Lunken Airport, and the Columbia-Tusculum Community Council

Project Risks

- Project Design and Construction Risks TBD.
- This project is dependent on completion of several other projects to avoid delay to this project.
- Project Costs are based on opinion of cost prepared by Arcadis, AACE Estimate Class 5 (-50% to +100% Accuracy).

Regulatory

WWIP Compliance Date	12/31/2034
Adaptive Management	Yes
Regulatory Approval Status	Approval in Ph 2B
Benefited CSOs	467, 468, 469, 472, 476, 656
Benefited SSOs	N/A
Benefited PSOs	N/A
CSO Wet Weather Bypass	NPDES No. 1PL00000-004

Project Schedule (Dates Actual/Forecasted)

Project Nomination(SG1)	*07/06/2022*
Planning Phase	
Planning NTP	*08/28/2024*
BCE Approved (SG2)	*01/01/2027*
Design Phase	
Design NTP	*01/01/2028*
60% Design (SG3)	*08/01/2030*
Submit for PTI	*08/01/2030*
100% Design (SG4)	*08/01/2031*
Const. Funding (BoCC)	*11/01/2030*
Construction Phase	
Construction NTP	*01/01/2031*
Subst. Completion (SC1)	*09/01/2034*
Final Completion	*04/24/2035*

Related Projects

10172950	LMWWTP Electrical, Primary, and Secondary Improvements	Predecessor
10172955	LMWWTP High Rate Treatment Preparation	Predecessor
multiple	multiple LMWWTP improvement projects	Predecessor
10281100	LMWWTP Solids Disposal With Odor Control	Predecessor

Project Cost Disclaimers

Project Cost Estimate: $ 198,000,000

(1) All costs presented are in 3Q23$. All costs are expressed to a degree of accuracy of no more than three significant digits, as per MSD Project Costing Manual v3. (2) All project related data contained herein reflects best available status as of March 2024. Changes in scope, cost estimates, and schedules are anticipated as part of the normal project delivery cycle. (3) Costs for full-time on-site construction management and inspection have not been included pending finalization of the Phase 2B project portfolio, project delivery methods, and Phase 2B Schedule to determine needs for outsourced versus in-house resources. (4) Programmatic Contingency for change management during design and construction is included in the MSD Allowance "Programmatic Contingency" and will be calculated at 7.5% of the OPCC. (5) Risk Contingency will be determined on a project specific basis once project design is authorized. Costs are not included herein.

10240640 - MCWWTP Dewatering Building Improvements
Project Fact Sheet

Project Identifiers		Project Location		Project Status:	
Project Type:	Treatment Facility	**WWTP Basin:**	Mill Creek	**Current Project Phase:**	Planning
CIP Category:	WWIP	**Watershed:**	Central	**Project Delivery Method:**	PDB or DBB
WWIP Index #:	248 (Adaptive)	**Municipality:**	City of Cincinnati	**Hydraulic Model Latest Version:**	System (2018-05-04)
Sanitary Sewer #:	n/a	**Neighborhood:**	Lower Price Hill	**Funding:**	WPCLF

Project Need and Problem Statement

The Mill Creek WWTP dewatering process suffers from significant reliability problems that often inhibit solids throughput and threaten permit compliance with respect to the incineration of biosolids. The dewatering building is original to the 1950's and although the process has been upgraded at least three times, most major process components are already well beyond their useful life. The last process upgrade was in the early 2000's, well prior to the 2010 installation of fluidized bed incinerators. This project is required to maintain existing treatment plant operations, and also to process additional solids generated by the future Mill Creek HRT facility. This project was a key component of MSD's 2019 Solids Handling Master Plan due to the benefits associated with increasing the reliability of Mill Creek solids handling assets and minimizing offsite odors.

Project Description

This project is included as part of the MCWWTP HRT Project Bundle.

This project will upgrade the Mill Creek dewatering process by constructing a new dewatering building on a site prepared for this purpose during the construction of the fluidized bed incinerators during Phase 1 of the WWIP. The facility will be designed to process all solids generated at Mill Creek WWTP, with or without the additional solids that will be generated from the proposed Mill Creek HRT. The facility will be designed with odor control, and with the ability to feed either the existing incineration process and its eventual replacement, i.e. an upgraded incineration process or alternative solids disposal process.

ROW/Acquisition Needs	Project Permitting Needs	Interagency Coordination
None required - all improvements will be made within the property of the existing treatment plant.	TBD	Key stakeholders are MSDGC, Hamilton County, OEPA.

Project Risks

- Project Design and Construction Risks TBD.
- Project Costs are based on opinion of cost prepared by MSD, AACE Estimate Class 5 (-50% to +100% Accuracy).

Regulatory

WWIP Compliance Date	12/31/2034
Adaptive Management	Yes
Regulatory Approval Status	Approval in Ph 2B
Benefited CSOs	N/A
Benefited SSOs	N/A
Benefited PSOs	N/A

Project Schedule (Dates Actual/Forecasted)

Project Nomination(SG1)	*11/09/2022*
Planning Phase	
Planning NTP	*10/14/2024*
BCE Approved (SG2)	*10/01/2025*
Design Phase	
Design NTP	*01/01/2027*
60% Design (SG3)	*11/15/2028*
Submit for PTI	*11/15/2028*
100% Design (SG4)	*11/15/2029*
Const. Funding (BoCC)	*01/01/2029*
Construction Phase	
Construction NTP	*01/01/2031*
Subst. Completion (SC1)	*11/01/2031*
Final Completion	*04/01/2032*

Related Projects

10144899	Mill Creek WWTP HRT Facility	Successor
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Project Cost Disclaimers

(1) All costs presented are in 3Q23$. All costs are expressed to a degree of accuracy of no more than three significant digits, as per MSD Project Costing Manual v3. (2) All project related data contained herein reflects best available status as of March 2024. Changes in scope, cost estimates, and schedules are anticipated as part of the normal project delivery cycle. (3) Costs for full-time on-site construction management and inspection have not been included pending finalization of the Phase 2B project portfolio, project delivery methods, and Phase 2B Schedule to determine needs for outsourced versus in-house resources. (4) Programmatic Contingency for change management during design and construction is included in the MSD Allowance "Programmatic Contingency" and will be calculated at 7.5% of the OPCC. (5) Risk Contingency will be determined on a project specific basis once project design is authorized. Costs are not included herein.

Project Cost Estimate: $ 151,000,000

10144888 - MCWWTP High Rate Treatment Pump Station
Project Fact Sheet

Project Identifiers		Project Location		Project Status:	
Project Type:	Treatment Facility	**WWTP Basin:**	Mill Creek	**Current Project Phase:**	Design
CIP Category:	WWIP	**Watershed:**	Central	**Project Delivery Method:**	PDB
WWIP Index #:	248 (Adaptive)	**Municipality:**	City of Cincinnati	**Hydraulic Model Latest Version:**	System (2018-05-04)
Sanitary Sewer #:	6793	**Neighborhood:**	Lower Price Hill	**Funding:**	WPCLF

Project Need and Problem Statement

This project will replace the Mill Creek Pump Station that has been in continuous operation since 1959, but that is now functionally obsolete. This system currently provides a total firm influent pumping capacity of 430 million gallons per day (MGD), but it suffers from reliability problems inherent to the original design. It cannot be expanded to add capacity, and it cannot be taken off-line for necessary upgrades or repairs without a long-term bypass of the treatment plant and significant environmental degradation.

This project will replace the aging pump station by constructing a new 700 MGD pump station that will be designed to serve both the Mill Creek WWTP and a future co-located high-rate treatment facility (HRT). The construction project will allow for an upgrade to the plant disinfection system to meet more extensive OEPA-required disinfection.

Project Description

This project is included as part of the MCWWTP HRT Project Bundle.

This is the second of three construction projects at the Mill Creek WWTP that are meant to address WWIP Index 248. The first project, the Diversion Chamber, has been completed. The current project will construct a new pump station, connecting the recently constructed Diversion Chamber structure to the treatment plant. The third, future project, consists of construction of an HRT to treat peak wet weather flows.

In addition to providing interim influent pumping capacity for the treatment plant of up to 430 MGD, the project will provide up to 700 MGD in total pumping capacity. The project will also plan and design for an upgraded treatment plant disinfection system.

ROW/Acquisition Needs	Project Permitting Needs	Interagency Coordination
None anticipated - Project will be located on existing MSD Mill Creek WWTP property.	Project requires standard construction project approvals and permits. The increase in pumped flow may require an antidegradation review prior to approval of the Ohio EPA permit-to-install (PTI).	Key stakeholders are MSDGC, Hamilton County, USACE, OEPA, USEPA, and ORSANCO.

Project Risks

- Encountering contaminated soil during construction.
- Impacting treatment plant operations during tie-in of new pump station to existing force mains.
- Project Costs are based on opinion of cost prepared by design builder, AACE Estimate Class 4 (-20% to +50% Accuracy).

Regulatory

WWIP Compliance Date	12/31/2034
Adaptive Management	Yes
Regulatory Approval Status	Approval in Ph 2B
Benefited CSOs	N/A
Benefited SSOs	N/A
Benefited PSOs	N/A

Project Schedule (Dates Actual/Forecasted)

Project Nomination(SG1)	*N/A*
Planning Phase	
Planning NTP	*01/11/2022*
BCE Approved (SG2)	*09/14/2022*
Design Phase	
Design NTP	*09/23/2023*
60% Design (SG3)	*09/24/2025*
Submit for PTI	*09/24/2025*
100% Design (SG4)	*09/24/2026*
Const. Funding (BoCC)	*11/01/2025*
Construction Phase	
Construction NTP	*01/01/2026*
Subst. Completion (SC1)	*11/29/2028*
Final Completion	*06/27/2029*

Related Projects

10144887	Mill Creek WWTP High Rate Treatment Facility Diversion Structure	Predecessor
10144889	Mill Creek WWTP HRT Facility	Successor
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Project Cost Disclaimers

Project Cost Estimate: $ 267,000,000

(1) All costs presented are in 3Q23$. All costs are expressed to a degree of accuracy of no more than three significant digits, as per MSD Project Costing Manual v3. (2) All project related data contained herein reflects best available status as of March 2024. Changes in scope, cost estimates, and schedules are anticipated as part of the normal project delivery cycle. (3) Costs for full-time on-site construction management and inspection have not been included pending finalization of the Phase 2B project portfolio, project delivery methods, and Phase 2B Schedule to determine needs for outsourced versus in-house resources. (4) Programmatic Contingency for change management during design and construction is included in the MSD Allowance "Programmatic Contingency" and will be calculated at 7.5% of the OPCC. (5) Risk Contingency will be determined on a project specific basis once project design is authorized. Costs are not included herein.

10142950 - East Branch Ohio River Interceptor Extension
Project Fact Sheet

Project Identifiers		Project Location		Project Status:	
Project Type:	Sewer	**WWTP Basin:**	Mill Creek	**Current Project Phase:**	Design
CIP Category:	WWIP	**Watershed:**	East Ohio River	**Project Delivery Method:**	DBB
WWIP Index #:	395A	**Municipality:**	City of Cincinnati	**Hydraulic Model Latest Version:**	Project (2024-Q1)
Sanitary Sewer #:	TBD	**Neighborhood:**	Queensgate	**Funding:**	ODOT

Project Need and Problem Statement

This stormwater separation project will take advantage of a unique opportunity to coordinate with the Ohio Department of Transportation (ODOT) on a solution for stormwater drainage and conveyance needs associated with the I-75/Brent Spence Bridge project. The project will remove approximately 110 acres of highway drainage area, and an additional 30 acres within the Queensgate neighborhood (partial separation), from the MSD combined sewer system. The project will eliminate two CSOs (489 and 432) and it will reduce overflows at two other CSOs (430 and 431). The project will also facilitate conveyance of wet weather flow in a manner that will allow for the performance of the future Mill Creek HRT facility to be maximized.

Project Description

This project is still being negotiated with ODOT.

This project is an adaptive management approach to Indices 394, 395, 396, 417, and 452.

This project will construct new stormwater conveyance infrastructure and it will reconfigure existing sewer system assets, including the McClean Avenue Sewer and the East Branch Ohio River Interceptor, to remove stormwater from the combined sewer system. Overflows will be eliminated or reduced at CSOs 430, 431, 432, and 489. The project includes a dynamic underflow control system to maximum underflow to the interceptor, and remaining overflow will be consolidated at CSO 666. This effort will involve design and construction coordination with ODOT on their upcoming project, HAM 75 113361 (Brent Spence Bridge).

ROW/Acquisition Needs	Project Permitting Needs	Interagency Coordination
Temporary and permanent easements will be required from private property owners, including Norfolk Southern, CSX, and USPS. Use of existing right-of-way and State of Ohio (ODOT) owned properties will also be required.	Project will require revisions to numerous CSO permits. Environmental permits for excavation in and near Mill Creek will also be required. Project requires standard construction project approvals and permits.	Coordination with Greater Cincinnati Waterworks transmission main located under Gest Street. Coordination with CSX/Norfolk Southern to ensure requirements to protect railyard infrastructure are met. Coordination with ODOT for agreement to operate and maintain DUC.

Project Risks

- Potential schedule delays due to coordination issues with the railroads.
- Construction risk associated with unforeseen conditions impacting the operation of tunnel boring machine.
- Project Costs are based on opinion of cost prepared by JACOBS Engineering, AACE Estimate Class 4 (-30% to +50% Accuracy).

Regulatory

WWIP Compliance Date	12/31/2034
Adaptive Management	Yes
Regulatory Approval Status	Approval in Ph 2B
Benefited CSOs	430, 432, 431A, 489, 666
Benefited SSOs	N/A
Benefited PSOs	N/A

Project Schedule (Dates Actual/Forecasted)

Project Nomination(SG1)	*11/09/2022*
Planning Phase	
Planning NTP	*08/18/2023*
BCE Approved (SG2)	*12/06/2023*
Design Phase	
Design NTP	*12/22/2023*
60% Design (SG3)	*09/18/2024*
Submit for PTI	*07/06/2025*
100% Design (SG4)	*11/12/2025*
Const. Funding (BoCC)	*12/11/2025*
Construction Phase	
Construction NTP	*03/24/2026*
Subst. Completion (SC1)	*07/11/2028*
Final Completion	*09/11/2028*

Related Projects

10144899	Mill Creek WWTP HRT Facility	Successor
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Project Cost Disclaimers

Project Cost Estimate: $ 148,000,000

(1) All costs presented are in 3Q23$. All costs are expressed to a degree of accuracy of no more than three significant digits, as per MSD Project Costing Manual v3. (2) All project related data contained herein reflects best available status as of March 2024. Changes in scope, cost estimates, and schedules are anticipated as part of the normal project delivery cycle. (3) Costs for full-time on-site construction management and inspection have not been included pending finalization of the Phase 2B project portfolio, project delivery methods, and Phase 2B Schedule to determine needs for outsourced versus in-house resources. (4) Programmatic Contingency for change management during design and construction is included in the MSD Allowance "Programmatic Contingency" and will be calculated at 7.5% of the OPCC. (5) Risk Contingency will be determined on a project specific basis once project design is authorized. Costs are not included herein.

Enclosure 1

Amended Final Wet Weather Improvement Program

This Amended Final Wet Weather Improvement Program ("Amended Final WWIP") is submitted to fulfill requirements of the Interim Partial Consent Decree on Sanitary Sewer Overflows ("SSO Decree") and the Consent Decree on Combined Sewer Overflows, Wastewater Treatment Plants and Implementation of Capacity Assurance Program Plan for Sanitary Sewer Overflows ("CSO Decree"). The SSO Decree and CSO Decree require submission of a Long Term Control Plan Update ("LTCPU") and the Capacity Assurance Program Plan ("CAPP"). This Amended Final WWIP meets the requirements of both plans.

As used in this Amended Final WWIP, "Defendants" means, collectively, the Board of County Commissioners of Hamilton County, Ohio and the City of Cincinnati, Ohio, and "Regulators" means, collectively, the U.S. EPA, Ohio EPA, and the Ohio River Valley Water Sanitation Commission (together referred to as the "Parties"). This Amended Final WWIP is based upon and supported by the monitoring, modeling, analytical, and public participation efforts that Defendants performed in accordance with the SSO Decree and CSO Decree, the information developed and submitted to the Regulators and other reports, studies, and information provided to the Regulators after the entry of the SSO and CSO Decrees. This Amended Final WWIP is proposed with the intent that the CSO and SSO Decrees are modified to conform to this Amended Final WWIP.[1]

Defendants' initial final WWIP was approved by the Regulators on January 6, 2010, and subsequently approved by the Court on August 10, 2010 ("Initial Final WWIP"). The Parties agreed to, and, when required, the district court has approved, several modifications to the Initial Final WWIP (e.g. a modified deadline for a Phase 2A plan submission). An index listing the Initial Final WWIP and all subsequent modifications, with docket or other references where applicable, is included here as **Attachment 1.**

This Amended Final WWIP replaces and supersedes the Initial Final WWIP and all

[1] Consent Decree Paragraph IX B. may need to be revised to reflect revision to Phase 2 scheduling.

subsequent modifications thereto, as referenced in **Attachment 1**. This Amended Final WWIP thus removes provisions that have previously been completed (e.g. Phase 1) or are no longer applicable. References to prior WWIP phases are used only as references to reflect prior accomplishments and WWIP progress. This Amended Final WWIP thus serves as the Defendants' WWIP plan, required under the LTCPU and CAPP of the SSO Decree and CSO Decree.

A. **WWIP Phase 1 –** Completed.

B. **WWIP Bridge –** Completed.

C. **WWIP Phase 2**

1. Phase 2A – Substantial Completion scheduled for December 31, 2024.

2. Phase 2B – Is scheduled for substantial completion by December 31, 2034. Phase 2B is subject to the terms of this Amended Final WWIP, where applicable, and the approved Phase 2B plan. The list of Phase 2B projects is set forth in **Attachment 2**.

3. Phase 2C and additional future phases:

The initial final WWIP contained, as its attachment 2, a list of all WWIP projects required for completion during Phase 2. The Parties have modified this list during prior WWIP phase implementations. An updated and current list of remaining Phase 2 WWIP projects is attached here as **Attachment 3**. A list of completed WWIP projects and WWIP spending completed after Phase 1 is included as **Attachment 4**

a. Schedule of Work: By June 30, 2034, Defendants shall submit to the Regulators a proposed Phase 2C schedule consisting of the remaining WWIP projects listed in **Attachment 3**, unless Defendants seek additional phase 2 subparts beyond Phase 2C, in accordance with Paragraph C.3.d below. The Phase 2C schedule shall be as expeditious as practicable, based on relevant factors, including but not limited to (a) the impact that the cost and length of the schedule will have on Defendants' financing in the tax exempt market,

(b) local and national experience with the time, cost, economics and practicality of CSO/SSO program implementation, (c) Defendants' experience and the impact of local, regional and national construction trends on project delivery capacity expectations and the potential scheduling constraints therefrom, and (d) technical feasibility.

b. Financial Capability Analysis: As part of the Phase 2C submission, Defendants will perform a financial capability analysis in accordance with U.S. EPA's Clean Water Act Financial Capability Assessment Guidance (February 2023) ("Guidance") and/or any other applicable US EPA guidance for financial capability using (1) the projected costs of the remaining WWIP projects for one analysis; and (2) the projected costs of the projects specified in Defendants' proposed Phase 2 schedule at issue if Defendants are proposing a schedule for a subpart of the remaining WWIP projects for the second analysis. Per U.S. EPA Guidance, Defendants' financial capability analysis may also consider unique local conditions, economic trends, and other socioeconomic data. Defendants may include projected future costs for "Asset Management" and for "Allowances." For Allowances, the amount used should not exceed an annual average of expenditures spent during the course of implementing the Phase 1 schedule (adjusted for inflation and escalated to current dollars), and, for Asset Management, the amount should not exceed $85.9 million per year (adjusted for inflation and escalated to current dollars). Defendants may use different cost figures for Allowances and/or for Asset Management, provided that Defendants reasonably demonstrate the necessity of greater spending.

c. As part of the Phase 2C submission, Defendants will identify remaining WWIP projects for removal from **Attachment 3**. These projects will be subject to removal because they are (1) no longer feasible, (2) no longer needed because another project, system activity or modeling improvement led to the achievement of the project's overflow performance criteria, or (3) being

replaced by a new WWIP project. Based on current information and modeling at the time of their Phase 2B submission, Defendants created a presumptive list of projects for removal from WWIP Phase 2 which is included here as **Attachment 5**. During implementation of Phase 2B, Defendants will continue to evaluate the list in **Attachment 5** and determine if additional projects can be removed from **Attachment 3**. A revised list of projects for removal from **Attachment 3** will be submitted with Defendants Phase 2C submission. The list included as **Attachment 5** is a presumed list of projects that will be removed based on current information. Defendants shall provide additional information requested by the Regulators that is reasonable to assist in evaluating projects for removal. If the Regulators believe that the project removal is not warranted, then they have the ability to seek Dispute Resolution pursuant to Section XXI of the CSO Consent Decree.

d. If Defendants fail to submit a Phase 2C schedule by June 30, 2034, in addition to applicable stipulated penalties, the Regulators may impose on Defendants an interim schedule for Phase 2C consisting of a part of the remaining Phase 2 projects that is as expeditious as practicable, which interim schedule is not subject to dispute resolution. Upon receipt of the Regulators' interim schedule, Defendants shall implement the Regulators' interim schedule until Defendants have submitted a proposed Phase 2C schedule (which Regulators shall promptly review) in accordance with the requirements of this Paragraph C.3, and Defendants have either (1) obtained the Regulators' approval of Defendants' proposed schedule, (2) Defendants' Phase 2C schedule has been determined in accordance with dispute resolution as set forth below in Paragraph E.4, or (3) the Regulators agree to adjust the Regulators' interim schedule as part of the Regulators' approval of the Defendants' Phase 2C schedule.

e. Defendants may request additional subparts beyond Phase 2C if they can demonstrate that the additional subpart is necessary and that the schedule for

completion of projects in Phase 2C is as expeditious as practicable based on the considerations and factors described in Paragraph C.3.a. above. If additional subparts beyond Phase 2C are warranted, then Defendants' Phase 2C will consist of only a subset of the remaining WWIP projects listed in **Attachment 3**. All schedules for additional Phase 2 subparts shall be as expeditious as practicable, based on the considerations and factors described in Paragraph C.3.a. above and according to the design and performance criteria set forth in **Attachment 3** (and **Attachment 6** for EHRT facilities).

f. All proposed schedules for Phase 2 subparts shall include planning and design work for remaining projects in the subsequent Phase subpart(s) in priority order to ensure that WWIP project work does not stop between Phase subparts for lack of planned and designed projects.

D. Supplemental Remedial Measures Plan: Defendants will be required to obtain a Permit to Install (PTI) from Ohio EPA for each specific EHRT facility included in **Attachment 2**. If (a) the Regulators provide notice to Defendants of the facts and circumstances of a controlling decision or rule indicating that Defendants will not be able to obtain a PTI for a specific EHRT facility, or (b) Defendants have determined, on an informed, reasonable basis, that Defendants will not be able to obtain a PTI for a specific EHRT facility, then as expeditiously as practicable, but in no event later than three months before the applicable date for commencement of construction of that specific EHRT facility, Defendants shall submit to the Regulators for their review and approval a proposed Supplemental Remedial Measures Plan ("SRM Plan").

Each SRM Plan shall specify remedial measures and a schedule that is as expeditious as practicable to ensure that the CSOs that were to have been addressed by the specific EHRT facility will comply with the requirements of the Clean Water Act, U.S. EPA's CSO Policy, Chapter 6111 of the Ohio Revised Code and the rules promulgated thereunder, the Compact (as defined in the CSO Decree) and the pollution control standards promulgated

thereunder, and Defendants' Current Permits (as defined in the CSO Decree). In any event, Defendants shall also explain why they believe that their proposed SRM Plan will ensure compliance with all applicable laws, including why they believe Defendants will likely be able to obtain any PTI(s) that will be required under Ohio law in order to implement their proposed SRM Plan.

E. Concepts Applicable to All Phases of the WWIP

1. Bond Covenants: The Regulators and Defendants do not presently expect or anticipate that implementation of the WWIP will cause Defendants to violate their existing bond covenants. However, because of the expected significance of a violation of bond covenants, if facts or circumstances arise that suggest that implementation of the WWIP may result in Defendants violating their bond covenants, Defendants may submit to the Regulators a proposed modification of an approved WWIP schedule (e.g., approved Phase 1 or 2 schedule) as necessary to avoid violating their bond covenants; provided, however, that Defendants demonstrate that:

a. The bond covenant(s) at issue are reasonable, taking into account (i) the Consent Decrees' requirement that WWIP schedules be as expeditious as practicable, and (ii) covenants that have been included in comparable bond issues by other wastewater or combined water/wastewater utilities; and

b. The proposed modification is (i) necessary to avoid violating their bond covenants, and (ii) results in a schedule that is as expeditious as practicable.

c. Nothing in this subparagraph prevents such similar modifications for potential bond covenant violations from being modified under Paragraph E.7.

2. Adaptive Plan Alterations:

a. Defendants may implement changes to one or more projects (including associated appropriate changes to Performance and Design Criteria) because of changes in watershed approaches, priorities, technologies, methods, model results, regulatory changes, and

other information through the concepts of "adaptive management"; provided that such changes will provide comparable or better aggregate control of annual volumes as the original project or projects ("Non-Material Modifications"). If Defendants seek a change under this provision that would result in a materially later final milestone date for the last scheduled milestone in an approved Phase 2 schedule, or if Defendants seek a change that would provide in the aggregate less than equal control of annual volumes as the original project or projects, and the Regulators agree with such change, then such change shall constitute a material modification of the Consent Decree and require judicial approval pursuant to Section XXIX of the Consent Decree ("Material Modification").

b. Defendants should propose such requests for Material Modifications no more frequently than once per calendar year. This provision does not prohibit requests for Non-Material Modifications.

3. Green Projects: Defendants may identify revisions to WWIP projects by adding or substituting "green infrastructure" for "grey infrastructure" where it is justified by business case evaluation in Defendants' sole discretion. These revisions are subject to Paragraph E.2. Defendants will make reasonable best efforts to request any such green modifications or substitutions that are classified as Material Modifications, along with a Phase 2 schedule submission, although requests may be made at other times as appropriate.

4. Submittals and Dispute Resolution.

a. The submittals required or permitted under this WWIP shall be subject to review and approval by the Regulators in accordance with Section XXX of the CSO Decree. The Regulators may approve the submittal or decline to approve it and provide written comments. Within 60 days of receiving the Regulators' written comments (or within such other timeframe as may be agreed to by the Parties), Defendants shall either: (i) alter the submittal consistent with the Regulators' written comments, and submit the revised submittal to the Regulators for final approval; or (ii) except as provided in Paragraph C.3.d or otherwise in Section XXI of the CSO Consent Decree, submit the matter for dispute resolution under Section XXI of the CSO Decree.

Upon receipt of the Regulators' final approval of the submittal, or upon completion of the submittal pursuant to dispute resolution (as permissible), Defendants shall implement the submittal in accordance with its terms.

b. Except as provided in Paragraph C.3.d or otherwise in Section XXI of the CSO Consent Decree, any dispute that arises with respect to the meaning, application, implementation, interpretation, amendment or modification of this WWIP, or with respect to Defendants' compliance herewith (including the adequacy of the Defendants' performance of the remedial measures and adequacy of the submittals required by this WWIP) or any delay hereunder, the resolution of which is not expressly provided for in this WWIP, shall be subject to dispute resolution pursuant to Section XXI of the CSO Consent Decree.

5. Asset Management. The term "asset management" generally refers to a comprehensive and structured approach to the long-term management of assets as tools for the efficient and effective delivery of services; for purposes of this WWIP, the term "Asset Management" means those same capital expenditures by MSD that are not formally considered WWIP projects or Allowance expenditures. Asset Management budgets are submitted as part of the annual capital budget which is then subject to public review and evaluation prior to approval by the Board of County Commissioners. Annually, in one of the quarterly reports, Defendants shall provide an accounting and listing of the work for which Asset Management capital funds have been spent during the preceding year as well as MSD's 3-year estimate of future Asset Management expenditures.

6. Allowances. In addition to the Long Term Control Plan and the Capacity Assurance Program Plan projects, the WWIP includes eight subject matter programs, referred to as "Allowances."[2] The Allowance programs exist to address, reduce and/or eliminate overflows and improve water quality consistent with federal and state law. Allowance program activities complement the LTCP and CAPP projects. However, unlike fixed location, discrete projects,

[2] WWIP Allowances were included as Index 113 of Attachment 1B to the Initial Final WWIP. This Index carries over to Phase 2 and is incorporated by reference into **Attachment 3** of this Amended Final WWIP.

Allowances instead arise due to newly discovered circumstances (e.g., WIB, Sewer/Manhole Relining, RDI/I, Urgent Capacity), opportunities to directly improve water quality (e.g., HSTS), District-wide, regional, or large-scale circumstances (e.g., RDI/I, green infrastructure), or information/analysis needs (e.g., RDI/I, WWIP studies). Because Allowances are typically not planned or designed years in advance, their budgets will vary from year to year. Annually, in one of the quarterly reports, Defendants shall provide an accounting and listing of the work for which Allowance monies have been spent during the preceding year as well as MSD's 3-year estimate of future expenditures. Listed below are names and descriptions of the Allowance programs.

a. Sewer Back-Up ("SBU") (formerly known as the Water-in-Basement Program (WIB)):

The SBU program operates clean-up, claims, and prevention activities, customer education and communication, property acquisition, and other activities related to the administration and management of this program.

b. Sewer Relining (Trenchless Technology) Program:

This program conducts internal lining of sewers and external lining of aerial sewers as a cost effective method of rehabilitating structurally deteriorated sewers. This program will include, but not limit itself to, spiral wound pipe, pipe bursting, directional drilling, carbon filament wrapping, and jack and boring. These projects are identified through investigations of the sewer lines and are prioritized based on a standardized condition assessment procedure.

c. Manhole Rehabilitation (Trenchless Technology) Program:

The manhole rehabilitation program provides a cost effective method of rehabilitating structurally deteriorated manholes. Like the Sewer Lining Trenchless Technology Program, manhole rehabilitation projects are identified through investigations and are prioritized based on a standardized condition assessment procedure.

d. Rainfall Derived Infiltration and Inflow (RDI/I) Program:

This program assists in the elimination of Sanitary Sewer Overflows. Projects for RDI/I are identified through investigations which may use intrusive methods. Remedial projects are funded through this program or either or both of the Sewer Relining and Manhole Rehabilitation Allowance Programs, depending on the choice of construction methods.

e. Home Sewage Treatment System (HSTS) Elimination Program:

This program conducts the design, property acquisition and construction of new sanitary sewers to connect properties in built up areas of the MSD service area to eliminate home sewage treatment systems (HSTS). These projects improve the water quality of WWIP watersheds by replacing failing or inadequate home systems. These projects are identified and prioritized based on the public health risk. HSTS construction projects will undergo public review and evaluation as part of proposed legislation and approval by the Board of County Commissioners.

f. Urgent Capacity Response Program:

This program funds measures that restore sewer capacity in existing CSO communities by identifying urgent WWIP construction work that is needed to address urgent CSO community capacity needs, SBU issues, or unpermitted flows. These measures are either not identified as WWIP projects or would be moved up from existing WWIP schedules. All construction projects will undergo public review and evaluation as part of proposed legislation and approval by the Board of County Commissioners.

g. WWIP Progress Studies and Recreation Management:

This allowance funds ongoing evaluation of the progress of the WWIP and various measures to address wet weather issues in CSO areas. Evaluations involve systematic review of the wet weather effect within watersheds, the sensitivity of various remedial projects on the system hydraulic grade lines etc. Findings of these studies will provide clear and strategic direction to the watershed planning group. This allowance also funds recreation management notice, reporting

and information needs.

h. MSD Sustainable Infrastructure (Green) Program:

This program will use Low Impact Development Best Management Practices (LID BMP), storm water offloading through stream separation, and promotion of sustainable best practices to remove storm water from sewers in both CSO and SSO areas. Program activities will initially include LID Demonstration Projects (to evaluate technologies and reduce storm water impacts to CSOs), Pilot Projects (to evaluate multiple methods in a set of multiple projects), Regional BMP Projects (larger sewershed projects expected to capture over 10 million gallons) and Large Scale Projects (long-term projects in major CSO sewersheds). These projects will be evaluated and, in some cases, prioritized on volumetric reduction of storm water from the system, and unit cost per gallon of water removed from the system. The larger, more expensive green projects will focus on projects capable of removing a minimum of 10 million gallons of storm water from the combined sewer system, at equal or lower cost than comparable "grey" infrastructure projects.

7. Economic Reopener:

a. Defendants shall not be required to implement or complete a Phase 2 subpart schedule of WWIP projects under an approved schedule if Defendants experience a significant unplanned financial hardship, as defined below.

b. If Defendants experience a significant unplanned financial hardship Defendants may implement project and/or scheduling modifications to an ongoing approved schedule. Such modifications include but are not limited to project start delays, substantial completion deadline extensions, and other modifications in response to the unplanned financial hardship. In such event, Defendants will promptly notify the Regulators in accordance with subparagraph 7(c) and (d) below.

i. For purposes of this paragraph, "significant unplanned financial hardship" shall mean a material adverse change to Defendants' financial circumstances or a material adverse change to the MSD Service Area that will impact the ability of MSD ratepayers to continue funding the completion of remaining WWIP projects as scheduled.

ii. Examples of a material adverse change to Defendants' financial circumstances include, but are not limited to:

1. an increase of greater than 25% of a projected (a) annual Total New Capital Purchases amount or (b) the Cumulative Total New Capital Purchases amount as projected in Defendants' Synario financing model used by Defendants in the ongoing Phase 2 subpart plan approved by the Regulators;

2. a decrease in the availability of capital financing with subsidized low interest rate loans (or grants) from the State of Ohio's Revolving Loan Fund, or similar funding sources for WWIP Projects, to a level that is 50% lower than projected in Defendants' Synario financing model used by Defendants in the ongoing Phase 2 subpart plan approved by the Regulators;

3. a decrease in MSD's Revenue by greater than 5% year over year for two consecutive years;

4. an increase of greater than 25% of the annual projected Operation and Maintenance Expense in Defendants' Synario financing model used by Defendants in the ongoing Phase 2 subpart plan approved by the Regulators;

5. a planned MSD capital expenditure in response to a new state or federal regulatory compliance requirement (e.g., PFAS) with a cost greater than 5% of the Cumulative Total New Capital Purchases amount as projected in Defendants' Synario financing model used by Defendants in the ongoing Phase 2 subpart plan approved by the Regulators; and/or

6. an increase in a WWIP project or project bundle's construction cost by greater than 25% of the cost estimated in Defendants' Phase 2 subpart plan approved by the Regulators.

iii. An example of such a material adverse change to the MSD Service Area would include, but not be limited to, a change in any of the Lowest Quintile Poverty Indicator Score metrics for the City of Cincinnati to a "weak" score, as outlined in the Guidance.

c. Defendants shall send to the Regulators notice of a modification under this paragraph and such notice shall include:

i. Identification of the economic reopener trigger (under subparagraph 7 (a) and (b);

ii. Description of the modification and its impacts to the approved WWIP project schedule; and

iii. Documents and information necessary to substantiate that a modification is warranted.

d. Defendants shall promptly provide reasonable additional information requested by the Regulators to assist in reviewing the modification. If the Regulators believe that Defendants' modification is not warranted, then the Regulators shall have the ability to seek Dispute Resolution pursuant to Section XXI of the CSO Consent Decree. If the Regulators do not initiate Dispute Resolution within sixty days of receiving Defendants' notice under this Paragraph, then such modification is deemed agreed to and incorporated into the then current and ongoing Phase 2 subpart plan and schedule.

e. Modifications due to significant unplanned financial hardship under this paragraph are not subject to the requirements of C.2, Adaptive Plan Alterations. This paragraph does not impact any ability of the Defendants to seek or implement Adaptive Plan Alteration or any other modifications or changes under this Amended Final WWIP or the Consent Decree.

F. Newly Discovered Outfalls

1. If Defendants determine in accordance with their Sewer Overflow Response Plan attached as Exhibit 6 to the Interim Partial Consent Decree on Sanitary Sewer Overflows as updated in 2018 or as may hereinafter be revised that there will be continuing capacity-related discharges from any CSO Outfall, SSO Outfall or Unpermitted Overflow Outfall that is not listed in Attachments 1B or 2 (collectively, "Discovered Outfall(s)"), Defendants shall notify the Regulators via the next quarterly report required by Paragraph XV.A of the CSO Decree as revised by the Revised First Amendment to Consent Decrees ("CSO Decree") of Defendants' determination. "Discovered Outfall(s)" does not include basement backups. Defendants shall eliminate discharges from Discovered Outfalls as expeditiously as practicable, but not later than 3 years after the date of the quarterly report in which Defendants notified the Regulators of such discharges, except as provided in Paragraph F.2 below. Defendants shall report the progress of their efforts in subsequent quarterly reports.

2. Defendants need not eliminate discharges from Discovered Outfalls in accordance with Paragraph F.1 if, within 18 months of the date of the quarterly report, Defendants submit to the Regulators for review, approval and implementation in accordance with Paragraph C.4 of this

WWIP a plan with specific measures, Design Criteria, Performance Criteria, and any necessary modification to an applicable CSO NPDES permit.

a. For discharges from Discovered Outfalls that are SSO Outfalls, the plan shall also include measures that have the goal of eliminating capacity-related discharges from the specific SSO Outfall;

b. For discharges from Discovered Outfalls that are CSO Outfalls, the plan shall also include measures necessary to ensure that the discharges will be eliminated or will comply with the Clean Water Act, US. EPA's CSO Policy, Chapter 6111 of the Ohio Revised Code and the rules promulgated thereunder, the Compact and the pollution control standards promulgated thereunder, and Defendants' Current Permits ("Applicable Requirements"); and

c. Other requirements

(i) It is expected that Discovered Outfalls will be eliminated or controlled via a project or bundle already listed in Attachment 3, and that the plan presented pursuant to this section will identify any needed additional Design Criteria or Performance Criteria, and be scheduled in accordance with the terms of the WWIP.

(ii) If the plan presented adds the Discovered Outfall to an existing WWIP project or bundle, then, once it is approved by the Regulators or resolved via dispute resolution, either:

a. the plan shall be implemented in accordance with the schedule for the existing WWIP project or bundle if the existing WWIP project or bundle is included in a Phase 2 schedule that has been approved by the Regulators or resolved via dispute; or

b. the schedule for implementing the plan shall be established in accordance with the Phase 2 scheduling process set forth in Paragraph C.3 at the time when the existing WWIP project or bundle is included in a subsequent Phase 2 schedule.

(iii) If the plan presented does not add the Discovered Outfall to an existing WWIP project or bundle, then, once it is approved by the Regulators or resolved via dispute resolution, the plan will be deemed to be a project in Attachment 2, and the schedule for implementing the plan shall be established in accordance with the Phase 2 scheduling process set forth in Paragraph C.3. in a subsequent Phase 2 schedule. If the plan presented does not add the Discovered Outfall to an existing WWIP project or bundle and Defendants are in the final subphase of implementing the Phase 2 schedule, then, in addition to including the elements required by Paragraph F.2, Defendants shall also include in the plan a schedule for implementing the plan that is as expeditious as practicable and, once the plan is approved by the Regulators or resolved via dispute resolution, Defendants shall implement the plan in accordance with the plan's schedule.

(iv) Defendants shall solicit public comments at least 45 days prior to the submission of the plan to the Regulators. At a minimum, Defendants will email Sierra Club to solicit comments and otherwise post the opportunity for comment on the MSD website and social media platforms. Defendants shall provide all public comments that they received to the Regulators when they submit their proposed plan in accordance with Paragraph F.2.

3. Unless the conditions in Paragraph F.2 have been met with regard to any specific discharge and Defendants' plan has been approved by the Regulators or established through dispute resolution, any discharge from any Discovered Outfall that occurs 3 years after the date of the quarterly report in which Defendants notified the Regulators of such discharge shall be a violation of a requirement of the WWIP in accordance with Section XVII.F.2 of the CSO Decree.

4. If the conditions in Paragraph F.2 have been met and Defendants' plan has been approved by the Regulators or established through dispute resolution, then any discharge from any such Discovered Outfall after the date for Substantial Completion of Construction in the applicable plan for the Discovered Outfall shall be a violation of a requirement of the WWIP in accordance with Section XVII.F.2 of the CSO Decree unless the discharge is from a CSO Outfall specified in the NPDES Permit in effect at the time of the discharge, in which case the discharge shall be a

violation of a requirement of the WWIP if the discharge does not comply with the Applicable Requirements.

G. Newly Created Outfalls

Defendants shall not create any new CSO Outfalls, SSO Outfalls or Unpermitted Overflow Outfalls (collectively, "New Outfall(s)") unless Defendants first request and obtain approval from the Regulators for the creation of such New Outfall. On the date they submit any request to the Regulators for approval of creation of a New Outfall, Defendants shall also email a copy of the request to Sierra Club and post a copy publicly (MSD website, social media, or other normal course of public communication) and indicate that the public can provide comments at any time. Defendants shall provide a copy of each comment that they receive to the Regulators. "New Outfall(s)" do not include existing enumerated outfalls that are temporarily relocated and will be addressed by completion of an identified WWIP project or bundle that is being implemented in a Phase 2 schedule that is in effect at the time the outfall is relocated, provided that the relocated outfall is eliminated by the date that construction is completed for the identified WWIP project or bundle. "New Outfall(s)" also do not include basement backups. The Regulators' approval for the creation of a New Outfall may include conditions governing operation and maintenance of the New Outfall; and/or conditions such as remedial measures, schedules and Performance Criteria governing reduction, treatment or elimination of discharges from the New Outfall. Any discharge from any New Outfall shall be a violation of a requirement of the WWIP in accordance with Section XVII.F.2 of the CSO Decree except for discharges from New Outfalls whose creation has been approved by the Regulators. Such discharges shall be a violation of a requirement of the WWIP if Defendants do not comply with the conditions included with the Regulators' approval of the creation of the New Outfall.

List of Attachments, all of which are incorporated into this Amended Final WWIP

Attachment 1: Index of initial final WWIP and subsequent modifications

Attachment 2: Phase 2B Project List

Attachment 3: Revised WWIP Phase 2 project list with detailed descriptions, design criteria

and performance criteria.

Attachment 4: WWIP Credit Spending for Projects Completed After Phase 1

Attachment 5: WWIP Projects Presumed Completed and Subject to Removal Before Phase 2C Schedule Finalization

Attachment 6: EHRT Design and Performance Criteria

Attachment 1

Index of Initial Final WWIP and Subsequent Modifications

Date	Description	Docket No.
1/6/2010	Regulator approval of Initial Final WWIP	412-3
5/30/2013	Non-material modifications to Attachments 1A, 1B, 1C, and 2, and replacement of the original Attachment 1C with a new Attachment 1C, resulting from the Plaintiffs' approval of the Revised Original LMCPR on May 30, 2013, to replace the LMCPR originally attached to the WWIP, as authorized under the WWIP	
8/26/2013	Non-material modifications to the Initial Final WWIP Attachments 1A, 1B and 2	
5/26/2015	Non-material modifications to the Initial Final WWIP Attachments 1A, 1B and 2	
10/8/2015	Non-material modifications to the Initial Final WWIP Attachments 1A, 1B and 2	
11/24/2015	Non-material modifications to the Initial Final WWIP Attachments 1A, 1B and 2	
3/3/2016	Non-material modifications to the Initial Final WWIP Attachments 1A, 1B and 2	
6/3/2016	Non-material modifications to the Initial Final WWIP Attachments 1A, 1B and 2	

12/28/2017	Non-material modifications to the Initial Final WWIP Attachments 1A, 1B and 2	
9/18/2018	Material modification, approved by the Court on September 18, 2018, to change the deadline for submission of a proposed Phase 2 or 2A schedule and add requirements to implement a "Bridge Schedule" of projects	1468
6/28/2023	Non-material modifications to the Initial Final WWIP Attachments 1A, 1B and 2 and in new Attachments 1C and 6	2065
5/6/2024	Material modification, Motion for Entry filed to the Court by Regulators on May 6, 2024, to add requirements for Newly Discovered Outfalls and Newly Created Outfalls.	2082

Attachment 2

Phase 2B Project List

Adaptive Bundle Identifier/WWIP Index:	Bundle/Project:
Adaptive Bundle (H)	**LMWWTP HRT Bundle**
195 – 206 (adaptive)	10172950 - LMWWTP Electrical, Primary, and Secondary Improvements
195 – 206 (adaptive)	10172955 - LMWWTP High Rate Treatment Preparation
195 – 206 (adaptive)	10281100 - LMWWTP Solids Disposal and Odor Control
195 – 206 (adaptive)	10172960 - LMWWTP HRT Facility
Adaptive Bundle (I)	**MCWWTP HRT Pump Station Bundle**
248 (adaptive)	10240640 - Dewatering Building Improvements
248 (adaptive)	10144888 - MCWWTP Pump Station
395A (adaptive for 394, 395, 396, 417 and 452)	10142950 - East Branch Ohio River Interceptor Extension

INDEX	WWIP ATTACHMENT 3		Sunk Costs 2006 Dollars	Sunk Costs 2023 Dollars	Remaining Cost (NOTE 10) 2006 Dollars	Remaining Cost 2023 Dollars		CSO SSO Identifier (NOTE 14)	Description / Design (NOTE 3)	Technology	Plan CAPP	Plan Remaining CSO (MG/year) (NOTE 5)
						Conversion Factor 1.685075						
INDEX	PID	PROJECT NAME	SUNK COST	SUNK COST	REMAINING COST	REMAINING COST (NOTE 17)			SCOPE	TECH	CAPP	ROV PLAN REMAINING
185	10171540	CSO 135 Elimination			$ 243,716	$ 410,680		CSO 135	Regulator Improvements - 2.4 cfs (Note 13)	RI		0.0
186	10171560	CSO 43 Elimination			$ 244,159	$ 411,426		CSO 43	Regulator Improvements - 2.8 cfs (Note 13)	RI		0.7
187	10171600	CSO 170 Elimination			$ 242,681	$ 408,936		CSO 170	EHRT - Regulator Improvement - 3.1 cfs	RI		in 71800
188	10171640	CSO 214 Partial Separation			$ 14,074,375	$ 23,716,377		CSO 214	Partial Separation (Note 13)	PS		57.4
189	10171660	CSO 500 Improvements			$ 243,069	$ 409,589		CSO 500	Regulator Improvement - 1.5 cfs. See E-500	RI		in 71800
190	10171680	CSO 501 Improvements			$ 243,373	$ 410,102		CSO 501	Regulator Improvement - 0.1cfs. See E-500	RI		0.0
191	10171700	CSO 549 Improvements			$ 243,613	$ 410,506		CSO 549	Regulator Improvement - 5.0 cfs. See E-500	RI		in 71800
192	10171720	CSO 550 Improvements			$ 243,820	$ 410,855		CSO 550	Regulator Improvement - 0.4 cfs. See E-500.	RI		in 71800
193	10171760	CSO 552 Improvements			$ 242,109	$ 407,972		CSO 552	Regulator Improvement - 19.4 cfs	RI		18.6
194	10171800	Upper Duck Creek EHRT Facility			$ 14,541,318	$ 24,503,211			E-500 - EHRT - 40-MGD - Serves CSOs 170, 549, 550, 501 & 500 (NOTE 2)	EHRT		106.0
~~195~~	~~10170782~~	~~(H) LM Four Mile Pump Station Upgrade~~			$ 3,617,502	$ 6,095,762			~~E-503 - Four Mile Pump Station Rec Proj – PS-1 (Note 13)~~	~~WWTP~~	~~NOTE 1~~	
~~196~~	~~10170783~~	~~(H) LMWWTP Pump Station Reconfiguration~~			$ 3,172,158	$ 5,345,324			~~E-503 - Modify LMR Pump Station Rec Proj – PS-5~~	~~WWTP~~	~~NOTE 1~~	
~~197~~	~~10170784~~	~~(H) LMWWTP Grit Station Upgrade~~			$ 8,174,858	$ 13,775,249			~~E-503 - Grit Collection Proj – SG-1 (Note 13)~~	~~WWTP~~	~~NOTE 1~~	
~~198~~	~~10170785~~	~~(H) LMWWTP Pump Station Hydraulic Improvements~~			$ 1,799,992	$ 3,033,122			~~E-503 - Four Mile Pump Station to Screen Building Rec Proj - H-1~~	~~WWTP~~	~~NOTE 1~~	
~~199~~	~~10170786~~	~~(H) LMWWTP Primary to Secondary Hydrau. Improvements~~			$ 1,328,132	$ 2,238,002			~~E-503 - Primary to Secondary Conveyance Rec Proj – H-2~~	~~WWTP~~	~~NOTE 1~~	
~~200~~	~~10170787~~	~~(H) LMWWTP Chemically Enhanced Primary~~			$ 5,860,701	$ 9,875,721			~~E-503 - Chemical Enhance Primary Rec Proj – PT-2~~	~~WWTP~~	~~NOTE 1~~	
~~201~~	~~10170788~~	~~(H) LMWWTP Secondary Treatment Modifications~~			$ 9,235,525	$ 15,562,552			~~E-503 - Modification to Secondary Treatment Rec Proj – ST-2~~	~~WWTP~~	~~NOTE 1~~	
~~202~~	~~10170790~~	~~(H) LMWWTP Chemical Feed Upgrades~~			$ 3,618,935	$ 6,098,177			~~E-503 - Upgrade Chemical Feed Sys Storage – D-2~~	~~WWTP~~	~~NOTE 1~~	
~~203~~	~~10170793~~	~~(H) LMWWTP Sludge Receiving Improvements~~			$ 455,361	$ 767,317			~~E-503 - Improvement to Sludge Receiving Facility Rec Proj – DR-6~~	~~WWTP~~	~~NOTE 1~~	
~~204~~	~~10170794~~	~~(H) LMWWTP Standby Power~~			$ 7,141,778	$ 12,034,432			~~E-503 - Dual Feed / Standby Power Rec Proj – E-1~~	~~WWTP~~	~~NOTE 1~~	
~~205~~	~~10172020~~	~~(H) LMWWTP Wet Weather Pump Station~~			$ 36,586,845	$ 61,651,578			~~E-505 - Wet Weather Pump Station with Screening 150 MGD to Auxiliary Outfall~~	~~WWTP~~	~~NOTE 1~~	
~~206~~	~~10172260~~	~~(H) LMWWTP Dry Weather Pump Station~~			$ 375,000	$ 631,903			~~Four Mile PS - Dry Weather Pumps - B&N Rec. Proj. PS-1~~	~~WWTP~~	~~NOTE 1~~	
195-206	10172950	(H) LMWWTP Electrical, Primary and Secondary Improvements							Refer Project Fact Sheet.	WWTP		
195-206	10172955	(H) LMWWTP High Rate Treatment Preparation							Refer Project Fact Sheet.	WWTP		
195-206	10172960	(H) LMWWTP HRT Facility							Refer Project Fact Sheet.	WWTP		
195-206	10281100	(H) LMWWTP Solids Disposal with Odor Control							Refer Project Fact Sheet.	WWTP		
207	10140400	Lockland Sewer Separation			$ 2,424,977	$ 4,086,268		SSO 1045, 1010	Replace collector following original alignment - 7968 ft of 12-24"	CONV	2 yr	
208	10142280	Oxley Grating			$ 241,149	$ 406,354		CSO 226	Regulator Improvement-6 cfs. Combine with implementation of green infrastructure as redevelopment, renovation, and routine maintenance occurs to achieve CSO control to achieve 85%.	RI		4.6
209	10142300	914 Oak St. Grating			$ 241,284	$ 406,582		CSO 559	Regulator Improvements-14.0 cfs. Green potential greater than storage need.	RI		7.0
210	10142320	200' West of Bacon St. Grating			$ 243,670	$ 410,602		CSO 515	Regulator Improvements-0.7 cfs	RI		0.0
211	10142340	Bacon St. Grating			$ 243,670	$ 410,602		CSO 516	Regulator Improvements-0.11 cfs	RI		0.1
212	10142360	No. 96 North Park Grating			$ 241,284	$ 406,582		CSO 538	Regulator Improvements-0.31 cfs	RI		0.1
213	10142380	117 E. Charlotte Grating			$ 241,356	$ 406,703		CSO 539	Regulator Improvements-5.0 cfs	RI		1.3
214	10142400	428 South Cooper Grating			$ 241,356	$ 406,703		CSO 562	Regulator Improvements-3.08 cfs	RI		0.0
215	10130000	Muddy Creek Basin Storage & Conveyance Sewer			$ 120,122,277	$ 202,415,046		SSO 701, 702, 692, 697,675-A, 1061	Storage & Conveyance Tunnel unloads Muddy Creek PS, Eliminating SSOs 692 & 697, provides CSO control for 518, 404, 405, and 406 - 25 ft diameter, 8500 ft long, firm influent pumping capacity, firm effluent pumping capacity, and peak wet weather treatment capacity at the Muddy Creek WWTP to all be 35 MGD.	TUNNEL	2 yr	NOTE 9
216	10130160	Muddy Creek Pump Station Upgrade and Forcemain			$ 8,643,782	$ 14,565,421		SSO 692, 697, 675-A	Elim. PSO - Increase capacity & convey to Hillside Relief Tunnel - 25 MGD pumps, 12" FM for DWF, 36" FM for WWF (associated with 30000)	PSU/FM	2 yr	
217	10130400	River Rd. Near Muddy Creek WWTP Conveyance Sewer			$ 396,774	$ 668,594		SSO 702	Rapid Run/Bender Rd. Interceptor directly into New Tunnel - 800 ft of 36"	CONV	2 yr	
218	10131020	CSO 402 Topinabee Dr. Reg. Improvements			$ 242,680	$ 408,934		CSO 402	Regulator Improvement - 13.3 cfs (dependent on 30000, 30160, 31120) (Note 13)	RI		7.2
219	10131040	CSO 403 Elco St. Div. Dam Reg. Improvements			$ 245,338	$ 413,413		CSO 403	Regulator Improvement - 7.10 cfs (dependent on 30000, 30160, 31120) (Note 13)	RI		3.6
220	10131060	CSO 404 Ivanhoe St. Reg. Improvements			$ 241,095	$ 406,263		CSO 404	Regulator Improvement - 26.9 cfs (dependent on 30000, 30160, 31120) (Note 13)	RI		16.2
221	10131080	CSO 405 Revere St. Reg. Improvements			$ 242,108	$ 407,970		CSO 405	Regulator Improvement - 6.20 cfs (dependent on 30000, 30160, 31120) (Note 13)	RI		3.7
222	10131100	CSO 406 Kennebeck St. Reg. Improvements			$ 242,079	$ 407,921		CSO 406	Regulator Improvement -15.4 cfs (dependent on 30000, 30160, 31120) (Note 13)	RI		9.0
223	10131120	West Branch Ohio River Interceptor Sewer			$ 3,477,204	$ 5,859,350		CSO 404, 405, 406	Convey Flow from CSO 404 to WWTP - 4000' - 60", sized for 85% control for CSOs 404, 405 and 406 (dependent on 30000, 30160)	CONV		-

INDEX	PID	PROJECT NAME	Sunk Costs 2006 Dollars	Sunk Costs 2023 Dollars	Remaining Cost (NOTE 10) 2006 Dollars	Remaining Cost 2023 Dollars Conversion Factor 1.685075	CSO SSO Identifier (NOTE 14)	Description / Design (NOTE 3)	Technology	Plan CAPP	Plan Remaining CSO (MG/year) (NOTE 5)
INDEX			SUNK COST	SUNK COST	REMAINING COST	REMAINING COST (NOTE 17)		SCOPE	TECH	CAPP	ROV PLAN REMAINING
224		Left Blank									
225		Left Blank									
226		Left Blank									
227		Left Blank									
228	10140480	Pleasant Run Interceptor Replacement			$ 1,203,840	$ 2,028,561		WIBs - Replace collector following original alignment - 4246 ft of 21-24"	CONV		
229		Left Blank									
229a	10141180	I-75 & Shepard Ave. ~~SSO 700~~ SSO 700 Reliability Improvements			$ 8,557,600	$ 14,420,198	SSO 700	Increase Storage at existing site. (NOTE 13)	STOR	2 yr	
230	10142120	Mill & Vine St, Grating			$ 241,286	$ 406,585	CSO 512	Regulator Improvements-3.25 cfs	RI		0.2
231	10142200	Bernard & Reisenberg Grating			$ 2,242,366	$ 3,778,555	CSO 513	Partial Separation (NOTE 13)	PS		1.7
232	10142220	Smalley Grating			$ 1,226,004	$ 2,065,909	CSO 514	Partial Separation (NOTE 13)	PS		0.2
233	10130020	Muddy Creek Interceptor Rehabilitation			$ 4,889	$ 8,238	SSO 1061 CSO 518 MH 16006007	Clean Interceptor - 5000 ft of 36"	CLEAN		
234	10130040	CSO 518 Muddy Creek Conveyance Sewer			$ 5,495,655	$ 9,260,591	SSO 1061 CSO 518 MH 16006007	Replace section of Muddy Creek Int. - 9000 ft of 36" (NOTE 13)	CONV	2 yr	
235	10130280	Addyston PS Elimination			$ 1,712,696	$ 2,886,021	PSO 730, MH 10902003	Elim. Addyston P.S. w/gravity along Rte. 50 - 2650' of 36" and two 100' of 24"	CONV	2 yr	
236	10130700	Muddy Creek @ Westbourne EHRT			$ 24,184,412	$ 40,752,548	CSO 198	EHRT - 126 MGD Community Priority (NOTE 2 and 13)	EHRT		61.2
237	10130720	CSO 518 Improvements			$ 244,422	$ 411,869	CSO 518	Regulator Improvement - 27.4 cfs Premised on CAPP Activity ID – 30040, 30000 Community Priority	RI		8.4
238	10130780	CSO's 223, 408, 410, 541, 654			$ 1,859,360	$ 3,133,161	223, 408, CSO 410, 541, 654	CD Exhibit 1 Partial Separation (NOTE 13)	PS		0.3
239	10130840	CSO's 411, 412, 413, 414, 415, 416			$ 4,082,231	$ 6,878,865	411, 412, CSO 413, 414, 415, 416	CD Exhibit 1 Regulator Improvement--3.21 cfs and Relocation Complete Partial Separation - Activity ID 31140 (NOTE 13)	PS		12.9
240	10131000	E. Branch Muddy Ph1 Interceptor - Combined in 31006						W-103 - CD Exhibit 1 Interceptor Replacement Phase 1	CONV		
241	10131002	E. Branch Muddy Ph2 Interceptor - Combined in 31006						W-103 - CD Exhibit 1 Interceptor Replacement Phase 2	CONV		
242	10131003	E. Branch Muddy Ph3-A Pump Station - Combined in 31006						W-103 - CD Exhibit 1 Interceptor Replacement Phase 3	CONV		
243	10131004	East Branch Muddy Ph3-B Pump Station - Combined in 31006						East Branch Muddy Ph3-B Pump Station	CONV		
244	10131006	East Branch Muddy Interceptor			$ 60,315,458	$ 101,636,070		W-105 - Interceptor Extension	CONV		
245	10131140	E. Branch Ohio Interceptor Sewer Separation			$ 15,848,746	$ 26,706,326	408, 411, CSO 412, 414, 415, 416	W-104 - Complete the Partial Separation in CSOs areas 408, 411, 412, 414, 415, 416	PS		In 30840 and 30780
246	**REMAINING PHASE 2 PROJECTS/BUNDLES**		**$182,720**	**$ 307,897**	**$1,700,117,714**	**$ 2,864,825,857**					
247	**MIWWTP**	**Mill Creek Wastewater Treatment Plant**									
247a	10145500	Mill Creek WWTP Outfall Improvements			$ 15,163,200	$ 25,551,129		To be evaluated in conjunction with Index Line 248	WWTP		NOTE 15
247b	10145580	Mill Creek WWTP Added Sludge Pumping			$ 1,315,000	$ 2,215,874		To be evaluated in conjunction with Index Line 248	WWTP		NOTE 15
248	10144882	Mill Creek WWTP Chemical Enhanced Primary Treatment	$ 164,235	$ 276,748	$ 25,215,765	$ 42,490,455		C-402 - Enhanced Primary Treatment. (NOTE 13)	WWTP	NOTE 1	NOTE 15
248 A	**10144888**	**(I) MCWWTP High Rate Treatment Pump Station**						**Refer to Project Fact Sheet.**	**WWTP**		
248 B	**10240640**	**(I) MCWWTP Dewatering Building Improvements**						**Refer to Project Fact Sheet.**	**WWTP**		
249	**LDCU**	**Lower Duck Creek Upper**									
250	10170920	Nu-Tone Parking Lot Grating			$ 9,989,847	$ 16,833,641	CSO 68	Storage - 2.53 MG	STOR		36.9
251	10170960	Madison & Redbank Grating			$ 277,349	$ 467,354	CSO 66	Regulator Improvements - 2.7 cfs	RI		0.0
252	10171260	4730 Madison Ave. Grating			$ 277,349	$ 467,354	CSO 61	Regulator Improvements - 8.2 cfs	RI		2.1
253	10171280	End of Harrow St. Div. Dam			$ 277,350	$ 467,356	CSO 64	Regulator Improvements - 9.7 cfs	RI		0.1
254	10171300	Brotherton Rd. Grating			$ 277,349	$ 467,354	CSO 80	Regulator Improvements - 7.0 cfs	RI		0.0
255	10171320	3675 Forest Hills Grating (Dynamic Underflow Control)			$ 277,349	$ 467,354	CSO 83	Regulator Improvements -11 cfs (NOTE 13)	RI	NOTE 11	2.7
256	10171340	3646 Madison Rd. Div. Dam			$ 277,350	$ 467,356	CSO 188	Regulator Improvements - 8.1 cfs	RI		4.4
257	10171360	Ford Gate Grating			$ 277,350	$ 467,356	CSO 199	Regulator Improvements - 27 cfs	RI		0.0
258	10171440	Camberwell Ave. Div. Dam			$ 2,259,200	$ 3,806,921	CSO 205	Partial Separation	PS		0.5
259	10171460	Old Red Bank Rd. Grating			$ 5,514,020	$ 9,291,537	CSO 84	Consolidate to STO @ CSO 503 1,500' of 72" sewer	STOR		in 71520
260	10171480	3979 Rosslyn Dr. Grating			$ 19,158,278	$ 32,283,135	CSO 136	Storage - 4.00 MG	STOR		31.0
261	10171520	Zaeh Rd. Grating			$ 5,099,999	$ 8,593,881	CSO 503	Pipe Rehab Replacement and Stream Restoration	SEP/GREEN		15.1

INDEX	WWIP ATTACHMENT 3		Sunk Costs 2006 Dollars	Sunk Costs 2023 Dollars	Remaining Cost (NOTE 10) 2006 Dollars	Remaining Cost 2023 Dollars		CSO SSO Identifier (NOTE 14)	Description / Design (NOTE 3)	Technology	Plan CAPP	Plan Remaining CSO (MG/year) (NOTE 5)
						Conversion Factor 1.685075						
INDEX	PID	PROJECT NAME	SUNK COST	SUNK COST	REMAINING COST	REMAINING COST (NOTE 17)			SCOPE	TECH	CAPP	ROV PLAN REMAINING
262	PLWWTP	Pleasant Run Wastewater Treatment Plant										
263	10145540	WWTP Joint MSD/ Butler County Facility			$ 100,354,974	$ 169,105,658			Pleasant Run Flow Diversion from Mill Creek - Joint MSD/Butler Co. Facility	WWTP	NOTE 1	
264	RL	Reading Lower										
265	10140340	Ronald Reagan & Reading Rd.			$ 1,402,999	$ 2,364,159		SSO 1001, 1020	Replacement collector following original alignment - 4336 ft of 12-21"	CONV	2 yr	
266	10142060	214 Clark St. Grating			$ 277,351	$ 467,357		CSO 507	Regulator Improvements-0.9 cfs	RI		0.4
267	10142080	Gebert St. Grating			$ 277,350	$ 467,356		CSO 509	Regulator Improvements-3.0 cfs	RI		0.1
268	10142100	531 Davis Street Grating			$ 277,350	$ 467,356		CSO 511	Regulator Improvements - 4.49 cfs	RI		0.0
269	10142140	Reading Rd @ Galbraith			$ 3,854,201	$ 6,494,618		CSO 670	Partial Separation	PS		2.2
270	10142160	Southern Ave. Grating			$ 277,350	$ 467,356		CSO 510	Regulator Improvements- 0.6 cfs	RI		0.1
271	10142180	245 Clark St. Overflow			$ 948,900	$ 1,598,968		CSO 508	Partial Separation	PS		1.3
272	LDR	Little Duck Regulators										
273	10171040	Camargo & East Fork Grating			$ 277,345	$ 467,347		CSO 69	Regulator Improvements - 8.4 cfs Relocated Completed CIP 96-12	RI		0.0
274	10171080	Plainville & Indian Hill			$ 277,345	$ 467,347		CSO 71	Regulator Improvements - 2.0 cfs Relocated Completed CIP 96-12	RI		0.3
275	10171100	4800 Jameson Grating			$ 277,344	$ 467,345		CSO 72	Regulator Improvements –1.7 cfs	RI		0.1
276	10171120	6402 Roe St. Grating			$ 277,345	$ 467,347		CSO 74	Regulator Improvements –3.2 cfs	RI		0.7
277	10171140	6333 Roe St. Grating			$ 277,344	$ 467,345		CSO 75	Regulator Improvements –7.9 cfs	RI		1.3
278	10171160	Bramble & Homer Grating			$ 277,344	$ 467,345		CSO 76	Regulator Improvements - 7.9 cfs	RI		1.3
279	10171180	3980 South Whetsel Grating			$ 277,344	$ 467,345		CSO 78	Regulator Improvements - 5.5 cfs	RI		0.3
280	10171200	Southern Ave. Grating			$ 277,346	$ 467,349		CSO 79	Regulator Improvements - 7.0 cfs	RI		1.5
281	10171220	Wooster @ Red Bank Div. Dam			$ 277,343	$ 467,344		CSO 656	Regulator Improvements Remove downstream flow restriction @ Beechmont Sluice Gate	RI		16.9
282	LDCR	Lower Duck Creek										
282a	10270190	Columbia Square Separation			$ 555,514	$ 936,083		CSO 469	CONV (NOTE 12 & NOTE 13)	CONV		
283	10171380	5150 Wooster Pike Grating			$ 2,180,499	$ 3,674,304		CSO 85	Full Separation	FS		0.0
284	10171400	Archer St. Div. Dam, SEP			$ 2,327,200	$ 3,921,507		CSO 86	Partial Separation CIP 93-02 HW/DW Relocate	PS		1.9
285	10171500	Turpin St. Div. Dam (Dynamic Underflow Control)			$ 277,349	$ 467,354		CSO 472	Regulator Improvements (NOTE 13)	RI	NOTE 11	26.5
286	ICWWTP	Indian Creek Wastewater Treatment Plant										
287	10110000	Indian Creek WWTP			$ 299,238	$ 504,238			Opt.Existing Facility, 8.2 - 10.8 MGD	Optimization	NOTE 1	
288	10110020	Cleves Pump Station			$ 11,042,000	$ 18,606,598		PSO 677	1.5 MG Storage w/new 3.6 MGD pumps and FM for wet weather flow	STOR	2 yr	
289	AC	Amberely Creek										
290	10141160	Reading Rd. & Losentiville Rd.			$ 824,968	$ 1,390,133		SSO 1032	Replace collector following original alignment - 1793 ft of 12-18"	CONV	2 yr	
291	10142460	Beredith & Kincaid Grating			$ 277,332	$ 467,325		CSO 505	Regulator Improvements -8.3 cfs	RI		0.0
292	10142480	Ridge/Lakeview Div. Dam			$ 277,332	$ 467,325		CSO 651	Regulator Improvements -3.75 cfs	RI		0.3
293	10142500	6536 Cliffridge Grating			$ 1,953,100	$ 3,291,120		CSO 506	Partial Separation	PS		1.3
294	CRU	Congress Run Upper										
295	10142520	146 Ridgeway Grating			$ 277,350	$ 467,356		CSO 535	Regulator Improvements -3.25 cfs	RI		0.0
296	10142540	60 St. Clair Grating			$ 277,350	$ 467,356		CSO 560	Regulator Improvement - 3.25 cfs	RI		0.0
297	10142580	No. 41 Sherry Grating			$ 928,701	$ 1,564,931		CSO 537	Partial Separation	PS		0.2
298	10141140	Ronald Reagan & Galbraith Rd.			$ 784,079	$ 1,321,232		SSO 1029	Replace collector following original alignment - 3005 ft of 15-21"	CONV	2 yr	
299	10145600	Anthony Wayne Flooded MHs			$ 65,126,882	$ 109,743,681		Anthony Wayne	Future Wet Weather Facility to provide system capacity in the Mill Creek Interceptor system			
300	10140880	W. Galbraith Road			$ 3,181,999	$ 5,361,907		SSO 568, 569	CIP 2008-25 (in planning)	CONV	2 yr	
301	10141100	Ronald Reagan & Galbraith			$ 7,297,254	$ 12,296,420		SSO 1029	Replace collector following original alignment - 15,583 ft of 21-48"; Tunnel 200 ft of 42"	CONV	2 yr	
302	TWLL	Tributary to Winton Lake Lower										
303	10141020	Colerain & Galbraith Storage Facility	$ 2,356	$ 3,970	$ 17,353,671	$ 29,242,237		SSO 640	Below ground Storage, protects trunk sewer - 5.9 MG	STOR	2 yr	
304	10140820	Colerain - Jessup Replacement Sewer	$ 2,406	$ 4,054	$ 5,893,498	$ 9,930,986			Replace collector following original alignment - 12,950 ft of 15-60"; Tunnel 220 ft of 18-42"	CONV		
305	MA	Montgomery All										
306	10170160	Dawson Rd. & Rosecrest Ave.			$ 2,150,290	$ 3,623,400		SSO 1008, 1014, 608	Replace existing pipe - Approx. 2600 LF of 18-27"	CONV	2 yr	
307	10170180	Miami Ave. N. Btwn Mardel Dr. & Euclid Rd.			$ 3,023,001	$ 5,093,983		SSO 1008	Replace existing pipe - Approx. 7300 LF of 15-21"	CONV	2 yr	
308	10170320	Miami Rd. W. @ Miami-Demar Rd.			$ 1,369,644	$ 2,307,953			Replace existing pipe - Approx. 1700 LF of 18"	CONV		
309	10170340	Graves Rd. @ Rheinstorm Park			$ 1,795,303	$ 3,025,220			Replace existing pipe - Approx. 3800 LF of 15-18"	CONV		
310	CCA	Clough Creek A										
311	10170120	Beechmont Ave. South of Birkshire			$ 3,524,420	$ 5,938,912		SSO 588	Replace existing pipe - Approx. 4000 LF of 27-30"	CONV	2 yr	

INDEX	WWIP ATTACHMENT 3		Sunk Costs 2006 Dollars	Sunk Costs 2023 Dollars	Remaining Cost (NOTE 10) 2006 Dollars	Remaining Cost 2023 Dollars		CSO SSO Identifier (NOTE 14)	Description / Design (NOTE 3)	Technology	Plan CAPP	Plan Remaining CSO (MG/year) (NOTE 5)
						Conversion Factor 1.685075						
INDEX	PID	PROJECT NAME	SUNK COST	SUNK COST	REMAINING COST	REMAINING COST (NOTE 17)			SCOPE	TECH	CAPP	ROV PLAN REMAINING
312	10170140	Birney Ln. South of Beechmont			$ 1,929,768	$ 3,251,804		SSO 588	Replace existing pipe - Approx. 4100 LF of 15-27"	CONV	2 yr	
313	10170220	Spindlehill Dr. @ Beechview Estates			$ 17,284,000	$ 29,124,836			Regional Storage - 4.6 MG	STOR		
314	10170240	Clough Pike @ Batavia Rd. & Corbly Rd.			$ 18,560,565	$ 31,275,944			Replace existing pipe - Approx. 9600 LF of 15-48"	CONV		
315	10170260	Clough Pike @ Bartels Rd. & Goldengate Dr.			$ 2,298,465	$ 3,873,086			Replace existing pipe - Approx. 3000 LF of 48"	CONV		
316	10170280	Berkshire Rd.			$ 2,882,335	$ 4,856,951			WIBs - Replace existing pipe - Approx. 4100 LF of 27-54"	CONV		
317	10170890	Berkshire HRT			$ 17,781,369	$ 29,962,940		CSO 182	EHRT - 44.3 MGD Community Priority (NOTE 2)	EHRT		18.3
318	10170900	Clough Cir. Div. Dam			$ 277,729	$ 467,994		CSO 476	Regulator Improvements - 49.2 cfs Premised on operational changes at WWTP Four Mile P.S.	RI		2.4
319	10170860	Prospect Woods			$ 819,293	$ 1,380,570		PSO 861	Prospect Woods PS Upgrade (NOTE 13)	PSU	2 yr	
320	W	Winton										
321	10140620	Springfield Pike & Riddle Rd.			$ 24,900,000	$ 41,958,368			Partially buried Storage - Protects Interceptors; 9.4 MG, gravity in & out	STOR		
322	10141040	Winton Rd. & Lakeview Dr.			$ 5,799,999	$ 9,773,433			New parallel sewer to follow original alignment - 11,238 ft of 18-42" Sensitive Receiving Stream	CONV		
323	10141320	Greenpine Acres PS			$ 609,699	$ 1,027,389		PSO 794	PS Elim, PSO 794, w/sewer	CONV	2 yr	
324	10140800	Ronald Reagan & Hamilton			$ 5,199,070	$ 8,760,823		SSO 612, 1003	Replace collector following original alignment - 12,396 ft of 12-48"; Tunnel 80 ft of 36"	CONV	2 yr	
325	DAL	Delta Ave. Lower										
326	10172000	Kellogg @ Wilmer, REG			$ 277,730	$ 467,996		CSO 669	Regulator Improvement	RI		0.0
327	D	Deerfield										
328	10170980	Stewart & Ken Arbre Grating			$ 277,349	$ 467,354		CSO 554	Regulator Improvements - 4.1 cfs	RI		0.0
329	10171000	6735 Ken Arbre Grating			$ 5,200,543	$ 8,763,305		CSO 555	Sewer Separation	PS		8.9
330	10171020	Stewart Rd. West Regulator			$ 11,779,329	$ 19,849,053		CSO 556	Storage - 2.90 MG	STOR		17.5
331	RR	Rapid Run										
332	10130440	Wulff Run Creek, From Neeb Rd. to Viscount			$ 3,293,342	$ 5,549,528			Replace Interceptor in Wulff Run - 4500 ft of 24"	CONV		
333	10130460	Delhi Rd & Oakwood Park Dr.			$ 8,389,474	$ 14,136,893		SSO 623	Storage Tank capturing SSO 623 - 1.25 MG w/3 MGD pump	STOR	2 yr	
334	10130500	Delhi Rd. East to Schroer Ave.			$ 1,524,556	$ 2,568,991			Replace Interceptor along original alignment through Delhi - 5500 ft of 18-24"	CONV		
335	10130760	Rapid Run & Devils Backbone			$ 26,634,390	$ 44,880,945		CSO 523	EHRT - 106 MGD Community Priority (NOTE 2)	EHRT		55.3
336	TWLU	Tributary to Winton Lake Upper										
337	10142260	Daly Rd. Vortex Separator			$ 63,483,831	$ 106,975,017		CSO 532	EHRT - 204.7 MGD Community Priority (NOTE 2)	EHRT		33.9
338	LDC	Lower Duck Conveyance										
339	10170200	Wooster Pike & West St.			$ 1,844,367	$ 3,107,897			WIBs - Replace existing pipe - Approx. 2800 LF of 12-27"	CONV		
340	10170680	Plainview Rd.			$ 1,580,886	$ 2,663,911			WIBs - Replace existing pipe - Approx. 2800 LF of 12-27"	CONV		
341	SP	Sycamore Plan										
342	10160020	Montgomery & Deerfield			$ 192,639	$ 324,611			Replace pipe - 500 ft of 18"	CONV		
343	CCB	Clough Creek B										
344	10170300	Gungadin Dr. W. of S Mile & Paddison			$ 4,716,433	$ 7,947,543			Replace existing pipe - Approx. 8800 LF of 21-27"	CONV		
345	10170360	Concordridge Dr. & Hunley Rd.			$ 5,019,056	$ 8,457,486			Replace existing pipe - Approx. 6600 LF of 15-18"	CONV		
346	10170380	Lawyer Rd. @ Heatherwood Ln.			$ 786,806	$ 1,325,827			Replace existing pipe - Approx. 2100 LF of 15"	CONV		
347	10170480	Clough Pike @ Goldengate Dr.			$ 4,263,535	$ 7,184,376			Replace existing pipe - Approx. 6100 LF of 21-27"	CONV		
348	10170500	Clough Pike @ Wolfangle Rd.			$ 2,185,711	$ 3,683,087			Replace existing pipe - Approx. 5300 LF of 18-21"	CONV		
349	PRWWTP	Polk Run Wastewater Treatment Plant										
350	10150020	Polk WWTP STO Storage Tank			$ 16,936,648	$ 28,539,522			Storage - 6 MG (NOTE 1)	STOR		
351	10150015	Polk Run WWTP Optimization Ph4			$ 8,156,003	$ 13,743,477			Polk Run WWTP Optimization Ph4	Optimization	NOTE 1	
352	10150080	Polk WWTP STO Replace Pipe			$ 5,852,872	$ 9,862,528			Replacement pipe - 800 ft of 30"/1 MG tank	CONV/STOR		
353	10150100	Polk WWTP CNV Map 015			$ 1,141,145	$ 1,922,915			Replacement pipe - 2700 ft of 15-18"	CONV		
354	10150140	Polk WWTP CNV Map 002			$ 5,424,227	$ 9,140,229			Replace pipe (200 ft of 18"). New PS & Storage tank	CONV/STOR		
355	10150160	Polk WWTP CNV Map 010			$ 12,937,008	$ 21,799,829			Replace pipe - 7000 ft of 36 - 48"	CONV		
356	CA	California Plan										
357	10170400	S Mile Rd. & Old Kellogg			$ 7,976,701	$ 13,441,339			Replace existing pipe - Approx. 5000 LF of 36-54"	CONV		
358	10170420	S Mile Rd. & Birney Ln.			$ 6,037,842	$ 10,174,217			Replace existing pipe - Approx. 2000 LF of 42"	CONV		
359	10170440	4 Mile Rd. @ I-275			$ 5,890,945	$ 9,926,684			Replace existing pipe - Approx. 7400 LF of 21-30"	CONV		
360	10170460	Indian Creek Rd.			$ 3,739	$ 6,300			Seal Manhole Lids	Seal Manhole Lids		
361	10170540	Kellogg Ave. @ Coney Island			$ 7,195,266	$ 12,124,563			Replace existing pipe - Approx. 6200 LF of 54-66"	CONV		
362	WOL	West Ohio Lower										
363	10144660	Delhi Ave. Div. Dam			$ 583,399	$ 983,071		CSO 420	Partial Separation	PS		0.1
364	10144680	River Rd. @ Delhi Div. Dam			$ 857,500	$ 1,444,952		CSO 421	Partial Separation	PS		0.2
365	10144760	Bold Face Sr. Div. Dam			$ 96,810,229	$ 163,132,497		CSO 419	EHRT - 275 MGD (NOTE 2)	EHRT		137.2
366	10144780	Mt. Echo Rd. Regulator			$ 277,350	$ 467,356		CSO 422	Regulator Improvements - 22.2 cfs	RI		13.4
367	10144800	Mt. Hope Ave. Regulator			$ 13,886,537	$ 23,399,856		CSO 423	Storage-3.5 MG	STOR		24.9
368	KRU	Kings Run Upper										
369	10142940	Ross Run Regulator			$ 277,300	$ 467,271		CSO 485	Regulator Improvements -70.4 cfs	RI		29.1

INDEX	PID	PROJECT NAME	Sunk Costs 2006 Dollars	Sunk Costs 2023 Dollars	Remaining Cost (NOTE 10) 2006 Dollars	Remaining Cost 2023 Dollars		CSO SSO Identifier (NOTE 14)	Description / Design (NOTE 3)	Technology	Plan CAPP	Plan Remaining CSO (MG/year) (NOTE 5)
	WWIP ATTACHMENT 3					Conversion Factor 1.685075						
INDEX	PID	PROJECT NAME	SUNK COST	SUNK COST	REMAINING COST	REMAINING COST (NOTE 17)			SCOPE	TECH	CAPP	ROV PLAN REMAINING
370	10143180	Wooden Shoe Regulator	$ 13,723	$ 23,124	$ 25,596,976	$ 43,132,824		CSO 217	Partial Separation with Storage – 1.5 MG (project included in Revised Original LMCPR)	PS/STOR		23.3
371	10143000	Kings Run and Spring Cove			$ 2,245,402	$ 3,783,671		CSO 486	Partial Separation	PS		0.4
372	10143040	Ross Run Grating			$ 186,895,962	$ 314,933,713		CSO 487	EHRT - 584 MGD (NOTE 2)	EHRT		289.2
373	10143140	Kings Run Regulator			$ 5,487,501	$ 9,246,851		CSO 483	Partial Separation to new interceptor connection	PS		15.3
374	HS	Hopple Street										
375	10142760	Vinton St. Regulator - CSO 8			$ 277,301	$ 467,273		CSO 8	Regulator Improvements - 1.54 cfs	RI		0.9
376	WF	West Fork										
377	10143680	Powers No. 1 Grating			$ 277,349	$ 467,354		CSO 527	Regulator Improvements - 4.6 cfs	RI		0.4
378	10143700	Beekman North Grating			$ 277,350	$ 467,356		CSO 528	Regulator Improvements - 3.0 cfs	RI		0.2
379	10143720	Beekman South Grating			$ 277,350	$ 467,356		CSO 530	Regulator Improvements - 8.5 cfs	RI		0.9
380	10143740	Liewellen Grating			$ 277,350	$ 467,356		CSO 529	Regulator Improvements - 3.9 cfs	RI		0.1
381	10143760	Hoffner Grating			$ 359,200	$ 605,279		CSO 123	Partial Separation	PS		0.0
382	10143780	Hays Grating			$ 895,800	$ 1,509,490		CSO 127	Partial Separation	PS		0.2
383	10143800	Todd No. 2 Grating			$ 1,337,900	$ 2,254,462		CSO 128	Partial Separation	PS		0.3
384	10143860	Butte/Todd 1/Twin Grating			$ 85,000,001	$ 143,231,377		CSO 130	Conveyance to Tunnel at Mill Creek, 12,600' of 84" sewer	CONV		56.3
385	10143820	Badgeley Run Grating - incl. with 10143860						CSO 125	Conveyance to Tunnel at Mill Creek, 12,600' of 84" sewer, Cost in CSO 130	CONV		68.9
386	10143840	Todd 1 Grating, CNV - incl. with 10143860						CSO 126	Conveyance to Tunnel at Mill Creek, 12,600' of 84" sewer, Cost in CSO 130	CONV		33.2
387	10143880	Twin Grating, CNV - incl. with 10143860						CSO 203	Conveyance to Tunnel at Mill Creek, 12,600' of 84" sewer, Cost in CSO 130	CONV		5.4
388	10143900	Dreman Grating - incl. with 10143860						CSO 117	Conveyance to Tunnel at Mill Creek, 12,600' of 84" sewer, Cost in CSO 130	CONV		9.4
389	EL	Elmwood Lower										
390	10142640	Vine St. Div. Dam			$ 1,019,100	$ 1,717,260		CSO 544	Partial Separation	PS		0.1
391	10142660	Murray Rd. Div. Dam			$ 510,101	$ 859,558		CSO 653	Partial Separation	PS		0.4
392	10142700	Bloody Run Regulator			$ 75,958,176	$ 127,995,223		CSO 181	EHRT - 230 MGD (NOTE 2)	EHRT		215.1
393	EO1U	East Ohio 1 Upper										
394	10144160	Gest St. West-2-A Div. Dam, STO						CSO 430	In-line Storage in existing piping (also 431 & 432)	STOR		27.6
395	10144180	9th & McLean Div. Dam, STO						CSO 432	In-line Storage in existing piping (also 430 & 431)	STOR		5.2
395A	10142950	(I) East Branch Ohio River Interceptor Extension						CSO 430, 431, 432, 489, 666	Partial Separation. Refer to Project Fact Sheet.	PS		Improves Performance of Indices 394, 395, 396, 417 & 452
396	10144200	Blackford St. Regulator			$ 2,702,301	$ 4,553,580		CSO 431	In-line Storage in existing piping (also 430 & 432) Dewater pump station for 2.0 MGD	STOR		102.5
397	EO2	East Ohio 2										
398	10144220	Pike St. Div. Dam			$ 277,350	$ 467,356		CSO 444	Regulator Improvement - 1.0 cfs	RI		0.1
399	10144240	Collard St. Regulator			$ 277,349	$ 467,354		CSO 447	Regulator Improvement - 2.6 cfs	RI		0.3
400	10144260	Riverfront Coliseum Regulator			$ 1,530,200	$ 2,578,502		CSO 443	Partial Separation	PS		0.1
401	10144320	Parsons St. Div. Dam			$ 277,350	$ 467,356		CSO 446	Regulator Improvement - 8.5 cfs	RI		4.1
402	10144340	Eggleston & 4th Div. Dam			$ 27,874,917	$ 46,971,326		CSO 461	EHRT - 120 MGD (NOTE 2)	EHRT		119.2
403	10144360	Eggleston & 3rd F. Div.			$ 277,350	$ 467,356		CSO 462	Regulator Improvement - 6.4 cfs	RI		3.6
404	10144380	Eggleston & 3rd			$ 277,350	$ 467,356		CSO 463	Regulator Improvement - 2.0 cfs	RI		1.0
405	10144400	Eggleston & 3rd E. Div.			$ 277,349	$ 467,354		CSO 464	Regulator Improvements- 5.8 cfs	RI		2.8
406	10144420	Eggleston & Pete Rose Way			$ 277,350	$ 467,356		CSO 465	Regulator Improvement - 2.6 cfs	RI		1.6
407	WOU	West Ohio Upper										
408	10144700	Evans & 6th Street Div.			$ 381,500	$ 642,856		CSO 668	Partial Separation	PS		0.5
409	10144720	Evans & River Rd. No. 1 Div.			$ 97,801	$ 164,802		CSO 426	Full Separation	FS		0.3
410	10144740	Evans & River Rd. No. 2 Div.			$ 1,682,099	$ 2,834,463		CSO 427	Partial Separation	PS		0.5
411	10144820	River Rd. @ State Div. Dam			$ 4,237,794	$ 7,141,001		CSO 424	Partial Separation	PS		5.2
412	10144860	State Ave. Div. Dam			$ 277,351	$ 467,357		CSO 425	Regulator Improvement - 1.7 cfs Overcontrol @ CSO 419	RI		8.5
413	EO1LW	East Ohio 1 Lower West										
414	10144020	Baymiller St. Regulator			$ 277,333	$ 467,327		CSO 435	Regulator Improvements-11.2 cfs	RI		6.6
415	10144040	Carr St. Regulator			$ 2,638,500	$ 4,446,070		CSO 433	Partial Separation	PS		1.0
416	10144060	Carr & Front Div. Dam			$ 824,599	$ 1,389,511		CSO 434	Partial Separation	PS		0.2
417	10144120	7th & Mclean Div. Dam			$ 785,300	$ 1,323,289		CSO 489	Partial Separation	PS		0.1
418	10144140	Gest & Front Regulator			$ 4,587,403	$ 7,730,118		CSO 436	Partial Separation	PS		8.4
419	CRL	Congress Run Lower										
420	10142560	Lockland & Highway Grating			$ 2,876,601	$ 4,847,288		CSO 490	Partial Separation	PS		0.9

INDEX	WWIP ATTACHMENT 3		Sunk Costs 2006 Dollars	Sunk Costs 2023 Dollars	Remaining Cost (NOTE 10) 2006 Dollars	Remaining Cost 2023 Dollars		CSO SSO Identifier (NOTE 14)	Description / Design (NOTE 3)	Technology	Plan CAPP	Plan Remaining CSO (MG/year) (NOTE 5)
						Conversion Factor 1.685075						
INDEX	PID	PROJECT NAME	SUNK COST	SUNK COST	REMAINING COST	REMAINING COST (NOTE 17)			SCOPE	TECH	CAPP	ROV PLAN REMAINING
421	10142600	Vine & Decamp Div. Dam			$ 8,274,751	$ 13,943,576		CSO 171	Storage - 2.00 MG	STOR		23.0
422	KRL	Kings Run Lower										
423	10142960	Station Ave. A. Div Dam			$ 277,301	$ 467,273		CSO 26	Regulator Improvements - 7.1 cfs	RI		0.0
424	10142980	Clifton Ave. West Grating			$ 1,159,300	$ 1,953,507		CSO 480	Partial Separation	PS		1.3
425	EO3W	East Ohio 3 West										
426	10144440	Walden St. Div. Dam			$ 6,473,599	$ 10,908,500		CSO 450	Partial Separation	PS		3.3
427	10144460	Hazen St. Div. Dam			$ 1,459,000	$ 2,458,524		CSO 451	Partial Separation	PS		1.0
428	10144480	Collins St. West Div. Dam			$ 1,323,000	$ 2,229,354		CSO 452	Partial Separation	PS		0.2
429	10144520	Hazen St. @ Glen Alley Div.			$ 541,898	$ 913,139		CSO 658	Full Separation	FS		0.0
430	10144560	Litherbury St. South Div.			$ 136,000	$ 229,170		CSO 449	Full Separation	FS		0.0
431	10144580	Collins St. West Regulator			$ 1,272,000	$ 2,143,415		CSO 453	Partial Separation	PS		0.5
432	10144600	Collins St. East Div. Dam			$ 19,890,435	$ 33,516,875		CSO 458	Storage - 6.0 MG Consolidate with CSO 460	STOR		10.1
433	10144640	Litherbury St. North Div.			$ 277,350	$ 467,356		CSO 448	Regulator Improvement - 5.5 cfs	RI		12.7
434	EO1LE	East Ohio 1 Lower East										
435	10144000	3rd St. @ Central Ave.			$ 277,331	$ 467,324		CSO 439	Regulator Improvements-52.4 cfs	RI		8.9
436	10144100	Central Ave. Grating			$ 3,683,099	$ 6,206,298		CSO 438	Partial Separation	PS		14.3
437	NSL	North Side Lower										
438	10143200	Geringer St. Grating			$ 277,300	$ 467,271		CSO 19	Regulator Improvement - 7.6	RI		0.9
439	EU	Elmwood Upper										
440	10142620	Maple St. Div. Dam			$ 277,301	$ 467,273		CSO 37	Regulator Improvements - 6.2 cfs	RI		1.3
441	10142720	64th St. Div. Dam			$ 2,280,418	$ 3,842,675		CSO 39	Partial Separation	PS		2.2
442	10142740	68th St. Div. Dam			$ 277,301	$ 467,273		CSO 488	Over Control at 181 to eliminate conveyance element	RI		35.3
443	SGL	Spring Grove Lower										
444	10143360	4710 Howard Grating			$ 277,300	$ 467,271		CSO 110	Regulator Improvements -2.90 cfs	RI		0.3
445	10143400	Springlawn Grating			$ 1,406,906	$ 2,370,742		CSO 111	Partial Separation	PS		4.1
446	10143420	1547 Springlawn Grating			$ 1,218,799	$ 2,053,768		CSO 112	Partial Separation	PS		0.7
447	EO3E	East Ohio 3 East										
448	10144500	Bayou St. 120 West Regulator			$ 471,800	$ 795,018		CSO 459	Partial Separation	PS		0.3
449	10144540	Eastern and Gotham			$ 2,435,600	$ 4,104,169		CSO 667	Partial Separation	PS		2.6
450	10144620	Bayou St. 100 West Div. Dam			$ 6,668,046	$ 11,236,158		CSO 460/458	Consolidate with CSO 458	CONV		14.7
451	LMCFR	Lower Mill Creek Final Remedy										
452	10145380	Mill Creek "Lower 11 CSO" Phase 2 CSO controls						CSOs 2, 3, 4, 5, 6, 7, 9, 666, 152, 428, and 429 ("Lower 11 CSOs")	Storage, conveyance, strategic separation, green infrastrucutre, using MSD's Integrated Watershed Planning approaches at the listed CSOs or in the LMC basin	NOTE 6		85% capture or control (aggregate) (NOTE 8)
453		Phase 2 Default (Lower Mill Creek Final Remedy)			$ 305,658,000	$ 515,056,654		CSOs 33, 10, 11, 12, 13, 14, 15, 22, 23, 24, 482, 28, 29, 30, 025, Este, 18, 21, 017	Default tunnel/conveyance	NOTE 7		85% capture or control (aggregate) (NOTE 8)
454	10130745	Werk & Westbourne Grating						CSO 522	EHRT - Sized so that, in conjunction with Attachment 1B Index 109 EHRT, total EHRT capacity is at least 106 MGD.	EHRT		64.7
455	10140000	SSO 1048 Conveyance Sewer Phase 1			$ 1,710,579	$ 2,882,454		SSO 1048	Replace collector following original alignment - 4115 ft of 18-27"; Tunnel 375 ft of 18-24"	CONV	2 yr	
456	10140020	SSO 1048 Conveyance Sewer Phase 2			$ 2,467,502	$ 4,157,926		SSO 1048	Replace collector following original alignment - 4256 ft of 30-36"	CONV	2 yr	
457	10140080	SSO 587 Conveyance Sewer			$ 1,178,958	$ 1,986,633		SSO 587	Replace collector following original alignment - 4235 ft of 15-24"	CONV	2 yr	
458	10140120	Sharonville/Evandale Trunk to SSO 700			$ 34,000,590	$ 57,293,544		SSO 1048, 587	24,929 LF of 30-66"; Tunnel 6250 LF of 30-78"	CONV	2 yr	
459	10141180	SSO 700 Final Remedial Plan (FRP)			$ 96,200,000	$ 162,104,215		SSO 700	24.8 MG storage and conveyance, in accordance with the descriptions and designs specified in the SSO 700 Final Remedial Plan approved by the Regulators on December 19, 2022. Project also includes those included in Index Lines 455-458 (moved from Index Lines 224-227) and upsizing of two (2) sewer segments as noted in the SSO 700 FRP.	STOR		
460	TOTAL PHASE 2 WITHOUT PHASE 2 ALLOWANCES		$182,720	$ 307,897	$2,077,237,782	$ 3,500,301,456						

WWIP ATTACHMENT 3

INDEX	PID	PROJECT NAME	Sunk Costs 2006 Dollars	Sunk Costs 2023 Dollars	Remaining Cost (NOTE 10) 2006 Dollars	Remaining Cost 2023 Dollars		CSO SSO Identifier (NOTE 14)	Description / Design (NOTE 3)	Technology	Plan CAPP	Plan Remaining CSO (MG/year) (NOTE 5)
						Conversion Factor 1.685075						
INDEX			SUNK COST	SUNK COST	REMAINING COST	REMAINING COST (NOTE 17)			SCOPE	TECH	CAPP	ROV PLAN REMAINING

NOTES:

1. PROJECT COMPLETE AND IN SERVICE AT SPECIFIED CAPACITY
2. FOR ALL PROJECTS WITH EHRT TECHNOLOGY VOLUME SHOWING IS REMAINING UNTREATED OVERFLOW - SEE ATTACHMENT 5.
3. CAPP DESIGN: ALL CAPP SEWER PROJECTS WILL BE DESIGNED TO MEET THE 10 YEAR DESIGN STORM EVENT. ALL CAPP PUMP STATION AND STORAGE FACILITIES WILL BE DESIGNED TO MEET THE 2 YEAR DESIGN STORM EVENT. THE 2 AND 10 YEAR DESIGN STORMS ARE SCS TYPE II - 24 HOUR EVENTS.
4. FOR THESE RTC PROJECTS, THE STATED REDUCTION IN THE TYPICAL YEAR CSO DISCHARGE VOLUME SHALL ALSO BE THE PERFORMANCE CRITERIA FOR THE FACILITY.
5. PERFORMANCE CRITERIA FOR CSO VOLUMES REMAINING AFTER IMPLEMENTATION OF CSO CONTROLS ARE THE VOLUMES NOT TO BE EXCEEDED AT A PARTICULAR OUTFALL DURING MSDGC'S TYPICAL RAINFALL YEAR (1970). COMPLIANCE WITH THESE CRITERIA WILL BE EVALUATED BY IMPLEMENTATION OF THE POST CONSTRUCTION MONITORING PROGRAM (APPROVED MARCH 20, 2020) UTILIZING MSDGC'S HYDROLOGIC AND HYDRAULIC MODEL TO NORMALIZE THE RESULTS OF THE POST CONSTRUCTION MONITORING TO THE TYPICAL YEAR.
6. DEFENDANTS MAY PROPOSE WORK AT ADDITIONAL CSOs IN THE LMC BASIN IN ACCORDANCE WITH THE PROVISIONS OF THE WWIP.
7. THE DEFAULT FINAL REMEDY FOR THE LOWER MILL CREEK FINAL REMEDY ("LMCFR") IS A TUNNEL(s)/CONVEYANCE, TO BE DESIGNED WITH REFERENCE TO THE FINAL LMCPR AND TO MEET THE APPLICABLE PERFORMANCE CRITERIA. THE PERFORMANCE CRITERIA FOR THESE CSOs WERE EXPRESSED AS "PLAN REMAINING CSO" VOLUMES, BASED ON MODELING PERFORMED AT THE TIME OF THE DEVELOPMENT OF THE WWIP. THE UPDATED PEFORMANCE CRITERION IS EXPRESSED AS 85% CAPTURE OR CONTROL, ACKNOWLEDGING UPDATED MODELING INFORMATION. GIVEN THE KNOWLEDGE GAINED BY DEFENDANTS OF THE LOWER MILL CREEK BASIN OVER THE PERIOD 2009-2012, AND THE PROJECTS INCLUDED IN THE REVISED ORIGINAL LMCPR, THE DEFENDANTS PROPOSE AND THE REGULATORS UNDERSTAND THAT CONSTRUCTION OF THE CSO TUNNEL IS LIKELY NOT THE COST-EFFECTIVE ALTERNATIVE FOR THE LMCFR. THE WWIP ENVISIONED THAT AN ALTERNATIVE OTHER THAN THE LMCFR TUNNEL COULD BE APPROPRIATE FOR THE LMCFR AND ALLOWS DEFENDANTS TO PROPOSE A DIFFERENT LMCFR PURSUANT TO THE WWIP. THE DEFENDANTS HAVE EXPRESSED INTENT TO TIMELY SUBMIT AN APPROVABLE PROPOSAL FOR A REVISED LMCFR THAT REFLECTS DEFENDANTS' INTEGRATED WATERSHED PLANNING APPROACH FOR THE AGGREGATED CSO FLOWS IN THE LOWER MILL CREEK BASIN. THE REGULATORS UNDERSTAND THIS INTENT AND IF A PROPOSAL IS SUBMITTED THAT IS CONSISTENT WITH THE PROVISIONS OF THE WWIP, THE REGULATORS ANTICIPATE APPROVING IT.
8. "PERCENT CAPTURE OR CONTROL" REFERS TO THE DIFFERENCE OF INFLOW VOLUME MINUS OVERFLOW VOLUME, DIVIDED BY INFLOW VOLUME, MULTIPLIED BY 100 [((INFLOW-OVERFLOW)/INFLOW) X 100], AS PREDICTED IN A TYPICAL YEAR USING THE MOST CURRENT MODEL APPLICABLE TO THE WATERSHED UPON ACHIEVEMENT OF FULL OPERATION. FOR THE PURPOSE OF COMPUTING "PERCENT CAPTURE OR CONTROL," INFLOW VOLUMES ARE THOSE PREDICTED BY MSDGC'S MOST CURRENT MODEL (1) USING MSDGC'S TYPICAL YEAR RAINFALL (1970); AND (2) BASED ON PRE-CONTROL CONDITIONS, DERIVED IN A MANNER CONSISTENT WITH HOW BASELINE CONDITIONS WERE DEFINED IN MSDGC'S JUNE 2006 "WET WEATHER IMPROVEMENT PROGRAM; VOLUME II, CSO LONG TERM CONTROL PLAN UPDATE REPORT," SECTION 4.7 ON PAGE 4-14. FOR THE PURPOSE OF COMPUTING "PERCENT CAPTURE OR CONTROL" OVERFLOW VOLUMES ARE THOSE PREDICTED BY THE MOST CURRENT MSDGC SYSTEM-WIDE MODEL FOR THE TYPICAL YEAR RAINFALL (1970) FOR POST-CONTROL CONDITIONS. COMPLIANCE WITH THESE CRITERIA WILL BE EVALAUTED BY IMPLEMENTATION OF THE POST CONSTRUCTION MONITORING PROGRAM (APPROVED MARCH 20, 2020) UTILIZING MSDGC'S HYDROLOGIC AND HYDRAULIC MODEL TO NORMALIZE THE RESULTS OF THE POST CONSTRUCTION MONITORING TO THE TYPICAL YEAR.
9. PROJECT IN ATTACHMENT 1B INDEX ROW 79 WAS AN INTERIM UPGRADE TO THE MUDDY CREEK WWTP RAW SEWAGE AND EFFLUENT PUMPING CAPACITIES, TO ACHIEVE MINIMUM FIRM INFLUENT AND EFFLUENT PUMPING CAPACITIES BOTH OF 28 MGD. FINAL FIRM INFLUENT PUMPING CAPACITY OF 35 MGD WILL BE ACHIEVED AS PART OF PHASE 2 PROJECT 10130000 (SEE ATTACHMENT 1B, INDEX ROW 151 & ATTACHMENT 2, INDEX ROW 215).
10. COSTS FOR PROJECTS REFLECT THE COST IDENTIFIED IN THE 2009 WWIP EXCEPT FOR PROJECTS CHANGED OR ADDED THROUGH "ADAPTIVE MANAGEMENT".
11. INSTALL UP-SIZED UNDERFLOW PIPES EQUIPPED WITH AUTOMATIC FLOW CONTROL GATES ON CSO 083 AND CSO 472, AND CONNECT THOSE AUTOMATIC GATES TO A SCADA SYSTEM TO ALLOW REMOTE AND POSSIBLY AUTOMATIC OPERATION OF THOSE GATES BASED ON FLOW CONDITIONS BOTH IN THE COLLECTION SYSTEM BOTH IN THE PROXIMITY OF THESE CSOS AS WELL AS IN THE INTERCEPTOR DOWNSTREAM OF THE TWO CSOS.
12. SEPARATE THE COLUMBIA SQUARE DEVELOPMENT SITE BY CONNECTING THE SITE STORM SEWERS TO A CURRENTLY UNUSED SEWER (PREVIOUSLY USED AS THE CSO 469 UNDERFLOW SEWER), AND CONSTRUCTING A NEW SEWER TO DIVERT THAT CURRENTLY UNUSED SEWER TO THE CSO 469 OUTFALL DOWNSTREAM OF THE REGULATOR.
13. PROJECT IS INCLUDED AS PART OF THE 2018 "BRIDGE" - EITHER IN WHOLE OR IN PART, APPROVED SEPTEMBER 18, 2018.
14. IN 2009, OHIO EPA CHANGED THE CSO NUMBERS USED TO IDENTIFY SOME OF DEFENDANTS' CSO OUTFALLS IN DEFENDANTS' NPDES PERMIT (1PX00022*CD; Application No. OH0105457). AS A RESULT, SOME OF THE CSO IDENTIFIER NUMBERS USED IN THE ORIGINAL WWIP NOW HAVE DIFFERENT NUMBERS IN DEFENDANTS' NPDES PERMIT. THE WWIP HAS BEEN MODIFIED TO CHANGE ALL THOSE CSO IDENTIFIER NUMBERS TO BE CONSISTENT WITH THE CSO IDENTIFIER NUMBERS IN DEFENDANTS' NPDES PERMIT. SPECIFICALLY, CSO IDENTIFIER NUMBERS ASSOCIATED WITH THE FOLLOWING INDEX LINES IN ATTACHMENT 1B HAVE BEEN CHANGED; INDEX LINES 55, 89, 95 AND 112. CSO IDENTIFIER NUMBERS ASSOCIATED WITH THE FOLLOWING INDEX LINES IN ATTACHMENT 2 HAVE BEEN CHANGED; 270, 370, 377-380, 388, 396, 398-401, 403-406, 409, 410, 412, 423, 426-428, 430, 431, 433, 435 AND 453.
15. ENHANCED PRIMARY TREATMENT MAY INCLUDE ENHANCED HIGH RATE TREATMENT TECHNOLOGIES. SCOPE OF WORK OF ATTACHMENT 2 INDEX LINE 248 INCLUDES AN EVALUATION TO DETERMINE POTENTIAL INCORPORATION OF PROJECT 10145500 (REMOVED FROM ATTACHMENT 1B INDEX LINE 103 AND ADDED TO ATTACHMENT 2 INDEX LINE 247a) FOR MILL CREEK WWTP OUTFALL IMPROVEMENTS AND PROJECT 10145580 (REMOVED FROM ATTACHMENT 1B INDEX LINE 105 AND ADDED TO ATTACHMENT 2 INDEX LINE 247b) FOR MILL CREEK WWTP ADDED SLUDGE PUMPING. THE PURPOSE OF THE EVALUATIONS WILL BE TO DETERMINE (1) WHETHER ADDITIONAL SLUDGE PUMPING IS NECESSARY TO PROCESS THE ADDITIONAL SLUDGE GENERATED BY CHEMICALLYENHANCED PRIMARY TREATMENT OR OTHER ENHANCED HIGH RATE TREATMENT TECHNOLOGY, (2) WHETHER ADDITIONAL AUXILIARY OUTFALL CAPACITY WILL BE NECESSARY TO ACCOMMODATE THE EXPANDED MILL CREEK WWTP PEAK TREATMENT CAPACITY, AND (3) IF SUCH INCREASES ARE NEEDED, THE SIZE AND DESIGN CRITERIA OF ADDITIONAL SLUDGE PUMPING ALONG WITH THE DESIGN AND SIZING OF OUTFALL IMPROVEMENTS TO HANDLE ANY ADDITIONAL FLOWS THROUGH THE TREATMENT PLANT.
16. **THE ALLOWANCES AS DEFINED IN THE FINAL WWIP SECTION C.6 AND REFLECTED IN INDEX 113 FROM THE ORIGINAL FINAL WWIP ATTACHMENT 1B, SHALL CONTINUE INTO PHASE 2.**
17. **REMAINING COSTS SHOWN IN 2023$ ARE BASED UPON THE INITIAL FINAL WWIP REMAINING COSTS SHOWN IN 2006$. THE MULTIPLYING FACTOR TO CONVERT 2006$ TO 2023$ IS 1.685075. PROJECT COSTS FOR PROJECTS ADDED TO ATTACHMENT 3 ARE TO BE DETERMINED.**

Bundle Identifiers:

(H)	**LITTLE MIAMI WWTP BUNDLE: THIS BUNDLE IN ATTACHMENT 3 CONSISTS OF ADDRESSING 12 INDEX PROJECTS BE REPLACED BY FOUR ADAPTIVE MANAGEMENT PROJECTS DURING PHASE 2B. THE FOUR PROJECTS ARE; 1) 10172950 LMWWTP ELECTRICAL, PRIMARY AND SECONDARY IMPROVEMENTS, 2) 10172955 LMWWTP HIGH RATE TREATMENT PREPARATION, 3) 10172960 LMWWTP HRT FACILITY AND 4) 10281100 LMWWTP SOLIDS DISPOSAL WITH ODOR CONTROL. REFER TO THE PROJECT FACT SHEETS FOR DETAILS ABOUT EACH ADAPTIVE MANAGEMENT PROJECT.**
(I)	**MILL CREEK WWTP BUNDLE: THIS BUNDLE IN ATTACHMENT 3 CONSISTS OF ADDRESSING SIX INDEX PROJECTS THAT ARE IMPROVED UPON BY THREE ADAPTIVE MANAGEMENT PROJECTS DURING PHASE 2B. INDEX 248 IS PARTIALLY ADDRESSED BY TWO ADAPTIVE MANAGEMENT PROJECTS WHICH ARE; 1) 10144888 MCWWTP HIGH RATE TREATMENT PUMP STATION, AND 2) 10240640 MCWWTP DEWATERING BUILDING IMPROVEMENTS, AND THE THIRD ADAPTIVE MANAGEMENT PROJECT, 3) 10142950 EAST BRANCH OHIO RIVER INTERCEPTOR EXTENSION, WHICH IMPROVES PERFORMANCE OF INDEX PROJECTS 394, 395, 396, 417 AND 452. REFER TO THE PROJECT FACT SHEETS FOR DETAILS ABOUT EACH ADAPTIVE MANAGEMENT PROJECT.**

Attachment 4
Credit for WWIP Spending on Projects
after Phase 1 and before Phase 2B

				1.685075	
WWIP Index	**WWIP Phase**	**Project Name**	**Project ID #'s**	**Total (2023$)**	**Total (2006$)**
453	Phase 2	CSO 12 Sewer Separation Outfall to Mill Creek	11242844	$ 499,985	$ 296,714
420, 442	Phase 2	CSO 488/490 I-75 Reconstruction Coordination	11142741	$ 1,391	$ 825
442	Phase 2	CSO 488 Strategic Sewer Separation Phase A	11142745	$ 167,725	$ 99,536
multiple	Phase 2	West Branch Muddy Creek Bundle	10130000	$ 487,851	$ 289,513
236	Phase 2	CSO 198 Partial Separation Phase 1	10132900	$ 310,054	$ 184,000
multiple & LMCPR	Phase 2	WWIP Phase 1 Construction Compliance Assurance	10140417	$ 7,616,952	$ 4,520,245
453	Phase 2	Vine Street at Erkenbrecher Avenue Sewer Separation Study	10142420	$ 352,409	$ 209,135
453	Phase 2	MLK Sewer Separation at Burnett Woods	10142916	$ 718	$ 426
multiple	Phase 2	LMWWTP Main Outfall Improvements	10170816	$ 224,423	$ 133,183
multiple	Phase 2	Greater Cincinnati East Side SBU Mitigation Study	11582000	$ 172,910	$ 102,612
multiple	Phase 2	Mill Creek Interceptor - Specific Basin Study	12240350	$ 494,157	$ 293,255
113	Phase 2	Main Sewer Renewal Program Allowance (2019-2023)	varies	$ 33,031,394	$ 19,602,329
113	Phase 2	MH Renewal Program Allowance (2019-2023)	varies	$ 4,921,843	$ 2,920,845
multiple	Phase 2	Phase 2 WWIP Planning (2019-2023)	varies	$ 4,858,972	$ 2,883,534
113	Phase 2	SBU Urgent Response Program (2019-2023)	varies	$ 603,635	$ 358,224
113	Phase 2	Local Sewers and Lateral Sewer Assessment Projects (HSTS Eliminations)	varies	$ 10,530,017	$ 6,248,990
317	Phase 2	Mt. Washington Source Control Implementation	10172940	$ 6,218,150	$ 3,690,132
		SUB-TOTAL OF PHASE 2 SPENDING:		**$ 70,492,586**	**$ 41,833,501**
185	Bridge	CSO 135 Elimination	10171540	$ 956,923	$ 567,882
186	Bridge	CSO 43 Elimination	10171560	$ 190,255	$ 112,906
188	Bridge	CSO 214 Partial Separation	10171641	$ 2,657,703	$ 1,577,202
195, 197	Bridge	LMWWTP Grit Station Upgrade & LM Four Mile PS Upgrade	10170812 10170810	$ 3,661,615	$ 2,172,968
195, 197	Bridge	LMWWTP Preliminary Treatment Improvements Ph. A	10170813	$ 18,473,202	$ 10,962,837
231	Bridge	CSO 513 Partial Sewer Separation (Benard & Reisenberg Grating)	10142200	$ 7,899,849	$ 4,688,129
232	Bridge	CSO 514 Sewer Sparation (Smalley Grating)	10142220	$ 146,464	$ 86,918
234	Bridge	CSO 518 MuC Conveyance Sewer (UMCI)	10130042 11530000	$ 12,283,913	$ 7,289,832
236	Bridge	Muddy Creek at Westbourne EHRT	10130850	$ 6,599,937	$ 3,916,702
238, 239	Bridge	CSO's **408 only** & CSO **411 only** - Bundled	10230640	$ 5,213,192	$ 3,093,745
255, 285	Bridge	CSO 83 & CSO 472 DUCs	10270170	$ 3,395,004	$ 2,014,749
319	Bridge	Prospect Woods	10270160	$ 1,350,345	$ 801,356
453	Bridge	CSO 21 I-75 Reconstruction Coordination	11143260	$ 431,183	$ 255,884
453	Bridge	CSO 12 Sewer Separation Phase A.4b (Right-of-Way)	11242843 11242846	$ 454,050	$ 269,454
229a	Bridge	SSO 700 Facility Improvements (Items 1-16 Exhibit A)	10241820	$ 12,057,011	$ 7,155,178
229a	Bridge	SSO 700 Facility Improvements (Disinfection Improvements - Item 17 Exhibit A)	10142070	$ 10,506,827	$ 6,235,228
282a	Bridge	Columbia Square Development Separation	10270190	$ 1,961,131	$ 1,163,824
248	Bridge	LMWWTP HRT Study and Bundle Project Integration Planning	10172030	$ 1,901,884	$ 1,128,664
218, 219, 220, 221, 222	Bridge	CSO 402-406 Regulator Improvements (design only)	10131021	$ 2,067,989	$ 1,227,238
248	Bridge	Mill Creek WWTP (CEPT/HRT) (Initial Partial Construction of Diversion Chamber)	10144886 10144887 12240350	$ 15,711,083	$ 9,323,670
		BRIDGE PROJECT SPENDING:		**$ 107,919,560**	**$ 64,044,366**
218, 219, 220, 221, 222	Phase 2A	CSO 402-406 Regulator Improvements (construction only)	10131021	$ 17,019,258	$ 10,100,000
248	Phase 2A	Mill Creek WWTP (CEPT/HRT) (Complete the Construction of Diversion Chamber)	10144882 10144886 10144887	$ 25,107,618	$ 14,900,000
248	Phase 2A	Mill Creek WWTP (CEPT/HRT) - Design Influent Pump Station for HRT	10144888	$ 14,660,153	$ 8,700,000
240, 241, 242, 243, 244	Phase 2A	East Branch Muddy Creek Interceptor (BCE)	10131006	$ 1,685,075	$ 1,000,000
204	Phase 2A	LMWWTP Standby Power	10172900	$ 11,627,018	$ 6,900,000
		PHASE 2A PROJECT COSTS:		**$ 70,099,120**	**$ 41,600,000**

TOTAL OF ALL COSTS AFTER PHASE 1 BEFORE PHASE 2B:	**$ 248,511,267**	**$ 147,477,867**

Attachment 5

Phase 2B Category	Category Type Code	No. of Index Projects per Category
Within HRT Zone of Influence, Requires Further Study post Phase 2B	Z	36
In Compliance with WWIP Performance Criteria by the beginning of Phase 2B	R	62
In Compliance with WWIP Performance Criteria by the end of Phase 2B	C	13
In Partial Compliance with WWIP Performance Criteria by the end of Phase 2B - Requires Further Study post Phase 2B	P	22
No Longer Feasible	N	1
Project Requires Further Study post Phase 2B	U	68
No Performance Criteria - Candidate for Removal from WWIP	A	27
Water-In-Basement Project	W	4
Ttotal number of Index projects in Attachment 3→		233

Phase 2B Category Descriptions

Within HRT Zone of Influence, Requires Further Study post Phase 2B	Z
This category consists of Index projects that would be impacted by an HRT at each of the three WWTPs (MC, LM & MuC) and further study is necessary, and/or the project will be completed after Phase 2B. It is anticipated that each of these projects would see a reduction of existing CSO volume after the HRT is constructed at each project's respective sewershed. The CSO reduction benefit would be determined after construction of the HRTs and once the new facilities have been in operation and the sewer systems performance behaviors have been monitored.	

In Compliance with WWIP Performance Criteria by the beginning of Phase 2B	R
This category consists of Index projects that are now, or expected to be, in compliance with the WWIP performance criteria by end of 2024. These are the results from improvements made to MSD's treatment facilities and sewer systems during the WWIP Phase 1 through WWIP Phase 2A period of both WWIP related and asset management related activities.	

In Compliance with WWIP Performance Criteria by the end of Phase 2B	C
This category consists of Index projects that will be completed and in compliance with the WWIP performance criteria by the end of the WWIP Phase 2B period.	

In Partial Compliance with WWIP Performance Criteria by the end of Phase 2B - Requires Further Study post Phase 2B	P
This category consists of Index projects that have made progress toward meeting WWIP performance criteria. Future work, post Phase 2B, is necessary to meet WWIP performance criteria.	

No Longer Feasible	N
This category is specifically for the Joint MSD/Butler County WWTP Facility (Index 263). The Pleasant Run Pump Stations would have been eliminated by the proposed WWTP so the Pleasant Run PS Upgrades project is required since the Joint WWTP Facility is not possible to build as concieved when it was included in the original Final WWIP.	

Project Requires Further Study post Phase 2B	U
This category consists of Index projects that are not in compliance with WWIP performance criteria and requires future study to determine how to achieve compliance. These Index projects will be completed post Phase 2B.	

No Performance Criteria - Candidate for Removal from WWIP	A
This category consists of Index projects that have no required performance criteria for Plan Remaining Overflow Volume. The WWIP Index projects that qualify for this category only have a scope criteria for a project with no association to overflow reduction or defininative environmental benefit. These projects appear to primarily be asset management type projects.	

Water-In-Basement Project	W
This category consists of Index projects that have no Plan Remaining Overflow Volume criteria but have a project description to address Water-In-Basement (WIB) issues. There is no specifically defined currently known problem within the zone of influence for each of these Index projects. As such, these Index projects are candidates for potential removal from the WWIP after further study is performed.	

Attachment 5

Chronological Order of WWIP Index Numbers

Index No.	Type	Index No.	Type	Index No.	Type
185	P	270	U	366	Z
186	R	271	U	367	Z
187	U	273	R	369	R
188	P	274	C	370	R
189	U	275	U	371	Z
190	R	276	U	372	R
191	U	277	R	373	P
192	U	278	R	375	R
193	U	279	R	377	R
194	U	280	R	378	U
195	C	281	R	379	U
196	C	282a	R	380	U
197	R	283	U	381	R
198	C	284	U	382	P
199	C	285	P	383	P
200	C	287	R	384	U
201	C	288	U	385	Z
202	C	290	U	386	U
203	C	291	U	387	U
204	R	292	U	388	R
205	C	293	U	390	U
206	C	295	R	391	U
207	U	296	U	392	Z
208	R	297	U	394	R
209	U	298	U	395	C
210	U	299	R	396	R
211	U	300	R	398	R
212	U	301	U	399	Z
213	U	303	U	400	Z
214	R	304	A	401	U
215	P	306	P	402	Z
216	U	307	R	403	U
217	Z	308	A	404	R
218	P	309	A	405	R
219	P	311	U	406	R
220	Z	312	U	408	Z
221	Z	313	A	409	Z
222	P	314	A	410	Z
223	Z	315	A	411	R
228	W	316	W	412	Z
229a	R	317	P	414	R
230	U	318	C	415	Z
231	R	319	R	416	Z
232	R	321	A	417	R
233	Z	322	A	418	R
234	Z	323	R	420	P
235	U	324	U	421	Z
236	Z	326	Z	423	R
237	Z	328	R	424	Z
238	P	329	U	426	R
239	P	330	U	427	U
240	Z	332	A	428	U
241	Z	333	U	429	R
242	Z	334	A	430	R
243	Z	335	Z	431	U
244	Z	337	U	432	U
245	P	339	W	433	U
247a	P	340	W	435	R
247b	P	342	A	436	R
248	P	344	A	438	Z
250	U	345	A	440	U
251	R	346	A	441	Z
252	U	347	A	442	Z
253	R	348	A	444	U
254	U	350	A	445	R
255	R	351	A	446	R
256	R	352	A	448	U
257	R	353	A	449	U
258	U	354	A	450	U
259	U	355	A	452	R
260	U	357	A	453	Z
261	P	358	A	454	P
263	N	359	A	455	R
265	R	360	A	456	R
266	U	361	A	457	R
267	U	363	R	458	R
268	R	364	Z	459	P
269	U	365	U		

WWIP Index Numbers Classified per Category

Totals→	1	4	13	22	27	36	62	68
#	N	W	C	P	A	Z	R	U
1	263	228	195	185	304	217	186	187
2		316	196	188	308	220	190	189
3		339	198	215	309	221	197	191
4		340	199	218	313	223	204	192
5			200	219	314	233	208	193
6			201	222	315	234	214	194
7			202	238	321	236	229a	207
8			203	239	322	237	231	209
9			205	245	332	240	232	210
10			206	247a	334	241	251	211
11			274	247b	342	242	253	212
12			318	248	344	243	255	213
13			395	261	345	244	256	216
14				285	346	326	257	230
15				306	347	335	265	235
16				317	348	364	268	250
17				373	350	366	273	252
18				382	351	367	277	254
19				383	352	371	278	258
20				420	353	385	279	259
21				454	354	392	280	260
22				459	355	399	281	266
23					357	400	282a	267
24					358	402	287	269
25					359	408	295	270
26					360	409	299	271
27					361	410	300	275
28						412	307	276
29						415	319	283
30						416	323	284
31						421	328	288
32						424	363	290
33						438	369	291
34						441	370	292
35						442	372	293
36						453	375	296
37							377	297
38							381	298
39							388	301
40							394	303
41							396	311
42							398	312
43							404	324
44							405	329
45							406	330
46							411	333
47							414	337
48							417	365
49							418	378
50							423	379
51							426	380
52							429	384
53							430	386
54							435	387
55							436	390
56							445	391
57							446	401
58							452	403
59							455	427
60							456	428
61							457	431
62							458	432
63								433
64								440
65								444
66								448
67								449
68								450

~~Revised~~ Attachment 6

Phase 2 EHRT Design and Performance Criteria

This Attachment 6 replaces and supersedes WWIP Attachment 5 for all Enhanced High Rate Treatment (EHRT) projects to be constructed in Phase 2.

~~Defendants agree to construct, according to the Design and Performance Criteria stated below, one Enhanced High Rate Treatment (as defined in Paragraph A.2 of the Final WWIP, "EHRT") Project in Phase 1 of the WWIP: the EHRT Pilot Project at Werk and Westbourne, Project Number 10130740. The Phase 1 EHRT Project will confirm the treatment performance of the EHRT technology of high rate sedimentation treatment, with disinfection treatment and dechlorination during the recreational season.~~

~~After construction, the Phase 1 EHRT Project will be operated and studied. The results of the study shall be submitted to the Regulators. The design for EHRT facilities to be constructed in Phase 2 will be based on the Design Criteria below, the results of the performance study of the Phase 1 EHRT Project and applicable requirements of federal and state law.~~

Design Criteria Applicable to All Phase 2 EHRT Facilities:

A. Design Numeric Criteria Goals

(1) High Rate ~~Sedimentation~~ Treatment. The EHRT facility shall be designed with the goal of achieving during the Recreation Season (May 1 to October 30) an average total suspended solids (TSS) removal rate of 70% at is design flow rate or below for all events in which the average influent solids exceed 150 mg/l, and for events in the Recreation Season in which the average influent TSS concentration is less than 150 mg/l an average effluent TSS concentration of no more than 45 mg/l.

(2) Disinfection Treatment. The EHRT facility shall be designed with goals of:
   (a) Achieving a mean of 3 to 4 log reduction of E. coli for all events during the Recreation Season at the design flow rate or below.; and
   (b) Complying with water quality-based E. coli limitations (or other then-applicable bacteriological parameters) and disinfection residuals requirements at its design flow and all flow rates below that design flow rate.

B. Design Criteria Specifics for Unit Processes

Each EHRT facility shall include the following unit processes:
(1) ~~Fine~~ Sscreenings (maximum ½ inch)~~s~~

(2) Grit removal

(3) Sludge pumping

~~(2)~~(4) Coagulant-assisted sedimentation, such as chemically-enhanced primary treatment (CEPT) or ballasted flocculation, or a filtration process such as cloth media filtration or compressible media filtration.

~~(3)~~(5) Coagulant feed and storage, as needed

~~(4)~~(6) Sodium h~~H~~ypochlorite disinfection, paracetic acid (PAA) disinfection, ultraviolet (UV) disinfection or a combination of these methods

~~(5)~~(7) Disinfectant feed and storage, as needed

~~(6)~~(8) Disinfectant removal (e.g., dechlorination), as needed

~~C. Each EHRT facility shall be designed with the following attributes:~~

~~(1) Effective mixing at each point of chemical addition;~~
~~(2) Separate sedimentation and disinfection contact zones;~~
~~(3) A minimum total nominal detention time of 27 minutes;~~
~~(4) A minimum nominal disinfection contact time of 10 minutes; and~~
~~(5) A maximum nominal sedimentation zone surface loading rate of 7,000 gpd/square foot.~~

Performance Criteria Applicable to All EHRT Facilities: Discharges from each EHRT facility shall comply with all requirements of state and federal law applicable to such discharges, and all requirements of state and federal permits applicable to such discharges.

Enclosure 2

June | 2024

Financial Capability Assessment
Based on EPA Guidance issued February 2023

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Executive Summary

This Financial Capability Assessment ("FCA") of the Metropolitan Sewer District of Greater Cincinnati ("MSD" or "the District") was prepared on behalf of the Board of County Commissioners of Hamilton County, OH ("Board" or "County") and is based on United States Environmental Protection Agency ("EPA") guidance issued in February 2023 (the "2023 Guidance"). The FCA submittal employs Alternative 2 that *"involves analyzing financial and rate models in addition to calculating the LQPI Score and performing a Financial Alternatives Analysis."*[1] The County's proposed Phase 2B Plan calls for $1.97 billion (2023$) ($1.17 billion in 2006 dollars) in capital project cash flows from 2024 through 2034 representing a marked (67.1 percent[2] annual average) increase in spending relative to District project delivery over the 2018 – 2023 time period. The County's Phase 2B Plan is proposed in the context of prevailing uncertainties that may compromise project milestones subject to enforcement. The District hopes to implement additional asset management projects and/or accelerate Phase 2B projects in the event that economic conditions and project delivery capacity permit.

MSD faces adverse construction market conditions that have, and will continue to, constrain project delivery capacity. The District has averaged roughly $107.4 million in capital expenditures over the last six years. The Phase 2B Plan calls for an average annual capital expenditure of $179.4 million in 2023 dollars. The Phase 2B Plan prioritizes environmental benefit and Consent Decree compliance and features near-term construction of the Little Miami Wastewater Treatment Plant ("WWTP") High-Rate Treatment System ("HRTS") and related projects including electrical and solids disposal improvements.

The Phase 2B Plan will enable program financing with rate increases projected to average approximately 4.5 percent per year as compared to a Phase 2B scenario that contemplates construction of three HRTSs and related Wet Weather Improvement Program ("WWIP") projects. This alternative three HRTSs Phase 2B project schedule is projected to require untenable rate increases averaging 8.9 percent over the entirety of the FY 2025 – 2034 Phase 2B term, with an aggregate rate increase of over 141 percent.[3]

Per the 2023 Guidance for Alternative 2, projections of the Residential Indicator – Cost per Household as a Percentage of Median Household Income – are presented across four (4) alternative Phase 2B Capital Program schedules for the 2024 – 2034 period in Appendix II. Projected Impacts by Household Size are presented in Appendix III.[4] Perhaps more important, projected impacts on the District's economically-disadvantaged households are also provided as additional information requested under the 2023 Guidance.

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[1] 2023 Guidance, p. 7

[2] Based on actual expenditures relative to County 2B Plan project spending forecasts expressed in 2023 dollar terms. The $1.97 billion cash-flow total includes $160.9 million for 2024 and aligns with the $1.8 billion program total cited for the FY 2025 – 2034 period. Capital project financing and rate increase requirements are based on projections of nominal dollar encumbrances of $2.19 billion for FY 2025 – 2034 and $2.31 billion for the FY 2024 – 2034 period.

[3] The County's Phase 2B Plan also involves financing a capital program that is projected to require marginally higher rate costs and related rate increases relative to programs that would prioritize either the Muddy Creek or Mill Creek HRTS bundles.

2023 Guidance tables with projections of the Lowest Quintile Residential Indicator ("LQRI")[5] and LQRI by Household Size are visually illustrative of current concerns and the potentially acute burdens of accelerated capital spending. Such spending is, as demonstrated below, not practicable given multiple market constraints and significant project delivery capacity limitations.

The Phase 2B Plan and capital program schedule provides for an effective balancing of the need to moderate rate increases given tenuous economic conditions in the region, while aggressively advancing capital improvements to achieve and sustain CWA compliance. This FCA submittal meets all requirements outlined in EPA's recent 2023 Guidance for Alternative 2 and is a key element of the County's complete Phase 2B WWIP submission due by June 30, 2024. It effectively updates and replaces prior FCA submittals for the District's Consent Decree compliance program.

Introduction

This Financial Capability Assessment ("FCA") of the Metropolitan Sewer District of Greater Cincinnati (MSD or "the District") was prepared on behalf of Hamilton County, OH. It is based on United States Environmental Protection Agency (EPA) guidance issued in February 2023 (the "2023 Guidance") which replaced EPA guidance issued in 1997 (the "1997 Guidance"). The 2023 Guidance "*encourages communities to provide information under either Alternative 1 **or** Alternative 2 to evaluate financial capability for CWA implementation schedules.*[6] *(emphasis added).* This FCA submittal employs Alternative 2. The FCA also includes an assessment using the 1997 Guidance as required by the County's Consent Decree and WWIP. This assessment is provided in Appendix VII.

Alternative 2 of the 2023 Guidance *"involves analyzing financial and rate models in addition to calculating the LQPI Score and performing a Financial Alternatives Analysis."*[7] The Lowest Quintile Poverty Indicator Score (LQPI) for Hamilton County, OH and the City of Cincinnati respectively are provided in Appendix IV; the Financial Alternatives Analysis is provided as Appendix V. Appendix VI offers a review of the evolution of EPA's Financial Capability Assessment guidance. Appendix VII provides the FCA analyses as called for under Alternative 1 (which retain the matrices outlined in EPA's original 1997 FCA guidance). Selected MSD financial reports and general information is located in Appendix VIII.

Financial Capability Assessment Guidance – Alternative 2

The 2023 Guidance's "*Alternative 2 provides an opportunity for communities that wish to use financial and rate model analyses to submit this more detailed information to assist in developing an appropriate schedule for implementing CWA control measures."*[8] Unlike Alternative 1, which requires completion of prescribed worksheets drawing largely from US Census data, CWA compliance cost estimates, and local community financial data, Alternative 2 submittal requirements are less prescriptive and center on documentation of the Permittee's cash-flow model structure, assumptions, and key inputs as well as consideration of alternative program financing scenarios.

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[5] See Appendix VII for a discussion of the evolution of the FCA guidance including a review of the recommendations for use of the LQRI metric that was set aside in the 2023 Guidance.

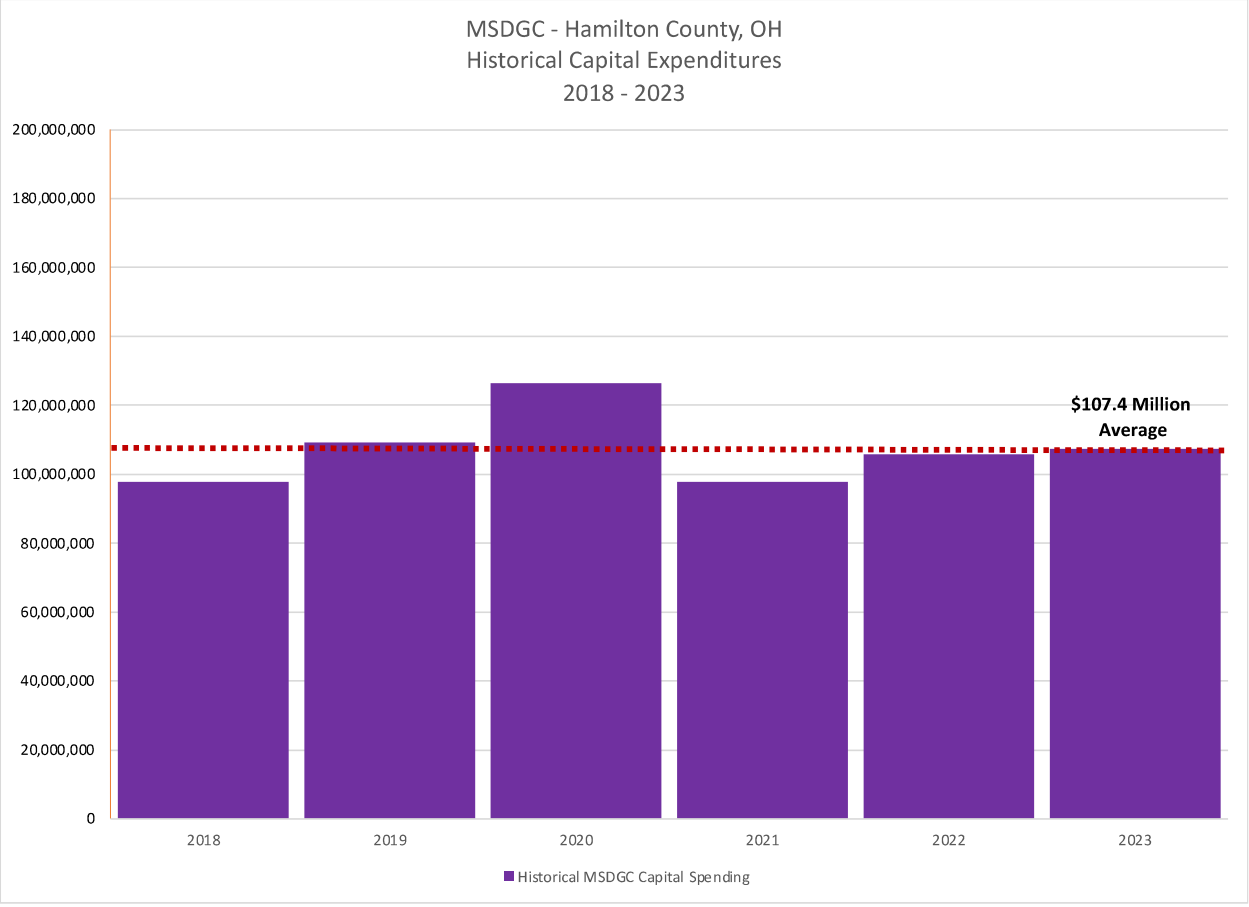
[6] 2023 Guidance, p. 7

[7] 2023 Guidance, p. 7

[8] 2023 Guidance, p. 16

A cash-flow forecast model for evaluation of MSD's Phase 2B program financing options and requisite system-wide rate increase requirements has been developed using the Synario software program. Appendix I provides documentation of the basic attributes of the Synario model framework for MSD system financing and is based on MSD's MS Excel-based model prepared by Black & Veatch. Appendix I also provides a summary of key Synario model assumptions as well as pro forma fund summary outputs for each of the capital program scenarios evaluated in this FCA. Hamilton County has provided EPA access to the MSD Synario model structure and training on model operations to facilitate prospective scenario analysis. The MSD Synario run documenting the cash-flow forecast associated with the Phase 2B Plan is being provided with the County's complete submission.

In contrast to the 2023 Guidance that anticipates different capital program durations, this submittal contemplates a 10-year Phase 2B compliance period. Scenarios are therefore defined by the capital projects to be financed and constructed within the 2025 – 2034 forecast period. The Phase 2B Plan analysis is informed by regional economic conditions and trends, and by recent MSD capital spending patterns. In particular, as shown below, the District has averaged roughly $107.4 million in capital expenditures over the last six years.



Although MSD has implemented and plans to implement further measures[9] to enhance its project delivery capacity, MSD faces adverse construction market conditions that have, and will continue to, constrain project delivery capacity. Such conditions include:

- Limited sewer-related construction capacity given major local and regional capital projects during the next few years.
- Shortage of design and construction professionals, both to hire in-house and within local firms.
- Limited number of new firms entering the Cincinnati market given significant federal dollars flowing to neighboring major markets.
- Ongoing supply chain issues.

These project delivery capacity constraints have been an important consideration in deliberations related to the MSD's rate levels in recent years and are a paramount consideration – in addition to concerns related to water affordability - for defining a reasonable, stable rate increase slope for the 10-Year Phase 2B term.

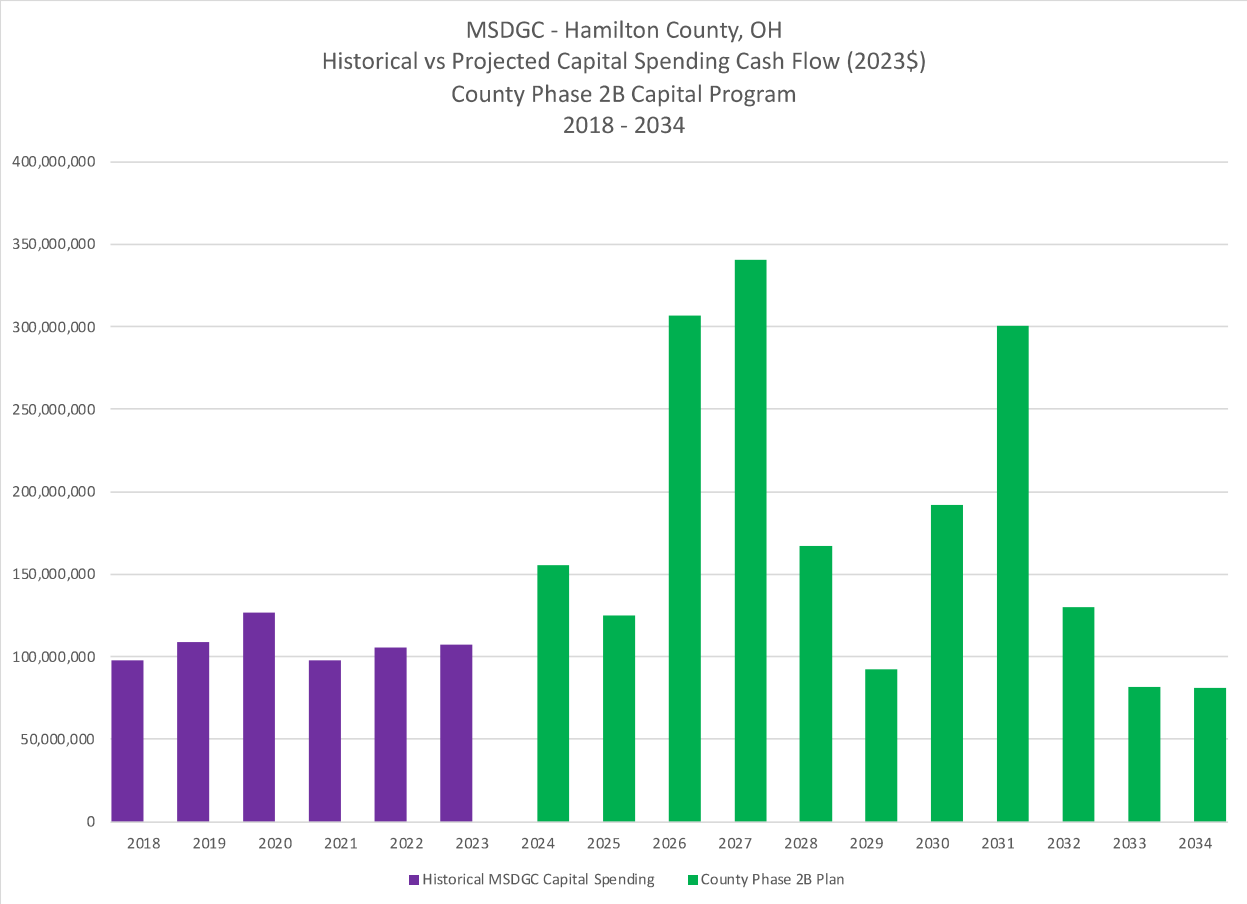
Phase 2B Capital Program Scenarios

For purposes of establishing Consent Decree obligations to be implemented over the 10-year Phase 2B forecast period 2025 – 2034, this FCA submittal contemplates a baseline program referred to as the **County's Phase 2B Plan** as summarized in the table below:

Bundle	Components
Little Miami	LMWWTP EPS Improvements
	LMWWTP High-Rate Treatment preparation
	LMWWTP HRT Facility
	LMWWTP Solids Disposal
Mill Creek	East Branch Ohio River Interceptor Extension
	MCWWTP High-Rate Treatment Pump Station
	MCWWTP Dewatering Building Improvements
Asset Management and Allowances	

[9] For example, hiring of an external Program Management team and supporting information system, use of alternative project delivery (i.e., progressive design-build) methods.

The Phase 2B Plan features construction of a HRTS facility at MSD's second largest WWTP that will reduce untreated overflows by 1.3 billion gallons per year. The Phase 2B Plan is a substantial commitment of economic resources for a service area facing severe, negative economic trends, burdened by recent and planned drinking water rates increases, and facing major sewer rate increases. The Phase 2B Plan calls for $1.97 billion (2023$) ($1.17 billion in 2006 dollars) in capital project spending from 2024 through 2034 representing a massive (67.1 percent[10] annual average) increase in spending relative to District project delivery over the 2018 – 2023 time period as illustrated below.



Capital Program Scenario Evaluation

As requested in EPA's 2023 Guidance, required rate increases and bill impacts for other scenarios were projected using the Synario cash-flow forecasting model. Three other Phase 2B scenarios were

[10] Based on actual expenditures relative to County 2B Plan project cash flow forecasts expressed in 2023 dollar terms. The $1.97 billion cash-flow total includes $160.9 million for 2024 and aligns with the $1.8 billion program total cited for the FY 2025 – 2034 period. Capital project financing and rate increase requirements are based on projections of nominal dollar **encumbrances** of $2.19 billion for FY 2025 – 2034 and $2.31 billion for the FY 2024 – 2034 period.

developed and considered for this FCA. These illustrate important challenges and concerns for defining Phase 2B project milestones. The other scenarios evaluated include:

- **Muddy Creek HRTS** at $1.98 billion in 2023 dollars ($1.12 billion in 2006 dollars) that contemplates construction of High-Rate treatment at the Muddy Creek WWTP only (instead of at the Little Miami WWTP) providing 0.228 billion gallons per year of overflow reduction. This program includes related capital projects, asset management investments, and various allowances.
- **Mill Creek HRTS** at $1.98 billion in 2023 dollars ($1.17 billion in 2006 dollars) that contemplates construction of High-Rate treatment at the Mill Creek WWTP only (instead of at the Little Miami WWTP) providing 0.64 per year billion gallons of overflow reduction. This program includes related capital projects, asset management investments, and various allowances.
- **Three (3) HRTSs (Little Miami, Muddy Creek and Mill Creek) + WWIP Spending** at $3.62 in 2023 dollars ($2.15 in 2006 dollars) that contemplates construction of HRTSs at all three of MSD's WWTPs providing 2.05 billion gallons per year of overflow reduction. This program includes additional WWIP project spending and related capital projects, asset management investments, and various allowances. [11]

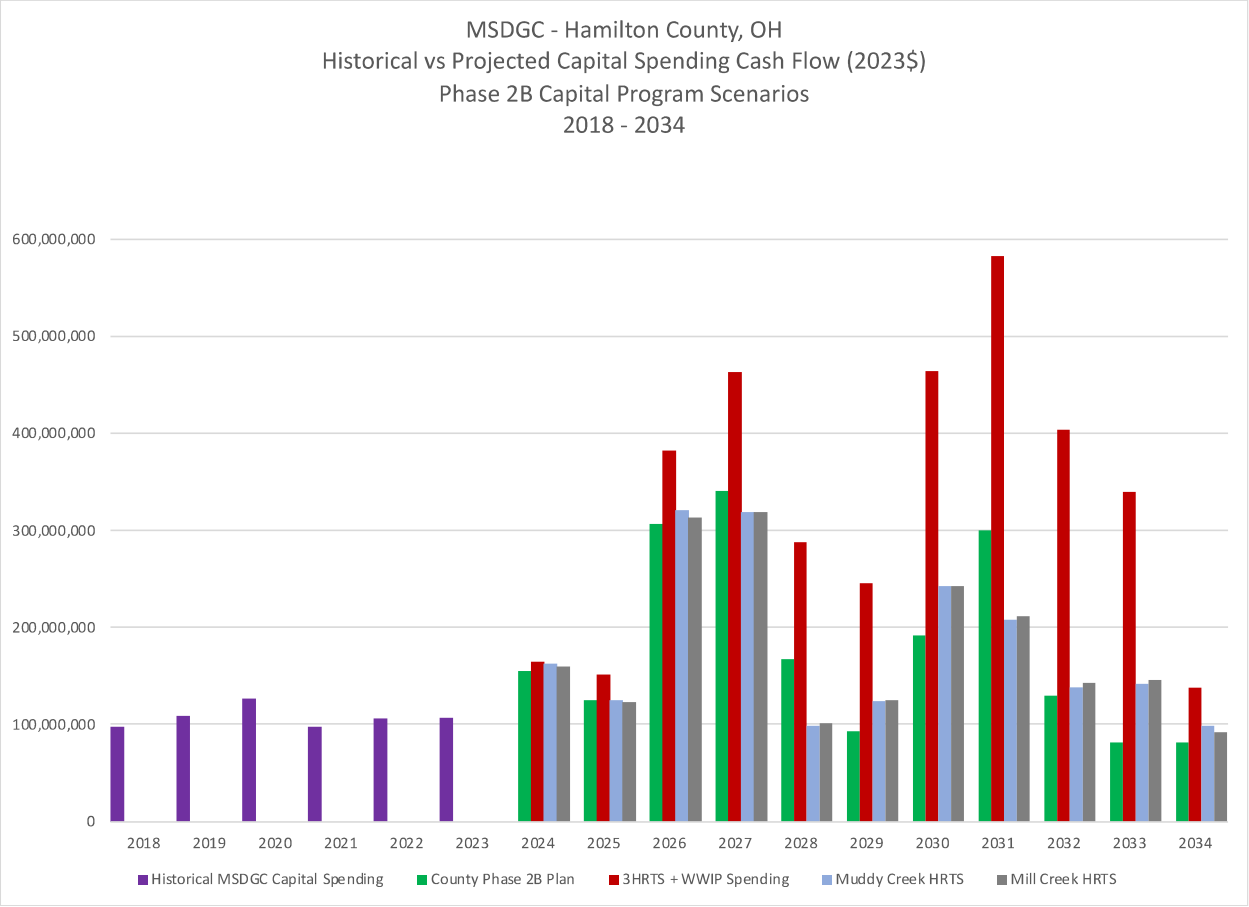
The pattern of spending for these 3 alternatives is illustrated below juxtaposed with MSD actual capital project spending between 2018 and 2023. Each of the single HRT scenarios contemplate cash flow requirements in the range of $1.98 billion (2023$) and represent substantial increases in MSD project completion relative to recent historic experience. The 3 HRTS + WWIP Spending scenario is untenable, requiring a 206.7 percent increase[12] in annual project delivery over the forecast period.

[11] The cash-flow totals include costs for 2024. Provided in the table below are cash-flow totals for the 2025 – 2034 Phase 2B period, for the 2024 – 34 period charted, and values for 2024 in 2006 dollars, 2023 dollars and nominal dollars.

	CASH FLOW BASIS								
	2025 - 2034			2024 - 2034			2024		
Scenario	2006 Dollars	2023 Dollars	Nominal Dollars	2006 Dollars	2023 Dollars	Nominal Dollars	2006 Dollars	2023 Dollars	Nominal Dollars
County Phase 2B Plan	$ 1,078,898,735	$ 1,818,025,286	$ 1,881,656,173	$ 1,171,172,622	$1,973,513,707	$2,042,586,689	$ 92,273,887	$ 155,488,421	$ 160,930,516
3HRTS + WWIP Spending	$ 2,052,109,749	$ 3,457,960,000	$ 3,578,988,600	$ 2,149,481,900	$3,622,039,377	$3,748,810,756	$ 97,372,151	$ 164,079,377	$ 169,822,156
Muddy Creek HRTS	$ 1,024,447,934	$ 1,816,150,412	$ 1,879,715,674	$ 1,120,829,173	$1,978,560,028	$2,047,809,627	$ 96,381,239	$ 162,409,616	$ 168,093,953
Mill Creek HRTS	$ 1,077,363,374	$ 1,815,438,087	$ 1,878,978,420	$ 1,172,356,431	$1,975,508,513	$2,044,651,310	$ 94,993,057	$ 160,070,425	$ 165,672,890

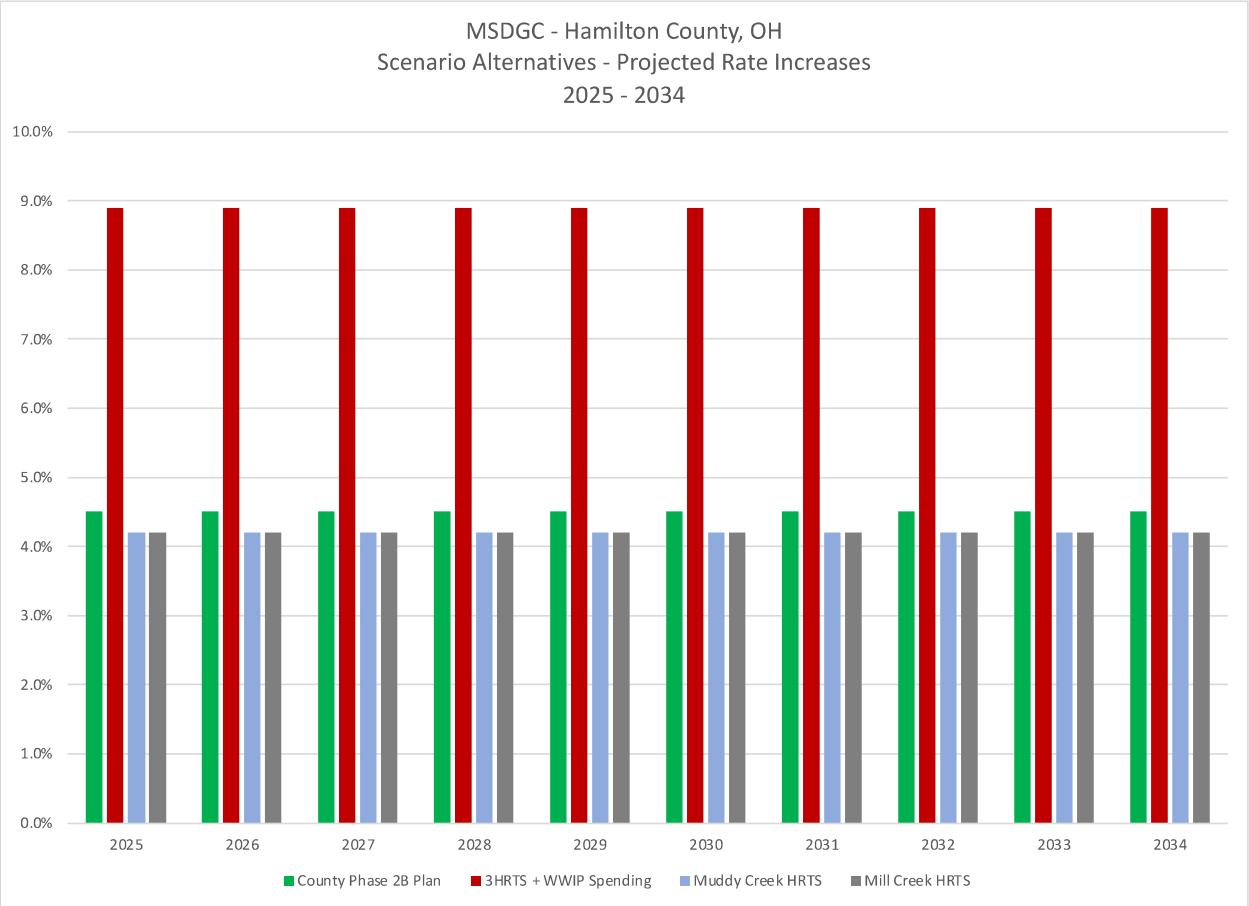
The County's Phase 2B program contemplates financing and rate increase requirements based on projections of nominal dollar **encumbrances** of $2.19 billion for FY 2025 – 2034 and $2.31 billion for the FY 2024 – 2034 period.

[12] Referencing projected spending in 2023 dollar terms.



Projected levelized rate increases for the 4 scenarios are as listed and illustrated graphically below:

- **County Phase 2B Plan** – 4.5 percent per annum.
- **Muddy Creek HRTS** - 4.2 percent per annum.
- **Mill Creek HRTS** - 4.2 percent per annum.
- **All 3HRTS + WWIP Spending** – 8.9 percent per annum.



These rate increases (projected costs per household and projected bills as a percent of Median Household Incomes) are based on project encumbrance requirement forecasts[13] and are provided in Appendix II that offers this data as presented in the 2023 Guidance as *Exhibit 6: Rate Increase Scenario and Median Household Impact.*[14] Exhibit 6 is supplemented with calculation of the Lowest Quintile Residential Indicator (LQRI) outlined in the draft EPA Guidance revisions promulgated in 2020 -2021 as discussed in Appendix VI.

The LQRI sections of the tables presented in Appendix II, perhaps more so than the Residential Indicator data called for in the 2023 Guidance, illustrate the acute challenges presented by the alternative scenarios. These sections show that MSD's existing rates already impose notable burdens on low-income customers at 2.63 percent of the upper limit of the Lowest Income Quintile. Scenarios that contemplate encumbrances in the $2.1 – $2.2 billion range are distressingly projected to increase that

[13] Encumbrance requirement forecasts for the four scenarios modeled using the Synario forecast model are offered in the table below:

	ENCUMBRANCE BASIS								
	2025 - 2034			2024 - 2034			2024		
Scenario	2006 Dollars	2023 Dollars	Nominal Dollars	2006 Dollars	2023 Dollars	Nominal Dollars	2006 Dollars	2023 Dollars	Nominal Dollars
County Phase 2B Plan	$ 962,996,782	$ 1,622,721,802	$ 2,187,515,052	$ 1,122,520,430	$ 1,891,531,113	$ 2,305,386,744	$ 159,523,648	$ 268,809,311	$ 117,871,692
3HRTS + WWIP Spending	$ 1,982,431,768	$ 3,340,546,212	$ 4,405,930,253	$ 2,142,949,051	$ 3,611,029,872	$ 4,525,725,625	$ 160,517,283	$ 270,483,660	$ 119,795,372
Muddy Creek HRTS	$ 962,996,690	$ 1,622,721,647	$ 2,151,481,570	$ 1,123,513,973	$ 1,893,205,307	$ 2,273,359,208	$ 160,517,283	$ 270,483,660	$ 121,877,638
Mill Creek HRTS	$ 962,996,781	$ 1,622,721,801	$ 2,163,177,446	$ 1,122,520,430	$ 1,891,531,113	$ 2,283,663,933	$ 159,523,648	$ 268,809,311	$ 120,486,487

[14] 2023 Guidance, p. 19.

burden to 3.65 – 3.76 percent by 2034. The All 3 HRTS + WWIP Spending scenario drives that burden to a punishing 5.67 percent of LQI, or over twice the claim on income already regarded as impermissibly burdensome by EPA Guidance.

This concern is further spotlighted in *Exhibit 7: Projected Impact of Program Costs by Household Size* called for in the 2023 Guidance and provided in Appendix III. Here again, while EPA's 2023 Guidance calls for calculation of Residential Indicator values for different size households employing Median Household Income levels, the tables provided also present calculations of LQRI by household size. This additional information illustrates that while the Residential Indicator impacts shown across scenarios suggest noteworthy burdens for the scenarios contemplating $2.1 – $2.2 billion in nominal dollar encumbrances (and the problems with the $4.4 billion scenario), the same tables estimated for economically-disadvantaged households indicate acute challenges. These tables show visually (with the color coding of burden levels that current burdens on low-income customers are generally high) that programs with estimated nominal dollar encumbrances in the $2.1 - $2.2 billion increase burdens markedly, and that the 3 HRTS + WWIP Spending scenario is effectively punitive and simply untenable.

Low-Income Burdens and Financial Alternatives

As shown in Appendix IV, the Low Income Poverty Index called for in the 2023 Guidance, the District service area has a huge number of low income households, particularly in Cincinnati. The District's current rates impose major financial burdens on low income households due in large part to the rate increases imposed to support prior Consent Decree phases.[15] The historical rate increase pattern limits the extent to which rate increases may be implemented prospectively without imposing acute burdens on low income households in the MSD Service Area.

The District has evaluated and employed a broad array of financial alternatives as documented in the Financial Alternatives Analysis submitted as Appendix V, a new FCA requirement included in the 2023 Guidance. This analysis identifies the District's strategies to reduce and manage costs, to distribute burdens equitably, and to address water affordability as permitted under the Ohio Revised Code.

Imperatives for Consent Decree Terms / FCA Updating

The County's Phase 2B Plan at $1.82 billion (2023$ for 2025-2034) is submitted in the midst of acute economic uncertainties and concerns related to ratepayer impacts, particularly on economically-disadvantaged households in the MSD Service Area. The Phase 2B Plan is sobered by the recognition that Consent Decree obligations are subject to enforcement, and that little flexibility is afforded permittees once Consent Decree project milestones are established. Given these considerations, the County's Phase 2B Plan must be achievable with near certainty notwithstanding potential financial, project delivery or construction market challenges (which may occasion economic reopening of the plan and schedule). It is also proposed under the practical assumption that the structuring of the compliance program (and related FCAs) in shorter term phases, with Phase 2B to be completed between

[15] MSDGC's recent rate increases must be placed into appropriate historical context with recognition of (1) 230% compounded increase in rates over the preceding 1.5 decades, and (2) adequacy of rate levels to support capital project encumbrances and expenditures in this period.

2025 and 2034, effectively sets aside the arbitrary scheduling boundaries contained in the 1997 Guidance and retained in the 2023 Guidance.[16]

The matrix analyses that characterized the 1997 Guidance (and is included in Alternative 1 of the 2023 Guidance) are provided as Appendix VII.[17] To ensure provision of a complete submittal, the matrices presented also include an analysis using the total estimated costs of Phase 2 for all future sub-phases (as required under the Consent Decree). As discussed in a review of the evolution of FCA guidance provided in Appendix VI, these matrix analyses do not offer insight into the development of a program schedule and may and should be effectively set aside. They do not consider or reflect the need to limit near-term rate increases in light of pandemic-related hardships, the need to build project delivery capacity over the Phase 2B term, or the need for flexibility to respond to evolving construction market and economic conditions. By selecting Alternative 2, the District effectively supplants use of the Alternative 1 matrices in favor of the more accurate, dynamic portrait of financial capabilities yielded through cash-flow analysis.

Summary: Basis for the County's Phase 2B Plan Schedule

The County's Phase 2B Plan and capital program was developed through extensive project planning and prioritization that involved in-depth consideration of regulatory requirements and opportunities to achieve the greatest environmental benefit as expeditiously as practicable. At the same time, the County's Phase 2B Plan was developed considering MSD's history of capital project delivery experience and very challenging construction market conditions during Phase 2B. The significant existing burdens on District ratepayers, particularly economically disadvantaged households, as well as scheduled future water system rate increases[18] are key further financial capability considerations that argue for average annual rate increases that balances financial burden and program implementation priorities. Three major alternative Phase 2B concepts were evaluated as required under the 2023 Guidance – Alternative 2; each was found to either (a) require either sharp rate increases and impractical levels of project delivery and spending or (b) yield significantly lower environmental benefits for similar levels of spending. The County's Phase 2B Plan has an aggressive schedule of overflow-reduction, spending and rate increases over a 10-year period, the same time frame as Phase 1. The Phase 2B Plan will thus impose notable financial burdens on MSD ratepayers as anticipated by the Consent Decree and CWA. .

Conclusions

[16] See 2023 Guidance, Exhibit 9. Recommended Implementation Schedule Benchmarks for Alternative 1, p.32. Yet, multiple cash-flow analyses used for FCAs developed prior to promulgation of the 2023 Guidance (and the formalization of Alternative 2) have resulted in longer-term (25+ year compliance periods, stated scheduling boundaries notwithstanding,

[17] The matrix analyses employ recent program cost estimates as discussed herein yet incorporate US Census and local financial indicator data collected in 2021.

[18] See " Cincinnati City Council OKs broad water rate increases", June 23, 2021, https://www.bizjournals.com/cincinnati/news/2021/06/23/cincinnati-city-council-increases-water-rates.html accessed May 1,2024.

The County's Phase 2B Plan reflects a continuing commitment to CWA requirements, appropriate prioritization of overflow-reducing projects and balancing of unique circumstances facing the District and its service areas. These considerations include, but are not limited to:

- MSD service area households have already been asked to bear a significant economic burden to effect CWA compliance and face financial capability limitations, recently exacerbated by pandemic, that generally limit the magnitude of tenable rate increases.
- Program scheduling is complicated by recent and ongoing adverse construction market conditions and project delivery constraints.
- Cash flow forecast modeling to evaluate alternative Phase 2B schedule options demonstrates the viability and preferability of the Phase 2B Plan. The Phase 2B Plan appropriately prioritizes projects to achieve the greatest environmental benefit per dollar spent as compared to alternatives while funding critical repairs and replacement of existing sewer assets.
- Accelerated or expanded program schedules beyond the Phase 2B Plan would require excessive rate increases. The All 3HRTS + WWIP Spending program schedule is not only impractical from a project delivery and adverse construction market condition standpoint but would impose untenable economic hardships. A schedule to complete all remaining Phase 2 projects was found to be even more impracticable and punishing.
- Cash-flow analysis and LQRI impacts must be the primary mechanism for determining community financial capabilities and schedule development. EPA's matrix analyses are uninformative and reference arbitrary schedule boundaries while cash-flow forecasting is indicative of encumbrance and related project execution capacity over time.

Critical economic uncertainties include capital project pricing estimates, project delivery capacity, and regional economic and income growth trends. The District has, and will continue to look toward opportunities to exceed Consent Decree requirements in the event that market conditions and financial capabilities permit.

APPENDIX I (a): Synario Model Description / Documentation

For Hamilton County, PFM has developed a cash-flow forecasting model to enable development of financial plans for the Metropolitan Sewer District of Greater Cincinnati ("MSD")'s system, including its prospective compliance with its Consent Decree obligations. The cash-flow forecasting model meets and exceeds all requirements of the cash-flow forecast models contemplated in EPA's 2023 Financial Capability Assessment Guidance for submittals using Alternative 2 and is intended to facilitate negotiation of Consent Decree compliance requirements, specifically project scheduling with the EPA and other parties.

PFM has developed the cash-flow forecasting model using Synario. Synario is a Java™-based agile financial modeling platform designed specifically to conduct prospective time-series financial analysis. The platform is purpose built to conduct complex and flexible financial analysis in a connected, cloud-based environment, making it easy to collaborate and share financial plan information.

Among its many reporting functions, the Synario model produces a pro forma cash-flow forecast that presents forecasted revenues, operations and maintenance (O&M) expenses, anticipated capital project spending, and related capital financing expenses. Key financial performance metrics – including debt service coverage and fund balances – are reported to ensure that forecasted cash-flows maintain compliance with bond covenants and financial policies.

Key functionality includes:

- **System-wide rate increase projections** – Synario can be used to solve for rate increase requirements that will ensure compliance with financial performance targets. Revenue projections are based on detailed information about billing determinants (e.g., accounts, billable volumes) and the structure of systems rates and charges (e.g., customer charges, volumetric rates by consumption block, other revenue components). Key assumptions, including assumptions related to customer account and billable volumes per account (by customer class) are documented in detailed assumptions tables.

- **Operation and Maintenance expense projections** - Synario develops O&M expense projections for the forecast period by referencing MSD budget and actual expense data and applying various assumptions related to future expenses. Multiple operating expense categories are projected independently over the forecast period at departmental, object code levels. Key assumptions based on market trends and historical data on specific expense items are summarized in the assumptions tables within the Synario model.

- **Capital program evaluation –** Synario enables evaluation of different capital programs over the forecast period and related capital program financing expenses, thereby enabling evaluation of Consent Decree compliance schedule alternatives. For MSD, capital programs delineated to include regulatory required projects – the Wet Weather Improvement Program – (WWIP) and Asset Management projects. Encumbrance requirements are based on identified capital project spending patterns expressed in nominal dollars based on assumed capital inflation rates.

- **Capital funding plan development –** Synario enables development of a capital financing program using revenue bonds (senior lien), State of Ohio SRF loans, and other debt instruments. Synario calculates related debt service schedules based on assumptions related to interest rates, terms, principal amortization structures, debt service reserve fund requirements, etc.

- **Financial Performance projections –** Synario's pro forma cash-flow forecasting provides projections of the flows of funds over the forecast period and resultant key financial performance metrics including debt service coverage and liquidity metrics (e.g., surplus fund balances)

The Synario cash-flow forecasting model has been used to evaluate the alternative scenarios developed for the County's Financial Capability Assessment under Alternative 2 of the 2023 Guidance. The cumulative forecast period cost of these scenarios in 2006 dollars, 2023 dollars and the nominal dollars for which financing is arranged are listed below[19]:

	2025 - 2034		
Scenario	2006 Dollars	2023 Dollars	Nominal Dollars
County Phase 2B Plan	$ 962,996,782	$ 1,622,721,802	$ 2,187,515,052
3HRTS + WWIP Spending	$ 1,982,431,768	$ 3,340,546,212	$ 4,405,930,253
Muddy Creek HRTS	$ 962,996,690	$ 1,622,721,647	$ 2,151,481,570
Mill Creek HRTS	$ 962,996,781	$ 1,622,721,801	$ 2,163,177,446

A summary of the key assumptions related to the alternatives evaluated is provided below. All assumptions are identified in the various Assumptions tables in each Synario model run.

The Synario run documenting the County's Phase 2B Plan is provided as part of the County's complete Phase 2B submission.

Pro forma fund summaries for each of the scenarios evaluated for the County's Alternative 2 submission are provided in the pages following the listing of key modeling assumptions.

[19] Estimated costs expressed in 2006 dollars and 2023 dollars are based on the projected encumbrance requirements of the alternative capital programs. Nominal dollar estimates are based on a combination of expenditures and encumbrances due to differences in funding requirements for different types of debt instruments (e.g., SRF loans are issued on a reimbursement basis vs. advance securing of proceeds via revenue bonds).

APPENDIX I (b) Synario Model – Key Assumptions Table

Appendix 1 (b)

Financial Capability Assessment - Alternative 2: Cash Flow Forecast Model
Forecast Assumptions Used for Synario Model Scenarios

Provided below is a listing of the assumptions used to develop the County's cash-flow forecasts using the Synario model (described in Appendix _). Except where noted, these assumptions were used to develop all of the scenarios presented in the County's Phase 2B submittal under Alternative 2 of the EPA's 2023 Financial Capability Assessment guidance. Given that the County may be subject to stipulated penalties for non-compliance with Phase 2B schedule milestones, forecast assumptions are conservative to mitigate risks that actual economic parameters prove to be unfavorable.

REVENUES			
Rate Components	2024	Forecast Period	Explanatory Notes
Minimum Charge Rate % Change	3%		Solved For in Model
Block 3-50ccf Rate % Change	3%		Solved For in Model
Block 50ccf+ % Change	3%		Solved For in Model
Septic Tank Disposal Growth Rate	3%		Solved For in Model
Sewerage Surcharge Revenue	3%		Solved For in Model
Other Revenue Change (1%)	1.00%	1.00%	MSD Assumption
Bad Debt % of Revenue	1.50%	1.50%	MSD Assumption
Commercial Customer Escalation Factor	0.35%	0.35%	Based on Estimated Service Area Employment Growth projections and capacity considerations.
Industrial Customer Escalation Factor	0.35%	0.35%	Based on Estimated Service Area Employment Growth projections and capacity considerations.
Multi-Family Customer Escalation Factor	0.25%	0.25%	Based on Estimated Service Area Population Growth projects and capacity considerations.
Single-Family Residential Customer Escalation Factor	0.25%	0.25%	Based on Estimated Service Area Population Growth projects and capacity considerations.
Commercial Average Consumption Escalation Factor	0.00%	0.00%	MSD Assumption
Industrial Average Consumption Escalation Factor	0.00%	0.00%	MSD Assumption
Multi-Family Average Consumption Escalation Factor	0.00%	0.00%	
Single-Family Residential Average Consumption Escalation Factor	0.00%	0.00%	MSD Assumption
Monthly Political Bodies Escalation Factor	0.00%	0.00%	Assumed basedon MSD Assumption for other categories.
O&M EXPENSE ESCALATION			
Personnel	N/A - From MSD Budget	3.50%	Informed by Employment Cost Index, Moody's Analytics, City of Cincinnati Labor agreements, and general regional trends.
Contractual Services	N/A - From MSD Budget	3.00%	4.5% in 2025, Assumption largely informed by CPI. Considers largely personnel-intensive character of utilities and thus procurements for contractual services.
Materials and Supplies	N/A - From MSD Budget	2.50%	3.5% through '27. Incorporates assumptions for structural changes in costs leading to sustained price increases.
Equipment	N/A - From MSD Budget	2.50%	3.5% through 27, Informed by various factors effecting supply and costs of machinery.
Benefits	N/A - From MSD Budget	3.50%	Informed by Employment Cost Index, Moody's Analytics, City of Cincinnati Labor agreements, and general regional trends.
Inflation	N/A - From MSD Budget	3.00%	Same as Contractual Services
Gas/Oil/Fuel	N/A - From MSD Budget	4.50%	Drop to 2.5% in 27-30, informed by continued sector volatility, and challenges mitigating steep cost increases with customer rates.
Power	N/A - From MSD Budget	2.50%	Informed by Moody's Analytics. Current proposals pending with PUC could impact energy escalation rates in the near term.
Chemicals	N/A - From MSD Budget	3.50%	4.5% in 2025, 4% in 2026 --- Incorporates considerations for recent price volatility, and challenges mitigating volatility in real time.
Pension	N/A - From MSD Budget	18.50%	Reflects a % of Salaries and Increases annualy based on CRS' March 7, 2024 Report.
CAPITAL COSTS (CIP)			
Description of CIP Scenario			
Capital Cost Escalation Rate	3.50%		Informed by current annual inflation rates in the region and national and regional structural considerations impacting capital inflation.
CAPITAL FINANCING			
ODWA Lending			
Term (Yrs)	25		
Structure	Level		
Interest Rates (	3.75%	3.75%	
Annual Amount			Depends on Scenario.
Revenue Bond Issues			
Term (Yrs)	30		
Structure	Level		Structure could fluctuate going forward.
Interest Rates	5.50%		
Annual Amount			Depends on Scenario
FINANCIAL PERFORMANCE TARGETS			
Min. Debt Service Coverage			
Sr. Lien			
All Obligations			1.7X
Min. Surplus Fund Balance			$150 Million

APPENDIX I (c): Synario Model Cash-Flow Pro Forma Fund Summaries

County Phase 2B Plan	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Rates															
Customer Service Charges % Change	-	-	-	-	3.00%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%
Cumulative Increase	-	-	-	-	3.00%	7.63%	12.48%	17.54%	22.83%	28.36%	34.13%	40.17%	46.48%	53.07%	59.96%
Average Annual Bill	660.63	660.63	660.63	680.45	700.86	732.40	765.36	799.80	835.79	873.40	912.71	953.78	996.70	1,041.55	1,088.42
Revenues															
Operating Revenue	258,511,186	261,753,033	275,718,534	284,397,554	288,918,251	301,435,465	314,851,039	328,976,008	343,776,726	359,285,576	375,536,494	392,565,042	410,408,490	429,105,891	448,698,175
Revenue Requirements															
Operation and Maintenance Expense	124,927,442	117,489,374	131,723,232	130,599,114	148,103,539	155,247,174	161,362,330	167,953,186	176,199,396	184,197,871	192,085,156	199,599,502	208,256,402	218,322,083	227,146,355
Debt - Revenue Bond Debt Service (Existing)	49,379,471	53,527,660	52,104,030	52,078,392	47,245,793	46,942,216	48,239,554	44,474,014	44,418,923	34,137,480	34,119,255	29,815,162	25,531,815	23,535,736	23,536,016
Debt - Revenue Bond Debt Service (New)	-	-	-	-	-	5,326,058	6,604,750	6,605,500	6,607,000	6,604,000	7,073,689	3,464,928	12,095,106	13,866,941	15,374,247
Total Revenue Bond Debt Service	49,379,471	53,527,660	52,104,030	52,078,392	47,245,793	52,268,274	54,844,304	51,079,514	51,025,923	40,741,480	41,192,944	33,280,090	37,626,920	37,402,676	38,910,262
Debt - Other Debt Service (Existing)	24,987,959	28,602,774	30,767,754	30,776,075	30,762,713	31,738,565	30,953,614	30,882,918	30,121,957	29,284,121	27,939,217	26,529,724	25,158,063	19,963,813	16,008,169
Debt - Other Debt Service (New)	-	-	-	-	-	-	4,907,062	4,907,062	4,907,062	30,547,401	40,895,896	40,895,896	40,895,896	55,740,056	76,865,041
Total Other Debt Service	24,987,959	28,602,774	30,767,754	30,776,075	30,762,713	31,738,565	35,860,676	35,789,980	35,029,019	59,831,522	68,835,112	67,425,620	66,053,959	75,703,869	92,873,210
Total Debt Service	74,367,430	82,130,434	82,871,784	82,854,467	78,008,506	84,006,839	90,704,980	86,869,493	86,054,942	100,573,002	110,028,056	106,705,710	103,680,880	113,106,546	131,783,472
Annual Equipment Purchases	2,774,157	1,994,513	3,151,686	2,987,929	3,700,000	3,829,500	3,963,533	4,102,256	4,204,813	4,309,933	4,417,681	4,528,123	4,641,326	4,757,359	4,876,293
Transfers to Surplus Account	64,881,000	61,485,000	66,352,000	62,675,000	75,357,000	61,709,215	62,997,303	63,654,572	77,458,757	81,450,134	74,879,667	74,092,219	86,992,980	99,017,288	98,525,872
Total Revenue Requirements	266,950,029	263,099,320	284,098,702	279,116,510	305,169,044	304,792,728	319,028,146	322,579,507	343,917,907	370,530,940	381,410,560	384,925,555	403,571,588	435,203,276	462,331,993
Capital															
New Capital Purchases - Escalated Total															
Asset Management	49,586,473	48,631,071	64,323,603	62,282,608	85,702,011	50,308,222	59,417,302	58,892,550	61,943,205	69,551,117	77,258,693	79,106,093	79,081,325	86,112,086	89,089,458
WWIP	76,854,007	49,088,311	41,431,981	45,130,822	32,169,681	72,281,322	279,579,539	207,676,160	154,740,342	62,350,950	177,842,132	323,995,607	110,880,663	43,467,980	43,940,308
Total New Capital Purchases - Escalated Total	126,440,479	97,719,383	105,755,583	107,413,430	117,871,692	122,589,544	338,996,841	266,568,710	216,683,547	131,902,067	255,100,825	403,101,699	189,961,987	129,580,066	133,029,766
Cumulative Capital Phase 2A Period															
New Capital Purchases - Escalated Cumulative Total	-	-	-	-	-	122,589,544	461,586,385	728,155,096	944,838,643	1,076,740,710	1,331,841,535	1,734,943,235	1,924,905,222	2,054,485,288	2,187,515,053
Bond Proceeds															
Revenue Bond Proceeds for Capital	-	-	-	-	99,963,047	-	-	-	-	6,721,508	34,441,674	37,803,882	25,534,592	21,661,463	25,984,271
OWDA Proceeds for Capital	-	-	-	-	78,725,000	-	-	-	-	-	-	-	-	-	-
OWDA Phase 2B Individual Projects	-	-	-	-	12,229,462	36,086,499	236,947,823	169,291,713	114,993,651	18,472,444	137,416,686	282,849,080	69,039,862	438,210	-
Total Proceeds for Capital	-	-	-	-	190,917,509	36,086,499	236,947,823	169,291,713	114,993,651	25,193,952	171,858,360	320,652,962	94,574,454	22,099,673	25,984,271
Fund Balances															
Surplus Fund	240,115,501	249,383,503	155,276,330	91,585,000	248,000,000	233,788,225	205,462,066	181,675,032	166,578,809	150,000,000	150,000,000	150,000,000	150,000,000	150,000,000	150,000,000
Debt Service Coverage															
Net Revenue from Operations	133,583,744	144,263,659	143,395,302	153,798,440	140,814,713	146,188,291	153,488,709	161,022,822	167,577,330	175,087,705	183,451,338	192,965,540	202,152,088	210,783,809	221,551,821
Connection Fee Revenue	3,448,617	2,551,000	3,517,934	3,553,114	3,588,645	3,624,531	3,660,777	3,697,384	3,734,358	3,771,702	3,809,419	3,847,513	3,885,988	3,924,848	3,964,096
Other Interest Income	9,183,655	4,400,843	3,334,735	2,401,373	5,272,148	9,482,121	9,106,901	8,231,262	7,467,958	6,925,177	6,481,193	6,490,198	6,498,763	6,537,020	6,592,546
Revenue Available for Coverage	146,216,016	151,215,502	150,847,971	159,752,927	149,675,505	159,294,943	166,256,387	172,951,468	178,779,646	185,784,584	193,741,949	203,303,251	212,536,839	221,245,677	232,108,463
Revenue Debt Service Coverage	296.11%	282.50%	289.51%	306.75%	316.80%	304.76%	303.14%	338.59%	350.37%	456.01%	470.33%	517.57%	564.85%	591.52%	596.52%
Minimum Required	125.00%	125.00%	125.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	125.00%	110.00%
MSD Policy	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%
Total Debt Service Coverage	196.61%	184.12%	182.03%	192.81%	191.87%	189.62%	183.29%	199.09%	207.75%	184.73%	176.08%	190.53%	204.99%	195.61%	176.13%
Minimum Required	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%
MSD Policy	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%

3 HRT + WWIP Spending	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Rates															
Customer Service Charges % Change	-	-	-	-	3.00%	8.90%	8.90%	8.90%	8.90%	8.90%	8.90%	8.90%	8.90%	8.90%	8.90%
Cumulative Increase	-	-	-	-	3.00%	12.17%	22.15%	33.02%	44.86%	57.75%	71.79%	87.08%	103.73%	121.86%	141.61%
Average Annual Bill	660.63	660.63	660.63	680.45	700.86	763.24	831.17	905.14	985.70	1,073.43	1,168.96	1,273.00	1,386.30	1,509.68	1,644.04
Revenues															
Operating Revenue	258,511,186	261,753,033	275,718,534	284,397,554	288,918,251	312,384,047	339,197,242	368,546,208	400,593,835	435,588,490	473,801,407	515,528,784	561,094,089	610,850,565	665,183,972
Revenue Requirements															
Operation and Maintenance Expense	124,927,442	117,489,374	131,723,232	130,599,114	148,103,539	155,247,174	161,389,618	168,216,775	178,069,469	186,883,808	195,221,075	203,814,617	218,090,720	230,399,852	240,820,137
Debt - Revenue Bond Debt Service (Existing)	49,379,471	53,527,660	52,104,030	52,078,392	47,245,793	46,942,216	48,239,554	44,474,014	44,418,923	34,137,480	34,119,255	29,815,162	25,531,815	23,535,736	23,536,016
Debt - Revenue Bond Debt Service (New)	-	-	-	-	-	5,326,058	6,604,750	16,136,767	24,149,966	27,601,685	33,360,788	76,599,723	86,532,561	89,372,599	90,356,984
Total Revenue Bond Debt Service	49,379,471	53,527,660	52,104,030	52,078,392	47,245,793	52,268,274	54,844,304	60,610,780	68,568,889	61,739,165	67,480,043	106,414,885	112,064,375	112,908,335	113,893,000
Debt - Other Debt Service (Existing)	24,987,959	28,602,774	30,767,754	30,776,075	30,762,713	31,738,565	30,953,614	30,882,918	30,121,957	29,284,121	27,939,217	26,529,724	25,158,063	19,963,813	16,008,169
Debt - Other Debt Service (New)	-	-	-	-	-	-	4,907,062	4,907,062	11,140,231	38,875,219	48,970,601	50,302,053	50,302,053	65,260,129	127,103,581
Total Other Debt Service	24,987,959	28,602,774	30,767,754	30,776,075	30,762,713	31,738,565	35,860,676	35,789,980	41,262,188	68,159,340	76,909,818	76,831,777	75,460,116	85,223,943	143,111,751
Total Debt Service	74,367,430	82,130,434	82,871,784	82,854,467	78,008,506	84,006,839	90,704,980	96,400,760	109,831,077	129,898,505	144,389,860	183,246,662	187,524,492	198,132,278	257,004,750
Annual Equipment Purchases	2,774,157	1,994,513	3,151,686	2,987,929	3,700,000	3,829,500	3,963,533	4,102,256	4,204,813	4,309,933	4,417,681	4,528,123	4,641,326	4,757,359	4,876,293
Transfers to Surplus Account	64,881,000	61,485,000	66,352,000	62,675,000	75,357,000	61,709,215	73,945,886	87,968,938	107,268,180	112,490,360	119,208,353	135,004,250	129,559,546	155,694,718	183,442,641
Total Revenue Requirements	266,950,029	263,099,320	284,098,702	279,116,510	305,169,044	304,792,728	330,004,016	356,688,730	399,373,539	433,582,606	463,236,970	526,593,652	539,816,084	588,984,206	686,143,822
Capital															
New Capital Purchases - Escalated Total															
Asset Management	51,284,750	44,691,005	64,323,603	62,282,608	83,987,315	89,895,478	93,041,820	96,298,284	99,668,724	103,157,129	106,767,629	110,504,496	114,372,153	118,375,178	122,518,310
WWIP	82,970,202	59,513,188	41,431,981	45,130,822	35,808,057	103,679,028	492,723,119	308,977,650	203,994,209	193,699,948	910,208,813	583,785,156	275,371,321	205,826,417	73,065,392
Total New Capital Purchases - Escalated Total	134,254,952	104,204,193	105,755,583	107,413,430	119,795,372	193,574,507	585,764,939	405,275,934	303,662,933	296,857,077	1,016,976,441	694,289,651	389,743,474	324,201,595	195,583,702
Cumulative Capital Phase 2A Period															
New Capital Purchases - Escalated Cumulative Total	-	-	-	-	-	193,574,507	779,339,446	1,184,615,379	1,488,278,313	1,785,135,389	2,802,111,831	3,496,401,482	3,886,144,956	4,210,346,551	4,405,930,253
Bond Proceeds															
Revenue Bond Proceeds for Capital	-	-	-	-	99,248,350	-	137,138,970	115,275,058	49,707,117	82,824,524	622,172,836	142,877,874	40,902,546	14,141,847	-
OWDA Proceeds for Capital	-	-	-	-	78,725,000	-	100,000,000	-	-	-	-	-	-	-	-
OWDA Phase 2B Individual Projects	-	-	-	-	15,867,839	39,563,205	243,638,906	198,936,945	138,439,360	93,324,268	267,185,805	407,732,091	210,819,291	145,858,715	12,050,196
Total Proceeds for Capital	-	-	-	-	193,841,189	39,563,205	480,777,876	314,212,003	188,146,477	176,148,792	889,358,641	550,609,965	251,721,837	160,000,562	12,050,196
Fund Balances															
Surplus Fund	240,115,501	249,383,503	155,276,330	91,585,000	249,000,000	167,309,968	145,000,000	150,000,000	150,000,000	150,000,000	150,000,000	150,000,000	150,000,000	150,000,000	158,443,319
Debt Service Coverage															
Net Revenue from Operations	133,583,744	144,263,659	143,995,302	153,798,440	140,814,713	157,136,873	177,807,624	200,329,433	222,524,366	248,704,682	278,580,331	311,714,168	343,003,369	380,450,713	424,363,835
Connection Fee Revenue	3,448,617	2,551,000	3,517,934	3,553,114	3,588,645	3,624,531	3,660,777	3,697,384	3,734,358	3,771,702	3,809,419	3,847,513	3,885,988	3,924,848	3,964,096
Other Interest Income	9,183,655	4,400,843	3,334,735	2,401,373	5,272,148	9,512,121	7,112,553	6,490,862	6,654,780	6,601,003	6,701,031	7,028,955	7,105,057	7,186,525	7,256,612
Revenue Available for Coverage	146,216,016	151,215,502	150,847,971	159,752,927	149,675,505	170,273,526	188,580,954	210,517,679	232,913,504	259,077,387	289,090,781	322,590,636	353,994,415	391,562,086	435,584,543
Revenue Debt Service Coverage	296.11%	282.50%	289.51%	306.75%	316.80%	325.77%	343.85%	347.33%	339.68%	419.63%	428.41%	303.14%	315.88%	346.80%	382.45%
Minimum Required	125.00%	125.00%	125.00%	110.00%	110.00%	110.00%	125.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	125.00%	110.00%
MSD Policy	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%
Total Debt Service Coverage	196.61%	184.12%	182.03%	192.81%	191.87%	202.69%	207.91%	218.38%	212.07%	199.45%	200.22%	176.04%	188.77%	197.63%	169.49%
Minimum Required	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%
MSD Policy	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%

Muddy Creek HRT	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Rates															
Customer Service Charges % Change	-	-	-	-	3.00%	4.20%	4.20%	4.20%	4.20%	4.20%	4.20%	4.20%	4.20%	4.20%	4.20%
Cumulative Increase	-	-	-	-	3.00%	7.33%	11.83%	16.53%	21.42%	26.52%	31.84%	37.38%	43.15%	49.16%	55.42%
Average Annual Bill	660.63	660.63	660.63	680.45	700.86	730.30	760.97	792.93	826.24	860.94	897.10	934.78	974.04	1,014.95	1,057.57
Revenues															
Operating Revenue	258,511,186	261,753,033	275,718,534	284,397,554	288,918,251	300,688,970	313,226,253	326,393,035	340,150,144	354,524,095	369,542,594	385,234,591	401,630,340	418,761,451	436,660,960
Revenue Requirements															
Operation and Maintenance Expense	124,927,442	117,489,374	131,723,232	130,599,114	148,103,539	155,247,174	161,374,166	167,924,207	176,048,616	183,650,609	190,689,247	198,224,217	207,133,054	216,081,837	224,729,928
Debt - Revenue Bond Debt Service (Existing)	49,379,471	53,527,660	52,104,030	52,078,392	47,245,793	46,942,216	48,239,554	44,474,014	44,418,923	34,137,480	34,119,255	29,815,162	25,531,815	23,535,736	23,536,016
Debt - Revenue Bond Debt Service (New)	-	-	-	-	-	5,326,058	6,604,750	6,605,500	6,607,000	8,111,870	11,352,352	15,533,907	19,505,446	22,977,119	26,458,107
Total Revenue Bond Debt Service	49,379,471	53,527,660	52,104,030	52,078,392	47,245,793	52,268,274	54,844,304	51,079,514	51,025,923	42,249,350	45,471,607	45,349,069	45,037,261	46,512,854	49,994,123
Debt - Other Debt Service (Existing)	24,987,959	28,602,774	30,767,754	30,776,075	30,762,713	31,738,565	30,953,614	30,882,918	30,121,957	29,284,121	27,939,217	26,529,724	25,158,063	19,963,813	16,008,169
Debt - Other Debt Service (New)	-	-	-	-	-	-	4,907,062	4,907,062	4,907,062	30,547,401	30,547,401	31,576,262	31,576,262	46,420,422	63,981,490
Total Other Debt Service	24,987,959	28,602,774	30,767,754	30,776,075	30,762,713	31,738,565	35,860,676	35,789,980	35,029,019	59,831,522	58,486,617	58,105,986	56,734,325	66,384,235	79,989,659
Total Debt Service	74,367,430	82,130,434	82,871,784	82,854,467	78,008,506	84,006,839	90,704,980	86,869,493	86,054,942	102,080,872	103,958,224	103,455,055	101,771,586	112,897,089	129,983,781
Annual Equipment Purchases	2,774,157	1,994,513	3,151,686	2,987,929	3,700,000	3,829,500	3,963,533	4,102,256	4,204,813	4,309,933	4,417,681	4,528,123	4,641,326	4,757,359	4,876,293
Transfers to Surplus Account	64,881,000	61,485,000	66,352,000	62,675,000	75,357,000	61,709,215	62,250,809	62,015,977	74,911,624	77,994,487	69,234,505	75,735,807	84,325,231	93,280,945	90,883,449
Total Revenue Requirements	266,950,029	263,099,320	284,098,702	279,116,510	305,169,044	304,792,728	318,293,488	320,911,933	341,219,994	368,035,901	368,299,656	381,943,203	397,871,196	427,017,231	450,473,452
Capital															
New Capital Purchases - Escalated Total															
Asset Management	51,284,750	44,691,005	64,323,603	62,282,608	88,129,833	51,615,525	65,322,721	81,694,485	86,031,832	97,266,446	100,782,736	103,419,225	104,379,279	112,106,161	115,966,477
WWIP	82,970,202	59,513,188	41,431,981	45,130,822	33,747,805	66,792,032	263,455,307	155,414,983	43,776,365	70,684,517	216,934,851	179,569,424	96,350,720	99,265,676	40,652,810
Total New Capital Purchases - Escalated Total	134,254,952	104,204,193	105,755,583	107,413,430	121,877,638	118,407,556	328,778,028	237,109,468	129,808,197	167,950,963	317,717,586	282,988,649	200,729,998	211,371,838	156,619,287
Cumulative Capital Phase 2A Period															
New Capital Purchases - Escalated Cumulative Total	-	-	-	-	-	118,407,556	447,185,584	684,295,052	814,103,250	982,054,213	1,299,771,799	1,582,760,448	1,783,490,446	1,994,862,284	2,151,481,571
Bond Proceeds															
Revenue Bond Proceeds for Capital	-	-	-	-	99,390,869	-	-	-	21,694,364	46,584,569	60,201,652	57,104,434	49,993,878	50,063,433	57,205,763
OWDA Proceeds for Capital	-	-	-	-	78,725,000	-	-	-	-	-	-	-	-	-	-
OWDA Phase 2B Individual Projects	-	-	-	-	13,807,586	35,192,008	230,016,506	121,994,871	9,541,325	35,179,107	179,899,172	141,781,996	58,005,381	59,549,344	-
Total Proceeds for Capital	-	-	-	-	191,923,455	35,192,008	230,016,506	121,994,871	31,235,689	81,763,676	240,100,824	198,886,430	107,999,259	109,612,777	57,205,763
Fund Balances															
Surplus Fund	240,115,501	249,383,503	155,276,330	91,585,000	245,000,000	233,985,722	208,206,490	165,025,654	150,000,000	150,000,000	150,000,000	150,000,000	150,000,000	150,000,000	150,000,000
Debt Service Coverage															
Net Revenue from Operations	133,583,744	144,263,659	143,995,302	153,798,440	140,814,713	145,441,797	151,852,087	158,468,827	164,101,528	170,873,486	178,853,347	187,010,374	194,497,286	202,679,614	211,931,032
Connection Fee Revenue	3,448,617	2,551,000	3,517,934	3,553,114	3,588,645	3,624,531	3,660,777	3,697,384	3,734,358	3,771,702	3,809,419	3,847,513	3,885,988	3,924,848	3,964,096
Other Interest Income	9,183,655	4,400,843	3,334,735	2,401,373	5,272,148	9,392,121	9,112,826	8,313,654	6,968,332	6,438,659	6,511,499	6,530,397	6,549,318	6,603,185	6,669,164
Revenue Available for Coverage	146,216,016	151,215,502	150,847,971	159,752,927	149,675,505	158,458,449	164,625,690	170,479,865	174,804,218	181,083,847	189,174,264	197,388,284	204,933,192	213,207,647	222,564,292
Revenue Debt Service Coverage	296.11%	282.50%	289.51%	306.75%	316.80%	303.16%	300.17%	333.75%	342.58%	428.61%	416.03%	435.26%	455.03%	458.38%	445.18%
Minimum Required	125.00%	125.00%	125.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	125.00%	125.00%	125.00%	125.00%
MSD Policy	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%
Total Debt Service Coverage	196.61%	184.12%	182.03%	192.81%	191.87%	188.63%	181.50%	196.25%	203.13%	177.39%	181.97%	190.80%	201.37%	188.85%	171.22%
Minimum Required	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%
MSD Policy	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%

Mill Creek HRT	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Rates															
Customer Service Charges % Change	-	-	-	-	3.00%	4.20%	4.20%	4.20%	4.20%	4.20%	4.20%	4.20%	4.20%	4.20%	4.20%
Cumulative Increase	-	-	-	-	3.00%	7.33%	11.83%	16.53%	21.42%	26.52%	31.84%	37.38%	43.15%	49.16%	55.42%
Average Annual Bill	660.63	660.63	660.63	680.45	700.86	730.30	760.97	792.93	826.24	860.94	897.10	934.78	974.04	1,014.95	1,057.57
Revenues															
Operating Revenue	258,511,186	261,753,033	275,718,534	284,397,554	288,918,251	300,688,970	313,226,253	326,393,035	340,150,144	354,524,095	369,542,594	385,234,591	401,630,340	418,761,451	436,660,960
Revenue Requirements															
Operation and Maintenance Expense	124,927,442	117,489,374	131,723,232	130,599,114	148,103,539	155,247,174	161,350,872	167,888,562	176,001,034	183,667,488	190,796,320	198,380,290	207,365,919	216,436,170	225,212,768
Debt - Revenue Bond Debt Service (Existing)	49,379,471	53,527,660	52,104,030	52,078,392	47,245,793	46,942,216	48,239,554	44,474,014	44,418,923	34,137,480	34,119,255	29,815,162	25,531,815	23,535,736	23,536,016
Debt - Revenue Bond Debt Service (New)	-	-	-	-	-	5,326,058	6,604,750	6,605,500	6,607,000	7,551,450	10,291,029	13,917,325	17,283,376	20,020,207	22,706,837
Total Revenue Bond Debt Service	49,379,471	53,527,660	52,104,030	52,078,392	47,245,793	52,268,274	54,844,304	51,079,514	51,025,923	41,688,930	44,410,284	43,732,487	42,815,191	43,555,942	46,242,853
Debt - Other Debt Service (Existing)	24,987,959	28,602,774	30,767,754	30,776,075	30,762,713	31,738,565	30,953,614	30,882,918	30,121,957	29,284,121	27,939,217	26,529,724	25,158,063	19,963,813	16,008,169
Debt - Other Debt Service (New)	-	-	-	-	-	-	4,907,062	4,907,062	4,907,062	30,547,401	30,547,401	30,547,401	30,547,401	45,391,561	68,548,960
Total Other Debt Service	24,987,959	28,602,774	30,767,754	30,776,075	30,762,713	31,738,565	35,860,676	35,789,980	35,029,019	59,831,522	58,486,617	57,077,125	55,705,464	65,355,374	84,557,129
Total Debt Service	74,367,430	82,130,434	82,871,784	82,854,467	78,008,506	84,006,839	90,704,980	86,869,493	86,054,942	101,520,452	102,896,901	100,809,612	98,520,655	108,911,317	130,799,982
Annual Equipment Purchases	2,774,157	1,994,513	3,151,686	2,987,929	3,700,000	3,829,500	3,963,533	4,102,256	4,204,813	4,309,933	4,417,681	4,528,123	4,641,326	4,757,359	4,876,293
Transfers to Surplus Account	64,881,000	61,485,000	66,352,000	62,675,000	75,357,000	61,709,215	62,250,809	62,043,153	74,949,212	78,043,880	69,762,753	76,666,898	86,794,395	96,269,618	94,472,580
Total Revenue Requirements	266,950,029	263,099,320	284,098,702	279,116,510	305,169,044	304,792,728	318,270,194	320,903,464	341,210,001	367,541,753	367,873,655	380,384,923	397,322,295	426,374,464	455,361,623
Capital															
New Capital Purchases - Escalated Total															
Asset Management	51,284,750	44,691,005	64,323,603	62,282,608	89,844,530	51,871,158	66,477,477	73,867,268	78,026,210	89,524,937	91,761,018	94,075,049	94,734,232	102,086,524	105,590,901
WWIP	82,970,202	59,513,188	41,431,981	45,130,822	30,641,957	65,238,298	262,006,453	164,199,991	55,734,766	76,789,552	226,549,501	194,833,604	112,067,841	115,514,787	42,227,879
Total New Capital Purchases - Escalated Total	134,254,952	104,204,193	105,755,583	107,413,430	120,486,487	117,109,456	328,483,931	238,067,258	133,760,976	166,314,489	318,310,519	288,908,653	206,802,073	217,601,311	147,818,780
Cumulative Capital Phase 2A Period															
New Capital Purchases - Escalated Cumulative Total	-	-	-	-	-	117,109,456	445,593,387	683,660,645	817,421,621	983,736,110	1,302,046,629	1,590,955,282	1,797,757,355	2,015,358,667	2,163,177,447
Bond Proceeds															
Revenue Bond Proceeds for Capital	-	-	-	-	99,105,566	-	-	-	13,629,182	39,378,659	52,210,334	48,394,148	39,418,624	38,630,589	44,821,902
OWDA Proceeds for Capital	-	-	-	-	78,725,000	-	-	-	-	-	-	-	-	-	-
OWDA Phase 2B Individual Projects	-	-	-	-	10,701,738	32,318,840	228,147,342	129,532,701	20,359,573	40,703,522	187,958,752	155,485,107	72,188,101	74,228,459	-
Total Proceeds for Capital	-	-	-	-	188,532,304	32,318,840	228,147,342	129,532,701	33,988,755	80,082,181	240,169,086	203,879,255	111,606,725	112,859,048	44,821,902
Fund Balances															
Surplus Fund	240,115,501	249,383,503	155,276,330	91,585,000	243,000,000	230,350,654	202,887,304	166,153,991	150,000,000	150,000,000	150,000,000	150,000,000	150,000,000	150,000,000	150,000,000
Debt Service Coverage															
Net Revenue from Operations	133,583,744	144,263,659	143,395,302	153,798,440	140,814,713	145,441,797	151,875,381	158,504,473	164,149,110	170,856,607	178,746,274	186,854,301	194,264,421	202,325,282	211,448,191
Connection Fee Revenue	3,448,617	2,551,000	3,517,934	3,553,114	3,588,645	3,624,531	3,660,777	3,697,384	3,734,358	3,771,702	3,809,419	3,847,513	3,885,988	3,924,848	3,964,096
Other Interest Income	9,183,655	4,400,843	3,334,735	2,401,373	5,272,148	9,332,121	9,003,774	8,153,962	7,002,004	6,434,110	6,503,371	6,518,358	6,533,324	6,581,121	6,641,323
Revenue Available for Coverage	146,216,016	151,215,502	150,247,971	159,752,927	149,675,505	158,398,449	164,539,931	170,355,819	174,885,471	181,062,419	189,059,064	197,220,172	204,683,733	212,831,251	222,053,610
Revenue Debt Service Coverage	296.11%	282.50%	289.51%	306.75%	316.80%	303.05%	300.01%	333.51%	342.74%	434.32%	425.71%	450.97%	478.06%	488.64%	480.19%
Minimum Required	125.00%	125.00%	125.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%
MSD Policy	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%	150.00%
Total Debt Service Coverage	196.61%	184.12%	182.03%	192.81%	191.87%	188.55%	181.40%	196.11%	203.23%	178.35%	183.74%	195.64%	207.76%	195.42%	169.77%
Minimum Required	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%	110.00%
MSD Policy	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%	130.00%

APPENDIX II: Scenario Summary Tables

Rate Increase Scenarios and MHI and LQI Impacts for Each Scenario

Exhibit 6: Rate Increase Scenarios and Related Median Household and Lowest Quintile Income Impacts

		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
County Phase 2B Plan													
Rate Increase	(Percentage)	0.0%	3.0%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
Cost Per Household (CPH)	$ Per year	$ 681	$ 701	$ 732	$ 765	$ 799	$ 835	$ 873	$ 912	$ 952	$ 995	$ 1,040	$ 1,086
Median Household Income (MHI)	$ Per year	$ 60,771	$ 61,683	$ 62,608	$ 63,547	$ 64,500	$ 65,468	$ 66,450	$ 67,447	$ 68,459	$ 69,486	$ 70,528	$ 71,586
Residential Indicator	(Percentage)	1.12%	1.14%	1.17%	1.20%	1.24%	1.28%	1.31%	1.35%	1.39%	1.43%	1.47%	1.52%
Cost Per Lowest Quintile Income Household	$ Per year	$ 639	$ 658	$ 688	$ 719	$ 751	$ 784	$ 819	$ 856	$ 894	$ 934	$ 976	$ 1,020
Lowest Quintile Income	$ Per year	$ 24,339	$ 24,582	$ 24,828	$ 25,076	$ 25,327	$ 25,580	$ 25,836	$ 26,094	$ 26,355	$ 26,619	$ 26,885	$ 27,154
Lowest Quintile Residential Indicator	(Percentage)	2.63%	2.68%	2.77%	2.87%	2.96%	3.07%	3.17%	3.28%	3.39%	3.51%	3.63%	3.76%
3HRTS + WWIP Spending													
Rate Increase	(Percentage)	0.0%	3.0%	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%
Cost Per Household (CPH)	$ Per year	$ 681	$ 701	$ 763	$ 831	$ 905	$ 985	$ 1,072	$ 1,167	$ 1,271	$ 1,384	$ 1,507	$ 1,640
Median Household Income (MHI)	$ Per year	$ 60,771	$ 61,683	$ 62,608	$ 63,547	$ 64,500	$ 65,468	$ 66,450	$ 67,447	$ 68,459	$ 69,486	$ 70,528	$ 71,586
Residential Indicator	(Percentage)	1.1%	1.1%	1.2%	1.3%	1.4%	1.5%	1.6%	1.7%	1.9%	2.0%	2.1%	2.3%
Cost Per Lowest Quintile Income Household	$ Per year	$ 639	$ 658	$ 717	$ 780	$ 849	$ 925	$ 1,007	$ 1,096	$ 1,194	$ 1,300	$ 1,415	$ 1,541
Lowest Quintile Income	$ Per year	$ 24,339	$ 24,582	$ 24,828	$ 25,076	$ 25,327	$ 25,580	$ 25,836	$ 26,094	$ 26,355	$ 26,619	$ 26,885	$ 27,154
Lowest Quintile Residential Indicator	(Percentage)	2.63%	2.68%	2.89%	3.11%	3.35%	3.62%	3.90%	4.20%	4.53%	4.88%	5.26%	5.67%
Muddy Creek HRTS													
Rate Increase	(Percentage)	0.0%	3.0%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%
Cost Per Household (CPH)	$ Per year	$ 681	$ 701	$ 730	$ 761	$ 793	$ 826	$ 860	$ 896	$ 933	$ 972	$ 1,013	$ 1,055
Median Household Income (MHI)	$ Per year	$ 60,771	$ 61,683	$ 62,608	$ 63,547	$ 64,500	$ 65,468	$ 66,450	$ 67,447	$ 68,459	$ 69,486	$ 70,528	$ 71,586
Residential Indicator	(Percentage)	1.12%	1.14%	1.17%	1.20%	1.23%	1.26%	1.29%	1.33%	1.36%	1.40%	1.44%	1.47%
Cost Per Lowest Quintile Income Household	$ Per year	$ 639	$ 658	$ 686	$ 714	$ 744	$ 775	$ 808	$ 841	$ 876	$ 913	$ 951	$ 991
Lowest Quintile Income	$ Per year	$ 24,339	$ 24,582	$ 24,828	$ 25,076	$ 25,327	$ 25,580	$ 25,836	$ 26,094	$ 26,355	$ 26,619	$ 26,885	$ 27,154
Lowest Quintile Residential Indicator	(Percentage)	2.63%	2.68%	2.76%	2.85%	2.94%	3.03%	3.13%	3.22%	3.33%	3.43%	3.54%	3.65%
Mill Creek HRTS													
Rate Increase	(Percentage)	0.0%	3.0%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%
Cost Per Household (CPH)	$ Per year	$ 681	$ 701	$ 730	$ 761	$ 793	$ 826	$ 860	$ 896	$ 933	$ 972	$ 1,013	$ 1,055
Median Household Income (MHI)	$ Per year	$ 60,771	$ 61,683	$ 62,608	$ 63,547	$ 64,500	$ 65,468	$ 66,450	$ 67,447	$ 68,459	$ 69,486	$ 70,528	$ 71,586
Residential Indicator	(Percentage)	1.12%	1.14%	1.17%	1.20%	1.23%	1.26%	1.29%	1.33%	1.36%	1.40%	1.44%	1.47%
Cost Per Lowest Quintile Income Household	$ Per year	$ 639	$ 658	$ 686	$ 714	$ 744	$ 775	$ 808	$ 841	$ 876	$ 913	$ 951	$ 991
Lowest Quintile Income	$ Per year	$ 24,339	$ 24,582	$ 24,828	$ 25,076	$ 25,327	$ 25,580	$ 25,836	$ 26,094	$ 26,355	$ 26,619	$ 26,885	$ 27,154
Lowest Quintile Residential Indicator	(Percentage)	2.63%	2.68%	2.76%	2.85%	2.94%	3.03%	3.13%	3.22%	3.33%	3.43%	3.54%	3.65%

APPENDIX III: Projected Rate Impacts by Household Size

Financial Capability Assessment – EPA Alternative 2 (Exhibit 7)
Residential Indicator and Lowest Quintile Residential Indicator by Household Size

Current Wastewater Rates – Residential Indicator by HH Size

Exhibit 7: Projected Impact of Program Costs by Household Size
Residential Indicator By Household Size

Household Size	Hamilton County, OH	MHI By HH Size 2021 Est (B19019)	Escalate: Enter Yrs 3	Current (2024) Wastewater Rates CCF 2	3	4	5	6	7	8	9
1-person household	39.60%	$ 28,771	$ 30,085	$ 41.50	$ 41.50	$ 47.74	$ 53.97	$ 60.21	$ 66.45	$ 72.69	$ 78.92
				1.66%	1.66%	1.90%	2.15%	2.40%	2.65%	2.90%	3.15%
2-person household	30.19%	$ 67,837	$ 70,937	$ 41.50	$ 41.50	$ 47.74	$ 53.97	$ 60.21	$ 66.45	$ 72.69	$ 78.92
				0.70%	0.70%	0.81%	0.91%	1.02%	1.12%	1.23%	1.34%
3-person household	13.25%	$ 71,091	$ 74,340	$ 41.50	$ 41.50	$ 47.74	$ 53.97	$ 60.21	$ 66.45	$ 72.69	$ 78.92
				0.67%	0.67%	0.77%	0.87%	0.97%	1.07%	1.17%	1.27%
4-person household	9.75%	$ 78,482	$ 82,069	$ 41.50	$ 41.50	$ 47.74	$ 53.97	$ 60.21	$ 66.45	$ 72.69	$ 78.92
				0.61%	0.61%	0.70%	0.79%	0.88%	0.97%	1.06%	1.15%
5-person household	4.72%	$ 90,486	$ 94,621	$ 41.50	$ 41.50	$ 47.74	$ 53.97	$ 60.21	$ 66.45	$ 72.69	$ 78.92
				0.53%	0.53%	0.61%	0.68%	0.76%	0.84%	0.92%	1.00%
6-person household	1.64%	$ 86,912	$ 90,884	$ 41.50	$ 41.50	$ 47.74	$ 53.97	$ 60.21	$ 66.45	$ 72.69	$ 78.92
				0.55%	0.55%	0.63%	0.71%	0.79%	0.88%	0.96%	1.04%
7-or-more person household	0.84%	$ 87,085	$ 91,064	$ 41.50	$ 41.50	$ 47.74	$ 53.97	$ 60.21	$ 66.45	$ 72.69	$ 78.92
				0.55%	0.55%	0.63%	0.71%	0.79%	0.88%	0.96%	1.04%

County Phase 2B Plan (Nominal Spend - $2.19 Billion) – 2034 Rate Impacts at MHI

County Phase 2B Plan Nominal 2025 - 2034 Spend =$2.19 Billion			Escalate: Enter Yrs 13	Projected 2034 Wastewater Rates							
1-person household	39.60%	$ 28,771	$ 35,440	64.46	64.46	74.15	83.83	93.52	103.2	112.89	122.57
				2.18%	2.18%	2.51%	2.84%	3.17%	3.49%	3.82%	4.15%
2-person household	30.19%	$ 67,837	$ 83,562	64.46	64.46	74.15	83.83	93.52	103.2	112.89	122.57
				0.93%	0.93%	1.06%	1.20%	1.34%	1.48%	1.62%	1.76%
3-person household	13.25%	$ 71,091	$ 87,570	64.46	64.46	74.15	83.83	93.52	103.2	112.89	122.57
				0.88%	0.88%	1.02%	1.15%	1.28%	1.41%	1.55%	1.68%
4-person household	9.75%	$ 78,482	$ 96,674	64.46	64.46	74.15	83.83	93.52	103.2	112.89	122.57
				0.80%	0.80%	0.92%	1.04%	1.16%	1.28%	1.40%	1.52%
5-person household	4.72%	$ 90,486	$ 111,461	64.46	64.46	74.15	83.83	93.52	103.2	112.89	122.57
				0.69%	0.69%	0.80%	0.90%	1.01%	1.11%	1.22%	1.32%
6-person household	1.64%	$ 86,912	$ 107,058	64.46	64.46	74.15	83.83	93.52	103.2	112.89	122.57
				0.72%	0.72%	0.83%	0.94%	1.05%	1.16%	1.27%	1.37%
7-or-more person household	0.84%	$ 87,085	$ 107,271	64.46	64.46	74.15	83.83	93.52	103.2	112.89	122.57
				0.72%	0.72%	0.83%	0.94%	1.05%	1.15%	1.26%	1.37%

3 HRTS + WWIP Spending (Nominal Spend - $4.40 Billion) – 2034 Rate Impacts at MHI

3HRTS + WWIP Spending Nominal 2025 - 2034 Spend =$4.4 Billion			Escalate: Enter Yrs 13	Projected 2034 Wastewater Rates							
1-person household	39.60%	$ 28,771	$ 35,440	97.35	97.35	111.98	126.61	141.24	155.87	170.5	185.13
				3.30%	3.30%	3.79%	4.29%	4.78%	5.28%	5.77%	6.27%
2-person household	30.19%	$ 67,837	$ 83,562	97.35	97.35	111.98	126.61	141.24	155.87	170.5	185.13
				1.40%	1.40%	1.61%	1.82%	2.03%	2.24%	2.45%	2.66%
3-person household	13.25%	$ 71,091	$ 87,570	97.35	97.35	111.98	126.61	141.24	155.87	170.5	185.13
				1.33%	1.33%	1.53%	1.73%	1.94%	2.14%	2.34%	2.54%
4-person household	9.75%	$ 78,482	$ 96,674	97.35	97.35	111.98	126.61	141.24	155.87	170.5	185.13
				1.21%	1.21%	1.39%	1.57%	1.75%	1.93%	2.12%	2.30%
5-person household	4.72%	$ 90,486	$ 111,461	97.35	97.35	111.98	126.61	141.24	155.87	170.5	185.13
				1.05%	1.05%	1.21%	1.36%	1.52%	1.68%	1.84%	1.99%
6-person household	1.64%	$ 86,912	$ 107,058	97.35	97.35	111.98	126.61	141.24	155.87	170.5	185.13
				1.09%	1.09%	1.26%	1.42%	1.58%	1.75%	1.91%	2.08%
7-or-more person household	0.84%	$ 87,085	$ 107,271	97.35	97.35	111.98	126.61	141.24	155.87	170.5	185.13
				1.09%	1.09%	1.25%	1.42%	1.58%	1.74%	1.91%	2.07%

Muddy Creek HRTS (Nominal Spend - $2.16 Billion) – 2034 Rate Impacts at MHI

Muddy Creek HRTS Nominal 2025 - 2034 Spend =$2.16 Billion			Escalate: Enter Yrs 13	Projected 2034 Wastewater Rates							
1-person household	39.60%	$ 28,771	$ 35,440	62.6	62.6	72.01	81.42	90.83	100.24	109.65	119.06
				2.12%	2.12%	2.44%	2.76%	3.08%	3.39%	3.71%	4.03%
2-person household	30.19%	$ 67,837	$ 83,562	62.6	62.6	72.01	81.42	90.83	100.24	109.65	119.06
				0.90%	0.90%	1.03%	1.17%	1.30%	1.44%	1.57%	1.71%
3-person household	13.25%	$ 71,091	$ 87,570	62.6	62.6	72.01	81.42	90.83	100.24	109.65	119.06
				0.86%	0.86%	0.99%	1.12%	1.24%	1.37%	1.50%	1.63%
4-person household	9.75%	$ 78,482	$ 96,674	62.6	62.6	72.01	81.42	90.83	100.24	109.65	119.06
				0.78%	0.78%	0.89%	1.01%	1.13%	1.24%	1.36%	1.48%
5-person household	4.72%	$ 90,486	$ 111,461	62.6	62.6	72.01	81.42	90.83	100.24	109.65	119.06
				0.67%	0.67%	0.78%	0.88%	0.98%	1.08%	1.18%	1.28%
6-person household	1.64%	$ 86,912	$ 107,058	62.6	62.6	72.01	81.42	90.83	100.24	109.65	119.06
				0.70%	0.70%	0.81%	0.91%	1.02%	1.12%	1.23%	1.33%
7-or-more person household	0.84%	$ 87,085	$ 107,271	62.6	62.6	72.01	81.42	90.83	100.24	109.65	119.06
				0.70%	0.70%	0.81%	0.91%	1.02%	1.12%	1.23%	1.33%

Mill Creek HRTS (Nominal Spend - $2.15 Billion) – 2034 Rate Impacts at MHI

Mill Creek HRTS Nominal 2025 - 2034 Spend =$2.15 Billion			Escalate: Enter Yrs 13	Projected 2034 Wastewater Rates							
1-person household	39.60%	$ 28,771	$ 35,440	62.6	62.6	72.01	81.42	90.83	100.24	109.65	119.06
				2.12%	2.12%	2.44%	2.76%	3.08%	3.39%	3.71%	4.03%
2-person household	30.19%	$ 67,837	$ 83,562	62.6	62.6	72.01	81.42	90.83	100.24	109.65	119.06
				0.90%	0.90%	1.03%	1.17%	1.30%	1.44%	1.57%	1.71%
3-person household	13.25%	$ 71,091	$ 87,570	62.6	62.6	72.01	81.42	90.83	100.24	109.65	119.06
				0.86%	0.86%	0.99%	1.12%	1.24%	1.37%	1.50%	1.63%
4-person household	9.75%	$ 78,482	$ 96,674	62.6	62.6	72.01	81.42	90.83	100.24	109.65	119.06
				0.78%	0.78%	0.89%	1.01%	1.13%	1.24%	1.36%	1.48%
5-person household	4.72%	$ 90,486	$ 111,461	62.6	62.6	72.01	81.42	90.83	100.24	109.65	119.06
				0.67%	0.67%	0.78%	0.88%	0.98%	1.08%	1.18%	1.28%
6-person household	1.64%	$ 86,912	$ 107,058	62.6	62.6	72.01	81.42	90.83	100.24	109.65	119.06
				0.70%	0.70%	0.81%	0.91%	1.02%	1.12%	1.23%	1.33%
7-or-more person household	0.84%	$ 87,085	$ 107,271	62.6	62.6	72.01	81.42	90.83	100.24	109.65	119.06
				0.70%	0.70%	0.81%	0.91%	1.02%	1.12%	1.23%	1.33%

Current Wastewater Rates – Lowest Quintile Residential Indicator by HH Size

Exhibit 6 - **LQRI REVISED:** Rate Increase Scenario and Lowest Quintile Residential Household Impact

Household Size	Hamilton County, OH	LQRI Factor 40.05% LQRI By HH Size 2021 Est (B19019)		Escalate: Enter Yrs 3	Current (2024) Wastewater Rates CCF 2	3	4	5	6	7	8	9
1-person household	35.24%	$ 11,523	$ 12,050		$ 41.50	$ 41.50	$ 47.74	$ 53.97	$ 60.21	$ 66.45	$ 72.69	$ 78.92
					4.13%	4.13%	4.75%	5.37%	6.00%	6.62%	7.24%	7.86%
2-person household	32.66%	$ 27,169	$ 28,411		$ 41.50	$ 41.50	$ 47.74	$ 53.97	$ 60.21	$ 66.45	$ 72.69	$ 78.92
					1.75%	1.75%	2.02%	2.28%	2.54%	2.81%	3.07%	3.33%
3-person household	13.51%	$ 28,472	$ 29,773		$ 41.50	$ 41.50	$ 47.74	$ 53.97	$ 60.21	$ 66.45	$ 72.69	$ 78.92
					1.67%	1.67%	1.92%	2.18%	2.43%	2.68%	2.93%	3.18%
4-person household	11.08%	$ 31,432	$ 32,868		$ 41.50	$ 41.50	$ 47.74	$ 53.97	$ 60.21	$ 66.45	$ 72.69	$ 78.92
					1.52%	1.52%	1.74%	1.97%	2.20%	2.43%	2.65%	2.88%
5-person household	4.75%	$ 36,240	$ 37,896		$ 41.50	$ 41.50	$ 47.74	$ 53.97	$ 60.21	$ 66.45	$ 72.69	$ 78.92
					1.31%	1.31%	1.51%	1.71%	1.91%	2.10%	2.30%	2.50%
6-person household	1.81%	$ 34,808	$ 36,399		$ 41.50	$ 41.50	$ 47.74	$ 53.97	$ 60.21	$ 66.45	$ 72.69	$ 78.92
					1.37%	1.37%	1.57%	1.78%	1.98%	2.19%	2.40%	2.60%
7-or-more person household	0.96%	$ 34,877	$ 36,471		$ 41.50	$ 41.50	$ 47.74	$ 53.97	$ 60.21	$ 66.45	$ 72.69	$ 78.92
					1.37%	1.37%	1.57%	1.78%	1.98%	2.19%	2.39%	2.60%

County Phase 2B Plan (Nominal Spend - $2.19 Billion) – Lowest Quintile Residential Indicator by HH Size

Exhibit 6 - **LQRI REVISED:** Rate Increase Scenario and Lowest Quintile Residential Household Impact
County Phase 2B Plan

Household Size	Hamilton County, OH			Escalate: Enter Yrs 13	Projected 2034 Wastewater Rates							
1-person household	35.24%	$ 11,523	$ 14,194		64.46	64.46	74.15	83.83	93.52	103.2	112.89	122.57
					5.45%	5.45%	6.27%	7.09%	7.91%	8.72%	9.54%	10.36%
2-person household	32.66%	$ 27,169	$ 33,467		64.46	64.46	74.15	83.83	93.52	103.2	112.89	122.57
					2.31%	2.31%	2.66%	3.01%	3.35%	3.70%	4.05%	4.39%
3-person household	13.51%	$ 28,472	$ 35,072		64.46	64.46	74.15	83.83	93.52	103.2	112.89	122.57
					2.21%	2.21%	2.54%	2.87%	3.20%	3.53%	3.86%	4.19%
4-person household	11.08%	$ 31,432	$ 38,718		64.46	64.46	74.15	83.83	93.52	103.2	112.89	122.57
					2.00%	2.00%	2.30%	2.60%	2.90%	3.20%	3.50%	3.80%
5-person household	4.75%	$ 36,240	$ 44,640		64.46	64.46	74.15	83.83	93.52	103.2	112.89	122.57
					1.73%	1.73%	1.99%	2.25%	2.51%	2.77%	3.03%	3.29%
6-person household	1.81%	$ 34,808	$ 42,876		64.46	64.46	74.15	83.83	93.52	103.2	112.89	122.57
					1.80%	1.80%	2.08%	2.35%	2.62%	2.89%	3.16%	3.43%
7-or-more person household	0.96%	$ 34,877	$ 42,961		64.46	64.46	74.15	83.83	93.52	103.2	112.89	122.57
					1.80%	1.80%	2.07%	2.34%	2.61%	2.88%	3.15%	3.42%

3 HRTS + WWIP Spending (Nominal Spend - $4.40 Billion) – Lowest Quintile Residential Indicator by HH Size

Exhibit 6 - **LQRI REVISED:** Rate Increase Scenario and Lowest Quintile Residential Household Impact
3HRTS + WWIP Spending

Household Size	Hamilton County, OH			Escalate: Enter Yrs 13	Projected 2034 Wastewater Rates							
1-person household	35.24%	$ 11,523	$ 14,194		97.35	97.35	111.98	126.61	141.24	155.87	170.5	185.13
					8.23%	8.23%	9.47%	10.70%	11.94%	13.18%	14.41%	15.65%
2-person household	32.66%	$ 27,169	$ 33,467		97.35	97.35	111.98	126.61	141.24	155.87	170.5	185.13
					3.49%	3.49%	4.02%	4.54%	5.06%	5.59%	6.11%	6.64%
3-person household	13.51%	$ 28,472	$ 35,072		97.35	97.35	111.98	126.61	141.24	155.87	170.5	185.13
					3.33%	3.33%	3.83%	4.33%	4.83%	5.33%	5.83%	6.33%
4-person household	11.08%	$ 31,432	$ 38,718		97.35	97.35	111.98	126.61	141.24	155.87	170.5	185.13
					3.02%	3.02%	3.47%	3.92%	4.38%	4.83%	5.28%	5.74%
5-person household	4.75%	$ 36,240	$ 44,640		97.35	97.35	111.98	126.61	141.24	155.87	170.5	185.13
					2.62%	2.62%	3.01%	3.40%	3.80%	4.19%	4.58%	4.98%
6-person household	1.81%	$ 34,808	$ 42,876		97.35	97.35	111.98	126.61	141.24	155.87	170.5	185.13
					2.72%	2.72%	3.13%	3.54%	3.95%	4.36%	4.77%	5.18%
7-or-more person household	0.96%	$ 34,877	$ 42,961		97.35	97.35	111.98	126.61	141.24	155.87	170.5	185.13
					2.72%	2.72%	3.13%	3.54%	3.95%	4.35%	4.76%	5.17%

Muddy or Mill Creek HRTS (Nominal Spend - $2.16 or $2.15 Billion – Lowest Quintile Residential Indicator by HH Size

Exhibit 6 - **LQRI REVISED:** Rate Increase Scenario and Lowest Quintile Residential Household Impact
Muddy Creek HRTS

Household Size	Hamilton County, OH			Escalate: Enter Yrs 13	Projected 2034 Wastewater Rates							
1-person household	35.24%	$ 11,523	$ 14,194		62.6	62.6	72.01	81.42	90.83	100.24	109.65	119.06
					5.29%	5.29%	6.09%	6.88%	7.68%	8.47%	9.27%	10.07%
2-person household	32.66%	$ 27,169	$ 33,467		62.6	62.6	72.01	81.42	90.83	100.24	109.65	119.06
					2.24%	2.24%	2.58%	2.92%	3.26%	3.59%	3.93%	4.27%
3-person household	13.51%	$ 28,472	$ 35,072		62.6	62.6	72.01	81.42	90.83	100.24	109.65	119.06
					2.14%	2.14%	2.46%	2.79%	3.11%	3.43%	3.75%	4.07%
4-person household	11.08%	$ 31,432	$ 38,718		62.6	62.6	72.01	81.42	90.83	100.24	109.65	119.06
					1.94%	1.94%	2.23%	2.52%	2.82%	3.11%	3.40%	3.69%
5-person household	4.75%	$ 36,240	$ 44,640		62.6	62.6	72.01	81.42	90.83	100.24	109.65	119.06
					1.68%	1.68%	1.94%	2.19%	2.44%	2.69%	2.95%	3.20%
6-person household	1.81%	$ 34,808	$ 42,876		62.6	62.6	72.01	81.42	90.83	100.24	109.65	119.06
					1.75%	1.75%	2.02%	2.28%	2.54%	2.81%	3.07%	3.33%
7-or-more person household	0.96%	$ 34,877	$ 42,961		62.6	62.6	72.01	81.42	90.83	100.24	109.65	119.06
					1.75%	1.75%	2.01%	2.27%	2.54%	2.80%	3.06%	3.33%

FORMAT KEY:

Cell Value < 0.01	AaBbCcYyZz
Cell Value between 0.01 and 0.02	AaBbCcYyZz
Cell Value between 0.02 and 0.03	AaBbCcYyZz
Cell Value between 0.03 and 0.04	AaBbCcYyZz
Cell Value between 0.04 and 0.05	AaBbCcYyZz
Cell Value > 0.05	AaBbCcYyZz

APPENDIX IV: Lowest Quintile Poverty Index

Lowest Quintile Poverty Indicator Score
Hamilton County, OH and Cincinnati, OH
US Census - 5 Year Estimates: 2018 - 2022

Poverty Prevalence Indicator	Wt.	National Value	Cincinnati Value	Cincinnati Score	Hamilton County Value	Hamilton County Score	
Lowest Quintile Income Indicator	50%	$30,785	$17,004	1	$26,292	2	US Census ACS - Household Income Quintile Upper Limits (B19080) 2018-2022, 5-Year Estimates
Percent Population with Income Below 200% of Federal Poverty Level	10%	29.8%	44.0%	1	30.1%	2	US Census S1701, POVERTY STATUS IN THE PAST 12 MONTHS), 2018-2022, 5-Year Estimates
Percent of Population Receiving Food Stamps/SNAP Benefits	10%	11.5%	18.0%	1	11.6%	2	US Census S2201, FOOD STAMPS/SUPPLEMENTAL NUTRITION ASSISTANCE PROGRAM (SNAP), 2018-2022, 5-Year Estimates
Percent Vacant Households	10%	10.8%	15.9%	1	8.2%	2	US Census B25002, OCCUPANCY STATUS, 2018-2022, 5-Year Estimates
Trend in Household Growth	10%		0.70%	2	0.60%	2	US Census B25002, OCCUPANCY STATUS, 2018-2022 and for 2013-2017, 5-Year Estimates
Percent Unemployed Population 16 and Over in Civilian Labor Force	10%	6.3%	7.6%	2	5.2%	2	US Census: SELECTED ECONOMIC CHARACTERISTICS ACS - Table DP05, 2018-2022 - 5-Year Estimates
Lowest Quintile Poverty Indicator Score				**1.2** High Impact		**2** Medium Impact	
Consumer Price index	Dec-21	*278.802*	Dec-22		*306.746*		
					1.1002		
*Current Year Occupied Housing Units (Households_*			*141,033*		*348,491*		US Census B25002, OCCUPANCY STATUS, 2018-2022 and for 2013-2017, 5-Year Estimates
5-Yr Previous Occupied Housing Units (Households			*136,180*		*338,267*		
Trend in Household Growth			0.70%		0.60%		

APPENDIX V: Financial Alternatives Analysis

1. **Financing Options for Capital Costs**
   a) Has the community discussed financing options, including timing, terms, and potential grants or forgiveness, with the responsible State Revolving Fund?
      i. Yes. Hamilton County/MSD has received such loan funding in the past and is currently pursuing it for future projects. Unfortunately, Ohio EPA blocked funding from Ohio's SRF for multiple years. Ohio EPA has recently lifted this prohibition and Hamilton County/MSD are once again receiving Ohio SRF project loans.
   b) What additional funding sources beyond the SRF such as grants, low-cost loans, or extended term loans has the community considered?
      i. In addition to State Revolving Loan Funds, Hamilton County/MSD is looking to other Bipartisan Infrastructure Law funding and has used Community Development Block Grant funding in the past. The County is developing its long-term funding strategy for Phase 2B and is evaluating the use of every available funding approach with the goal of minimizing the financial impact to the community.
   c) Has the community considered special assessment districts to finance geographically defined project work?
      i. Yes. Hamilton County/MSD has for many years used special assessments on property tax bills to finance projects in specific neighborhoods which are converting from individual septic or other private systems to connect to the Hamilton County/MSD system.
   d) Has the community considered other revenue sources such as sales or property taxes, rental income from water tower leases, or other potential sources of support?
      i. Yes. Hamilton County/MSD has considered several other revenue sources to reduce the direct burden of the Consent Decree on ratepayers. In fact, the Board of Commissioners of Hamilton County, in response to public complaints about rising rates, created its MSD Rate Affordability Task Force (Affordability Task Force), which convened during 2015-2016 to investigate ways to address the problem of rate increases and affordability problems. Most of the 9 recommendations have been implemented, with the remaining in progress.
      ii. Ohio law has long prohibited the use of sales and property taxes for County Sewer Districts such as Hamilton County/MSD and requires usage charges as the primary (and almost exclusive) means of paying for Hamilton County/MSD operations and capital programs.
      iii. Hamilton County/MSD does not own any water towers that it could lease for rental income.
   e) Has the community evaluated how it can reduce overall operating and program costs?
      i. Yes. Hamilton County/MSD prepare and evaluate an annual budget that includes capital costs and O&M expenses. Budget increases are approved only when necessary. The focus of budget decisions is on maintaining reliable services, complying with the Consent Decree and ensuring a minimal burden of increased rates is placed on MSD customers.
   f) Other Considerations:
      i. Hamilton County/MSD also routinely reevaluates the debt portfolio to consider refinancing and other options to realize debt service savings.

2. **Rate Design**
    a) In what ways has the community evaluated modifications to its rate structure that could increase revenue and/or reduce burden on the lowest income residents?
        i. As previously mentioned, the Board of Commissioners of Hamilton County, in response to public complaints about rising rates, created its MSD Rate Affordability Task Force (Affordability Task Force), which convened during 2015-2016 to investigate ways to address the problem of rate increases and affordability problems, including modified rate structures. As a result of the Affordability Task Force recommendations, several billing structural changes have been made and a Customer Assistance Program (CAP) was established. However, Hamilton County/MSD is limited by Ohio Law which significantly limits the type of legally permissible rate structures. *See* O.R.C. 6117.02.
    b) Has the community prepared a forward-looking financial plan and rate analysis within the last five years? If so, was the plan implemented?
        i. Yes. Hamilton County/MSD produces a five-year financial plan and rate analysis that is updated annually.
    c) Does the community have identified separate rate structures for commercial, industrial, and wholesale customers reflecting their particular demands on the collection and treatment system? Has the utility considered tiered based rates?
        i. Yes. Hamilton County/MSD follows Cost of Service rate setting methodology allocating costs within its rate structure based upon customer classes. A minimum base charge is determined by the meter size of the property's water meter. A larger base charge is applied for larger meter connections which roughly correlate to the type of customer (commercial vs residential). In addition, commercial/industrial users are subject to industrial surcharge rates and industrial pretreatment charges. See additional information on the Affordability Task Force and the limitations of Ohio law on permissible rate structures as noted above and the current rate structure noted below.
    d) Does the community use inclining block rates that charge higher per gallon rates for higher increments of use?
        i. Hamilton County/MSD uses a two-part rate structure. First, there is a minimum base charge that covers 3 CCFs of water usage and is based on the size of the water meter for the property. Second, there is a declining block commodity charge based on the rate of water consumption. See additional information as noted above.
    e) If charging a flat fee, has the community considered switching to a volumetric fee so that high-output customers pay for the wastewater they generate?
        i. See above responses on MSD's rate structure, the Affordability Task Force and the limitations of Ohio law on permissible rate structures.
3. **Ratepayer Support Options for Lower Income Residential Customers**
    a) Does the community currently have, or looked into, setting up a CAP?
        i. Yes. Hamilton County/MSD offers a Customer Assistance Program (CAP) within the confines of Ohio State Law to help low-income senior citizens pay their sewer bills. Eligible applicants receive a 25% discount on their monthly sewer bill (including both the minimum base charge and the commodity charge). The estimated savings for participants are $120 or more per year. The program is only available to low-income seniors who meet specific eligibility requirements related to age, income, and home ownership. Please see: https://www.msdgc.org/Customer_care/customer_assistance/index.html
    b) If you have a CAP, what is the enrollment rate? What efforts have been made to ensure low-income households are informed about the program and enroll? Are there ways to make the

application process easier for customers to enroll, e.g. by providing for enrollment in-person, online, and mail, in multiple languages, if appropriate; partnering with local organizations to help with outreach and enrollment; allowing for automatic enrollment or using proof of eligibility for other income-qualified benefits?

i. As of July 13, 2023, there are 3,362 participants in MSD's CAP program which reflects an increase in enrollment of 6.8% since December 31, 2022.

ii. MSD implemented an initial communication and outreach strategy at the outset of the CAP which included a press release, online informational webpage, social media engagement, numerous public meetings, coordination with senior service organizations, and local news media coverage. Information is also currently available on the MSD website, its social media pages, and is provided in billing inserts.

1. https://msdgc.org/programs/customer-assistance-program-cap/

iii. Enrollment in the CAP is available through online, email and mail-in applications. The Greater Cincinnati Water Works is MSD's billing agent. They also refer eligible customers to MSD's CAP program. MSD has partnered with local organizations to improve outreach and enrollment.

c) Has the community considered other types of customer support beyond a CAP for lower income residential customers?

i. The following programs are available to support customers. Several of these programs are offered in conjunction with the Greater Cincinnati Water Works (GCWW) because approximately 90% of the Hamilton County/MSD service area is within the GCWW service area for drinking water and GCWW handles invoicing for Hamilton County/MSD customers who receive their water from GCWW. Others relate to federal funding and are administered by other local entities. Note: All programs have income eligibility requirements and/or tenant versus owner requirements.

1. Leak detection and management: GCWW provides write-offs of up to $1,000 for external leaks (service branch) if the customer can prove a leak existed and the account has two successive months of unusually high usage. Hamilton County/MSD will write off a portion of sewer bill if customer can prove water from the leak did not go into the sewer.
2. GCWW "Promise Pay" Payment Plans: Provides repayment plans for delinquent accounts with interest-free fixed monthly amounts.
3. Senior Citizen Assistance: In addition to Hamilton County/MSD's CAP, the Hamilton County Senior Utility and Home Repair Assistance program through the Council on Aging administers federal funds to provide one-time payments of delinquent GCWW or Duke Energy electric bills for lower income seniors.
4. Federal Relief funds related to the COVID Pandemic: Several entities administer relief funds from the American Rescue Plan and Cares Act to low-income qualifying households. These entities include the GCWW, the Cincinnati Community Action Agency, the Hamilton County Jobs and Family Services and the State of Ohio LIHWAP program. These are primarily one-time payments for delinquent accounts, but some programs offer multiple relief payments over a period of time. Many of these programs have recently ended. *See* https://www.cincinnati-oh.gov/water/gcwwcares/

ii. Also, within the community there are several private non-profit social services and religious based programs that assist low-income residential customers.

d) Are there policies in place to protect customers, including vulnerable populations, from shutoffs?

i. See above responses regarding available programs and the role of the GCWW. GCWW is a separate utility, not governed by Hamilton County, which provides water services for the majority of the MSD Service Area and thus controls shutoffs.

e) Does the community have reduced rates for vulnerable populations, such as seniors on fixed incomes?

i. See above information on the CAP program. Hamilton County/MSD is presently offering all possible customer assistance programs that are allowable under Ohio Law. Ohio law would need significant changes to permit additional customer assistance programs. *See* O.R.C. 6117.02.

4. Financial and Utility Management

a) Is the utility accounted for as a proprietary/enterprise fund or a separate independent utility?

i. Restricted Proprietary/Enterprise Fund under Ohio law.

b) Are all rate revenues or other user charges used to fund the utility's operations? Do the rates charged recover the full cost of providing wastewater services (taking into consideration capital costs, operation and maintenance expenses, and environmental costs)?

i. Yes.

c) Does the utility have programs to optimize maintenance and asset management to reduce life cycle costs?

i. Yes. MSD tracks asset condition and performance, age, maintenance costs, and replacement costs as part of an asset maintenance and management program. These costs are included as a factor in the current Consent Decree and aspects of MSD's assent maintenance and management are required by the current Consent Decree.

d) Are partnerships with other utilities, including joint procurement, or shared management and staffing arrangements, regionalization, or consolidations options to provide economies of scale and reduce per customer costs feasible in this community?

i. MSD operates as a County Sewer District per O.R.C. 6117 in 43 of Hamilton County's 49 separate political jurisdictions. Under Ohio law, regionalization would require termination of the existing County Sewer District (requiring Federal Court approval due to the Consent Decrees) and then approval by all of the political jurisdictions to become part of a regional district. This would create judicial and political chaos and is unlikely to occur, as many communities might opt out of a regional district, seek sewer service from abutting counties, and avoid future Consent Decree-related rate increases.

ii. Ohio law does allow for political jurisdictions within the state to participate in joint procurement programs or to purchase off another governmental jurisdiction's contracts, such as the State of Ohio's contracts, when advantageous. MSD/City of Cincinnati do take advantage of such procurement opportunities.

e) Has the utility or related municipality instituted a stormwater management program when evaluating long-term control plan schedules? If so, are impervious area-based stormwater fees used to fund the stormwater compliance costs?

i. MSD's service area has several individual stormwater districts including separate districts for the City of Cincinnati and other political jurisdictions. While Hamilton County's MS4 district includes several jurisdictions, it is not comprehensive. Some separate municipal Stormwater districts charge their own stormwater fees using various mechanisms including impervious surface fees and tax revenues.

f) Does the utility provide direct financial assistance (through rebates, upfront subsidies, or direct replacement of fixtures) for efficiency improvements including leak repairs or replacement of inefficient fixtures or appliances?
    i. Hamilton County/MSD works with The Greater Cincinnati Water Works to provide such leak detection and management programs. See responses above and GCWW's website at https://www.cincinnati-oh.gov/water/billing-information/leak-adjustment-program/

g) Other considerations:
    i. GCCW, the local drinking water utility for the majority of the Hamilton County/MSD Service Area, has recently increased, and plans to continue to increase, water rates in the near future. Hamilton County/MSD, the sewer utility, most recently instituted a 3% rate increase for 2023 and 2024. Hamilton County/MSD previously instituted significant rate increases before and during completion of Phase 1 of the Consent Decree – rates were increased annually between 4% and 14% every year from 2003 to 2015 for a cumulative increase of over 195%. These significant rate increases led to a large balance in the Hamilton County/MSD surplus fund, which paid for projects during and after Phase 1, including currently ongoing projects.

APPENDIX VI: Evolving Financial Capability Assessment Guidance

Financial Capability Assessments have been used since (at least) the late 1990s to evaluate permittees' capabilities to finance improvements required to achieve Clean Water Act compliance. These analyses are intended to examine a permittee community's financial capabilities and do not address individual customers' ability to pay for water service bills.[20] Since 1995 and 1997, EPA guidance has featured the use of workbooks and matrix analyses (as described below) to make determinations of the degree of economic burden (e.g., Low, Medium, High) that would be imposed with financing CWA required improvements. EPA guidance outlines compliance program scheduling boundaries associated with different burden level determinations.

The evolution of FCA guidance over the 30 years it has been employed by EPA to inform Consent Decree program scheduling[21] (as outlined below) provides background for the County's election to conduct its FCA for Phase 2B using Alternative 2 of the 2023 Guidance. In so doing, the County sets aside consideration of the flawed matrix analyses called for in prior FCA guidance and offers financial capability information aligned to how the County develops its capital program financing strategies.

1995 Substantial and Widespread Economic And Social Impact Assessment[22]

EPA's Interim Economic Guidance for Water Quality Standards, promulgated in 1995, outlines a two-phase analysis whereby a Municipal Preliminary Screener and an index of socioeconomic indicators, referred to as the Secondary Score, are identified. For public entities, the Municipal Preliminary Screener provides for a determination of current and projected program costs as a percentage of the discharger's Median Household Income (MHI); the discharger's Secondary Score references a variety of measures of financial strength and performance. In combination, using the matrix below, the Municipal Preliminary Screener and Secondary Score are intended to offer insight into the extent of substantial impacts that a defined program will impose on a community.

Two years later, this methodology was also incorporated, with some changes in terminology, into EPA guidance on Financial Capability Assessment and Schedule development to address Combined Sewer Overflows.[23]

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[21] And, for example, Water Quality Standards (WQS) variance decisions.

[22] United States Environmental Protection Agency, "Interim Economic Guidance for Water Quality Standards Workbook," EPA-823-B-95-002, March 1995

[23] United States Environmental Protection Agency, "Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development, EPA 832-B-97-004, February 1997.

1997 Financial Capability Assessment Guidance [24]

EPA's original FCA Guidance outlined a two-phase analysis whereby a Residential Indicator and an index of Permittee's Financial Capability Indicators are identified. The Residential Indicator provides for a determination of current and projected program costs[25] as a percentage of the permittee's Median Household Income (MHI); the permittee's Financial Indicators reference a variety of measures of financial strength and performance. In combination, using the matrix below, the Residential and Financial Indicators are intended to offer insight into the extent of economic burden that a defined program will impose on a community. Essentially, the same methodology is reflected in EPA's guidance related to social and economic impact assessments used for purpose of considering Use Attainability and potential Water Quality Standards variances in the Safe Drinking Water Act (SDWA) compliance context.

EPA Guidance Financial Capability Matrix			
Permittee Financial Capability Indicators Score (Socioeconomic, Debt and Financial Indicators)	Residential Indicator (Cost Per Household as a % of MHI)		
	Low (Below 1.0%)	Medium (1% - 2%)	High Above 2%)
Weak (Average below 1.5)	Medium Burden	High Burden	High Burden
Medium (Average between 1.5 and 2.5)	Low Burden	Medium Burden	High Burden
Strong (Average Above 2.5)	Low Burden	Low Burden	Medium Burden

* United States Environmental Protection Agency, "Combined Sewer Overflows: Guidance for Financial Capability Assessment and Schedule Development," EPA 832-B-97-004, February 1997. P.41

EPA guidance and negotiation practices also offer general boundaries for adjustments to program schedules established to reflect "normal engineering and construction practices." These boundaries are based on differing levels of economic burden and, in essence, reflect the notion of enabling schedule relief in response to potential economic burdens. The FCA Guidance also contains many caveats concerning the potential use of FCA results, noting that enforcement actions are subject to negotiation and that "special circumstances" will be considered.

[24] United States Environmental Protection Agency, "Combined Sewer Overflows: Guidance for Financial Capability Assessment and Schedule Development," EPA 832-B-97-004, February 1997.

[25] "Current and planned wastewater treatment (WWT) and Combined Sewer Overflow (CSO) controls. (p. 10)

1997 Guidance Review and Critiques

Over the 2.5 decades since original publication, many stakeholders, including the water utility associations and the United States Conference of Mayors, articulated a host of issues with the EPA FCA guidance. These challenges included but were not limited to:

- The dubious logic of an indicator-based Financial Capability Matrix approach to determining the extent of burden as signaled by:
    - No financial indicators relating to the relative costs of other household necessities including, for example, shelter costs and electricity rates.
    - Arithmetic averaging of (arguably inadequate and duplicative[26]) financial indicators (e.g. equal weighting) despite undoubted differences in their relative importance,
    - Use of a "snapshot" of indicator values without consideration of past or emerging trends impacting these values.
    - Singular use of Median Household Indicator values without consideration of the distribution of incomes across service populations.
- The absence of references to utility rates or customer bills under alternative rate increase programs that directly impact ratepayer financial capabilities.

In response to a congressional directive to update EPA policies and guidance on affordability, the Environmental Protection Agency (EPA) contracted with the National Academy of Public Administration (NAPA) to conduct an independent study to create a definition of, and framework for, community affordability of clean water. The subsequent report[27] echoed many of the flaws identified in previous advocacy. In April 2019, in advance of EPA's pending update of its guidance, a report sponsored by water utility associations[28] provided a new framework and methodology to address the shortcomings of the 1997 guidance and accommodate the recommendations contained in the NAPA Report.

[26] These measures are inadequate because of the ready availability of additional and arguably better indicators (as discussed by NACWA in prior publications and in the 2013 USCOM/AWWA/WEF publication: "Affordability Assessment Tool for Federal Water Mandates"); duplicative in that bond ratings, a Guidance indicator, already consider many of the same financial indicators used in the index, and because MHI is already employed in the residential indicator calculation.

[27] Developing a New Framework for Community Affordability of Clean Water Services, National Academy Of Public Administration (NAPA), October 2017

[28] Developing a New Framework for Household Affordability and Financial Capability Assessment in the Water Sector, American Water Works Association, National Association of Clean Water Agencies and Water Environment Federation, April 2019.

2020 – 2021 FCA Guidance Revision

In August, 2020 EPA posted a revision to the 1997 guidance[29] that incorporated many of the recommendations of the NAPA and industry association reports including, perhaps most notably, a focus on impacts on low-income populations. This FCA methodology included use of an additional "Lowest Quintile Burden" matrix that looked at cost as a percentage of lowest quintile income (the Lowest Quintile Residential Indicator or "LQRI") and an index of poverty prevalence indicators (the Poverty Indicator). The 2020 FCA guidance also indicated an implementation schedule benchmark of up to 25 years (absent consideration of additional information) for a community faced with a "High Burden." EPA's 2020 FCA guidance underwent review per the Regulatory Freeze Pending Review Memorandum issued by the White House on January 20, 2021.

As noted in public comments provided following EPA's publication of its 2020 FCA guidance, EPA's FCA guidance revisions made a number of critical improvements to the original 1995 / 1997 guidance documents. In particular, EPA was commended for:

- Enabling use of cash-flow forecast modeling to facilitate the assessment of community financial capabilities
- Including a measure of cost impacts on lowest quintile income residents, and for considering the prevalence of poverty in communities
- Enabling consideration of total water (e.g., drinking water, wastewater, stormwater) service costs

While the water utility associations, as well as numerous other stakeholders, expressed continuing concerns about several methodological and policy-based aspects of the revised guidance,[30] the Proposed 2020 FCA guidance revisions were viewed by the regulated community and industry associations and organizations as generally responsive to prior critical reviews.[31]

In contrast, public comments offered by selected environmental advocacy groups[32] indicated acute concerns with the Proposed FCA guidance revisions. In general, these concerns centered

[29] Proposed 2020 Financial Capability Assessment Guidance, EPA-HQ-OW-2020-0426, USEPA, August 28, 2020 which was followed by prepublication as 2021 Financial Capability Assessment Guidance, 800B21001, January 2021.
[30] Including retention of the Financial Indicator Index, particularly property tax-related metrics, prescriptions about proposed cost adjustments based on household sizes, and others (as discussed below).
[31] See, for example, AWWA/NACWA/WEF Joint letter dated March 16, 2021; comments submitted by Hamilton County, Ohio and on behalf of: Capital Region Water (Harrisburg, PA), Gary (IN) Sanitary District, City of Lancaster (PA), Muncie (IN) Sanitary District, City of Terre Haute (IN), and the Illinois Association of Wastewater Agencies in October 2021.
[32] Including, for example, the Environmental Protection Network and National Resources Defense Council.

on the potential for the guidance revisions to enable extended compliance schedules, delaying remediation of environmental harms. These stakeholders called for the guidance to address the potential to revise utility financing practices and rate structures to address water affordability while continuing to require timely compliance.[33]

Proposed 2022 FCA Guidance Revision (adopted in 2023 Final Guidance)

In December 2021, EPA outlined potential revisions to the 2020 FCA guidance in a presentation provided in the context of the Agency's Water Affordability Learning Exchange.[34] Potential revisions included adding requirements to document affordability strategies, revisions to recommended compliance timelines, update of a Poverty Indicator index, and revising options for incorporating a lowest quintile measure. Perhaps most notable of these potential revisions was the effective abandonment of the Lowest Quintile Residential Indicator measure and relegation of consideration of Lowest Quintile Income as indicative of the prevalence of poverty in a community rather than to highlight potential claims of water service costs on incomes of economically disadvantaged customers. The proposed 2022 FCA Guidance revision was effectively adopted, with few and inconsequential revisions, in the Agency's final guidance issued in February 2023.

The 2023 FCA guidance preserves the acknowledgement that prescribed information submittals may not present a complete and accurate picture of a particular permittee's circumstances. Yet, the final FCA guidance compromises many of the methodological and procedural improvements to the original 1997 FCA guidance outlined in EPA's September 2021 version. Again, these improvements were responsive to long-standing concerns outlined most recently in reports offered by the National Academy of Public Administrators as well as the water industry associations.

Water, wastewater and stormwater utilities concerns continue to include that the 2023 FCA guidance:

- Fails to a consider prospective compliance funding impacts on low-income customers but rather amplifies consideration of the prevalence of poverty in a permittee's service area.
- Calls for submittal of a Financial Alternatives Analysis as a precursor to consideration of extended compliance schedules or water quality standards variances. The guidance does not address prevailing legal or logistical constraints on the prescribed alternatives nor

[33] See, for example, Environmental Protection Network Comments on Proposed 2020 Financial Capability Assessment for Clean Water Act Obligations dated October 19, 2020
[34] Slide presentation: EPA's Financial Capability Assessment for Clean Water Act Obligations, EPA, December 2021

how EPA will gauge whether a permittee's alternatives analysis supports a particular level of burden determination.

- Reiterates defined scheduling benchmarks, most notably 20 years for High Burden communities (or up to 25 years based on additional considerations) rather than referencing useful lives or assets, longer-term financing periods, or recognizing that many 25+ year periods have been approved.

However, the final 2023 Guidance retains the option initially provided for in the Proposed 2021 guidance revisions for communities/permittees to demonstrate financial capability through "dynamic financial and rate models" that evaluate impacts on customers' bills. Use of this Alternative #2 obviates many of the flaws and problems with the burden designations and scheduling boundaries that characterize the Alternative #1 matrix analyses. Because Alternative #2 is more informative and better aligned to actual practice in developing MSD financial plans, it has been selected as the basis for MSD's Phase 2B FCA submittal.

APPENDIX VII: 1997 Financial Capability Assessment Guidance Matrices

Metropolitan Sewer District of Greater Cincinnati (MSDGC)

Financial Capability Assessment UPDATE and 2023 Clean Water Act Financial Capability Assessment Guidance

EPA Guidance: EPA 832-B-97-004 (March 1997) EPA OW, 800b21001, February 2023

Worksheets 1- 10

	Line #		County Phase 2B MSDGC - Hamilton Cty	All Phase 2 Requirements	Data Sources / Notes
RESIDENTIAL INDICATOR					
WORKSHEET #1					
Current WWT Costs					
Annual Operation & Maintenance Expenses (Excluding Depreciation)	100		$148,103,539	$148,103,539	MSD 2024 Operating Budget, County Phase 2B Plan Pro Forma
Annual Pay-Go Costs (Motor Vehicles)	101a		$3,700,000	$3,700,000	MSD 2024 Operating Budget
Annual Long-term Debt Service	101b		$73,812,780	$73,812,780	Synario Pro Forma Fund Summaries
Subtotal (Line 100 + 101)	102		$225,616,319	$225,616,319	
Projected WWT and CSO Costs (in Current Dollars):					
Project Cost					
2024 Cost Estimate	**Infl Fact**		$1,818,025,286	$6,754,000,000	(2023 Dollars) for the FY 2025 - 2034 period and total remaining Phase 2 CWA compliance costs)
Current $ Cost	1.00		$1,818,025,286	$6,754,000,000	
Debt Financed			$1,818,025,286	$6,754,000,000	The $1.82 B value aligns to County Phase 2B Plan **cash-flow forecast** for the FY 2025 - 2034 period. Nominal dollar encumbrances over this period are anticipated to be $2.19 billion.
Pay-Go Allowance Cost					
Incremental O&M Expense as a % of Project Cost					
% of Cost Financed through Debt			100%		
% of Cost Financed through Pay-Go			0%		$6.7 Billion value provided in E-mail titled: Phase 2 Updated Estimated Cost (2023$) from D. Edelstein (5/1/24)
Pay-Go Financing Financing					
Assumed Term					
Revenue Bond Financing					
Assumed Term			30	30	Synario Model assumptions for revenue bond issues - See Appendix 1 (b)
Assumed Interest Rate			5.50%	5.50%	
IFA Loan Financing					
Maximum Amount			-		
Assumed Term			30		
Assumed Interest Rate			3.22%		
Projected Increase in Annual O&M Expense	103	0.75%	$13,635,190	$50,655,000	
Projected Increase in Annual Pay-Go Expense	104a	0.00%	$0	$0	
Projected Increase in Annual Debt Service Expense	104b		$125,089,938	$464,711,602	
Total Projected Increase in Annual Costs	105		$138,725,128	$515,366,602	
Total Current and Projected WWT & CSO Costs (Line 102 + Line 105)	106		$364,341,447	$740,982,921	
Residential Share of Total WWT and CSO Costs					
			61.20%	61.20%	Regulator's value
Residential Share of Total WWT and CSO Cost	107		$222,976,965	$453,481,548	
Total Number of Households in Service Area	108		310,076	310,076	As reported in UC Economics Analysis (see note below) for 2020 number of households
Cost Per Household Per Year (Line 107 / Line 108)	109		$719.10	$1,462.49	
WORKSHEET #2					
Median Household Income					
Census Year MHI	201		$58,115	$58,115	Based on UC Economics analysis of MHI for MSD service area. See: Demographic and Socioeconomic Analysis of Hamilton County, its Political Subdivisions, and the MSD Service Area, January 2024.
MHI Adjustment Factor	202		1.061	1.061	Adjustment based on assumption of 1.5% income growth rate
Adjusted MHI	203		$61,683	$61,683	
Annual WWT and CSO Control Cost Per Household (Line 109)	204		$719.10	$1,462.49	
Select CPH or Rates basis	CPH				
Residential Indicator: Annual Cost Per Household as a Percent of MHI	205		1.17%	2.37%	Mid-Range
Residential Indicator: Annual Cost Per Household as a Percent of Lowest Quintile Income	205		3.09%	6.28%	High

Metropolitan Sewer District of Greater Cincinnati (MSDGC)

Financial Capability Assessment UPDATE and 2023 Clean Water Act Financial Capability Assessment Guidance

EPA Guidance: EPA 832-B-97-004 (March 1997) EPA OW, 800b21001, February 2023

Worksheets 1- 10

	Line #	County Phase 2B MSDGC - Hamilton Cty	All Phase 2 Requirements	Data Sources / Notes
PERMITTEE FINANCIAL INDICATORS				
WORKSHEET #3				
Most Recent GO Bond Rating	301	Aa2	Aa2	Annual Information Statement, County of Hamilton, Ohio 2022 p. 140
Most Recent Revenue (Water and Sewer) Bond Rating	302	Aa2 |AA+	Aa2 |AA+	
Summary Bond Rating	303	AA2 | AA*	AA2 | AA*	
WORKSHEET #4				
Direct Net Debt GO Bonds Excluding Double-Barreled Bonds)	401		$0	
Debt of Overlapping Entities (Proportionate Share of Multi-jurisdictional Debt)	402		$0	
Overall Net Debt (Line 401 + Line 402)	403	$0	$0	Calculated
Market Value of Property	404	$331,372,712	$331,372,712	Hamilton County, Ohio, 2021 Annual Comprehensive Financial Report For the fiscal year ended
Overall Net Debt as a Percent of Full Market Value ((Line 403/Line 404) x 100)	405	0.00%	0.00%	Calculated
WORKSHEET #5				
Unemployment Rate - Permittee	501	3.60%	3.60%	
Unemployment Rate - County	502	3.60%	3.60%	US Census - DP03 Selected Economic Statistics for US and Hamilton County, 2016- 2020, (5 Year Estimates)
Benchmark - Average U.S. Unemployment Rate	503	3.40%	3.40%	
Line 501 (or 502) -Line 503		0.20%	0.20%	
WORKSHEET #6				
Median Household Income - Permittee (Line 203)	601	$61,683	$61,683	
U.S. Median Household Income (Census Year)	602	$64,994	$64,994	US Census - DP03 Selected Economic Statistics for US, Hamilton County, 2016- 2020 (5 Year Estimates)
MHI Adjustment Factor (Line 202)	603	1.0614	1.0614	
Adjusted U.S. Median Household Income (Line 602 * Line 603)	604	$68,984	$68,984	Applies assumed growth rate of 1.5% / year to align with MSD service area estimate notwithstanding national update
WORKSHEET #7				
Full Market Value of Real Property (Line 404)	701	$62,559,332,000	$62,559,332,000	Hamilton County, Ohion, 2021 Annual Comprehensive Financial Report For the fiscal year ended
Property Tax Revenues	702	$320,478,271	$320,478,271	December 31, 2021, p 180 and p. 185
Property Tax Revenue as a Percent of Full Market Property Value (Line 702/ Line 701) X 100	703	0.5123%		Calculated
WORKSHEET #8				
Property Tax Revenue Collected (Line 702)	801	$320,478,271	$320,478,271	
Property Taxes Levied	802	$331,372,712	$331,372,712	Hamilton County, Ohio, 2021 Annual Comprehensive Financial Report For the fiscal year ended, December 31, 2021, p. 185
Property Tax Revenue Collection Rate (Line 801 / Line 802) x 100	803	96.71%	96.71%	Calculated

Metropolitan Sewer District of Greater Cincinnati (MSDGC)

Financial Capability Assessment UPDATE **and** 2023 Clean Water Act Financial Capability Assessment Guidance

EPA Guidance: EPA 832-B-97-004 (March 1997) EPA OW, 800b21001, February 2023

Worksheets 1- 10

	Line #		County Phase 2B MSDGC - Hamilton Cty	All Phase 2 Requirements	Data Sources / Notes
WORKSHEET #9					
Summary of Permittee Financial Indicators Score					
Bond Rating	901		1	1	
Overall Net Debt as a % of FMV	902		3	3	
Unemployment Rate	903		2	2	
MHI	904		2	2	
Property Tax Revenue as a % of FMV	905		1	1	
Property Tax Revenue Collection Rate	906		2	2	
Permittee Indicators Score	907		1.80	1.80	
WORKSHEET #10					
Residential Indicator Score (Line 205)	1001		1.17%	2.37%	
Permittee Financial Capability Indicators Score (Line 907)	1002		1.8	1.8	
Financial Capability Matrix Category	1003		**Medium Burden**	**High Burden**	Reference Matrix
Income Quintile Upper Limits / Usage / Bill Calcs		Weighting			
Lowest Quintile - Cincinnati			$15,990	$15,990	US Census ACS - Household Income Quintile Upper Limits (B19080) 2016-20 5 yr Est.
Lowest Quintile - Hamilton County			$23,275	$23,275	
Adjusted LQI -- Cincinnati			$16,972	$16,972	MHI Adjustment Factor * ACS reported LQI Measures
Adjusted LQI - Hamilton County			$24,704	$24,704	
Lowest Quintile Income Upper Limit (wt. Avg.)					

APPENDIX VIII: MSD Financial Reports



METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

CAPITAL IMPROVEMENT PROGRAM (CIP)

BUDGET REQUEST 2024 - 2028

October 23, 2023

Hamilton County

- Commissioner Alicia Reece, President
- Commissioner Denise Driehaus, Vice President
- Commissioner Stephanie Summerow Dumas
- Jeff Aluotto, County Administrator

City of Cincinnati

- Mayor Aftab Pureval
- Sheryl M. M. Long, City Manager

Metropolitan Sewer District of Greater Cincinnati

Leadership

- Diana Christy, Executive Director
- Jenny Richmond, Deputy Director
- Ryan Welsh, Deputy Director and Chief Engineer

Managing & Contributing Staff

- David Raffenberg, Superintendent, Wastewater Engineering,MSD
- Teresa Brandenburg, Assistant Superintendent, Wastewater Engineering, MSD
- Sara Cramer, Principal Engineer, Wastewater Engineering, MSD
- Ian Laseke, Principal Engineer, Wastewater Engineering, MSD
- Matt Spidare, Principal Engineer, Wastewater Engineering, MSD
- Tony Yee, Principal Engineer, Wastewater Engineering, MSD
- Ian McCoy, Division Manager, IT, MSD
- Todd Papes, Program Manager, Program Management Team
- Joe Graf, Hamilton County Oversight

Metropolitan Sewer District of Greater Cincinnati
Capital Budget and Capital Improvement Program
Year 2024

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Glossary of Terms

Abbreviation	Description
ALW	Allowance
BOCC	Board of County Commissioners, Hamilton County, OH
CDOTE	Cincinnati Department of Transporation & Engineering
CEHRT	Chemically Enhanced High Rate Treatment
CIP	Capital Improvement Program
CON	Contingency
CSO	Combined Sewer Overflow; discharge from a combined sewer collection system.
EPA	Environmental Protection Agency
FAC	Treatment Facility
HNS	Home Numbers
HSTS	Home Sewage Treatment System
HW/DW	High Water, Dry Weather, referes to a specific type of CSO, the condition that occurs when the interceptor sewer floods from area rivers or creeks back-flowing into a CSO structure, resulting in extraneous waters that cause a combined discharge further down the collection system
ITS	IT System
LMCPR	Lower Mill Creek Partial Remedy
LMWWTP	Little Miami Waste Water Treatment Plant
MCWWTP	Mill Creek Waste Water Treatment Plant
MGD	Million Gallons per Day
MSD	Metropolitan Sewer District
MUWWTP	Muddy Creek Waste Water Treatment Plant
N/A	Not Applicable
NPDES	National Pollution Discharge Elimination System; permitting authority overseen by USEPA
O&M	Operations and Maintenance
ODOT	Ohio Department of Transportation
OEPA	Ohio Environmental Protection Agency
ORC	Ohio Revised Code
PRWWTP	Polk Run Waste Water Treatment Plant
PS	Pump Station
PSO	Pump Station Overflow
SBU	Sewer Back Up (aka WIB Water-In-Basement)
SCADA	Supervisory Control and Data Acquisition
SCWWTP	Sycamore Creek Waste Water Treatment Plant
SRC	Source Control
SSO	Sanitary Sewer Overflow; discharge from a separate sanitary sewer
STY	Study
SWR	Sewer
WWC	Wastewater Collection Division of MSD
WWIP	Wet Weather Improvement Program
WWT	Wastewater Treatment Division of MSD
WWTP	Wastewater Treatment Plant

ANNUAL CIP LEGISLATION ASSUMPTIONS

The development of this CIP was based on several key assumptions that are defined below:

Escalation, Inflation, and Labor Inflation

Per MSD's Project Costing Manual

Planning / Study

The cost for planning or study, during any stage of the planning phase. May be performed by MSD personnel and or by consultant contract.

Design

The cost for detailed design during the design phase. May be performed by MSD personnel and or by consultant contract.

Pre Construction Services

Prior to 2020, this included the cost of MSD personnel performing support functions during the planning and design phases. These costs are now captured in an Allowance for MSD Labor.

Miscellaneous Expense

The cost of all permit fees paid directly by MSD during the design phase. These costs include, but are not limited to, PTI, street opening permit, building permits, 401 permits. In addition, costs may include utility relocations and demolition if not handled during construction.

Right of Way

The cost of easement acquisition by MSD personnel, professional services for appraisal and title opinions, appropriation costs, court costs, and compensation paid to property owners for easements during the design phase.

Construction

The bid cost to construct the project as estimated by the engineer, including startup and commissioning costs if required for project.

Construction Services

The cost for construction phase professional services, as needed, including construction management, construction inspection, field engineering and other related costs.

MSD Labor

The cost for MSD project planning, design and delivery related activities, including project management, construction management, construction inspection, field engineering, and other project-related personnel costs.

2024 - 2028 CIP

The schedule for the Phase 2 WWIP remains under development by the City and County in preparation for anticipated Regulatory discussions. Individual projects to be advanced are subject to change pending on-going engineering or affordability considerations. Due to the evolving nature of these evaluations and their direct impact on future regulatory compliance, the Projects associated with the future Phase 2 WWIP have not been included in this CIP.

Legislated Costs

Legislated costs include costs that have been previously legislated and legislation anticipated to be approved during 2024. Due to this assumption, it may be the case that some legislated costs may not have been approved at the time of drafting this document.

Cost Estimates

MSD cost estimates follow industry best practice by using Association for the Advancement of Cost Engineering International (AACE) standards. Planning projects have the most uncertainty as they are based on minimal definition of scope (AACE Class 5 estimate) and have an expected accuracy range of -50% to +100%. Accuracy of cost estimates increases significantly as designs progress, and construction projects can have a Class 2 or Class 1 estimate because they are better defined, and because the estimated cost is based on a formal requirement called the Engineer's Opinion of Probable Construction Costs (OPCC). Recent economic volatility and local market conditions have generally created higher levels of cost uncertainty for future construction projects, and this effect is compounded for projects in the latter years of the 5-year CIP.

Project Schedules

Project schedules are established based on the use of a standard template developed for the type and size of the project. The schedules are then refined to address project specific issues or complexities, such as alternative delivery method, hydraulic physical modeling, or extensive ROW acquisition requirements. In general, the schedule templates for conveyance projects account for a typical ROW activity and duration. This is not included in most facility projects. All schedules are created and maintained in Primavera P6 and updated on a regular basis to reflect the current forecasted completion of the remaining milestones.

HRT Project Schedules

All HRT project schedules included herein are subject to change based on ongoing regulatory discussions related to Phase 2A of the WWIP. The schedules will be adjusted prior to finalization of the CIP.

2024 CIP Projects

Metropolitan Sewer District of Greater Cincinnati

Planning/Design/Easement Funding Request (Exhibit A)

Project ID	Project Type	Project Name	Project Phase(s)	P/D/E Funds Requested
10132930	SWR	Wulff Run Sewer Replacement	(Design,Easement)	$2,722,000
10142950	SWR	East Branch Ohio River Interceptor Extension	(Design)	$1,900,000
10145680	SRC	CSO 24 Regulator Improvements	(Planning)	$167,000
10182024	ALW	Urgent Capacity Response 2024	(Planning)	$500,000
10190224	ALW	Phase 2 WWIP Planning 2024	(Planning)	$1,000,000
10199024	ALW	Program Management and Support Services 2024	(Design)	$7,394,299
10199124	ALW	Hamilton County Utility Oversight and Coordination 2024	(Design)	$4,878,359
10222010	FAC	TCWWTP Aeration Basin Conversion	(Design)	$1,346,200
10230655	SWR	Muddy Creek Road and Rosebud Drive Sewer Replacement	(Design,Easement)	$300,000
10232025	SWR	3731 Glenmore Avenue Sewer Evaluation	(Design)	$154,000
10232045	FAC	MUWWTP UV Disinfection Replacement	(Planning)	$245,000
10240275	SWR	SSO 603 and 704 Improvements	(Design)	$348,000
10240525	SWR	Victory Parkway Sewer Rehabilitation	(Design)	$132,060
10240790	SWR	Clifton Avenue at Parker Street Sewer Replacement	(Planning)	$92,000
10240845	SWR	Taft Road & McMillan Street Sewer Replacement	(Design,Easement)	$435,800
10242055	SWR	Queen City Avenue (HN 2047) Sewer Rehabilitation	(Design,Easement)	$165,500
10242080	SWR	Fenton Avenue (HN 1336) Sewer Relocation	(Design,Easement)	$248,000
10242090	SWR	Donna Lane & Ester Marie Drive Sewer Relocation and Rehab	(Design,Easement)	$185,000
10242105	SWR	Loth Street (HN 2272) Sewer Relocation and Rehab	(Design,Easement)	$327,000
10242155	SWR	Morrison Avenue Sewer Replacement	(Planning)	$160,000
10242185	SWR	Anthony to Innes Sewer Replacement	(Planning)	$237,000
10252035	SWR	East Loveland Ave Sewer Replacement Phase 2	(Planning)	$251,600
10270225	SWR	Elsmere Avenue from Slane to Lafayette Sewer Replacement	(Design,Easement)	$1,104,000
10272050	PS	Wayside Hills Pump Station	(Design,Easement)	$642,500
10272075	SWR	Wayside Avenue and Colter Avenue Sewer Improvements	(Design,Easement)	$483,400
10272080	SWR	Madison Rd and Edwards Rd Sewer Improvements	(Design,Easement)	$434,500
10272090	SWR	Delta Ave at Linwood Ave Sewer Replacement	(Planning)	$231,000
10280244	ALW	Hydraulic Modeling 2024	(Planning)	$2,794,000
10281100	FAC	LMWWTP Solids Disposal With Odor Control	(Design)	$1,400,000
10282024	ALW	CIP Planning Projects 2024	(Planning)	$4,000,000
10282424	ALW	Flow Monitoring Support 2024	(Planning)	$2,120,000
13090000	CON	Programmatic Contingency	(Design)	$5,000,000
13099999	ALW	MSD LABOR	(Design)	$6,210,000
33 Planning/Design/Easement Projects in 2024				**$ 47,608,218**

FY 2024 MSD CIP Funding Request
Metropolitan Sewer District of Greater Cincinnati
Estimate of Construction
Detailed Project Estimated Cost (Exhibit B)

ID#	CIP#	Project Name	Location	Explanation/Description	Legislation Type	Resolution 1	Resolution 2	Resolution 3		Current Request	WWIP	AM	Proj Start	Proj End
10180124	NA	Main Sewer Renewal Program 2024	Throughout the MSD service area	This allowance addresses the renewal, repair, and rehabilitation of existing main sewers throughout MSD's service area using trenchless technologies. The program focuses on structurally deteriorated main sewers to improve the hydraulic performance of the sewer. Building sewers are excluded. Trenchless technologies have many benefits such as; shorter duration, durable, safer, and cost effective. This program's scope will include, but not limit itself to, slip-lining, point lining, spiral wound lining, pipe bursting, carbon filament wrapping, directional drilling, jack-and-boring, Cured-in-place-pipe, and other methods. The sewer segments to be addressed under this program were identified through investigations (condition assessments) of the sewer lines and are prioritized based on their risk ranking relative to sewer's structural condition, and the likelihood and consequence of a sewer failure. The risk ranking is calculated utilizing the Gravity Sewer Asset Management System (GSAM).	Const	Approve - plans/ specs/ cost est.	Necessity/ Proceed	Authorize - advertise and bid	$	6,662,658.00	X		Jan 2024	Dec 2024
10180224	NA	Manhole Renewal Program 2024	Throughout the MSD service area	This allowance addresses the repair, rehabilitation and replacement of structurally deteriorated manholes throughout the system. The work includes manhole repairs, rim adjustments, replacement, and chimney repairs to accommodate street paving and improvement projects. Manhole repairs, rehab and replacement projects are prioritized based on their risk ranking relative to structural condition and the likelihood and consequence of failure.	Const	Approve - plans/ specs/ cost est.	Necessity/ Proceed	Authorize - advertise and bid	$	1,079,083.00	X		Jan 2024	Dec 2024
10281324	NA	Prioritized Wastewater Collection System Improvements 2024	Throughout the MSD service area	This allowance is intended to repair and renew failed and/or structurally deteriorated sewer segments by responding to sudden, unexpected system failures, completing planned repairs and improvements to high-risk utility-owned assets, to remedy structurally failed privately-owned active building sewers located within the right-of-way, and making prioritized system improvements through construction coordination of projects. Collectively, this operational strategy will assist in achieving and maintaining acceptable levels of service at the lowest life-cycle cost.	Const	Approve - plans/ specs/ cost est.	Necessity/ Proceed	Authorize - advertise and bid	$	21,424,500.00		X	Jan 2024	Dec 2024
10280724	NA	Critical Asset Management Projects 2024	Throughout the MSD service area	This allowance provides capital resources to address a risk-based prioritized wastewater treatment expenditure that are critical to sustain operational, regulatory, and safety expected performance levels. Expenditures are identified, planned, prioritized, and executed within the allowance annual budget.	Const	Approve - plans/ specs/ cost est.	Necessity/ Proceed	Authorize - advertise and bid	$	7,427,350.00		X	Jan 2024	Dec 2024
								Total	**$**	**36,593,591.00**				

FY 2024 MSD CIP Funding Request
Metropolitan Sewer District of Greater Cincinnati
Estimate of Construction
Detailed Project Estimated Cost (Exhibit B)

ID#	CIP#	Project Name	Planning	Design	Pre-Construction Services	Miscellaneous Expense	Right Of Way	Construction	Contingency	Construction Services	Interest / Financing	Total
10180124	NA	Main Sewer Renewal Program 2024	$ -	$ -	$ -	$ -	$ -	$ 6,662,658.00	$ -	$ -	$ -	$ 6,662,658.00
10180224	NA	Manhole Renewal Program 2024	$ -	$ -	$ -	$ -	$ -	$ 968,211.00	$ -	$ 110,872.00	$ -	$ 1,079,083.00
10281324	NA	Prioritized Wastewater Collection System Improvements 2024	$ -	$ -	$ -	$ -	$ -	$ 18,360,900.00	$ -	$ 3,063,600.00	$ -	$ 21,424,500.00
10280724	NA	Critical Asset Management Projects 2024	$ -	$ -	$ -	$ -	$ -	$ 7,427,350.00	$ -	$ -	$ -	$ 7,427,350.00
											Total	**$ 36,593,591.00**

Approved this _____ day of _____, 2023
Board of County Commissioners
Hamilton County, Ohio

Ryan Welsh, P.E.
Deputy Director, MSD
Hamilton County Sanitary Engineer
(for the purposes of the Metropolitan Sewer District of Greater Cincinnati
as authorized in the Resolution of February 28, 2007, Comm. Minutes, Vol. 305, Images 4190-4191)
City of Cincinnati Department of Sewers

Project ID	Project Type	Project Name	Project Phase(s)	2024 Total Requested	Total Project Cost
10132930	SWR	Wulff Run Sewer Replacement	(Design,Easement)	$2,722,000	$31,605,600
10142950	SWR	East Branch Ohio River Interceptor Extension	(Design)	$1,900,000	$109,900,000
10145680	SRC	CSO 24 Regulator Improvements	(Planning)	$167,000	$3,344,000
10180124	ALW	Main Sewer Renewal Program 2024	(Construction)	$6,662,658	$6,662,658
10180224	ALW	Manhole Renewal Program 2024	(Construction)	$1,079,083	$1,079,083
10182024	ALW	Urgent Capacity Response 2024	(Planning)	$500,000	$500,000
10190224	ALW	Phase 2 WWIP Planning 2024	(Planning)	$1,000,000	$1,000,000
10199024	ALW	Program Management and Support Services 2024	(Design)	$7,394,299	$7,394,299
10199124	ALW	Hamilton County Utility Oversight and Coordination 2024	(Design)	$4,878,359	$4,878,359
10222010	FAC	TCWWTP Aeration Basin Conversion	(Design)	$1,346,200	$10,994,500
10222015	PS	Stratford Lake Pump Station Elimination	(Construction)	$150,000	$246,733
10230655	SWR	Muddy Creek Road and Rosebud Drive Sewer Replacement	(Design,Easement)	$300,000	$895,000
10232025	SWR	3731 Glenmore Avenue Sewer Evaluation	(Design)	$154,000	$566,000
10232045	FAC	MUWWTP UV Disinfection Replacement	(Planning)	$245,000	$5,273,000
10240275	SWR	SSO 603 and 704 Improvements	(Design)	$348,000	$11,570,181
10240445	SWR	Colton Lane Sewer Replacement	(Construction)	$425,900	$478,544
10240525	SWR	Victory Parkway Sewer Rehabilitation	(Design)	$132,060	$3,092,770
10240760	SWR	Highland and Burnet Sewer Replacement	(Construction)	$308,326	$449,263
10240790	SWR	Clifton Avenue at Parker Street Sewer Replacement	(Planning)	$92,000	$923,000
10240810	SWR	Overlook Avenue near Glenway Ave Sewer Replacement	(Construction)	$396,000	$928,000
10240820	SWR	Reading Road at Stewart Place Sewer Replacement	(Construction)	$372,513	$738,513
10240845	SWR	Taft Road & McMillan Street Sewer Replacement	(Design,Easement)	$435,800	$1,956,600
10242055	SWR	Queen City Avenue (HN 2047) Sewer Rehabilitation	(Design,Easement)	$165,500	$403,500
10242080	SWR	Fenton Avenue (HN 1336) Sewer Relocation	(Design,Easement)	$248,000	$1,578,000

2024 CIP Projects

Metropolitan Sewer District of Greater Cincinnati

Project ID	Project Type	Project Name	Project Phase(s)	2024 Total Requested	Total Project Cost
10242090	SWR	Donna Lane & Ester Marie Drive Sewer Relocation and Rehab	(Design,Easement)	$185,000	$883,000
10242105	SWR	Loth Street (HN 2272) Sewer Relocation and Rehab	(Design,Easement)	$327,000	$2,187,000
10242155	SWR	Morrison Avenue Sewer Replacement	(Planning)	$160,000	$2,500,000
10242185	SWR	Anthony to Innes Sewer Replacement	(Planning)	$237,000	$4,270,000
10252035	SWR	East Loveland Ave Sewer Replacement Phase 2	(Planning)	$251,600	$5,914,299
10270225	SWR	Elsmere Avenue from Slane to Lafayette Sewer Replacement	(Design,Easement)	$1,104,000	$9,489,300
10272050	PS	Wayside Hills Pump Station	(Design,Easement)	$642,500	$2,332,500
10272075	SWR	Wayside Avenue and Colter Avenue Sewer Improvements	(Design,Easement)	$483,400	$867,200
10272080	SWR	Madison Rd and Edwards Rd Sewer Improvements	(Design,Easement)	$434,500	$3,425,525
10272090	SWR	Delta Ave at Linwood Ave Sewer Replacement	(Planning)	$231,000	$4,820,000
10280244	ALW	Hydraulic Modeling 2024	(Planning)	$2,794,000	$2,794,000
10280724	ALW	Critical Asset Management Projects 2024	(Construction)	$7,427,350	$7,427,350
10281100	FAC	LMWWTP Solids Disposal With Odor Control	(Design,Construction)	$175,800,000	$193,380,943
10281324	ALW	Prioritized Wastewater Collection System Improvements 2024	(Construction)	$21,424,500	$21,424,500
10282024	ALW	CIP Planning Projects 2024	(Planning)	$4,000,000	$4,000,000
10282424	ALW	Flow Monitoring Support 2024	(Planning)	$2,120,000	$2,120,000
13090000	CON	Programmatic Contingency	(Design)	$5,000,000	$55,306,868
13099999	ALW	MSD LABOR	(Design)	$6,210,000	$55,240,593
42 CIP Projects for 2024				**$260,254,548**	**$584,840,681**

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Wulff Run Sewer Replacement

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10132930**
WWIP Index #: **332 333 334**
Project Type: **Sewer**
Project Phase: Planning
WWTP Basin: Muddy Creek
Sanitary Sewer No: **7187**
Watershed: Wulff Run
Municipality: Delhi Township
Neighborhood: Inside Ham Cty/Outside City

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): 623

Project Description

This project is located in the Muddy Creek sewershed of the West Basin in Delhi Township, Hamilton County, Ohio. The sewer that collects flow from the area along Delhi Road and Wulff Run Creek is undersized. The proposed project area begins as a 12-inch sewer near Schroer Avenue and ends as an 18-inch sewer at Neeb Rd. Most of the sewer segments show surcharging in the 6-month design storm. There are a number of confirmed overflowing manholes along Wulff Run, as well as SBU properties and SSO 623 on a branch line at Viscount Drive. The project will evaluate alternatives for upsizing the sewer or otherwise improving conveyance capacity as well as evaluate alternatives for control of SSO 623.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$489,500	$489,500	$0	$0	$489,500
Design	$908,700	$0	$1,800,000	$0	$1,800,000
Pre-Construction Services	$0	$0	$0	$0	$0
Miscellaneous Expense	$164,300	$0	$422,000	$0	$422,000
Right-of-Way	$0	$0	$500,000	$0	$500,000
Construction	$28,131,300	$0	$0	$27,631,300	$27,631,300
Program Management	$0	$0	$0	$0	$0
Construction Services	$762,800	$0	$0	$762,800	$762,800
Interest / Financing	$0	$0	$0	$0	$0
Total	$30,456,600	$489,500	$2,722,000	$28,394,100	$31,605,600

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$489,500	$2,722,000	$0	$0	$28,394,100	$0	$31,605,600

Prior Legislation Action

Jan 2023,Aug 2023

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	11/27/2023	01/01/2024	03/18/2026	03/01/2028		08/31/2029	
End Date	11/27/2024	10/20/2027	07/30/2027	08/31/2029		08/31/2030	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

East Branch Ohio River Interceptor Extension

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10142950**
Project Type: **Sewer**
WWTP Basin: Mill Creek
Watershed: East Ohio River
Municipality: City of Cincinnati
Neighborhood: Queensgate
WWIP Index #: **394,395,396,417**
Project Phase: Planning
Sanitary Sewer No:

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): 430,431,432,489,666
SSO(s): N/A
PSO(s): N/A

Project Description

This project will plan, design, and construct conveyance system infrastructure improvements to increase flow from combined sewer overflows (CSOs) 666, 430, 431, 432, and 489 to the Mill Creek WWTP. Overflow volumes from CSOs 666, 430, and 431 will be mitigated, and overflow volumes from CSOs 432 and 489 will be eliminated via separation. This effort will involve design and construction coordination with ODOT on their upcoming project, HAM 75 113361, as well as full construction cost reimbursement from ODOT. At the direction of the County, the proposed construction legislation of $103,300,000 has been removed from the 2025 CIP Year. This likely will be required however in order to award this contract when bid.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$1,600,000	$1,000,000	$0	$0	$1,000,000
Design	$3,400,000	$3,400,000	$1,900,000	$0	$5,300,000
Pre-Construction Services	$0	$0	$0	$0	$0
Miscellaneous Expense	$300,000	$300,000	$0	$0	$300,000
Right-of-Way	$0	$0	$0	$0	$0
Construction	$79,300,000	$0	$0	$100,500,000	$100,500,000
Program Management	$0	$0	$0	$0	$0
Construction Services	$4,700,000	$0	$0	$2,800,000	$2,800,000
Interest / Financing	$0	$0	$0	$0	$0
Total	$89,300,000	$4,700,000	$1,900,000	$103,300,000	$109,900,000

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$4,700,000	$1,900,000	$0	$0	$0	$0	$6,600,000

Prior Legislation Action

Jan 2023

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/03/2023	01/02/2023	08/21/2024	03/24/2026		09/24/2027	
End Date	11/29/2023	10/06/2025	08/20/2025	09/24/2027		09/22/2028	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

CSO 24 Regulator Improvements

2024 Capital Budget and Capital Improvement Program

Project Overview		Benefited CSO(s), SSO(s), PSO(s)	
Project ID: **10145680**	WWIP Index #: **453R**	CSO(s):	24
Project Type: **Source Control**	Project Phase: Preplanning	SSO(s):	N/A
WWTP Basin: Mill Creek	Sanitary Sewer No: **7247**	PSO(s):	N/A
Watershed: Kings Run			
Municipality: City of Cincinnati			
Neighborhood: Northside			

Project Description

Combined Sewer Outfall (CSO) 24, located in the Ludlow Run sewer system, has chronic underflow drain blockages that cause dry weather overflows into the Mill Creek. The project will evaluate hydraulic improvements for the underflow pipe and condition of the nearby sewer system. The project is located in the Northside neighborhood of Cincinnati and the bottom of the Kings Run watershed.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$167,000	$0	$167,000	$0	$167,000
Design	$312,000	$0	$0	$312,000	$312,000
Pre-Construction Services	$0	$0	$0	$0	$0
Miscellaneous Expense	$106,000	$0	$0	$106,000	$106,000
Right-of-Way	$0	$0	$0	$0	$0
Construction	$2,360,000	$0	$0	$2,360,000	$2,360,000
Program Management	$0	$0	$0	$0	$0
Construction Services	$399,000	$0	$0	$399,000	$399,000
Interest / Financing	$0	$0	$0	$0	$0
Total	$3,344,000	$0	$167,000	$3,177,000	$3,344,000

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$0	$167,000	$418,000	$0	$0	$0	$585,000

Prior Legislation Action

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/02/2024	11/26/2025	03/10/2027	05/07/2029		11/08/2030	
End Date	11/26/2025	11/29/2028	09/07/2028	11/08/2030	09/09/2030	11/07/2031	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Main Sewer Renewal Program 2024

2024 Capital Budget and Capital Improvement Program

Project Overview		Benefited CSO(s), SSO(s), PSO(s)	
Project ID: **10180124**	WWIP Index #: **113**	CSO(s):	N/A
Project Type: **Allowance**	Project Phase: Allowance	SSO(s):	N/A
WWTP Basin: Multiple	Sanitary Sewer No:	PSO(s):	N/A
Watershed: Multiple			
Municipality: System Wide			
Neighborhood: Systemwide			

Project Description

This allowance addresses the renewal, repair, and rehabilitation of existing main sewers throughout MSD's service area using trenchless technologies. The program focuses on structurally deteriorated main sewers to improve the hydraulic performance of the sewer. Building sewers are excluded. Trenchless technologies have many benefits such as; shorter duration, durable, safer, and cost effective. This program's scope will include, but not limit itself to, slip-lining, point lining, spiral wound lining, pipe bursting, carbon filament wrapping, directional drilling, jack-and-boring, Cured-in-place-pipe, and other methods. The sewer segments to be addressed under this program were identified through investigations (condition assessments) of the sewer lines and are prioritized based on their risk ranking relative to sewer's structural condition, and the likelihood and consequence of a sewer failure. The risk ranking is calculated utilizing the Gravity Sewer Asset Management System (GSAM).

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$0	$0	$0	$0	$0
Design	$0	$0	$0	$0	$0
Pre-Construction Services	$0	$0	$0	$0	$0
Miscellaneous Expense	$0	$0	$0	$0	$0
Right-of-Way	$0	$0	$0	$0	$0
Construction	$0	$0	$6,662,658	$0	$6,662,658
Program Management	$0	$0	$0	$0	$0
Construction Services	$200,000	$0	$0	$0	$0
Interest / Financing	$0	$0	$0	$0	$0
Total	$200,000	$0	$6,662,658	$0	$6,662,658

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$0	$6,662,658	$0	$0	$0	$0	$6,662,658

Prior Legislation Action

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	n/a	01/01/2024	n/a	01/01/2024		n/a	
End Date	n/a	06/30/2025	n/a	06/30/2025		n/a	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Manhole Renewal Program 2024

2024 Capital Budget and Capital Improvement Program

Project Overview		Benefited CSO(s), SSO(s), PSO(s)	
Project ID: **10180224**	WWIP Index #: **113**	CSO(s):	N/A
Project Type: **Allowance**	Project Phase: Allowance	SSO(s):	N/A
WWTP Basin: System Wide	Sanitary Sewer No:	PSO(s):	N/A
Watershed: Multiple			
Municipality: Multiple			
Neighborhood: Systemwide			

Project Description

This allowance addresses the repair, rehabilitation and replacement of structurally deteriorated manholes throughout the system. The work includes manhole repairs, rim adjustments, replacement, and chimney repairs to accommodate street paving and improvement projects. Manhole repairs, rehab and replacement projects are prioritized based on their risk ranking relative to structural condition and the likelihood and consequence of failure.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$0	$0	$0	$0	$0
Design	$0	$0	$0	$0	$0
Pre-Construction Services	$0	$0	$0	$0	$0
Miscellaneous Expense	$0	$0	$0	$0	$0
Right-of-Way	$0	$0	$0	$0	$0
Construction	$0	$0	$968,211	$0	$968,211
Program Management	$0	$0	$0	$0	$0
Construction Services	$0	$0	$110,872	$0	$110,872
Interest / Financing	$0	$0	$0	$0	$0
Total	$0	$0	$1,079,083	$0	$1,079,083

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$0	$1,079,083	$0	$0	$0	$0	$1,079,083

Prior Legislation Action

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	n/a	01/01/2024	n/a	01/01/2024		n/a	
End Date	n/a	12/31/2024	n/a	12/31/2024		n/a	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Urgent Capacity Response 2024

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10182024**
Project Type: **Allowance**
WWTP Basin: System Wide
Watershed: Multiple
Municipality: System Wide
Neighborhood: Systemwide

WWIP Index #:
Project Phase: Allowance
Sanitary Sewer No: **7250**

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): N/A

Project Description

This allowance will provide funding for professional services for conducting any needed general ad-hoc studies, model calibration, and or engineering services needed to evaluate priority and chronic SBU areas. Where capital projects are needed to resolve identified issues, new projects will be nominated for inclusion in future CIP.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$500,000	$0	$500,000	$0	$500,000
Design	$0	$0	$0	$0	$0
Pre-Construction Services	$0	$0	$0	$0	$0
Miscellaneous Expense	$0	$0	$0	$0	$0
Right-of-Way	$0	$0	$0	$0	$0
Construction	$0	$0	$0	$0	$0
Program Management	$0	$0	$0	$0	$0
Construction Services	$0	$0	$0	$0	$0
Interest / Financing	$0	$0	$0	$0	$0
Total	$500,000	$0	$500,000	$0	$500,000

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$0	$500,000	$0	$0	$0	$0	$500,000

Prior Legislation Action

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/01/2024	n/a	n/a	n/a		n/a	
End Date	12/31/2024	n/a	n/a	n/a		n/a	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Phase 2 WWIP Planning 2024

2024 Capital Budget and Capital Improvement Program

Project Overview		Benefited CSO(s), SSO(s), PSO(s)	
Project ID: **10190224**	WWIP Index #: **113**	CSO(s):	N/A
Project Type: **Allowance**	Project Phase: Allowance	SSO(s):	N/A
WWTP Basin: System Wide	Sanitary Sewer No: **7051**	PSO(s):	N/A
Watershed: Multiple			
Municipality: System Wide			
Neighborhood: Systemwide			

Project Description

This allowance will provide funding for regulatory related legal services and as-needed Studies or Engineering Services in support of the development of the Phase 2 WWIP.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$0	$0	$1,000,000	$0	$1,000,000
Design	$0	$0	$0	$0	$0
Pre-Construction Services	$0	$0	$0	$0	$0
Miscellaneous Expense	$0	$0	$0	$0	$0
Right-of-Way	$0	$0	$0	$0	$0
Construction	$0	$0	$0	$0	$0
Program Management	$0	$0	$0	$0	$0
Construction Services	$0	$0	$0	$0	$0
Interest / Financing	$0	$0	$0	$0	$0
Total	$0	$0	$1,000,000	$0	$1,000,000

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$0	$1,000,000	$0	$0	$0	$0	$1,000,000

Prior Legislation Action

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/02/2024	n/a	n/a	n/a		n/a	
End Date	12/26/2024	n/a	n/a	n/a		n/a	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Program Management and Support Services 2024

2024 Capital Budget and Capital Improvement Program

Project Overview		Benefited CSO(s), SSO(s), PSO(s)	
Project ID: **10199024**	WWIP Index #: **113**	CSO(s):	N/A
Project Type: **Allowance**	Project Phase: Allowance	SSO(s):	N/A
WWTP Basin: System Wide	Sanitary Sewer No:	PSO(s):	N/A
Watershed: Multiple			
Municipality: System Wide			
Neighborhood: Systemwide			

Project Description

This allowance will provide funding for the integrated Program Management Team (PMT) providing essential support to MSD for the development and delivery of the entire CIP, inclusive of all WWIP and Asset Management projects and allowances. The services are defined in an Annual Program Work Plan which is reviewed by MSD and the County annually to confirm priorities and objectives. The PMT services have averaged less than 5% annually as a percent of the CIP, which is consistent with average National Program Management Fees, per CMAA. This allowance also provides $300,000 in funding for capital project related legal services provided by outside counsel.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$0	$0	$0	$0	$0
Design	$0	$0	$0	$0	$0
Pre-Construction Services	$0	$0	$7,394,299	$0	$7,394,299
Miscellaneous Expense	$0	$0	$0	$0	$0
Right-of-Way	$0	$0	$0	$0	$0
Construction	$0	$0	$0	$0	$0
Program Management	$0	$0	$0	$0	$0
Construction Services	$0	$0	$0	$0	$0
Interest / Financing	$0	$0	$0	$0	$0
Total	$0	$0	$7,394,299	$0	$7,394,299

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$0	$7,394,299	$0	$0	$0	$0	$7,394,299

Prior Legislation Action

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/02/2024	n/a	n/a	n/a		n/a	
End Date	12/31/2024	n/a	n/a	n/a		n/a	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Hamilton County Utility Oversight and Coordination 2024

2024 Capital Budget and Capital Improvement Program

Project Overview		Benefited CSO(s), SSO(s), PSO(s)	
Project ID: **10199124**	WWIP Index #: **113**	CSO(s):	N/A
Project Type: **Allowance**	Project Phase: Allowance	SSO(s):	N/A
WWTP Basin: System Wide	Sanitary Sewer No:	PSO(s):	N/A
Watershed: Multiple			
Municipality:			
Neighborhood:			

Project Description

The Hamilton County Board of County Commissioners has determined that the use of County staff, outside consultants, and attorneys ("County Monitor Team") is warranted to perform oversight of MSD's implementation of the Wet Weather Improvement Program "WWIP". This project funds this oversight function. The County Monitor Team will work closely with MSD employees and supplemental staff. The Board is solely responsible for selecting, supervising, and directing the County monitor. The Board is solely responsible for determining that (1) the County Monitor Team's work is an appropriate expenditure of MSD funds under R.C. 6117.02 and consistent with the 1968 Operating Agreement (including all amendments), and (2) the County Monitor Team is charging fees and expenses consistent with the Board's contracts with the County Monitor consultant.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$0	$0	$0	$0	$0
Design	$0	$0	$0	$0	$0
Pre-Construction Services	$0	$0	$4,878,359	$0	$4,878,359
Miscellaneous Expense	$0	$0	$0	$0	$0
Right-of-Way	$0	$0	$0	$0	$0
Construction	$0	$0	$0	$0	$0
Program Management	$0	$0	$0	$0	$0
Construction Services	$0	$0	$0	$0	$0
Interest / Financing	$0	$0	$0	$0	$0
Total	$0	$0	$4,878,359	$0	$4,878,359

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$0	$4,878,359	$0	$0	$0	$0	$4,878,359

Prior Legislation Action

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	n/a	n/a	n/a	n/a		n/a	
End Date	n/a	n/a	n/a	n/a		n/a	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

TCWWTP Aeration Basin Conversion

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10222010** WWIP Index #: **NA**
Project Type: **Treatment Facility** Project Phase: Planning
WWTP Basin: Taylor Creek Sanitary Sewer No: **6989**
Watershed: Taylor Creek - Miamitown
Municipality: Colerain Township
Neighborhood: Inside Ham Cty/Outside City

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): N/A

Project Description

The Taylor Creek Wastewater Treatment Plant's (TCWWTP) aeration basins are original to the plant and over time developed operational and maintenance issues. Specific items include, but not limited to, biological treatment interruptions and treatment process short circuiting, unreliable wheel drive assembly, deterioration of the concrete walls, and aeration system deficiencies. This project will replace the aeration tanks at Taylor Creek WWTP to improve operation and maintenance, to meet future nutrient removal requirements, and to treat additional flow from the future Whitewater Township Rt. 128 sewer expansion.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$250,000	$0	$0	$0	$0
Design	$390,000	$0	$956,200	$0	$956,200
Pre-Construction Services	$120,000	$0	$0	$0	$0
Miscellaneous Expense	$390,000	$0	$390,000	$0	$390,000
Right-of-Way	$0	$0	$0	$0	$0
Construction	$3,100,000	$0	$0	$8,662,100	$8,662,100
Program Management	$0	$0	$0	$0	$0
Construction Services	$390,000	$0	$0	$986,200	$986,200
Interest / Financing	$0	$0	$0	$0	$0
Total	$4,640,000	$0	$1,346,200	$9,648,300	$10,994,500

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$0	$1,346,200	$9,648,300	$0	$0	$0	$10,994,500

Prior Legislation Action

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	06/07/2021	01/02/2024	n/a	03/26/2026		05/21/2027	
End Date	02/21/2024	11/12/2025	n/a	05/21/2027		05/19/2028	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Stratford Lake Pump Station Elimination

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10222015** WWIP Index #: **NA**
Project Type: **Pump Station** Project Phase: Design/ROW
WWTP Basin: Taylor Creek Sanitary Sewer No:
Watershed: Taylor Creek - Miamitown
Municipality: Green Township
Neighborhood: Inside Ham Cty/Outside City

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): N/A

Project Description

As a result of the recent 514 Agreement with the Ivy Rose development, a new gravity sewer connecting Castlebrook Ct. to Reemlin Rd. has been installed. This has eliminated the need for the Stratford Lakes Pump Station which has been offline since Fall 2022. The intent of this project is to remove the Stratford Lakes Pump Station and, if feasible, relocate the associated odor control system contained within the existing pump station to a location closer to the Boomer Road low pressure force main.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$76,733	$76,733	$0	$0	$76,733
Design	$104,261	$0	$0	$0	$0
Pre-Construction Services	$0	$0	$0	$0	$0
Miscellaneous Expense	$46,300	$20,000	$0	$0	$20,000
Right-of-Way	$0	$0	$0	$0	$0
Construction	$591,580	$0	$150,000	$0	$150,000
Program Management	$0	$0	$0	$0	$0
Construction Services	$61,524	$0	$0	$0	$0
Interest / Financing	$0	$0	$0	$0	$0
Total	$880,398	$96,733	$150,000	$0	$246,733

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$96,733	$150,000	$0	$0	$0	$0	$246,733

Prior Legislation Action

Dec 2020,Jan 2022

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/01/2021	01/10/2022	n/a	06/07/2024		02/03/2025	
End Date	10/29/2021	01/24/2024	n/a	02/03/2025	12/04/2024	02/02/2026	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Muddy Creek Road and Rosebud Drive Sewer Replacement

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10230655**
WWIP Index #: **NA**
Project Type: **Sewer**
Project Phase: Planning
WWTP Basin: Muddy Creek
Sanitary Sewer No: **6771**
Watershed: Upper Muddy Creek
Municipality: City of Cincinnati
Neighborhood: Westwood

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): N/A

Project Description

The project will evaluate the replacement or rehabilitation of approximately 700-linear feet of structurally deficient 24-inch vitrified clay sewers near the intersection of Muddy Creek Road and Rosebud Drive installed in 1923. The planning effort will also evaluate alternatives for alleviating capacity related issues in the project area which may include evaluation of a relief sewer to the Westwood Trunk Sewer located south of Muddy Creek Road.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$0	$143,000	$0	$0	$143,000
Design	$86,000	$0	$170,000	$0	$170,000
Pre-Construction Services	$15,000	$0	$0	$0	$0
Miscellaneous Expense	$120,000	$0	$60,000	$0	$60,000
Right-of-Way	$7,500	$0	$70,000	$0	$70,000
Construction	$400,000	$0	$0	$400,000	$400,000
Program Management	$0	$0	$0	$0	$0
Construction Services	$52,000	$0	$0	$52,000	$52,000
Interest / Financing	$0	$0	$0	$0	$0
Total	$680,500	$143,000	$300,000	$452,000	$895,000

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$143,000	$300,000	$0	$0	$0	$452,000	$895,000

Prior Legislation Action

Dec 2020,Dec 2021

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/01/2021	11/13/2024	03/04/2026	10/10/2028		12/10/2029	
End Date	11/13/2024	05/24/2028	03/02/2028	12/10/2029	10/10/2029	12/09/2030	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

3731 Glenmore Avenue Sewer Evaluation

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10232025**
WWIP Index #: **N/A**
Project Type: **Sewer**
Project Phase: Planning
WWTP Basin: Muddy Creek
Sanitary Sewer No: **7045**
Watershed: Schiabel Creek
Municipality: Green Township
Neighborhood: Inside Ham Cty/Outside City

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): 522
SSO(s): N/A
PSO(s): 697

Project Description

This project was nominated by WWC due to the deteriorating condition of sewer segments under buildings. This project will rehabilitate multiple pipe segments that are located underneath buildings. The project includes approximately 975 feet of 24 to 36 inch diameter sewer. Most of the sewers in the project area were installed around in 1925. The project is located in Green Township, Hamilton County, near the intersection of Glenmore Avenue and Harrison Avenue.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$66,000	$32,000	$0	$0	$32,000
Design	$83,000	$0	$83,000	$0	$83,000
Pre-Construction Services	$0	$0	$0	$0	$0
Miscellaneous Expense	$71,000	$0	$71,000	$0	$71,000
Right-of-Way	$0	$0	$0	$0	$0
Construction	$380,000	$0	$0	$380,000	$380,000
Program Management	$0	$0	$0	$0	$0
Construction Services	$0	$0	$0	$0	$0
Interest / Financing	$0	$0	$0	$0	$0
Total	$600,000	$32,000	$154,000	$380,000	$566,000

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$32,000	$154,000	$0	$0	$380,000	$0	$566,000

Prior Legislation Action

Dec 2020

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/01/2021	01/01/2024	01/21/2026	03/01/2028		08/31/2029	
End Date	01/10/2024	07/13/2026	07/22/2027	08/31/2029	07/02/2029	08/31/2030	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

MUWWTP UV Disinfection Replacement

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10232045**
WWIP Index #: **N/A**
Project Type: **Treatment Facility**
Project Phase: Preplanning
WWTP Basin: Muddy Creek
Sanitary Sewer No: **7216**
Watershed: Lower Muddy Creek
Municipality: City of Cincinnati
Neighborhood: Sayler Park

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): N/A

Project Description

The Muddy Creek WWTP utilizes an ultraviolet radiation (UV) system to disinfect secondary effluent before discharging to the Ohio River. The existing system was installed in 2002 and it is beyond its estimated useful life and obsolete. The manufacturer, Trojan technologies, no longer supports the installed model. While consumables like lamps, sleeves, and ballast are still available for purchase; other critical replacement parts will only be available for a limited time as supplies last. This project will evaluate alternatives to replace the existing UV system and related equipment to meet future needs.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$245,000	$0	$245,000	$0	$245,000
Design	$385,000	$0	$0	$385,000	$385,000
Pre-Construction Services	$0	$0	$0	$0	$0
Miscellaneous Expense	$110,000	$0	$0	$110,000	$110,000
Right-of-Way	$0	$0	$0	$0	$0
Construction	$3,760,000	$0	$0	$3,760,000	$3,760,000
Program Management	$0	$0	$0	$0	$0
Construction Services	$773,000	$0	$0	$773,000	$773,000
Interest / Financing	$0	$0	$0	$0	$0
Total	$5,273,000	$0	$245,000	$5,028,000	$5,273,000

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$0	$245,000	$495,000	$0	$4,533,000	$0	$5,273,000

Prior Legislation Action

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/02/2024	10/15/2025	n/a	03/01/2028		08/31/2029	
End Date	10/15/2025	10/13/2027	n/a	08/31/2029	07/02/2029	08/30/2030	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

SSO 603 and 704 Improvements

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10240275** WWIP Index #: **227R**
Project Type: **Sewer** Project Phase: Planning
WWTP Basin: Mill Creek Sanitary Sewer No: **5968**
Watershed: East Branch Mill Creek
Municipality: Sycamore Township
Neighborhood: Inside Ham Cty/Outside City

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): 603,704

Project Description

The project area includes SSOs 603 and 704 as well as approximately 6,000-linear feet of existing sewer constructed between 1940 and 1948, most of which is severely deteriorated. SSO 704 was constructed in 1952 to relieve basement flooding and SSO 603 was installed at an unknown date. Both SSOs are classified as Generally Active SSOs. The intent of this project is to eliminate modeled overflows at SSO 603 and SSO 704 for the 10-year, 24- hour storm. This may include repair or replacement with upsized sewers of the existing 6,000-linear feet of existing 15- and 18-inch diameter sanitary sewer. This project is located near a stream south of Trebor Drive, from Belfast Avenue to Tudor Court in Sycamore Township, Hamilton County, Ohio.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$0	$0	$0	$0	$0
Design	$126,100	$446,100	$323,000	$0	$769,100
Pre-Construction Services	$33,600	$336,804	$0	$0	$336,804
Miscellaneous Expense	$10,300	$27,800	$25,000	$0	$52,800
Right-of-Way	$5,000	$971,596	$0	$0	$971,596
Construction	$892,200	$5,300,000	$0	$3,660,000	$8,960,000
Program Management	$0	$35,681	$0	$0	$35,681
Construction Services	$139,400	$182,000	$0	$39,600	$221,600
Interest / Financing	$37,700	$222,600	$0	$0	$222,600
Total	$1,244,300	$7,522,581	$348,000	$3,699,600	$11,570,181

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$7,522,581	$348,000	$0	$3,699,600	$0	$0	$11,570,181

Prior Legislation Action

Dec 2007,Aug 2008,Dec 2011,Aug 2012,May 2014,Aug 2019,Nov 2019

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	04/10/2023	02/21/2024	01/08/2025	02/10/2027		09/11/2028	
End Date	02/21/2024	09/30/2026	07/09/2026	09/11/2028		09/10/2029	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Colton Lane Sewer Replacement

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10240445** WWIP Index #: **N/A**
Project Type: **Sewer** Project Phase: Design/ROW
WWTP Basin: Mill Creek Sanitary Sewer No: **7226**
Watershed: East Branch Mill Creek
Municipality: City of Deer Park
Neighborhood: Inside Ham Cty/Outside City

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): N/A

Project Description

This project was nominated by Wastewater Collection Division due to failing sewers within close proximity to residential structures. This project includes the replacement of approximately 240-liner feet of 12-inch to 15-inch diameter reinforced concrete sewer. The alignment will connect to existing manholes and require the reconnection of 4 sanitary laterals. Benefits of the new sewer include reducing risk by removing structurally deficient assets from underneath a residence, increasing accessibility by moving the sewer into the public right of way, and decreasing inflow into the system.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$0	$11,373	$0	$0	$11,373
Design	$41,800	$0	$0	$0	$0
Pre-Construction Services	$12,200	$0	$0	$0	$0
Miscellaneous Expense	$34,100	$25,000	$0	$0	$25,000
Right-of-Way	$0	$15,000	$0	$0	$15,000
Construction	$203,400	$0	$411,100	$0	$411,100
Program Management	$0	$1,270	$0	$0	$1,270
Construction Services	$14,800	$0	$14,800	$0	$14,800
Interest / Financing	$800	$0	$0	$0	$0
Total	$307,100	$52,643	$425,900	$0	$478,543

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$52,643	$425,900	$0	$0	$0	$0	$478,543

Prior Legislation Action

May 2014,Jan 2022

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	07/22/2011	11/08/2021	08/08/2023	06/07/2024		04/03/2025	
End Date	09/18/2012	01/10/2024	10/25/2023	04/03/2025	01/03/2025	04/03/2026	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Victory Parkway Sewer Rehabilitation

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10240525**
Project Type: **Sewer**
WWTP Basin: Mill Creek
Watershed: East Ohio River
Municipality: City of Cincinnati
Neighborhood: East Walnut Hills

WWIP Index #:
Project Phase: Planning
Sanitary Sewer No: **6589**

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): N/A

Project Description

The existing 36-inch stone sewer was constructed prior to 1912 is experiencing deformation in the crown area. In addition, there are several areas where the stones have apparently come loose and are missing. As a result of the deterioration of the mortar, there are also several locations where there is infiltration into the pipe. The project will evaluate approximately 450-linear feet of 36-inch diameter sewer, including CCTV inspection and smoke and dye testing. A business case evaluation will be performed using the data gathered during the planning phase. This sewer parallels a portion of Victory Parkway between McMillian Avenue and Cypress Place in the Walnut Hills neighborhood of the City of Cincinnati, Hamilton County, Ohio.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$0	$193,252	$0	$0	$193,252
Design	$56,900	$209,800	$69,800	$0	$279,600
Pre-Construction Services	$18,600	$18,600	$0	$0	$18,600
Miscellaneous Expense	$30,900	$30,900	$62,260	$0	$93,160
Right-of-Way	$0	$56,200	$0	$0	$56,200
Construction	$310,600	$0	$0	$2,329,000	$2,329,000
Program Management	$0	$1,958	$0	$0	$1,958
Construction Services	$32,700	$0	$0	$121,000	$121,000
Interest / Financing	$2,700	$0	$0	$0	$0
Total	$452,400	$510,710	$132,060	$2,450,000	$3,092,770

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$510,710	$132,060	$0	$0	$2,450,000	$0	$3,092,770

Prior Legislation Action

May 2014,Dec 2016,Jan 2020,Jun 2022,Dec 2022

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	10/07/2019	01/02/2024	08/20/2025	03/30/2028		10/29/2029	
End Date	05/15/2024	02/09/2026	08/19/2027	10/29/2029	07/31/2029	10/29/2030	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Highland and Burnet Sewer Replacement

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10240760**
Project Type: **Sewer**
WWTP Basin: Mill Creek
Watershed: East Ohio River
Municipality: City of Cincinnati
Neighborhood: Mt. Auburn
WWIP Index #: **NA**
Project Phase: Design/ROW
Sanitary Sewer No: **6689**

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): N/A

Project Description

The BCE recommended alternative is to fill, seal and abandon the western end of the deep sewer under houses and divert any flow to adjacent sewers to address structural defects present in 21-inch vitrified clay sewers. 2140 Highland house service will need to be diverted to an adjacent sewer in Highland Avenue.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$0	$0	$0	$0	$0
Design	$270,000	$97,037	$0	$0	$97,037
Pre-Construction Services	$73,000	$0	$0	$0	$0
Miscellaneous Expense	$610,000	$35,900	$0	$0	$35,900
Right-of-Way	$105,000	$8,000	$0	$0	$8,000
Construction	$2,100,000	$0	$298,226	$0	$298,226
Program Management	$0	$0	$0	$0	$0
Construction Services	$250,000	$0	$10,100	$0	$10,100
Interest / Financing	$0	$0	$0	$0	$0
Total	$3,408,000	$140,937	$308,326	$0	$449,263

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$140,937	$308,326	$0	$0	$0	$0	$449,263

Prior Legislation Action

Dec 2020,Oct 2021,Apr 2023

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/06/2020	01/04/2021	10/25/2023	03/27/2025		12/22/2025	
End Date	08/25/2021	11/13/2024	08/27/2024	12/22/2025	09/23/2025	12/22/2026	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Clifton Avenue at Parker Street Sewer Replacement

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10240790**
Project Type: **Sewer**
WWTP Basin: Mill Creek
Watershed: Central
Municipality: City of Cincinnati
Neighborhood: CUF
WWIP Index #: **000**
Project Phase: Preplanning
Sanitary Sewer No: **6699**

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): N/A

Project Description

This project is located in the CUF neighborhood of the City of Cincinnati centered along Clifton Avenue between Lyon Street to the North and Hastings Street to the South. The existing sewer system is located under numerous structures and contains multiple extreme-risk segments beyond the point of rehabilitation. This project will evaluate replacement or abandonment of approximately 2,600-linear feet of 18-inch to 42-inch combined sewer along with the installation of approximately 700-linear feet of combined sewer, including restoration of associated service laterals.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$92,000	$0	$92,000	$0	$92,000
Design	$121,000	$0	$0	$121,000	$121,000
Pre-Construction Services	$0	$0	$0	$0	$0
Miscellaneous Expense	$69,000	$0	$0	$69,000	$69,000
Right-of-Way	$50,000	$0	$0	$50,000	$50,000
Construction	$533,000	$0	$0	$533,000	$533,000
Program Management	$0	$0	$0	$0	$0
Construction Services	$58,000	$0	$0	$58,000	$58,000
Interest / Financing	$0	$0	$0	$0	$0
Total	$923,000	$0	$92,000	$831,000	$923,000

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$0	$92,000	$240,000	$0	$0	$591,000	$923,000

Prior Legislation Action

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/02/2024	10/15/2025	01/27/2027	09/05/2028		03/08/2030	
End Date	10/15/2025	04/19/2028	01/26/2028	03/08/2030		03/07/2031	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Overlook Avenue near Glenway Ave Sewer Replacement

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10240810**
Project Type: **Sewer**
WWTP Basin: Mill Creek
Watershed: Bold Face Creek
Municipality: City of Cincinnati
Neighborhood: West Price Hill

WWIP Index #: **N/A**
Project Phase: Design/ROW
Sanitary Sewer No: **6703**

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): N/A

Project Description

This project was nominated due to the failing sewers under buildings, including a sewer directly underneath St. Teresa of Avila Elementary School. The failing sewer segments are located under structures and on private properties and are not accessible from the public right-of-way. The project will mitigate the risk of failing sewers under buildings by rehabilitating failing pipe segments with a structural liner. The scope of the project includes rehabilitation of approximately 958-liner feet of 15-inch pipe, 296-liner feet of 12-inch pipe, and 211-linear feet of 18-inch pipe.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$0	$178,000	$0	$0	$178,000
Design	$55,000	$200,000	$0	$0	$200,000
Pre-Construction Services	$8,300	$0	$0	$0	$0
Miscellaneous Expense	$69,000	$69,000	$0	$0	$69,000
Right-of-Way	$30,000	$85,000	$0	$0	$85,000
Construction	$230,000	$0	$381,000	$0	$381,000
Program Management	$0	$0	$0	$0	$0
Construction Services	$29,000	$0	$15,000	$0	$15,000
Interest / Financing	$0	$0	$0	$0	$0
Total	$421,300	$532,000	$396,000	$0	$928,000

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$532,000	$396,000	$0	$0	$0	$0	$928,000

Prior Legislation Action

Jan 2020,Jan 2022

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	04/30/2019	01/10/2022	08/30/2023	06/12/2024		06/09/2025	
End Date	08/24/2022	01/24/2024	10/31/2023	06/09/2025	03/10/2025	06/08/2026	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Reading Road at Stewart Place Sewer Replacement

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10240820**
Project Type: **Sewer**
WWTP Basin: Mill Creek
Watershed: Ross Run
Municipality: City of Cincinnati
Neighborhood: Avondale
WWIP Index #: **NA**
Project Phase: Design/ROW
Sanitary Sewer No: **6707**

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): N/A

Project Description

The purpose of this project is to address the public sewer in poor condition located under an existing building at 3326 Reading Road. The sewers located in the project area are over 100-years old and contain multiple defects. This project will rehabilitate approximately 380-liner feet of existing sewer segments by CIPP lining.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$51,000	$0	$0	$0	$0
Design	$61,000	$240,000	$0	$0	$240,000
Pre-Construction Services	$9,800	$0	$0	$0	$0
Miscellaneous Expense	$81,000	$81,000	$0	$0	$81,000
Right-of-Way	$45,000	$45,000	$0	$0	$45,000
Construction	$290,000	$0	$338,613	$0	$338,613
Program Management	$0	$0	$0	$0	$0
Construction Services	$34,000	$0	$33,900	$0	$33,900
Interest / Financing	$0	$0	$0	$0	$0
Total	$571,800	$366,000	$372,513	$0	$738,513

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$366,000	$372,513	$0	$0	$0	$0	$738,513

Prior Legislation Action

Dec 2020

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/01/2020	01/04/2021	06/30/2023	01/09/2025		07/13/2026	
End Date	06/23/2021	08/21/2024	06/04/2024	07/13/2026	05/12/2026	07/12/2027	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Taft Road & McMillan Street Sewer Replacement

2024 Capital Budget and Capital Improvement Program

Project Overview		Benefited CSO(s), SSO(s), PSO(s)	
Project ID: **10240845**	WWIP Index #: **NA**	CSO(s):	N/A
Project Type: **Sewer**	Project Phase: Planning	SSO(s):	N/A
WWTP Basin: Mill Creek	Sanitary Sewer No: **6775**	PSO(s):	N/A
Watershed: East Ohio River			
Municipality: City of Cincinnati			
Neighborhood: East Walnut Hills			

Project Description

The project will replace or rehab structurally deficient, 52" stone sewer located under or near residential structures, and investigate the feasibility and possible construction of a new alignment to provide relief to the local sewer main. This project is located in the East Walnut Hill neighborhood of the City of Cincinnati, Hamilton County, Ohio.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$0	$420,000	$0	$0	$420,000
Design	$710,000	$0	$223,100	$0	$223,100
Pre-Construction Services	$270,000	$0	$0	$0	$0
Miscellaneous Expense	$2,200,000	$0	$70,200	$0	$70,200
Right-of-Way	$142,500	$0	$142,500	$0	$142,500
Construction	$7,200,000	$0	$0	$990,700	$990,700
Program Management	$0	$0	$0	$0	$0
Construction Services	$930,000	$0	$0	$110,100	$110,100
Interest / Financing	$0	$0	$0	$0	$0
Total	$11,452,500	$420,000	$435,800	$1,100,800	$1,956,600

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$420,000	$435,800	$0	$0	$1,100,800	$0	$1,956,600

Prior Legislation Action

Dec 2020

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/01/2021	05/01/2024	08/06/2025	03/03/2028		09/04/2029	
End Date	05/01/2024	10/27/2027	08/08/2027	09/04/2029	07/05/2029	09/03/2030	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Queen City Avenue (HN 2047) Sewer Rehabilitation

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10242055**
Project Type: **Sewer**
WWTP Basin: Mill Creek
Watershed: Lick Run
Municipality: City of Cincinnati
Neighborhood: South Fairmount

WWIP Index #:
Project Phase: Planning
Sanitary Sewer No: **6941**

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): N/A

Project Description

This project addresses an approximately 130-linear foot high-risk 24-inch combined sewer located under a residential structure. The project will evaluate the replacement or rehabilitation of the 24-inch combined sewer to reduce the risk of impact to the residential structure and improve access and maintainability of the sewer. This project is located at 2047 Queen City Avenue in the South Fairmount neighborhood of the City of Cincinnati, Hamilton County, Ohio.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$0	$80,000	$0	$0	$80,000
Design	$40,000	$0	$100,000	$0	$100,000
Pre-Construction Services	$52,000	$0	$0	$0	$0
Miscellaneous Expense	$43,000	$0	$43,000	$0	$43,000
Right-of-Way	$22,500	$0	$22,500	$0	$22,500
Construction	$140,000	$0	$0	$140,000	$140,000
Program Management	$0	$0	$0	$0	$0
Construction Services	$18,000	$0	$0	$18,000	$18,000
Interest / Financing	$0	$0	$0	$0	$0
Total	$315,500	$80,000	$165,500	$158,000	$403,500

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$80,000	$165,500	$0	$0	$0	$158,000	$403,500

Prior Legislation Action

Jan 2022

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/10/2022	01/01/2024	01/21/2026	09/05/2028		03/08/2030	
End Date	10/16/2024	04/12/2028	01/20/2028	03/08/2030	01/07/2030	03/07/2031	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Fenton Avenue (HN 1336) Sewer Relocation

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10242080** WWIP Index #:
Project Type: **Sewer** Project Phase: Planning
WWTP Basin: Mill Creek Sanitary Sewer No: **6966**
Watershed: East Branch Mill Creek
Municipality: City of Reading
Neighborhood: Inside Ham Cty/Outside City

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): N/A

Project Description

The project is in the City of Reading, located within the East Branch Mill Creek watershed and the Mill Creek basin. The project will investigate potential capacity issues and relocate high and extreme risk sewer segments in the area of 1336 Fenton Avenue.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$0	$110,000	$0	$0	$110,000
Design	$150,000	$0	$165,000	$0	$165,000
Pre-Construction Services	$35,000	$0	$0	$0	$0
Miscellaneous Expense	$277,000	$0	$75,000	$0	$75,000
Right-of-Way	$8,000	$0	$8,000	$0	$8,000
Construction	$1,100,000	$0	$0	$1,100,000	$1,100,000
Program Management	$0	$0	$0	$0	$0
Construction Services	$120,000	$0	$0	$120,000	$120,000
Interest / Financing	$0	$0	$0	$0	$0
Total	$1,690,000	$110,000	$248,000	$1,220,000	$1,578,000

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$110,000	$248,000	$0	$0	$0	$1,220,000	$1,578,000

Prior Legislation Action

Jan 2022

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/10/2022	01/01/2024	01/21/2026	09/05/2028		03/08/2030	
End Date	10/16/2024	04/12/2028	01/20/2028	03/08/2030	01/07/2030	03/07/2031	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Donna Lane & Ester Marie Drive Sewer Relocation and Rehab

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10242090** WWIP Index #: **N/A**
Project Type: **Sewer** Project Phase: Planning
WWTP Basin: Mill Creek Sanitary Sewer No: **6968**
Watershed: East Branch Mill Creek
Municipality: Sycamore Township
Neighborhood: Inside Ham Cty/Outside City

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): N/A

Project Description

This project addresses high and extreme risk combined sewer segments ranging from 12-inch to 15-inch in diameter. Some of these sewers are located under residential structures. The project will evaluate the replacement or rehabilitation of the combined sewers to reduce the risk of impact to the residential structure and improve access and maintainability of the sewer. The project is located near the intersection of Donna Lane and Ester Marie Drive in Sycamore Township, Hamilton County, Ohio.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$0	$86,000	$0	$0	$86,000
Design	$110,000	$0	$110,000	$0	$110,000
Pre-Construction Services	$21,000	$0	$0	$0	$0
Miscellaneous Expense	$170,000	$0	$60,000	$0	$60,000
Right-of-Way	$15,000	$0	$15,000	$0	$15,000
Construction	$540,000	$0	$0	$540,000	$540,000
Program Management	$0	$0	$0	$0	$0
Construction Services	$72,000	$0	$0	$72,000	$72,000
Interest / Financing	$0	$0	$0	$0	$0
Total	$928,000	$86,000	$185,000	$612,000	$883,000

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$86,000	$185,000	$0	$0	$0	$612,000	$883,000

Prior Legislation Action

Jan 2022

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/10/2022	01/01/2024	01/21/2026	09/05/2028		03/08/2030	
End Date	10/16/2024	04/12/2028	01/20/2028	03/08/2030	01/07/2030	03/07/2031	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Loth Street (HN 2272) Sewer Relocation and Rehab

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10242105**
Project Type: **Sewer**
WWTP Basin: Mill Creek
Watershed: Central
Municipality: City of Cincinnati
Neighborhood: Mt. Auburn

WWIP Index #: **N/A**
Project Phase: Planning
Sanitary Sewer No: **6971**

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): N/A

Project Description

This project addresses capacity issues and high and extreme risk combined sewer segments ranging from 24-inch to 36-inch in diameter. Some of these sewers are located under residential structures. The project will evaluate the replacement or rehabilitation of the combined sewers to reduce the risk of impact to the residential structures and improve access and maintainability of the sewer. The project is located near 2272 Loth Street in the Mt. Adams neighborhood of the City of Cincinnati, Hamilton County, Ohio.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$0	$160,000	$0	$0	$160,000
Design	$230,000	$0	$230,000	$0	$230,000
Pre-Construction Services	$58,000	$0	$0	$0	$0
Miscellaneous Expense	$480,000	$0	$75,000	$0	$75,000
Right-of-Way	$22,000	$0	$22,000	$0	$22,000
Construction	$1,500,000	$0	$0	$1,500,000	$1,500,000
Program Management	$0	$0	$0	$0	$0
Construction Services	$200,000	$0	$0	$200,000	$200,000
Interest / Financing	$0	$0	$0	$0	$0
Total	$2,490,000	$160,000	$327,000	$1,700,000	$2,187,000

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$160,000	$327,000	$0	$0	$0	$1,700,000	$2,187,000

Prior Legislation Action

Jan 2022

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/10/2022	01/01/2024	01/21/2026	09/05/2028		03/08/2030	
End Date	10/16/2024	04/12/2028	01/20/2028	03/08/2030	01/07/2030	03/07/2031	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Morrison Avenue Sewer Replacement

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10242155**
Project Type: **Sewer**
WWTP Basin: Mill Creek
Watershed: Clifton
Municipality: City of Cincinnati
Neighborhood: Clifton

WWIP Index #: **N/A**
Project Phase: Preplanning
Sanitary Sewer No: **7046**

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): N/A

Project Description

The project will conduct a planning analysis to evaluate replacement or rehabilitation of approximately 1,800-ft of 18-in to 36-in diameter sewers. The existing system is located underneath multiple residential structures and contains several high and extreme risk segments. The project is located at the intersection of Ludlow Avenue and Morrison Avenue in the Clifton neighborhood of the City of Cincinnati.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$120,000	$0	$160,000	$0	$160,000
Design	$200,000	$0	$0	$240,000	$240,000
Pre-Construction Services	$0	$0	$0	$0	$0
Miscellaneous Expense	$270,000	$0	$0	$100,000	$100,000
Right-of-Way	$20,000	$0	$0	$50,000	$50,000
Construction	$1,800,000	$0	$0	$1,820,000	$1,820,000
Program Management	$0	$0	$0	$0	$0
Construction Services	$190,000	$0	$0	$130,000	$130,000
Interest / Financing	$0	$0	$0	$0	$0
Total	$2,600,000	$0	$160,000	$2,340,000	$2,500,000

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$0	$160,000	$390,000	$0	$0	$1,950,000	$2,500,000

Prior Legislation Action

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	05/09/2022	10/15/2025	01/27/2027	04/13/2029		10/14/2030	
End Date	10/15/2025	10/18/2028	07/27/2028	10/14/2030	08/14/2030	10/13/2031	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Anthony to Innes Sewer Replacement

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10242185**
Project Type: **Sewer**
WWTP Basin: Mill Creek
Watershed: West Fork
Municipality: City of Cincinnati
Neighborhood: Northside
WWIP Index #: **N/A**
Project Phase: Preplanning
Sanitary Sewer No: **7143**

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): 125
SSO(s): N/A
PSO(s): N/A

Project Description

The project will repair or replace approximately 2,000-ft of 12-in to 30-in. clay sewer with multiple high and extreme risk segments within the Northside neighborhood of Cincinnati, OH. Approximately half of the sewer system is located underneath homes between Anthony and Innes Avenues as well as Otte Avenue and Robinson Circle. The project will incorporate Otte Avenue Sewer Replacement, Project ID 10240330, due to its proximity to the larger effort in the neighborhood.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$100,000	$0	$237,000	$0	$237,000
Design	$120,000	$0	$0	$463,000	$463,000
Pre-Construction Services	$0	$0	$0	$0	$0
Miscellaneous Expense	$120,000	$0	$0	$158,000	$158,000
Right-of-Way	$25,000	$0	$0	$58,000	$58,000
Construction	$620,000	$0	$0	$3,354,000	$3,354,000
Program Management	$0	$0	$0	$0	$0
Construction Services	$85,000	$0	$0	$0	$0
Interest / Financing	$0	$0	$0	$0	$0
Total	$1,070,000	$0	$237,000	$4,033,000	$4,270,000

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$0	$237,000	$679,000	$0	$0	$3,354,000	$4,270,000

Prior Legislation Action

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/02/2024	10/15/2025	01/27/2027	03/13/2029		09/13/2030	
End Date	10/15/2025	10/18/2028	07/27/2028	09/13/2030	07/15/2030	09/12/2031	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

East Loveland Ave Sewer Replacement Phase 2

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10252035**
WWIP Index #: **N/A**
Project Type: **Sewer**
Project Phase: Preplanning
WWTP Basin: Polk Run
Sanitary Sewer No: **7200**
Watershed: Polk Run
Municipality: City of Loveland
Neighborhood: Outside Ham Cty/Outside City

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): N/A

Project Description

MSD will replace and upsize about 3200-ft of existing 8-in diameter sewer along E. Loveland Avenue. The work will be on two (2) sections of sanitary sewers on East Loveland Avenue (between MH 68409002-61114003 and between MHs 61115010-61115001) to address condition and capacity deficiencies. Visual condition assessments have shown the presence of multiple structural defects in the VCP sewer along East Loveland Avenue. Longitudinal cracking was observed in portions of these segments along with portions of broken pipe and joint offsets. In addition, the existing hydraulic sewer model indicates capacity issues in the system. Improving capacity in the sewer has the potential to alleviate overflows and reduce risk of SBUs in a densely populated residential area. This phase 2 project will follow standard MSD delivery strategy for design-bid-build projects

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$251,600	$0	$251,600	$0	$251,600
Design	$407,400	$0	$0	$407,400	$407,400
Pre-Construction Services	$0	$0	$0	$0	$0
Miscellaneous Expense	$0	$0	$0	$174,399	$174,399
Right-of-Way	$100,000	$0	$0	$100,000	$100,000
Construction	$4,980,900	$0	$0	$4,980,900	$4,980,900
Program Management	$0	$0	$0	$0	$0
Construction Services	$0	$0	$0	$0	$0
Interest / Financing	$0	$0	$0	$0	$0
Total	$5,739,900	$0	$251,600	$5,662,699	$5,914,299

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$0	$251,600	$681,799	$0	$0	$4,980,900	$5,914,299

Prior Legislation Action

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/02/2024	10/15/2025	01/27/2027	09/05/2028		03/08/2030	
End Date	10/15/2025	04/19/2028	01/26/2028	03/08/2030	01/07/2030	03/07/2031	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Elsmere Avenue from Slane to Lafayette Sewer Replacement

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10270225**
WWIP Index #: **N/A**
Project Type: **Sewer**
Project Phase: Planning
WWTP Basin: Little Miami
Sanitary Sewer No: **6697**
Watershed: Upper Duck Creek
Municipality: City of Norwood
Neighborhood: Inside Ham Cty/Outside City

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): N/A

Project Description

The project was nominated by Wastewater Collection division (WWC) due to the observed structural defects for assets located directly adjacent to, or underneath, several residences. During planning efforts, three separate sewer crossings that run through the cross section of the sewer were discovered, which would not allow the sewer to be lined, and it was found that many homes in the project area experience sewer backups during wet weather. The recommended replacement alternative consists of approximately 1,000-liner feet of 54-inch and 1,720-liner feet of 60-inch combined sewer. Additionally, this alternative requires approximately 13 manholes, 120 laterals to be reconstructed with two-way cleanouts, and 1,600-liner feet of pipe to be filled, sealed, and abandoned. If the project does not proceed forward, existing assets will remain underneath residential structures, presenting risk. Also, the area has significant capacity issues that would go unaddressed.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$0	$163,000	$0	$0	$163,000
Design	$140,000	$0	$752,900	$0	$752,900
Pre-Construction Services	$29,000	$0	$0	$0	$0
Miscellaneous Expense	$240,000	$0	$200,800	$0	$200,800
Right-of-Way	$142,500	$0	$150,300	$0	$150,300
Construction	$800,000	$0	$0	$8,210,000	$8,210,000
Program Management	$0	$0	$0	$0	$0
Construction Services	$100,000	$0	$0	$12,300	$12,300
Interest / Financing	$0	$0	$0	$0	$0
Total	$1,451,500	$163,000	$1,104,000	$8,222,300	$9,489,300

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$163,000	$1,104,000	$0	$0	$8,222,300	$0	$9,489,300

Prior Legislation Action

Jan 2020

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	04/29/2019	01/02/2024	02/18/2026	03/30/2028		10/01/2029	
End Date	10/30/2024	11/10/2027	08/19/2027	10/01/2029	07/31/2029	09/30/2030	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Wayside Hills Pump Station

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10272050**
WWIP Index #: **NA**
Project Type: **Pump Station**
Project Phase: Planning
WWTP Basin: Little Miami
Sanitary Sewer No: **6948**
Watershed: Upper Duck Creek
Municipality: Anderson Township
Neighborhood: California

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): N/A

Project Description

The Wayside Hills Pump Station consists of a 0.35 MGD pump station, 1,840 feet of 4-inch force main, and 7 air release valves. The pump station has several critical assets that are in poor condition and or reaching the end of their useful life. This project will evaluate the pump station, force main and other appurtenances for rehab, replacement, or elimination. The project is located in Anderson Township at 5783 Shady Hollow Ln in the California watershed of the Little Miami Basin.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$0	$220,000	$0	$0	$220,000
Design	$210,000	$0	$210,000	$0	$210,000
Pre-Construction Services	$49,000	$0	$0	$0	$0
Miscellaneous Expense	$410,000	$0	$410,000	$0	$410,000
Right-of-Way	$22,500	$0	$22,500	$0	$22,500
Construction	$1,300,000	$0	$0	$1,300,000	$1,300,000
Program Management	$0	$0	$0	$0	$0
Construction Services	$170,000	$0	$0	$170,000	$170,000
Interest / Financing	$0	$0	$0	$0	$0
Total	$2,161,500	$220,000	$642,500	$1,470,000	$2,332,500

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$220,000	$642,500	$0	$0	$0	$1,470,000	$2,332,500

Prior Legislation Action

Dec 2020,Jun 2021,Nov 2021

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	11/14/2023	11/27/2024	03/18/2026	10/10/2028		04/12/2030	
End Date	11/27/2024	06/07/2028	03/16/2028	04/12/2030	02/11/2030	04/11/2031	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Wayside Avenue and Colter Avenue Sewer Improvements

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10272075**
Project Type: **Sewer**
WWTP Basin: Little Miami
Watershed: Clough
Municipality: City of Cincinnati
Neighborhood: Mt. Washington
WWIP Index #: **N/A**
Project Phase: Planning
Sanitary Sewer No: **7106**

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): N/A

Project Description

This project will address capacity issues due to reported surcharging by residents and inconsistent pipe sizes in the system. This project will evaluate replacement of approximately 3,000-linear feet of existing sanitary sewer to increase conveyance capacity of the sewer system. In addition, the project will eliminate hydraulic bottlenecks in critical areas where capacity is constrained. The project area is located west of Sutton Avenue, bounded by Colter Avenue to the south and Wayside Avenue to the north in the Mt Washington neighborhood of the City of Cincinnati, Hamilton County, Ohio.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$122,100	$122,100	$0	$0	$122,100
Design	$168,700	$0	$202,400	$0	$202,400
Pre-Construction Services	$0	$0	$0	$0	$0
Miscellaneous Expense	$36,000	$0	$36,000	$0	$36,000
Right-of-Way	$0	$0	$245,000	$0	$245,000
Construction	$1,349,400	$0	$0	$121,400	$121,400
Program Management	$0	$0	$0	$0	$0
Construction Services	$140,300	$0	$0	$140,300	$140,300
Interest / Financing	$0	$0	$0	$0	$0
Total	$1,816,500	$122,100	$483,400	$261,700	$867,200

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$122,100	$483,400	$0	$0	$0	$261,700	$867,200

Prior Legislation Action

Jan 2022

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/10/2022	10/16/2024	02/18/2026	10/10/2028		04/12/2030	
End Date	10/16/2024	05/10/2028	02/20/2028	04/12/2030	02/11/2030	04/11/2031	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Madison Rd and Edwards Rd Sewer Improvements

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10272080**
Project Type: **Sewer**
WWTP Basin: Little Miami
Watershed: Upper Duck Creek
Municipality: City of Cincinnati
Neighborhood: Hyde Park
WWIP Index #: **N/A**
Project Phase: Planning
Sanitary Sewer No: **7122**

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): N/A

Project Description

This project addresses the remediation of the 30 existing sewer segments due shape loss, longitudinal and spiral cracking, and capacity-related issues. Several of the sewer segments identified for evaluation currently rank as high- and extreme-risk of failure. This project will evaluate approximately 4,100-linear feet of combined sewer. CIPP replacement or lining of these segments will improve the structural integrity of the pipes, reduce the risk rating, and prolong the useful life of the sewer. However, there are three segments that run under buildings that would potentially need relocated or lined.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$196,900	$196,900	$0	$0	$196,900
Design	$305,400	$0	$309,000	$0	$309,000
Pre-Construction Services	$0	$0	$0	$0	$0
Miscellaneous Expense	$90,700	$0	$90,700	$0	$90,700
Right-of-Way	$34,800	$0	$34,800	$0	$34,800
Construction	$2,575,225	$0	$0	$2,575,225	$2,575,225
Program Management	$0	$0	$0	$0	$0
Construction Services	$172,300	$0	$0	$218,900	$218,900
Interest / Financing	$0	$0	$0	$0	$0
Total	$3,375,325	$196,900	$434,500	$2,794,125	$3,425,525

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$196,900	$434,500	$0	$0	$0	$2,794,125	$3,425,525

Prior Legislation Action

Jan 2022

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/10/2022	10/16/2024	02/04/2026	09/05/2028		03/08/2030	
End Date	10/16/2024	04/26/2028	02/06/2028	03/08/2030	01/07/2030	03/07/2031	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Delta Ave at Linwood Ave Sewer Replacement

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10272090**
Project Type: **Sewer**
WWTP Basin: Little Miami
Watershed: Lower Duck Creek
Municipality: Columbia Township
Neighborhood: Mt. Lookout
WWIP Index #: **NA**
Project Phase: Preplanning
Sanitary Sewer No: **7260**

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): N/A

Project Description

This project will conduct planning for the replacement of 2,800-ft of existing combined sewers at Delta Ave from Griest Ave to Linwood Ave. The project area contains multiple segments with shapeloss, longitudinal cracking, and capacity related issues. Due to the poor condition of the sewers, rehabilitation via lining is not feasible. Sewers within the project area range from medium to extreme risk and surcharge as frequently as the 6-month storm.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$231,000	$0	$231,000	$0	$231,000
Design	$397,000	$0	$0	$397,000	$397,000
Pre-Construction Services	$0	$0	$0	$0	$0
Miscellaneous Expense	$142,000	$0	$0	$142,000	$142,000
Right-of-Way	$0	$0	$0	$0	$0
Construction	$3,725,000	$0	$0	$3,725,000	$3,725,000
Program Management	$0	$0	$0	$0	$0
Construction Services	$325,000	$0	$0	$325,000	$325,000
Interest / Financing	$0	$0	$0	$0	$0
Total	$4,820,000	$0	$231,000	$4,589,000	$4,820,000

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$0	$231,000	$539,000	$0	$0	$4,050,000	$4,820,000

Prior Legislation Action

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/02/2024	11/26/2025	03/10/2027	04/04/2029		10/04/2030	
End Date	11/26/2025	11/22/2028	09/01/2028	10/04/2030	08/05/2030	10/04/2031	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Hydraulic Modeling 2024

2024 Capital Budget and Capital Improvement Program

Project Overview		Benefited CSO(s), SSO(s), PSO(s)	
Project ID: **10280244**	WWIP Index #: **N/A**	CSO(s):	N/A
Project Type: **Allowance**	Project Phase: Allowance	SSO(s):	N/A
WWTP Basin: System Wide	Sanitary Sewer No:	PSO(s):	N/A
Watershed: Multiple			
Municipality: System Wide			
Neighborhood: Systemwide			

Project Description

This allowance will provide funding for professional hydraulic modeling and calibration services to improve the System-Wide Model (SWM) through systematic calibration over a 20-year life-cycle and the incorporation of project-specific models for each of MSD's seven sewersheds. Sewer modeling is used to assist in the project nomination, planning and design process managed by MSD's WWE Division. Ensuring the SWM is accurate and updated is essential to MSD's compliance with the requirements of the Global Consent Decree and MSD's CSO NPDES permit. MSD is committed to ensuring its system-wide model meets the latest standards and provides the best available tool for assessing, planning, and designing MSD's infrastructure. Budget is based on 56 meters for systematic calibration of the SWM and 50 project-specific meters at a cost of $24,000 per meter.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$1,200,000	$0	$2,794,000	$0	$2,794,000
Design	$0	$0	$0	$0	$0
Pre-Construction Services	$0	$0	$0	$0	$0
Miscellaneous Expense	$0	$0	$0	$0	$0
Right-of-Way	$0	$0	$0	$0	$0
Construction	$0	$0	$0	$0	$0
Program Management	$0	$0	$0	$0	$0
Construction Services	$0	$0	$0	$0	$0
Interest / Financing	$0	$0	$0	$0	$0
Total	$1,200,000	$0	$2,794,000	$0	$2,794,000

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$0	$2,794,000	$0	$0	$0	$0	$2,794,000

Prior Legislation Action

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/01/2024	n/a	n/a	n/a		n/a	
End Date	12/31/2024	n/a	n/a	n/a		n/a	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Critical Asset Management Projects 2024

2024 Capital Budget and Capital Improvement Program

Project Overview		Benefited CSO(s), SSO(s), PSO(s)	
Project ID: **10280724**	WWIP Index #: **N/A**	CSO(s):	N/A
Project Type: **Allowance**	Project Phase: Allowance	SSO(s):	N/A
WWTP Basin: System Wide	Sanitary Sewer No:	PSO(s):	N/A
Watershed: Multiple			
Municipality: System Wide			
Neighborhood: Systemwide			

Project Description

This allowance provides capital resources to address a risk-based prioritized wastewater treatment expenditure that are critical to sustain operational, regulatory, and safety expected performance levels. Expenditures are identified, planned, prioritized, and executed within the allowance annual budget.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$0	$0	$0	$0	$0
Design	$0	$0	$0	$0	$0
Pre-Construction Services	$0	$0	$0	$0	$0
Miscellaneous Expense	$0	$0	$0	$0	$0
Right-of-Way	$0	$0	$0	$0	$0
Construction	$0	$0	$7,427,350	$0	$7,427,350
Program Management	$0	$0	$0	$0	$0
Construction Services	$0	$0	$0	$0	$0
Interest / Financing	$0	$0	$0	$0	$0
Total	$0	$0	$7,427,350	$0	$7,427,350

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$0	$7,427,350	$0	$0	$0	$0	$7,427,350

Prior Legislation Action

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	n/a	n/a	n/a	01/02/2024		n/a	
End Date	n/a	n/a	n/a	12/27/2024		n/a	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

LMWWTP Solids Disposal With Odor Control

2024 Capital Budget and Capital Improvement Program

Project Overview

Project ID: **10281100**
Project Type: **Treatment Facility**
WWTP Basin: Little Miami
Watershed: Lower Duck Creek
Municipality: City of Cincinnati
Neighborhood: East End

WWIP Index #: **200**
Project Phase: Design/ROW
Sanitary Sewer No: **6914**

Benefited CSO(s), SSO(s), PSO(s)

CSO(s): N/A
SSO(s): N/A
PSO(s): N/A

Project Description

This Progressive Design-Build project will address critical solids handling, disposal and odor control needs at Little Miami WWTP. The project includes the following improvements: a new anaerobic digestion facility that will generate Class A biosolids; sludge receiving, pretreatment and storage facilities for imported sludges from Polk Run WWTP and Sycamore Creek WWTP; sludge thickening facilities; digester gas conditioning and facilities to use the digester gas onsite for power generation; sludge dewatering facilities; facilities for loading sludge into vehicles for off-site land application; improvements for the mitigation of struvite deposition; odor control and treatment; a levee around the new facilities for flood protection; site improvements, electrical system improvements, I&C improvements, and other supporting systems; and integration with remaining facilities at the Little Miami WWTP. This project is located at the Little Miami WWTP at 225 Wilmer Ave in the East End neighborhood of the City of Cincinnati.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$0	$856,325	$0	$0	$856,325
Design	$2,402,500	$15,246,200	$0	$0	$15,246,200
Pre-Construction Services	$586,800	$678,418	$0	$0	$678,418
Miscellaneous Expense	$216,200	$800,000	$1,400,000	$0	$2,200,000
Right-of-Way	$0	$0	$0	$0	$0
Construction	$0	$0	$173,300,000	$0	$173,300,000
Program Management	$0	$0	$0	$0	$0
Construction Services	$0	$0	$1,100,000	$0	$1,100,000
Interest / Financing	$0	$0	$0	$0	$0
Total	$3,205,500	$17,580,943	$175,800,000	$0	$193,380,943

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$17,580,943	$175,800,000	$0	$0	$0	$0	$193,380,943

Prior Legislation Action

Jan 2019,Feb 2020,Apr 2020,Dec 2020,Jan 2022,Nov 2022,Jan 2023

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	04/26/2019	11/04/2021	n/a	06/21/2024		08/14/2028	
End Date	10/06/2021	04/23/2024	n/a	08/15/2029		08/13/2029	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Prioritized Wastewater Collection System Improvements 2024

2024 Capital Budget and Capital Improvement Program

Project Overview		Benefited CSO(s), SSO(s), PSO(s)	
Project ID: **10281324**	WWIP Index #: **N/A**	CSO(s):	N/A
Project Type: **Allowance**	Project Phase: Allowance	SSO(s):	N/A
WWTP Basin: System Wide	Sanitary Sewer No:	PSO(s):	N/A
Watershed: Multiple			
Municipality: System Wide			
Neighborhood: Systemwide			

Project Description

This allowance is intended to repair and renew failed and or structurally deteriorated sewer segments by responding to sudden, unexpected system failures, completing planned repairs and improvements to high-risk utility-owned assets, to remedy structurally failed privately-owned active building sewers located within the right-of-way, and making prioritized system improvements through construction coordination of projects. Collectively, this operational strategy will assist in achieving and maintaining acceptable levels of service at the lowest life-cycle cost.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$0	$0	$0	$0	$0
Design	$0	$0	$0	$0	$0
Pre-Construction Services	$0	$0	$0	$0	$0
Miscellaneous Expense	$0	$0	$0	$0	$0
Right-of-Way	$0	$0	$0	$0	$0
Construction	$0	$0	$18,360,900	$0	$18,360,900
Program Management	$0	$0	$0	$0	$0
Construction Services	$0	$0	$3,063,600	$0	$3,063,600
Interest / Financing	$0	$0	$0	$0	$0
Total	$0	$0	$21,424,500	$0	$21,424,500

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$0	$21,424,500	$0	$0	$0	$0	$21,424,500

Prior Legislation Action

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	n/a	n/a	n/a	01/01/2024		n/a	
End Date	n/a	n/a	n/a	12/31/2024		n/a	n/a

Project Overview		Benefited CSO(s), SSO(s), PSO(s)	
Project ID: **10282024**	WWIP Index #: **N/A**	CSO(s):	N/A
Project Type: **Allowance**	Project Phase: Allowance	SSO(s):	N/A
WWTP Basin: System Wide	Sanitary Sewer No:	PSO(s):	N/A
Watershed: Multiple			
Municipality: System Wide			
Neighborhood: Systemwide			

Project Description

This allowance will provide funding for work on MSD Basin and Facility planning across the MSD service area. This may include ad-hoc studies and engineering services needed to confirm and develop project needs and nominations, as well as to support digital twin implementation at the treatment plants in furtherance of facility planning. This fund is vital to development of discrete capital needs and prioritization of the system improvements in the 5-Year CIP and beyond, as studies and plans guide engineering-based capital investment priorities and recommendations over the long-term. Project nominations resulting from studies and plans will be submitted for inclusion in the following year's CIP Book for funding appropriation.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$0	$0	$4,000,000	$0	$4,000,000
Design	$0	$0	$0	$0	$0
Pre-Construction Services	$0	$0	$0	$0	$0
Miscellaneous Expense	$0	$0	$0	$0	$0
Right-of-Way	$0	$0	$0	$0	$0
Construction	$0	$0	$0	$0	$0
Program Management	$0	$0	$0	$0	$0
Construction Services	$0	$0	$0	$0	$0
Interest / Financing	$0	$0	$0	$0	$0
Total	$0	$0	$4,000,000	$0	$4,000,000

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$0	$4,000,000	$0	$0	$0	$0	$4,000,000

Prior Legislation Action

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/01/2024	n/a	n/a	n/a		n/a	
End Date	12/31/2024	n/a	n/a	n/a		n/a	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Flow Monitoring Support 2024

2024 Capital Budget and Capital Improvement Program

Project Overview		Benefited CSO(s), SSO(s), PSO(s)	
Project ID: **10282424**	WWIP Index #: **N/A**	CSO(s):	N/A
Project Type: **Allowance**	Project Phase:	SSO(s):	N/A
WWTP Basin: System Wide	Sanitary Sewer No: **7126**	PSO(s):	N/A
Watershed: Multiple			
Municipality: System Wide			
Neighborhood: Systemwide			

Project Description

This allowance will provide funding to support the deployment of flow monitors in the collection system. Flow monitoring is an essential activity for maintaining and improving the district's hydraulic models and in the development of capital projects. Flow monitoring is the action of collecting data from the field regarding the hydraulic conditions in the collection system, which is then used to calibrate or improve sections of the system wide models so that the models can support alternative analysis and project planning. The timing and duration of monitoring depends on the use of the data but must be at least one full year for projects seeking wet weather solutions or improving the system wide model. Small projects in separated areas may not require a full year. Meters are deployed in all regions of the MSD service area, as needed, to support specific project needs. MSD's Remote Monitoring Section optimizes internal and external resources to provide flow monitoring services for an average of $20,000 meter per year. Budget is based on the installation of 56 meters for systematic calibration of the SWM and 50 meters to support capital project development.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$2,068,800	$0	$2,120,000	$0	$2,120,000
Design	$0	$0	$0	$0	$0
Pre-Construction Services	$0	$0	$0	$0	$0
Miscellaneous Expense	$0	$0	$0	$0	$0
Right-of-Way	$0	$0	$0	$0	$0
Construction	$0	$0	$0	$0	$0
Program Management	$0	$0	$0	$0	$0
Construction Services	$0	$0	$0	$0	$0
Interest / Financing	$0	$0	$0	$0	$0
Total	$2,068,800	$0	$2,120,000	$0	$2,120,000

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$0	$2,120,000	$0	$0	$0	$0	$2,120,000

Prior Legislation Action

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	01/01/2024	n/a	n/a	n/a		n/a	
End Date	12/31/2024	n/a	n/a	n/a		n/a	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

Programmatic Contingency

2024 Capital Budget and Capital Improvement Program

Project Overview		Benefited CSO(s), SSO(s), PSO(s)	
Project ID: **13090000**	WWIP Index #: **N/A**	CSO(s):	N/A
Project Type: **Contingency**	Project Phase:	SSO(s):	N/A
WWTP Basin: System Wide	Sanitary Sewer No:	PSO(s):	N/A
Watershed:			
Municipality: System Wide			
Neighborhood: Systemwide			

Project Description

For 2024, the Allowance for Programmatic Contingency is estimated at $5 million which is consistent with expenditures from this fund in recent years, and consistent with industry standard benchmarking. Costs are allocated to specific capital projects as they are expended for the purposes of additional necessary funding PS Agreements for planning design construction services, City-Contractor Agreements for approved change requests change orders, and for the funding construction contracts where the lowest awarded bid amount is less than 120% of the Engineer's Estimate (original legislation amount).

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$0	$0	$0	$0	$0
Design	$0	$0	$0	$0	$0
Pre-Construction Services	$0	$0	$0	$0	$0
Miscellaneous Expense	$50,000,000	$15,306,868	$5,000,000	$35,000,000	$55,306,868
Right-of-Way	$0	$0	$0	$0	$0
Construction	$0	$0	$0	$0	$0
Program Management	$0	$0	$0	$0	$0
Construction Services	$0	$0	$0	$0	$0
Interest / Financing	$0	$0	$0	$0	$0
Total	$50,000,000	$15,306,868	$5,000,000	$35,000,000	$55,306,868

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$15,306,868	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$40,306,868

Prior Legislation Action

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	n/a	n/a	n/a	01/03/2011		n/a	
End Date	n/a	n/a	n/a	12/31/2016		n/a	n/a

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

MSD LABOR

2024 Capital Budget and Capital Improvement Program

Project Overview		Benefited CSO(s), SSO(s), PSO(s)	
Project ID: **13099999**	WWIP Index #: **N/A**	CSO(s):	N/A
Project Type: **Allowance**	Project Phase: Allowance	SSO(s):	N/A
WWTP Basin: System Wide	Sanitary Sewer No:	PSO(s):	N/A
Watershed: Multiple			
Municipality: Multiple			
Neighborhood: Systemwide			

Project Description

This allowance was initiated in 2020 to allow all MSD WWE staff to discontinue direct charges to projects and instead charge to an allowance that would then be allocated back to projects by MSD Accounting. The cost of MSD WWE labor has been removed from project specific budgets to avoid double counting.

Cost Description	Original Project Estimate	Prior Legislation	Current Legislation	Future Legislation	Current Project Estimate
Planning	$0	$0	$0	$0	$0
Design	$0	$0	$0	$0	$0
Pre-Construction Services	$0	$0	$0	$0	$0
Miscellaneous Expense	$0	$21,939,673	$6,210,000	$27,090,920	$55,240,593
Right-of-Way	$0	$0	$0	$0	$0
Construction	$0	$0	$0	$0	$0
Program Management	$0	$0	$0	$0	$0
Construction Services	$0	$0	$0	$0	$0
Interest / Financing	$0	$0	$0	$0	$0
Total	$0	$21,939,673	$6,210,000	$27,090,920	$55,240,593

5 Year Projected Legislation

Prior Legislation	2024	2025	2026	2027	2028	Project Total
$21,939,673	$6,210,000	$6,427,350	$6,652,310	$6,885,140	$7,126,120	$55,240,593

Prior Legislation Action

Jan 2020,Dec 2020,Jan 2021,Jan 2022,Jan 2023

Project Schedule

Project Phase	Planning	Design	Right of Way	Construction	Substantial Comp.	Closeout	Regulatory Compliance
Start Date	n/a	n/a	n/a	n/a		n/a	
End Date	n/a	n/a	n/a	n/a		n/a	n/a

Project ID	Project Type	Project Name	Project Phase(s)	2025 Total Requested	Total Project Cost
10130280	PS	Addyston Pump Station Elimination	(Design,Easement)	$1,321,000	$11,749,382
10144888	FAC	MCWWTP High Rate Treatment Pump Station	(Construction)	$162,913,100	$184,336,176
10145680	SRC	CSO 24 Regulator Improvements	(Design)	$418,000	$3,177,000
10172955	FAC	LMWWTP High Rate Treatment Preparation	(Design)	$2,705,000	$48,358,500
10172960	FAC	LMWWTP HRT Facility	(Design,Easement)	$24,662,500	$234,498,500
10180125	ALW	Main Sewer Renewal Program 2025	(Construction)	$6,895,852	$6,895,852
10180225	ALW	Manhole Renewal Program 2025	(Construction)	$1,116,840	$1,116,840
10182025	ALW	Urgent Capacity Response 2025	(Planning)	$517,500	$517,500
10190225	ALW	Phase 2 WWIP Planning 2025	(Planning)	$1,035,000	$1,035,000
10199025	ALW	Program Management and Support Services 2025	(Design)	$7,653,100	$7,653,100
10199125	ALW	Hamilton County Utility Oversight and Coordination 2025	(Design)	$5,049,102	$5,049,102
10222005	PS	Colerain-Bevis Pump Station Replacement	(Design,Easement)	$682,000	$5,742,000
10222010	FAC	TCWWTP Aeration Basin Conversion	(Construction)	$9,648,300	$9,648,300
10230090	PS	Barrington Hills, Barrington Hills BLK. F, Gil Volz, and Kirkridge Acres P.S. Eliminations	(Construction)	$8,422,400	$10,708,945
10230150	SWR	Addyston Creek and Sewer Rehab	(Construction)	$627,000	$969,283
10230170	SWR	Harrison Avenue North and South Hydraulic Improvements	(Design,Easement)	$955,000	$5,925,000
10232045	FAC	MUWWTP UV Disinfection Replacement	(Design)	$495,000	$5,028,000
10240271	SWR	Lower Mill Creek HW DW Protection	(Construction)	$5,963,500	$8,553,471
10240320	SWR	Wilder Avenue Sewer Replacement	(Construction)	$679,700	$1,219,818

Project ID	Project Type	Project Name	Project Phase(s)	2025 Total Requested	Total Project Cost
10240640	FAC	MCWWTP Dewatering Building Improvements	(Design)	$8,302,000	$171,511,000
10240720	SWR	Valleyview Court Sewer Replacement	(Construction)	$1,212,000	$1,711,000
10240725	SWR	Shaffer Avenue Sewer Replacement	(Construction)	$944,200	$1,421,700
10240735	SWR	De Votie Avenue Sewer Replacement	(Construction)	$1,150,000	$1,672,000
10240765	SWR	Fyffe Avenue Sewer	(Design,Easement)	$428,000	$1,706,300
10240790	SWR	Clifton Avenue at Parker Street Sewer Replacement	(Design,Easement)	$240,000	$831,000
10240855	SWR	Connecticut Avenue Sewer Replacement	(Construction)	$3,071,400	$3,957,400
10242030	SWR	Dorchester Avenue at Highland Avenue Sewer Replacement	(Construction)	$970,600	$1,207,988
10242110	SWR	Central Avenue and W 9th Street Sewer	(Design,Easement)	$331,000	$2,013,000
10242115	SWR	Central Avenue (HN 1964) Sewer	(Design,Easement)	$167,500	$541,000
10242125	SWR	Sycamore Street Sewer	(Design,Easement)	$825,000	$2,935,000
10242155	SWR	Morrison Avenue Sewer Replacement	(Design,Easement)	$390,000	$2,340,000
10242180	SWR	Winton Lake Aerial Sewer Structure and Weir Modifications	(Design,Easement)	$220,000	$1,400,000
10242185	SWR	Anthony to Innes Sewer Replacement	(Design,Easement)	$679,000	$4,033,000
10242200	SWR	Walnut Hills Cemetery Sewer Replacement	(Planning)	$230,000	$4,150,000
10252035	SWR	East Loveland Ave Sewer Replacement Phase 2	(Design,Easement)	$681,799	$5,662,699
10270026	PS	Camargo Canyon Pump Station Elimination	(Construction)	$1,178,400	$1,642,695
10270110	SWR	Linwood Avenue Sewer Replacement	(Construction)	$733,500	$1,218,167
10270175	SWR	East Hill Ave Sewer Replacement	(Construction)	$2,304,000	$2,877,600
10272070	SWR	Summerview Low Pressure Forcemain	(Construction)	$120,600	$280,535

Project ID	Project Type	Project Name	Project Phase(s)	2025 Total Requested	Total Project Cost
10272090	SWR	Delta Ave at Linwood Ave Sewer Replacement	(Design)	$539,000	$4,589,000
10280245	ALW	Hydraulic Modeling 2025	(Planning)	$2,891,790	$2,891,790
10280725	ALW	Critical Asset Management Projects 2025	(Construction)	$7,687,308	$7,687,308
10281325	ALW	Prioritized Wastewater Collection System Improvements 2025	(Construction)	$22,174,358	$22,174,358
10282025	ALW	CIP Planning Projects 2025	(Planning)	$4,140,000	$4,140,000
10282425	ALW	Flow Monitoring Support 2025	(Planning)	$2,194,200	$2,194,200
13090000	CON	Programmatic Contingency	(Design)	$5,000,000	$50,306,868
13099999	ALW	MSD LABOR	(Design)	$6,427,350	$49,030,593
47 CIP Projects for 2025				**$316,992,899**	**$908,307,970**

Project ID	Project Type	Project Name	Project Phase(s)	2026 Total Requested	Total Project Cost
10172095	SWR	CSO 182 Strategic Sewer Separation	(Design,Easement)	$947,900	$6,730,723
10172950	FAC	LMWWTP Electrical, Primary, and Secondary Improvements	(Construction)	$58,728,600	$61,955,400
10180126	ALW	Main Sewer Renewal Program 2026	(Construction)	$7,137,207	$7,137,207
10180226	ALW	Manhole Renewal Program 2026	(Construction)	$1,155,619	$1,155,619
10182026	ALW	Urgent Capacity Response 2026	(Planning)	$535,613	$535,613
10190226	ALW	Phase 2 WWIP Planning 2026	(Planning)	$1,071,225	$1,071,225
10199026	ALW	Program Management and Support Services 2026	(Design)	$7,920,959	$7,920,959
10199126	ALW	Hamilton County Utility Oversight and Coordination 2026	(Design)	$5,225,821	$5,225,821
10240275	SWR	SSO 603 and 704 Improvements	(Construction)	$3,699,600	$11,222,181
10240426	PS	Pleasant Run Pump Station Upgrades	(Construction)	$29,179,000	$35,745,239
10240740	SWR	Tennessee Avenue (HN 1754) Sewer Replacement	(Construction)	$210,300	$560,300
10240775	SWR	Gilbert Avenue at Casino Sewer Replacement	(Construction)	$7,551,700	$8,240,100
10240795	SWR	Central to McMicken at Stark St Sewer Replacement	(Construction)	$3,006,300	$3,430,282
10240875	SWR	Ledgewood Ave Sewer Replacement	(Construction)	$6,193,000	$7,293,000
10242200	SWR	Walnut Hills Cemetery Sewer Replacement	(Design,Easement)	$970,000	$3,920,000
10262015	FAC	SCWWTP Secondary Clarifier Upgrade	(Construction)	$5,340,000	$6,067,216
10272025	SWR	Wasson Ravine Sewer Replacement	(Construction)	$1,986,000	$2,703,895
10280246	ALW	Hydraulic Modeling 2026	(Planning)	$2,993,003	$2,993,003
10280726	ALW	Critical Asset Management Projects 2026	(Construction)	$7,956,364	$7,956,364

2026 CIP

Metropolitan Sewer District of Greater Cincinnati

Project ID	Project Type	Project Name	Project Phase(s)	2026 Total Requested	Total Project Cost
10281326	ALW	Prioritized Wastewater Collection System Improvements 2026	(Construction)	$22,950,461	$22,950,461
10282026	ALW	CIP Planning Projects 2026	(Planning)	$4,284,900	$4,284,900
10282426	ALW	Flow Monitoring Support 2026	(Planning)	$2,270,997	$2,270,997
13090000	CON	Programmatic Contingency	(Design)	$5,000,000	$45,306,868
13099999	ALW	MSD LABOR	(Design)	$6,652,310	$42,603,243
24 CIP Projects for 2026				**$192,966,879**	**$299,280,616**

Project ID	Project Type	Project Name	Project Phase(s)	2027 Total Requested	Total Project Cost
10132930	SWR	Wulff Run Sewer Replacement	(Construction)	$28,394,100	$28,883,600
10172955	FAC	LMWWTP High Rate Treatment Preparation	(Construction)	$45,653,500	$45,653,500
10180127	ALW	Main Sewer Renewal Program 2027	(Construction)	$7,387,010	$7,387,010
10180227	ALW	Manhole Renewal Program 2027	(Construction)	$1,196,066	$1,196,066
10182027	ALW	Urgent Capacity Response 2027	(Planning)	$554,360	$554,360
10190227	ALW	Phase 2 WWIP Planning 2027	(Planning)	$1,108,718	$1,108,718
10199027	ALW	Program Management and Support Services 2027	(Design)	$8,198,193	$8,198,193
10199127	ALW	Hamilton County Utility Oversight and Coordination 2027	(Design)	$5,408,725	$5,408,725
10232025	SWR	3731 Glenmore Avenue Sewer Evaluation	(Construction)	$380,000	$412,000
10232030	PS	Rapid Run and Foley Road PS Receiver Manhole Installation	(Construction)	$274,900	$519,300
10232035	SWR	CSO 541 Outfall Replacement	(Construction)	$995,100	$1,406,500
10232045	FAC	MUWWTP UV Disinfection Replacement	(Construction)	$4,533,000	$4,533,000
10240200	SWR	Harvey Ave-Hickman Ave Sewer Replacement	(Construction)	$1,440,000	$2,190,377
10240525	SWR	Victory Parkway Sewer Rehabilitation	(Construction)	$2,450,000	$2,960,710
10240780	SWR	Galbraith Rd to Sheldon Avenue Sewer Replacement	(Construction)	$613,560	$1,231,060
10240845	SWR	Taft Road & McMillan Street Sewer Replacement	(Construction)	$1,100,800	$1,520,800
10242025	SWR	Davey Avenue to Hamilton Avenue Sewer Replacement	(Construction)	$513,100	$1,147,120
10242085	PS	Village Woods Pump Station and System Improvements	(Construction)	$740,600	$974,600

2027 CIP

Metropolitan Sewer District of Greater Cincinnati

Project ID	Project Type	Project Name	Project Phase(s)	2027 Total Requested	Total Project Cost
10242140	FAC	MCWWTP Dewatering Building Odor Control	(Construction)	$2,301,300	$3,453,300
10242180	SWR	Winton Lake Aerial Sewer Structure and Weir Modifications	(Construction)	$1,070,000	$1,180,000
10270225	SWR	Elsmere Avenue from Slane to Lafayette Sewer Replacement	(Construction)	$8,222,300	$8,385,300
10280247	ALW	Hydraulic Modeling 2027	(Planning)	$3,097,759	$3,097,759
10280727	ALW	Critical Asset Management Projects 2027	(Construction)	$8,234,837	$8,234,837
10281327	ALW	Prioritized Wastewater Collection System Improvements 2027	(Construction)	$23,754,397	$23,754,397
10282027	ALW	CIP Planning Projects 2027	(Planning)	$4,434,872	$4,434,872
10282427	ALW	Flow Monitoring Support 2027	(Planning)	$2,350,482	$2,350,482
13090000	CON	Programmatic Contingency	(Design)	$5,000,000	$40,306,868
13099999	ALW	MSD LABOR	(Design)	$6,885,140	$35,950,933
28 CIP Projects for 2027				**$176,292,819**	**$246,434,387**

Project ID	Project Type	Project Name	Project Phase(s)	2028 Total Requested	Total Project Cost
10180128	ALW	Main Sewer Renewal Program 2028	(Construction)	$7,645,555	$7,645,555
10180228	ALW	Manhole Renewal Program 2028	(Construction)	$1,237,928	$1,237,928
10182028	ALW	Urgent Capacity Response 2028	(Planning)	$573,763	$573,763
10190228	ALW	Phase 2 WWIP Planning 2028	(Planning)	$1,147,524	$1,147,524
10199028	ALW	Program Management and Support Services 2028	(Design)	$8,485,130	$8,485,130
10199128	ALW	Hamilton County Utility Oversight and Coordination 2028	(Design)	$5,598,030	$5,598,030
10222005	PS	Colerain-Bevis Pump Station Replacement	(Construction)	$4,750,000	$5,060,000
10230655	SWR	Muddy Creek Road and Rosebud Drive Sewer Replacement	(Construction)	$452,000	$595,000
10240640	FAC	MCWWTP Dewatering Building Improvements	(Construction)	$160,689,000	$163,209,000
10240765	SWR	Fyffe Avenue Sewer	(Construction)	$1,158,000	$1,278,300
10240790	SWR	Clifton Avenue at Parker Street Sewer Replacement	(Construction)	$591,000	$591,000
10242055	SWR	Queen City Avenue (HN 2047) Sewer Rehabilitation	(Construction)	$158,000	$238,000
10242080	SWR	Fenton Avenue (HN 1336) Sewer Relocation	(Construction)	$1,220,000	$1,330,000
10242090	SWR	Donna Lane & Ester Marie Drive Sewer Relocation and Rehab	(Construction)	$612,000	$698,000
10242105	SWR	Loth Street (HN 2272) Sewer Relocation and Rehab	(Construction)	$1,700,000	$1,860,000
10242110	SWR	Central Avenue and W 9th Street Sewer	(Construction)	$1,552,000	$1,682,000
10242115	SWR	Central Avenue (HN 1964) Sewer	(Construction)	$268,500	$373,500
10242155	SWR	Morrison Avenue Sewer Replacement	(Construction)	$1,950,000	$1,950,000

2028 CIP

Metropolitan Sewer District of Greater Cincinnati

Project ID	Project Type	Project Name	Project Phase(s)	2028 Total Requested	Total Project Cost
10242185	SWR	Anthony to Innes Sewer Replacement	(Construction)	$3,354,000	$3,354,000
10252035	SWR	East Loveland Ave Sewer Replacement Phase 2	(Construction)	$4,980,900	$4,980,900
10270155	SWR	Paxton Avenue Sewer Rehabilitation	(Construction)	$2,454,000	$2,674,240
10272050	PS	Wayside Hills Pump Station	(Construction)	$1,470,000	$1,690,000
10272075	SWR	Wayside Avenue and Colter Avenue Sewer Improvements	(Construction)	$261,700	$383,800
10272080	SWR	Madison Rd and Edwards Rd Sewer Improvements	(Construction)	$2,794,125	$2,991,025
10272090	SWR	Delta Ave at Linwood Ave Sewer Replacement	(Construction)	$4,050,000	$4,050,000
10280248	ALW	Hydraulic Modeling 2028	(Planning)	$3,203,181	$3,203,181
10280728	ALW	Critical Asset Management Projects 2028	(Construction)	$8,523,057	$8,523,057
10281328	ALW	Prioritized Wastewater Collection System Improvements 2028	(Construction)	$24,585,800	$24,585,800
10282028	ALW	CIP Planning Projects 2028	(Planning)	$4,590,093	$4,590,093
10282428	ALW	Flow Monitoring Support 2028	(Planning)	$2,432,749	$2,432,749
13090000	CON	Programmatic Contingency	(Design)	$5,000,000	$35,306,868
13099999	ALW	MSD LABOR	(Design)	$7,126,120	$29,065,793
32 CIP Projects for 2028				**$274,614,155**	**$331,384,236**

CERTIFICATE OF CLERK

IT IS HEREBY CERTIFIED that the foregoing is a true and correct transcript of resolutions adopted by the Board of County Commissioners in session this _____ day of _____, 2023.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the Official Seal of the Office of the Board of County Commissioners of Hamilton County, Ohio this _____ day of _____, 2023.

_____

Leslie R. Hervey, Clerk
Board of County Commissioners
Hamilton County, Ohio

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI
HAMILTON COUNTY

REGULAR AUDIT

FOR THE YEAR ENDED DECEMBER 31, 2020

OHIO AUDITOR OF STATE
KEITH FABER

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI
HAMILTON COUNTY
DECEMBER 31, 2020

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OHIO AUDITOR OF STATE
KEITH FABER

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INDEPENDENT AUDITOR'S REPORT

Metropolitan Sewer District of Greater Cincinnati
Hamilton County
1605 Gest Street
Cincinnati, Ohio 45204

To the Hamilton County Board of Commissioners:

Report on the Financial Statements

We have audited the accompanying financial statements of the Metropolitan Sewer District of Greater Cincinnati, Hamilton County, Ohio (the District), as of and for the years ended December 31, 2020 and 2019, and the related notes to the financial statements, which collectively comprise the District's basic financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

Management is responsible for preparing and fairly presenting these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes designing, implementing, and maintaining internal control relevant to preparing and fairly presenting financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to opine on these financial statements based on our audit. We audited in accordance with auditing standards generally accepted in the United States of America and the financial audit standards in the Comptroller General of the United States' *Government Auditing Standards*. Those standards require us to plan and perform the audit to reasonably assure the financial statements are free from material misstatement.

An audit requires obtaining evidence about financial statement amounts and disclosures. The procedures selected depend on our judgment, including assessing the risks of material financial statement misstatement, whether due to fraud or error. In assessing those risks, we consider internal control relevant to the District's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not to the extent needed to opine on the effectiveness of the District's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of management's accounting policies and the reasonableness of their significant accounting estimates, as well as our evaluation of the overall financial statement presentation.

We believe the audit evidence we obtained is sufficient and appropriate to support our audit opinions.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the District, as of December 31, 2020 and 2019, and the changes in financial position andcash flows for the years then ended in accordance with the accounting principles generally accepted in the United States of America.

Emphasis of Matter

As discussed in Note 15 to the financial statements, the financial impact of COVID-19 and the continuing emergency measures may impact subsequent periods of the District. We did not modify our opinion regarding this matter.

Other Matters

Required Supplementary Information

Accounting principles generally accepted in the United States of America require this presentation to include *management's discussion and analysis*, and schedules of net pension and other post-employment benefit liabilities and pension and other post-employment benefit contributions listed in the table of contents, to supplement the basic financial statements. Although this information is not part of the basic financial statements, the Governmental Accounting Standards Board considers it essential for placing the basic financial statements in an appropriate operational, economic, or historical context. We applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, consisting of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, to the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not opine or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to opine or provide any other assurance.

Other Reporting Required by Government Auditing Standards

In accordance with *Government Auditing Standards*, we have also issued our report dated May 27, 2021, on our consideration of the District's internal control over financial reporting and our tests of its compliance with certain provisions of laws, regulations, contracts and grant agreements and other matters. That report describes the scope of our internal control testing over financial reporting and compliance, and the results of that testing, and does not opine on 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 District's internal control over financial reporting and compliance.

Keith Faber
Auditor of State
Columbus, Ohio
May 27, 2021

THE METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI
HAMILTON COUNTY

MANAGEMENT DISCUSSION AND ANALYSIS
(UNAUDITED)

This section of the Metropolitan Sewer District's annual financial report presents our discussion and analysis of the District's financial performance during the fiscal years ended December 31, 2020 and December 31, 2019. Please read it in conjunction with the District's basic financial statements and footnotes, beginning on page 11.

FINANCIAL HIGHLIGHTS FOR THE YEAR

- Assets and deferred outflows exceeded liabilities and deferred inflows by $1,076 million at the close of the 2020 fiscal year.
- The District's net position decreased by $59.9 million in 2020, or -5.3%.
- During fiscal year 2020, the District's total assets increased $28 million to $2,367 million, a 1.2% increase.
- Total long-term liabilities increased $124 million to $1,325 million in fiscal year 2020.
- A refinance of the 2010A and 2010B Bonds occurred in November 2020, to a 2020A Revenue Bond, resulting in a Premium of $18.9 million, and a net present value savings of 13.1 million.
- The District's debt service coverage ratio remains strong at 1.8 for fiscal year 2020.

FINANCIAL STATEMENTS OVERVIEW

Financial Reporting Entity– The Metropolitan Sewer District of Greater Cincinnati is a Hamilton County enterprise fund managed and operated by the City of Cincinnati. The District is operated pursuant to the authority of the Revised Code authorizing the formation of joint sewer districts, agreements between counties and municipal corporations. The District provides sewage treatment within a service area of approximately 400 square miles and encompasses portions of four counties in southwestern Ohio. The District provides wastewater removal and treatment to over 220,000 residential, commercial and industrial sewer connections and operates and maintains over 3,000 miles of sanitary and combined sewers, seven major wastewater treatment plants and 100 pump stations. As an enterprise fund, operations are reported on the full accrual basis of accounting: revenues are recognized when earned, and expenses are recognized when incurred. The County issues a separate Comprehensive Annual Financial Report which includes the District as a separate enterprise fund of the County. The financial statements of the District report information about the District using accounting methods similar to those used by private-sector companies. These statements provide both long-term and short-term information about the District's overall financial status.

Financial Statement Structure --

In addition to the Independent Auditor's Report, the annual financial report consists of three segments:

- The Management's Discussion and Analysis provides explanations for and analysis of the Department's financial activities based upon currently known facts, conditions, and decisions of the Department's management. While primarily focused on current year results compared with prior years, this discussion also addresses certain long-term issues, which may, in management's opinion, impact the District's financial performance.

- Basic Financial Statements, which depict the District's financial position as of December 31, 2020 and 2019, along with earnings performance and cash flow information. These statements include the Statement of Net Position, the Statement of Revenues, Expenses, and Changes in Net Position and the Statement of Cash Flows.
- The accompanying notes explain some of the financial statement data and provide more detailed information.

Required Basic Financial Statements -- The Statement of Net Position is the first required statement; it includes the District's assets and liabilities and provides information about the nature and amounts of investments in resources (assets) and nature and extent of obligations (liabilities) with the difference being reported as net position. It also provides the basis for computing the rates of return, evaluating the capital structure of the District, and assessing the liquidity and financial flexibility of the District. Over time, increases or decreases in the District's net position is one indicator of whether its financial health is improving or deteriorating. Other non-financial factors such as changes in economic conditions, population growth, and new or changed legislation also need to be considered in assessing the District's financial condition. The Statement of Revenues, Expenses, and Change in Net Position is the second required financial statement which demonstrates the changes in net position from one fiscal period to the next by accounting for revenues and expenditures and measuring the financial results of operations. This statement measures the profitability (i.e. change in net position) of the District's operations over the past year and can be used to determine whether the District has successfully recovered all of its costs through its user fees and other charges. The final required financial statement is the Statement of Cash Flows. The primary purpose of this statement is to provide information about the District's cash receipts, cash payments, and net changes in cash and cash equivalents resulting from operations, investing, and capital and noncapital financing activities. It also provides information regarding sources of cash, uses of cash, and changes in cash balances during the reporting period

Notes to the audited financial statements contain information essential to understanding them, such as the District's significant accounting policies and information about certain financial statement account balances

FINANCIAL ANALYSIS

Table A below shows that in fiscal year 2020, 87.8% of the District's net position reflects its investment in capital assets (e.g., buildings, sewer laterals, and equipment), less related debt still outstanding used to acquire those assets. These capital assets are used primarily in the collection and treatment of wastewater throughout the District's service area.

- The related liabilities will be repaid with resources provided by system users through rates and fees. Long-term debt (net of the current portion) decreased by $34.2 million in 2020, or -3.85%, and decreased by $.6 million in 2019, or -0.7%.
- Net position decreased $59.9 million in 2020, and decreased $6.1 million in 2019. Percentage decreases over the two year period of -5.3%, and -0.5%, respectively. Total expenses in both years was due to fluctuations attributable to accounting for pensions.

Table A
Condensed Summary of Net Position
(In Thousands)

	2020	Percentage Increase (Decrease) over 2019	2019	Percentage Increase (Decrease) over 2018	2018	Percentage Increase (Decrease over 2017
Current and other assets	$ 79,756	19.6%	$ 66,692	-2.5%	$ 67,052	-10.5%
Noncurrent (restricted) Assets	$ 459,288	-10.9%	$ 515,270	-2.6%	$ 529,280	1.1%
Capital assets, net	$ 1,827,577	4.0%	$ 1,757,052	5.1%	$ 1,672,436	6.1%
Total assets	2,366,621	1.2%	2,339,014	3.1%	2,268,768	3.6%
Deferred Outflows	$ 129,753	44.6%	$ 89,737	200.2%	$ 29,889	57.5%
Current liabilities	$ 76,484	-9.7%	$ 84,745	2.8%	$ 82,403	9.3%
Noncurrent liabilities	$ 1,324,567	10.3%	$ 1,200,583	13.5%	$ 1,057,773	3.8%
Total liabilities	$ 1,401,051	9.0%	$ 1,285,328	12.7%	$ 1,140,176	-1.7%
Deferred Inflows	$ 19,481	152.1%	$ 7,726	-53.6%	$ 16,650	-65.9%
Net investment in capital assets	$ 944,971	11.6%	$ 847,027	11.2%	$ 761,989	9.7%
Restricted	$ 4,573	-36.2%	$ 7,172	1.5%	$ 7,063	1.3%
Unrestricted	$ 126,298	-55.1%	$ 281,498	-24.5%	$ 372,779	-0.5%
Total Net Position	$ 1,075,842	-5.3%	$ 1,135,697	-0.5%	$ 1,141,831	13.5%

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Table B below shows total operating revenues for fiscal year 2020 of $257.5 million, a decrease of $14.8 million, or -5.4%. Operating revenues were $272.3 million, a decrease of .6 million, or -.2% in 2019. Meanwhile, total expenses increased $33 million, or 10.9%, in 2020 and increased $75.9 million, or 33.5%, in 2019. Increase in total expenses in both those years was due to fluctuations attributable to accounting for pensions.

Table B
Condensed Summary of Revenues
Expenses and Changes in Net Position
(In Thousands)

	2020	Percentage Increase (Decrease) over 2019	2019	Percentage Increase (Decrease) over 2018	2018	Percentage Increase (Decrease) over 2017
Operating revenues	$ 257,484	-5.4%	$ 272,273	-0.2%	$ 272,885	-6.4%
Nonoperating revenues	13,930	-23.1%	18,121	25.0%	14,495	35.5%
Total revenues	271,414	-6.5%	290,394	1.0%	287,380	-4.9%
Depreciation and amortization expense	$ 66,437	-0.3%	$ 66,628	2.3%	$ 65,132	10.3%
Other operating expenses	125,252	-0.1%	125,343	5.9%	118,355	-0.6%
Pension Expense	114,027	52.2%	74,942	992.3%	6,861	-117.0%
Nonoperating expenses	29,934	-16.4%	35,810	-1.9%	36,492	-10.9%
Total expenses	$ 335,650	10.9%	$ 302,723	33.5%	$ 226,840	27.0%
Income from operations	$ (64,236)	421.0%	$ (12,329)	-120.4%	$ 60,540	-51.0%
Capital contributions	$ 4,381	-29.3%	$ 6,195	26.6%	$ 4,894	3.4%
Change in net position	$ (59,855)	875.8%	$ (6,134)	-109.4%	$ 65,434	-49.0%
Total Net Position, beginning	1,135,697	-0.5%	1,141,831	6.1%	1,076,397	13.5%
Total Net Position, ending	$1,075,842	-5.3%	$ 1,135,697	-0.5%	$ 1,141,831	6.1%

- Operating expenses, excluding depreciation, amortization and net pension expense, decreased by $.9 million to $125.2 million in 2020 from $125.3 million in 2019. The decrease was due to a decrease in Utilities, fuel and supplies and Other Operating expenses. 2019 saw an increase of $6.9 million, or 5.9%, over the prior year. The increase was due to purchased services and other expenses.
- Salary and wages increased $.4 million to $57.7 million in 2020 compared to $57.3 million in 2019. This was a combination of Salary and Wages and Benefits.
- Depreciation expense decreased $.2 million, or -0.3%, in 2020. Depreciation expense increased $1.5 million, 2.3%, in 2019 compared to the prior year.

- Non-operating expenses for 2020 were $29.9 million in, a decrease of $5.9 million or -16.4%. 2019 decreased $.6 million, or -1.9%, due to changes in interest expense and the fair value of investments.
- The City of Cincinnati offered an Early Retirement Incentive Program (ERIP) in 2007. In 2016, MSD paid the City $8,723,061, its share of the remaining liability to the City Retirement System. This amount represents in full the liability for the years 2015-2023 and is being amortized over 7 years. ERIP amortization expense was $1,250 million in both 2020 and 2019.

Table C reflects year-end capital balances. As of December 31, the District's investment in capital assets (net of accumulated depreciation) amounted to $1,828 million in 2020, $1,757 million in 2019. Capital assets increased $70.5 million, or 4.0%, on system improvement projects, land acquired for those projects and equipment replacement in 2020. Capital contributions were $4.4 million and $6.2 million in 2020 and 2019, respectively.

Capital construction and sewer improvement projects were 33.1% in 2020 and 15.6% of the program in 2019. Additional information on the District's capital assets can be found in Note 5 to the financial statements.

Table C
Capital Assets
(In Thousands)

	2020	Percentage Increase (Decrease) over 2019	2019	Percentage Increase (Decrease) over 2018	2018	Percentage Increase (Decrease) over 2017
Land	$ 10,188	0.0%	$ 10,188	0.0%	10,188	57.2%
Buildings	356,666	0.0%	356,666	0.2%	355,865	0.7%
Equipment	726,265	4.3%	696,317	2.0%	682,525	15.0%
Sewer Laterals	1,348,645	3.0%	1,309,864	1.3%	1,293,287	9.8%
Construction in progress	488,533	14.1%	428,108	35.7%	315,384	-19.5%
Subtotal	$ 2,930,297	4.6%	$ 2,801,143	5.4%	$ 2,657,249	5.3%
Less accumulated depreciation	1,102,720	5.6%	1,044,091	6.0%	984,813	4.0%
Net capital assets	$ 1,827,577	4.0%	$ 1,757,052	5.1%	$ 1,672,436	6.1%

Bond Issuances

The District finances its construction program through a combination of revenue bonds, state revolving loans through the State of Ohio and cash, with the primary source being tax-exempt revenue bonds. The District's revenue bond rates are:

- Moody's Investors Services Aa2
- Standard & Poor's Corporation AA+

Revenue bond service Debt Coverage in 2020 was 271% and 271% in 2019, compared to an Agency policy of 150% (25% higher than indenture requirements). The total debt coverage for 2020 was 177% and 184% in 2019, compared to the indenture requirement of 125%.

Rate Increase - Hamilton County Commissioners have not approved a rate increase of the District's sewer fee for 2016 - 2021. The District's large capital program to meet Federal EPA requirements will likely necessitate a rate increase in the near future.

GASB 68

During 2015, the Metropolitan Sewer District of Greater Cincinnati adopted GASB Statement 68, "Accounting and Financial Reporting for Pensions—an Amendment of GASB Statement 27," which significantly revised accounting for pension costs and liabilities. For reasons discussed below, many end users of this financial statement will gain a clearer understanding of the Metropolitan Sewer District of Greater Cincinnati's actual financial condition by adding deferred inflows related to pension and the net pension liability to the reported net position and subtracting deferred outflows related to pension.

Governmental Accounting Standards Board standards are national and apply to all government financial reports prepared in accordance with generally accepted accounting principles. When accounting for pension costs, GASB 27 focused on a funding approach. This approach limited pension costs to contributions annually required by law, which may or may not be sufficient to fully fund each plan's *net pension liability*. GASB 68 takes an earnings approach to pension accounting; however, the nature of Ohio's statewide pension systems and state law governing those systems requires additional explanation in order to properly understand the information presented in these statements.

Under the standards required by GASB 68, the net pension liability equals the Metropolitan Sewer District of Greater Cincinnati's proportionate share of each plan's collective:

1. Present value of estimated future pension benefits attributable to active and inactive employees' past service
2 Minus plan assets available to pay these benefits

GASB notes that pension obligations, whether funded or unfunded, are part of the "employment exchange" – that is, the employee is trading his or her labor in exchange for wages, benefits, and the promise of a future pension. GASB noted that the unfunded portion of this pension promise is a present obligation of the government, part of a bargained-for benefit to the employee, and should accordingly be reported by the government as a liability since they received the benefit of the exchange. However, the Metropolitan Sewer District of Greater Cincinnati is not responsible for certain key factors affecting the balance of this liability. The Metropolitan Sewer District of Greater Cincinnati employees are covered by two pension systems. They are the City of Cincinnati Retirement System (CRS), and the Ohio Public Employees Retirement System (OPERS). The City of Cincinnati Retirement System (CRS) is accounted for as a single employer defined benefit pension plan. For CRS, the employee shares the obligation of funding

pension benefits with the employer. Both employer and employee contribution rates are set by the City of Cincinnati ordinance. The CRS system provides retirement and disability benefits, annual cost of living adjustments, and death benefits to plan members and beneficiaries. The City of Cincinnati makes employer contributions based on a percentage of covered payroll of all CRS members. For Ohio PERS, the employee shares the obligation of funding pension benefits with the employer. Both employer and employee contribution rates are capped by State statute. A change in these caps requires action of both Houses of the General Assembly and approval of the Governor. Benefit provisions are also determined by State statute. The employee enters the employment exchange with the knowledge that the employer's promise is limited not by contract but by law. The employer enters the exchange also knowing that there is a specific, legal limit to its contribution to the pension system. In Ohio, there is no legal means to enforce the unfunded liability of the pension system *as against the public employer.* State law operates to mitigate/lessen the moral obligation of the public employer to the employee, because all parties enter the employment exchange with notice as to the law. The pension system is responsible for the administration of the plan.

Most long-term liabilities have set repayment schedules or, in the case of compensated absences (i.e. sick and vacation leave), are satisfied through paid time-off or termination payments. There is no repayment schedule for the net pension liability. As explained above, changes in pension benefits, contribution rates, and return on investments affect the balance of the net pension liability, but are outside the control of the local government. In the event that contributions, investment returns, and other changes are insufficient to keep up with required pension payments, State statute does not assign/identify the responsible party for the unfunded portion. Due to the unique nature of how the net pension liability is satisfied, this liability is separately identified within the long-term liability section of the statement of net position.

In accordance with GASB 68, the Metropolitan Sewer District of Greater Cincinnati's statements prepared on an accrual basis of accounting include an annual pension expense for their proportionate share of each plan's *change* in net pension liability not accounted for as deferred inflows/outflows.

The COVID-19 Crisis has MSD reassessing the 2021 budget expenditures.

For additional information on the Management Discussion and Analysis please contact:

Metropolitan Sewer District of Greater Cincinnati
Office of the Director
1600 Gest Street
Cincinnati, OH 45204

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Metropolitan Sewer District
Statement of Net Position
For The Periods Ended December 31, 2020 And December 31, 2019
(All amounts expressed in thousands)

	2020	2019
ASSETS		
Current assets:		
Cash, cash equivalents and pooled investments held by the City of Cincinnati (Note 2)	$ 20,876	$ 20,975
Accounts receivable (Note 3)	40,575	41,326
Prepaid expenses and other (Note 14)	3,449	4,235
Total current assets	64,900	66,536
Noncurrent assets:		
Restricted assets:		
Cash, cash equivalents, and pooled investments held by the City of Cincinnati		
Construction account (Note 2)	25,610	67,394
Amount to be transferred to surplus account (Note 2)	61,485	64,881
Held by trustee: (Note 4)		
Cash and cash equivalents (Note 2)	69,663	90,568
Investments - Held to maturity (Note 2)	302,530	292,427
Total restricted assets	459,288	515,270
Other assets:		
Other	14,856	156
Total other assets	14,856	156
Capital assets: (Note 5)		
Land	10,188	10,188
Buildings	356,666	356,666
Sewer Laterals	1,348,645	1,309,864
Equipment	726,265	696,317
Construction in progress	488,533	428,108
Total capital assets	2,930,297	2,801,143
Less:		
Accumulated depreciation	(1,102,720)	(1,044,091)
Net capital assets	1,827,577	1,757,052
Total noncurrent assets	2,301,721	2,272,478
Total assets	2,366,621	2,339,014
Deferred outflow of resources		
Deferred charges on refunding	7,348	8,675
Deferred Pension Outflows	122,405	81,062
Total Deferred Outflow of Resources	129,753	89,737

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

Metropolitan Sewer District
Statement of Net Position
For The Periods Ended December 31, 2020 And December 31, 2019
(All amounts expressed in thousands)

	2020	2019
LIABILITIES		
Current liabilities:		
Payable from current assets:		
Current portion of long-term debt (Note 6)	51,046	50,491
Current portion of compensated absences (Note 8)	4,123	4,758
Accounts payable	5,880	5,876
Accrued payroll expenses	2,957	2,078
Total current liabilities payable from current assets	64,006	63,203
Payable from restricted assets:		
Construction accounts payable	10,505	19,373
Accrued interest payable	1,973	2,169
Total current liabilities payable from restricted assets	12,478	21,542
Total current liabilities	76,484	84,745
Noncurrent liabilities:		
Accrued compensated absences (Note 8)	6,276	5,161
Long-term debt (Note 6)	887,372	921,568
Net Pension Liability CRS (Note 9)	425,757	236,224
Net Pension Liability OPERS	3,093	4,380
Net Other Post Employment Benefit Liability (Note 10)	2,069	33,250
Total noncurrent liabilities	1,324,567	1,200,583
Total liabilities	1,401,051	1,285,328
Deferred Inflow of resources		
Deferred Pension Inflows (Note 10)	19,481	7,726
Net position:		
Net investment in capital assets	944,971	847,027
Restricted	4,573	7,172
Unrestricted (Note 15)	126,298	281,498
Total Net Position	$ 1,075,842	$ 1,135,697

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

Metropolitan Sewer District
Statement of Revenue, Expenses and Changes in Fund Net Position
For The Periods Ended December 31, 2020 And December 31, 2019
(All amounts expressed in thousands)

	2020	2019
REVENUES		
Operating revenues:		
Sewerage service charges	$ 231,510	$ 251,239
Sewer surcharges	22,331	17,212
All other revenues	3,643	3,822
Total operating revenues	257,484	272,273
EXPENSES		
Operating expenses:		
Personnel services:		
Salary and Wages	57,703	57,314
Pension Expense	114,027	74,942
Purchased services	35,998	32,386
Utilities, fuel and supplies	20,219	20,983
Depreciation and amortization	66,437	66,628
Other expenses	11,332	14,660
Total operating expenses	305,716	266,913
Operating income	(48,232)	5,360
NONOPERATING		
Nonoperating revenues (expenses):		
Interest income	9,323	13,316
Change in fair value of investments	4,607	4,805
Interest expense	(29,934)	(35,810)
Total nonoperating revenues (expenses)	(16,004)	(17,689)
Income (loss) before contributions	(64,236)	(12,329)
-		
Capital contributions	4,381	6,195
Change in net position	(59,855)	(6,134)
Total net position, beginning	1,135,697	1,141,831
Total net position, ending	$ 1,075,842	$ 1,135,697

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

Metropolitan Sewer District
Statement of Cash Flow
For The Periods Ended December 31, 2020 And December 31, 2019
(All amounts expressed in thousands)

	2020	2019
Cash flows from Operating Activities:		
Cash received from customers	$ 255,121	$ 265,017
Cash payments for goods and services	(66,325)	(69,187)
Cash payments for personnel costs	(56,498)	(57,296)
Other operating revenues	3,136	3,356
Net Cash Provided by Operating Activities	135,434	141,890
Cash Flows from Capital and Related Financing Activities:		
Principal and interest payments on long-term debt	(80,624)	(84,772)
Acquisition and construction of capital assets	(126,440)	(109,081)
Loan proceeds	1,942	19,588
Transfer into construction account from trustee investment account	82,711	0
Transfer from operating cash account to trustee investment account	(64,881)	(82,711)
Tap-in fees	2,878	4,244
Proceeds from the sale of capital assets	285	119
Net Cash (Used) by Capital and Related Financing Activities	(184,129)	(252,613)
Cash Flows from Investing Activities:		
Purchase of government securities	(25,512)	77,939
Net increase (decrease) in fair value of cash and investments	4,607	4,805
Interest earned on investments	3,416	3,298
Net Cash Provided (Used) by Investing Activities	(17,489)	86,042
Net Increase (Decrease) in Cash and Cash Equivalents	(66,184)	(24,681)
Cash and Cash Equivalents at January 1	243,818	268,499
Cash and Cash Equivalents at December 31	$ 177,634	$ 243,818
Reconciliation of Operating Income to Net Cash Provided by Operating Activities:		
Income from operations	$ (48,232)	$ 5,360
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation and amortization	66,437	66,628
Capital Expenses moved to Operating	2,018	87
Operating Expenses moved to Capital	0	(141)
Changes in assets and liabilities:		
Net change in customer accounts receivable	751	(1,670)
Net change in prepaid assets	(464)	656
Net change in other assets	(14,700)	26
Net change in operating accounts payable	4	(1,749)
Net change in accrued payroll and related expenses	2,265	(92)
Net Pension Liability	188,246	126,441
Net Other Post Employment Benefit Liability (Note 10)	(31,181)	17,350
Net Change in cash received from customers	980	221
Net Change in Deferred Charges on Refunding Outflows	1,327	1,327
Net Change in Deferred Pension Outflows	(41,343)	(61,175)
Net Change in Deferred Pension Inflows (Note 10)	11,755	(8,924)
Net Change in Capital Expenses 7600 moved to Fixed Assets in Fund 701	(2,429)	(2,455)
Net Cash Provided by Operating Activities	$ 135,434	$ 141,890
Non-cash Transactions:		
Structures donated as contributed capital in aid of construction	$ 3,456	$ 4,050
Acquisition and construction of capital asset paid directly by WPCLF loan proceeds	18,142	32,028
Construction accounts payable related to acquisition of capital assets	10,505	19,373

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

NOTE 1 - ACCOUNTING POLICIES

A summary of the significant accounting policies applied in the accompanying financial statements follows:

Organization

The Metropolitan Sewer District of Greater Cincinnati (MSD), an enterprise fund of the County of Hamilton, Ohio, collects and treats industrial and residential wastewater for municipalities and unincorporated areas of Hamilton County. MSD was formed on April 10, 1968, pursuant to resolutions of the Board of County Commissioners of Hamilton County and Ordinances of the City of Cincinnati, providing for a consolidation of the City Sewer Department and the County Sewer District. The two entities executed an agreement with an initial 50-year term. Per the agreement, the City is responsible for operational management. The original agreement was set to expire in April 2018 but has since been extended indefinitely by the Federal District Court. The parties remain in mediation in Federal District Court to resolve their remaining disputes.

Under a contract with the City of Cincinnati, the Board designated the City as its agent for the maintenance and operation of MSD. The annual budget, prepared on a non-GAAP budgetary basis of accounting, is approved by the Board and administered by the City. Budgetary control is exercised at the divisional level, and between personnel and all other costs. The County issues a separate Comprehensive Annual Financial Report which includes MSD as a separate enterprise fund of the County.

Basis of Accounting

The accompanying financial statements were prepared on the accrual basis of accounting, whereby revenues and expenses are recognized in the period earned or incurred.

Use of Estimates

The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions 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.

Statement of Cash Flows

For purposes of the Statements of Cash Flows, all highly liquid investments with a maturity of three months or less when purchased are considered to be cash equivalents. Pooled cash and investments held by the City of Cincinnati are considered cash equivalents by MSD.

Investments

MSD is required by Ohio law to invest in only United States obligations; federal agency securities; Ohio bonds and other obligations or such obligations of political subdivisions of the state, provided that the subdivisions are located within Hamilton County; time certificates of deposit or deposit accounts in an eligible institution; and no load money market mutual funds consisting only of investments mentioned above. Investments are required to mature within five years from the date of settlement, unless the investment is matched to a specific obligation or debt of MSD.

GASB Statement No. 72, *Fair Value Measurement and Application*, addresses accounting and financial reporting issues related to fair value measurements. This Statement provides guidance for determining a fair value measurement for financial reporting purposes for applying fair value to certain investments and disclosures related to all fair value measurements.

Prepaids

Payments made for services that will benefit periods beyond fiscal year end December 31, 2020, are recorded as prepaids using the consumption method. A current asset for the prepaid amount is recorded at the time of the purchase and an expense is reported in the year in which services are consumed.

Inventory

Supplies and materials are stated at the lower of cost or market on a first-in, first-out (FIFO) basis.

Capital Assets

Capital assets include land, construction in progress, buildings, sewer laterals and mains, studies and equipment. Capital assets are defined as assets with an initial, individual cost of more than $5,000.

Capital assets are stated at historical cost for assets acquired after MSD's inception in 1968. Assets which were acquired prior to 1968 and not identifiable with specific historical costs are not included in the capital assets balance. Assets acquired by MSD through contributions, such as contributions from land developers and federal and state grants, are capitalized and recorded in the plant records at the contributors' reported cost. Construction costs include the cost of in-force labor. See Note 5 for more information on capital assets.

Land acquired for MSD's use is titled to either the City of Cincinnati or Hamilton County. The cost of this land has been recorded on the books of MSD since it has the full benefit of the land as an economic resource.

Depreciation expense is computed on the straight-line method over the estimated useful lives of the respective assets. The estimated lives are as follows:

Building	40 years
Sewer Laterals	40 years
Equipment	5-25 years

Any gain or loss arising from the disposal of capital assets has been credited or charged to income.

Unamortized Financing Costs

The unamortized financing costs include insurance, consulting and attorney fees incurred in connection with the revenue bond obligations. These amounts are being amortized on the straight-line method over the lives of the revenue bonds. Bond premiums and discounts are being amortized on the interest method over the lives of the revenue bonds.

Deferred Outflows/Inflows of Resources

In addition to assets, the statement of financial position will sometimes report a separate section for deferred outflows of resources. Deferred outflows of resources represent a consumption of net position that applies to a future period and will not be recognized as an outflow of resources (expense) until then. For MSD, deferred outflows of resources are reported on the statement of net position for deferred charges on refunding, pension and other postemployment benefits (OPEB). A deferred charge on refunding results from the difference in the carrying value of refunded debt and its reacquisition price. This amount is deferred and amortized over the shorter of the life of the refunded or refunding debt. The deferred outflows of resources related to pension and OPEB are explained in Notes 9 and 10.

In addition to liabilities, the statement of financial position reports a separate section for deferred inflows of resources. Deferred inflows of resources represent an acquisition of net position that applies to a future period and will not be recognized until that time. For MSD, deferred inflows of resources have been recorded in the statement of net position for pension and OPEB, as explained in Notes 9 and 10.

Pension/OPEB Plans

Employees participate in either the City of Cincinnati's Retirement System or the Ohio Public Employees Retirement System. For purposes of measuring the net pension and OPEB liabilities, deferred outflows of resources and deferred inflows of resources related to pension and OPEB, and pension and OPEB expense, information about the fiduciary net position of the pension and OPEB plans and additions to/deductions from their fiduciary net position have been determined on the same basis as they are reported by the retirement systems. For this purpose, benefit payments (including refunds of employee contributions) are recognized when due and payable in accordance with the benefit terms. The retirement systems report investments at fair values.

Compensated Absences

Compensated absences include accrued vacation time, sick leave, compensatory time and other related payments. Compensatory time and vacation time are paid out in full upon termination and are expensed in the year earned. Sick leave is paid out at various levels. The liability for sick leave is computed with the Termination Payment Method using an historical average of total years worked and total amount paid. The current amounts are an average of the annual expenditures. The entire compensated absence liability is reported on the financial statements.

Net Position

Net positions are the difference between assets, deferred outflows, deferred inflows, and liabilities. Net investment in capital assets are capital assets less accumulated depreciation and any outstanding long-term debt related to the acquisition, construction or improvement of those assets. Net positions are reported as restricted when there are legal limitations that are imposed on their use by county legislation or external restrictions by other governments, creditors or grantors. Restricted net positions of the MSD relate to debt service.

MSD applies restricted resources when an expense is incurred for purposes for which both restricted and unrestricted net positions are available. MSD does not have net position restricted by enabling legislation.

Operating Revenues and Expenses

Operating revenues are those revenues that are generated directly from the primary activity of the proprietary fund. For the District, these revenues are charges for services for wastewater treatment. Operating expenses are necessary costs incurred to provide the service that is the primary activity of the fund.

Contributions of Capital

Contributions of capital arise from outside contributions of capital assets or outside contributions of resources restricted to capital acquisition and construction.

Customer Assistance Program (CAP)

A Customer Assistance Program (CAP) was approved by the Board of Commissioners in April, 2019 to take effect on July 31, 2019. This program is a 25% discount on sewer bills offered to low income seniors over the age of 65. Depending on the number of customers that apply, the District estimates this could affect revenue in the amount of $250,000 up to $2.2 million, with 100% participation.

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NOTE 2 - DEPOSITS AND INVESTMENTS

Deposits

State statutes classify monies held by the District into three categories.

Active deposits are public deposits necessary to meet current demands on the treasury. Such monies must be maintained either as cash in the District's Treasury, in commercial accounts payable or withdrawable on demand, including negotiable order of withdrawal (NOW) accounts, or in money market deposit accounts.

Inactive deposits are public deposits that the District has identified as not required for use within the current two-year period of designation of depositories. Inactive deposits must either be evidenced by certificates of deposit maturing not later than the end of the current period of designation of depositories, or by savings or deposit accounts including, but not limited to, passbook accounts.

Interim deposits are deposits of interim monies. Interim monies are those monies which are not needed for immediate use but which will be needed before the end of the current period of designation of depositories. Interim deposits must be evidenced by time certificates of deposit maturing not more than one year from the date of deposit or by savings or deposit accounts including passbook accounts.

Protection of the District's deposits is provided by the Federal Deposit Insurance Corporation (FDIC), by eligible securities pledged by financial institution as security for repayment, by surety company bonds deposited with the finance director by the financial institution or by a single collateral pool established by the financial institution to secure the repayment of all public monies deposited with the institution.

Custodial credit risk is the risk that in the event of a bank failure, the government's deposits may not be returned to it. The District's policy for deposits is collateral is required for demand deposits and certificates of deposit at 105 percent, or 102 percent if the financial institution participates in the Treasurer of State's Ohio Pooled Collateral System, of all deposits not covered by federal deposit insurance. Obligations that may be pledged as collateral are obligations of the United States and its agencies and obligations of the State and its municipalities, school districts, and district corporations. Obligations pledged to secure deposits must be delivered to a bank other than the institution in which the deposit is made. Written custodial agreements are required. The District is required to categorize deposits and investments according to GASB Statement No. 3 *Deposits with Financial Institutions, Investments, and Reverse Purchase Agreements*. The carrying value of the District's cash and cash equivalent deposits was $107,971,000 and $153,250,000 at December 31, 2020 and 2019, respectively.

Amounts held by the City of Cincinnati are invested on MSD's behalf in accordance with the Cincinnati Municipal Code. Amounts held by the City are collateralized as part of the City's cash and investment balances. For GASB 40 disclosure requirements, refer to the financial statements as of June 30, 2020 for the City of Cincinnati.

Although the pledging bank has an investment and securities pool used to collateralize all public deposits, which are held in the financial institution's name, noncompliance with federal requirements could

potentially subject the District to a successful claim by the FDIC. The deposits not covered by federal depository insurance are considered uninsured and uncollateralized and subject to custodial credit risk.

Investments

State Statute, board of county commissioners resolutions, and the 1985 Trust Indenture as amended authorize the District to invest in obligations of U. S. Treasury, agencies and instrumentalities, certificates of deposit, repurchase agreements, money market deposit accounts, municipal depository funds, super NOW accounts, sweep accounts, separate trading of registered interest and principal of securities, mutual funds, bonds and other obligations of this State, and the State Treasurer's investment pool. Repurchase agreements are limited to 30 days and the market value of the securities must exceed the principal value of the agreement by at least 2 percent and be marked to market daily. Investments in stripped principal or interest obligations reverse repurchase agreements and derivatives are prohibited. The issuance of taxable notes for the purpose of arbitrage, the use of leverage and short selling are also prohibited. An investment must mature within five years from the date of purchase unless matched to a specific obligation or debt of the District, and must be purchased with the expectation that it will be held to maturity. Investments may only be made through specified dealers and institutions. Payment for investments may be made only upon delivery of the securities representing the investments to the finance director or, if the securities are not represented by a certificate, upon receipt of confirmation of transfer from the custodian. The District has no investment policy that addresses interest rate risk.

Custodial Credit Risk – For an investment, custodial credit risk is the risk that, in the event of the failure of the counterparty the District will not be able to recover the value of its investments or collateral securities that are in the possession of an outside party. The Federal National Mortgage Association Notes, Federal Home Loan Mortgage Corporation Notes, and the Federal Home Loan Bank Notes are exposed to custodial credit risk in that they are uninsured, unregistered, and held by the counterparty's trust department or agent but not in the District's name. The District has no investment policy dealing with investment custodial risk beyond the requirement in state statute that prohibits payment for investments prior to the delivery of the securities representing such investments to the Treasurer or qualified trustee.

Funds held by the trustee are eligible investments as defined by the Trust Agreement and are in the name of the trustee for the benefit of MSD.

Investments made by MSD are summarized below. Trustee account investments are categorized according to credit risk into the following categories: (1) insured or registered, or securities held by MSD or its agent (bank trust department) in the MSD's name; or (2) uninsured and unregistered, with securities held by the counterparty's trust department or agent in the MSD's name; or (3) uninsured, unregistered securities held by the counterparty, or its trust department or agent but not in MSD's name. Money market funds are unclassified investments since they are not evidenced by securities that exist in physical or book entry form. As stated in GASB Statement No. 40, obligations of the U. S. government or obligations explicitly guaranteed by the U. S. government are not considered to have credit risk and do not require disclosure of credit quality.

The money market funds are invested in a treasury obligation fund with a Moody's credit rating of Aaa.

Concentration of Credit Risk: The Metropolitan Sewer District uses the City of Cincinnati's Investment Policy which addresses concentration of credit risk by requiring investments to be diversified to reduce risk of loss resulting from over concentration of assets in a specific issue or class of security. The following table includes the percentage of each investment type held by MSD at December 31, 2020.

Investment Type	Fair Value	% of Total
Deposits held by the City of Cincinnati	$107,971	22.49
U.S. Agency Securities	181,716	37.84
U.S. Treasury Securities	120,811	25.16
Money Market Funds	69,665	14.51
	$480,163	100.00

The classification of cash and cash equivalents and investments on the financial statements is based on criteria set forth in GASB Statement No. 9. A reconciliation between the classifications of cash and investments of the financial statements and the classification per GASB Statement No. 3 is as follows:

(all amounts in thousands)

December 31, 2020	Cash and Cash Equivalents	Investments
GASB Statement No. 9	$177,636	$302,527
Money Market Funds	(69,665)	69,665
Total	$107,971	$372,192

(all amounts in thousands)

December 31, 2019	Cash and Cash Equivalents	Investments
GASB Statement No. 9	$243,852	$292,397
Money Market Funds	(90,602)	90,602
Total	$153,250	$382,999

Fair Value Measurements: MSD categorizes its fair value measurements within the fair value hierarchy establish by GASB Statement No. 72. MSD has the following recurring fair value measurements as of December 31, 2020:

	Fair Value Measurements Using *(amounts in thousands)*		
Investments by Fair Value Level	Fair Value	Quoted Price In Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)
U.S. Treasury Securities	$120,811	$120,811	
U.S. Agency Securities	181,176		$181,176
	$301,987	$ 120,811	$181,176

U.S. Treasury securities classified in Level 1 of the fair value hierarchy are valued using quoted market prices. U.S. Agency securities classified in Level 2 of the fair value hierarchy are valued using pricing sources as provided by investment managers.

NOTE 3 - ACCOUNTS RECEIVABLE

Accounts receivable consist of the following:

(all amounts in thousands)

	2020	2019
Sewer charges and surcharges:		
Unbilled amount	$20,702	$23,768
Billed amount	28,015	22,205
Less Allowance for doubtful accounts	(10,015)	(5,710)
Other	1,873	1,063
Total	$40,575	$41,326

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NOTE 4 - RESTRICTED ASSETS

The Trust Agreement for the Series A Revenue Bonds (see Long-Term Debt Note) requires the establishment of certain trust accounts including a Bond Account, Bond Reserve Account, and a Surplus Account to be held by the Trustee. The Bond Account will be used to accumulate periodic principal and interest payments. The Bond Reserve Account will be funded in an amount equal to the highest annual future debt service requirement. The Surplus Account is available to be used for any other Sewer System purpose. The Trust Agreement also requires the creation of a Construction Account to be held by the City to pay for project costs. At December 31, 2020 and 2019 the following balances (at fair value) were maintained in the trust accounts:

(all amounts in thousands)

	2020	2019
Held by trustee:		
Reserve	$50,163	$54,870
Bond retirement	4,573	7,176
Surplus	317,457	320,953
Total	$372,193	$382,999

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NOTE 5 - CAPITAL ASSETS

(all amounts in thousands)

December 31, 2020	Beginning Balance	Increase	Decrease	Ending Balance
Capital Assets, not being depreciated:				
Land	$ 10,188			$ 10,188
Construction in progress	428,108	135,713	(75,288)	488,533
	$ 438,296	$ 135,713	$ (75,288)	$ 498,721
Capital Assets, being depreciated:				
Buildings	356,666		-	356,666
Equipment	696,317	31,177	(1,229)	726,265
Sewer Laterals	1,309,864	45,373	(6,592)	1,348,645
	2,362,847	76,550	(7,821)	2,431,576
Total Capital Assets	2,801,143	212,263	(83,109)	2,930,297
Less accumulated depreciation:				
Buildings	163,280	7,398		170,678
Equipment	347,685	19,932	(1,217)	366,400
Sewer Laterals	533,126	32,516		565,642
Total Accumulated Depreciation	1,044,091	59,846	(1,217)	1,102,720
Net Capital Assets	$ 1,757,052	$ 152,417	$ (81,892)	$ 1,827,577

Capital Asset category Sewer Laterals is comprised of two asset types, one is Sewer Lateral which are depreciated and Study Assets which are amortized.

In 2020, Capital Assets depreciation expense was $59,845,000 and Study Assets amortization expense was $6,592,000 for a total depreciation and amortization expense of $66,437,000 for the year.

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NOTES TO THE FINANCIAL STATEMENTS
FOR THE YEARS ENDED DECEMBER 31, 2020 AND 2019

(all amounts in thousands)

December 31, 2019	Beginning Balance	Increase	Decrease	Ending Balance
Capital Assets, not being depreciated:				
Land	$ 10,188			$ 10,188
Construction in progress	315,384	112,724		428,108
	$ 325,572	$ 112,724	$ -	$ 438,296
Capital Assets, being depreciated:				
Buildings	355,865	801	-	356,666
Equipment	682,525	14,144	(352)	696,317
Sewer Laterals	1,293,287	23,602	(7,025)	1,309,864
	2,331,677	38,547	(7,377)	2,362,847
Total Capital Assets	2,657,249	151,271	(7,377)	2,801,143
Less accumulated depreciation:				
Buildings	155,889	7,391		163,280
Equipment	328,465	19,547	(327)	347,685
Sewer Laterals	500,459	32,667		533,126
Total Accumulated Depreciation	984,813	59,605	(327)	1,044,091
Net Capital Assets	$ 1,672,436	$ 91,666	$ (7,050)	$ 1,757,052

In 2019 depreciation expense was $59,605,000 and Study Assets amortization expense was $7,023,000, for a total depreciation and amortization expense of $66,628,000 for the year.

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NOTE 6 - LONG-TERM DEBT

Long-term debt consisted of the following:

(all amounts in thousands)

	Principal Issue	Interest Rate %	Year of Maturity	2020	2019
Revenue Bonds					
2020	74,525	5.00	2035	$ 74,525	
2019 - Direct Placement	107,970	4.00-5.00	2034	107,970	$ 107,970
2015	52,520	3.00-5.00	2025	11,460	16,005
2014	162,650	4.00-5.00	2032	124,365	139,620
2013 (a)	258,695	0.45-5.00	2038	150,465	153,880
2010 (c)	130,675	2.00-5.37	2035	-	101,000
				468,785	518,475
Ohio Water and Sewer Rotary Commission	-	-	-	50	50
Ohio Public Works Commission	-	0.00-3.00	2041	355	514
Water Pollution Control Loan Fund	-	2.50-3.50		379,947	376,198
Capital Lease Payable	15,000	2.00-5.00	2029	8,150	8,870
Total obligations				857,287	904,107
Bond Premiums				81,131	67,951
Deferred loss on defeasance				(7,348)	(8,675)
Current maturities				(51,046)	(50,491)
Long-term portion				$ 880,024	$ 912,892

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Principal and interest payments on long-term debt for the next five years and thereafter are as follows:

(all amounts in thousands)

	Revenue Bonds		Direct Placement Bonds		WPCLF*		OPWC		Capital Lease	
Year	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest
2021	$ 24,350	$ 18,186	$ 5,650	$ 5,342	$ 20,216	$ 7,147	$ 73	$ 3	$ 755	$ 359
2022	25,365	16,823	5,865	5,116	22,069	7,493	39	2	795	321
2023	26,615	15,555	6,150	4,823	22,618	6,978	40	1	830	281
2024	27,945	14,224	6,450	4,515	23,113	6,449	25	-	865	248
2025	29,345	12,828	6,760	4,192	22,999	5,898	11	-	900	214
2026-2030	137,350	41,859	38,720	15,576	116,220	21,302	52	-	4,005	453
2031-2035	66,445	15,058	38,375	4,914	79,783	9,275	52	-	-	-
2036-2040	23,400	2,378	-	-	32,105	4,459	52	-	-	-
2041-2045					17,703	2,722	11			
2046-2050					23,120	1,100				
	$ 360,815	$ 136,911	$ 107,970	$ 44,478	$ 379,946	$ 72,823	$ 355	$ 6	$ 8,150	$ 1,876

* This represents the WPCLF loan balances outstanding at 12/31/2020. The total WPCLF loan availability is $406,047.

Bond discount, premium, and loss on defeasance activity for the year:

December 31, 2020	Beginning Balance	Amortized	Refunded	Issued	Ending Balance
Bond Premium	$ 67,951	$ (5,690)	$ 18,870	$ -	$ 81,131
Loss on defeasance	(8,675)	1,327	-	-	(7,348)
Total	$ 59,276	$ (4,363)	$ 18,870	$ -	$ 73,783

December 31, 2019	Beginning Balance	Amortized	Refunded	Issued	Ending Balance
Bond Premium	$ 48,947	$ (4,041)	$ 23,045	$ -	$ 67,951
Loss on defeasance	(10,002)	1,327	-	-	(8,675)
Total	$ 38,945	$ (2,714)	$ 23,045	$ -	$ 59,276

Long-term debt activity for the year:

(all amounts in thousands)

December 31, 2020	Beginning Balance	Additions	Reductions	Ending Balance
Revenue Bonds	$ 410,505	$ 74,525	$ 124,215	$ 360,815
Revenue Bonds - Direct Placement	$ 107,970			$ 107,970
Ohio Water and Sewer Rotary Commission	50	-	-	$ 50
Ohio Public Works Commission	514	-	159	$ 355
Water Pollution Control Loan Fund	376,198	21,557	17,809	$ 379,946
Capital Lease Payable	8,870	-	720	8,150
Total	$ 904,107	$ 96,082	$ 142,903	$ 857,286

December 31, 2019	Beginning Balance	Additions	Reductions	Ending Balance
Revenue Bonds	$ 571,280		$ 160,775	$ 410,505
Revenue Bonds - Direct Placement	$ -	$ 107,970		$ 107,970
Ohio Water and Sewer Rotary Commission	50	-	-	$ 50
Ohio Public Works Commission	672	-	158	$ 514
Water Pollution Control Loan Fund	343,868	52,671	20,341	$ 376,198
Capital Lease Payable	9,560	-	690	8,870
Total	$ 925,430	$ 160,641	$ 181,964	$ 904,107

Revenue Bonds – Direct Placement

Effective November 26, 2019, MSD issued $107,970,000 Series A, Direct Placement Bond dated November 26, 2019. The proceeds from the 2019 Series A Bonds were used to defease the 2009B Revenue Bonds and pay for cost of issuance. The 2019 Series A Bonds were issued at a premium of $23,045,166. The 2019A Bonds are special obligations of the District, payable solely from the new revenues of the District and were issued on parity with the 2009 and 2010, 2013, 2014, 2015 bonds, secured equally and ratably under the Trust Agreement.

Revenue Bonds

a) Effective November 17, 2020, MSD issued $74,525,000 Series A, Sewer System Refunding Revenue Bonds dated November 17, 2020. The proceeds from the 2020 Series A Bonds were used to defease portions of the 2010A and 2010B revenue bonds and pay for the cost of issuance. The 2020 A bonds are special obligations of the District, payable solely from the net revenues of the District and were issued on parity with the 2010, 2013, 2014, 2015, 2019 bonds secured equally and ratable under the Trust Agreement.

A portion of the proceeds was used to purchase U.S. Government Securities which were deposited in an irrevocable trust with an escrow agent to provide for all future debt service to

refund $101,000,000 of outstanding 2010A and 2010B Bonds. As a result, these bonds are considered defeased and the liability of those bonds removed from the balance sheet.

Although the refunding resulted in the recognition of an account premium of $18,870,385, MSD has, in effect, reduced its aggregate debt service payments by $18,190,000, and obtained a present value of savings of $13,091,284.

b) Effective March 3, 2015, MSD issued $52,520,000 Series A, Sewer System Refunding Revenue Bonds dated March 3, 2015. The proceeds from the 2015 Series A Bonds were used to defease portions of the 2005A revenue bonds and pay for the cost of issuance. The 2015A bonds are special obligations of the District, payable solely from the net revenues of the District and were issued on parity with the 1997, 2000, 2001, 2003A, 2003B, 2004, 2005A, 2005B, 2006, 2007, 2009A, and 2009B bonds, secured equally and ratably under the Trust Agreement.

A portion of the proceeds was used to purchase U.S. Government Securities which were deposited in an irrevocable trust with an escrow agent to provide for all future debt service to refund $60,360,000 of outstanding 2005A Bonds. As a result, these bonds are considered defeased and the liability for those bonds removed from the balance sheet.

Although the refunding resulted in the recognition of an accounting loss of $1,464,000 in accordance with GASB 23, Accounting and Financial Reporting for Refunding of Debt Reported by Proprietary Activities, MSD has, in effect, reduced its aggregate debt service payments by $16,845,000, and obtained a present value of savings of $6,363,000.

c) Effective November 19, 2014, MSD issued $162,650,000 Series A, Sewer System Refunding Revenue Bonds dated November 19, 2014. The proceeds from the 2014 Series A Bonds were used to defease portions of the 2003, 2005, and 2006 revenue bonds and pay for the cost of issuance. The 2014A bonds are special obligations of the District, payable solely from the net revenues of the District and were issued on parity with the 1997, 2000, 2001, 2003A, 2003B, 2004, 2005A, 2005B, 2006, 2007, 2009A, and 2009B bonds, secured equally and ratably under the Trust Agreement.

A portion of the proceeds was used to purchase U.S. Government Securities which were deposited in an irrevocable trust with an escrow agent to provide for all future debt service to refund $750,000 of outstanding 2003 Series A Bonds, $61,190,000, of outstanding 2005 Series B Bonds, $60,620,000 of outstanding 2006 Series A Bonds, $52,505,000 of outstanding 2007 Series A Bonds, and $6,790,000 of outstanding 2009 Series A Bonds. As a result, these bonds are considered defeased and the liability for those bonds removed from the balance sheet.

Although the refunding resulted in the recognition of an accounting loss of $14,949,000 in accordance with GASB 23, Accounting and Financial Reporting for Refunding of Debt Reported by Proprietary Activities, MSD has, in effect, reduced its aggregate debt service payments by $70,966,000, and obtained a present value of savings of $24,543,000.

d) Effective July 31, 2013, MSD issued $178,760,000 Series A, Sewer System Refunding Revenue Bonds and $79,935,000 Series B, Sewer System Refunding Revenue Bonds dated July 31, 2013. A portion of the proceeds from the 2013 Series A and 2013 Series B Bonds were used to defease portions of the 2003 and 2004 revenue bonds and pay for the cost of issuance. The 2013A bonds are special obligations of the District, payable solely from the net revenues of the District and were issued on parity with the 1997, 2000, 2001, 2003A, 2003B, 2004, 2005A, 2005B, 2006, 2007, 2009A, 2009B, 2010A, and 2010B bonds, secured equally and ratably under the Trust Agreement.

A portion of the proceeds was used to purchase U.S. Government Securities which were deposited in an irrevocable trust with an escrow agent to provide for all future debt service to refund $112,720,000 of outstanding 2003 Series A Bonds, and $28,470,000 of outstanding 2004 Series A Bonds. As a result, these bonds are considered defeased and the liability for those bonds removed from the balance sheet.

The remaining proceeds from the 2013 Series A and 2013 Series B bonds were used to permanently fund certain previous capital expenditures and fund the new bond reserve requirements.

e) Effective November 3, 2010, MSD issued $43,595,000 Series A, Sewer System Refunding Revenue Bonds dated November 3, 2010. The proceeds from the 2010 Series A Bonds were used to defease portions of the 2000, 2001, and 2003 revenue bonds and pay for the cost of issuance. The 2010A bonds are special obligations of the District, payable solely from the net revenues of the District and were issued on parity with the 1997, 2000, 2001, 2003A, 2003B, 2004, 2005A, 2005B, 2006, 2007, 2009A, and 2009B bonds, secured equally and ratably under the Trust Agreement.

A portion of the proceeds was used to purchase U.S. Government Securities which were deposited in an irrevocable trust with an escrow agent to provide for all future debt service to refund $2,730,000 of outstanding 2000 Series A Bonds, $25,290,000 of outstanding 2001 Series A Bonds, and $17,035,000 of outstanding 2003 Series A Bonds. As a result, these bonds are considered defeased and the liability for those bonds removed from the balance sheet.
Although the refunding resulted in the recognition of an accounting loss of $3,379,000 in accordance with GASB 23, the District in effect reduced its aggregate debt service payments by $8,824,000 and obtained and economic gain (difference between the present values of the old and new debt service payments) of $5,304,000.

Effective November 3, 2010, MSD issued $87,080,000 Series B Sewer System Improvement Revenue Bonds (Build America Bonds) dated November 3, 2010. The proceeds from the 2010 Series B bonds were used to permanently fund certain previous capital expenditures, fund the new bond reserve requirements and pay the cost of issuance. The 2010 Series B bonds are special obligations of the District, payable solely from the net revenues of the District and were issued on a parity with the 1997, 2000, 2001, 2003A, 2003B, 2004, 2005A, 2005B, 2006, 2007, 2009A, and 2009B bonds, secured equally and ratably under the Trust Agreement.

The 2010 and 2009 bonds may be redeemed prior to their maturities in accordance with provisions of the bond resolutions. The redemption process for the bonds includes declining premiums up to 2 percent of principal.

At December 31, 2020, and December 31, 2019 the amount of defeased debt outstanding was $318,320,000 and $263,595,000, respectively.

Maturities for bonds over the next five years and thereafter are shown below:

(all amounts in thousands)

Year	2020 Bonds	2019 Bonds	2015 Bonds	2014 Bonds	2013 Bonds	Total
2021	4,020	5,650	3,670	8,895	7,765	$ 30,000
2022	6,070	5,865	1,810	9,330	8,155	$ 31,230
2023	6,360	6,150	1,900	9,795	8,560	$ 32,765
2024	6,675	6,450	1,990	10,285	8,995	$ 34,395
2025	7,000	6,760	2,090	10,810	9,445	$ 36,105
2026-2031	21,920	38,720	-	63,415	52,015	$176,070
2031-2035	22,480	38,375	-	11,835	32,130	$104,820
2036-2041					23,400	$ 23,400
	$ 74,525	$107,970	$ 11,460	$ 124,365	$150,465	$468,785

Under the terms of the amended revenue bond trust indenture, MSD has agreed to certain covenants, among other things, to restrict additional borrowing, maintain rates sufficient to meet debt service requirements and maintain specified fund balances under trust agreements.

The Revenue bond issues as discussed above contain covenants which require MSD to maintain a level of debt service coverage. The following calculation reflects MSD's debt service coverage.

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NOTES TO THE FINANCIAL STATEMENTS
FOR THE YEARS ENDED DECEMBER 31, 2020 AND 2019

(all amounts in thousands)

	2020	2019
Revenues:		
Total operating revenues	$ 257,484	$ 272,273
Interest income	9,323	13,316
Tap-in/connection fees	3,457	4,050
Total pledged revenue	270,264	289,639
Total operating and maintenance expenses less depreciation and amortization	125,252	125,343
Net income available for debt service (a)	$ 145,012	$ 164,296
Principal and interest requirement on revenue bonds (b)	$ 53,528	$ 60,737
Principal and interest requirements on obligations (c)	$ 82,081	$ 89,486
Debt service coverage		
Revenue bonds (a) divided by (b)	271%	271%
All obligations (a) divided by (c)	177%	184%
Maximum debt service coverage required on revenue bonds	125%	125%

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Ohio Water Development Authority Contracts

All contracts between the Ohio Water Development Authority (OWDA) and the Metropolitan Sewer District require MSD to prescribe and charge such rates for sewer usage which are sufficient (after expenses of operation and maintenance) to pay principal and interest on OWDA contracts. The principal is repayable in equal semi-annual installments to maturity.

Ohio Water and Sewer Rotary Commission

Advances from Ohio Water and Sewer Rotary Commission represent tap-in fees and acreage assessments to be forwarded to the Commission upon collection from customers. Such advances do not bear interest unless they are determined to be in default.

Ohio Public Works Commission

The MSD has entered into agreements with the Ohio Public Works Commission (OPWC) for financing of certain qualified capital projects. As the projects progress the commitments are drawn down as funds are paid by OPWC directly to the contractors. The principal is repayable in semi-annual installments to the date of maturity for each project.

Water Pollution Control Loan Fund

The MSD has received low interest loan commitments from the Ohio Water Pollution Control Loan fund for certain qualified projects. As the projects progress the commitments are drawn down. The principal is repayable in semi-annual installments to the date of maturity for each project.

Interest on Long-Term Obligations

The following interest costs were incurred and expensed or capitalized as part of the cost of MSD's additions to capital assets.

(all amounts in thousands)

	2020	2019
Interest incurred	$ 29,934	$ 35,810
Less interest capitalization	-	-
Interest expense	$ 29,934	$ 35,810

MSD has implemented the GASB 89 Accounting for Interest Cost incurred before the end of a construction period in 2018.

NOTE 7 – CAPITAL LEASE

The District entered into a capital lease for a new engineering building in 2010. The lease obligation meets the criteria of a capital lease. The leased asset was capitalized at the amount of the present value of the minimum lease payments at inception of the lease. Capital asset acquired under capital lease is as follows:

Buildings	$15,000,000

The following is a schedule of the future minimum lease payments required under the capital lease and the present value of the minimum lease payments as of fiscal year end.

(all amounts in thousands)

Fiscal Year Ending December 31,	Long-Term Debt
2021	$ 1,114
2022	1,116
2023	1,111
2024	1,113
2025	1,114
2026-2029	4,458
Total Minimum Lease Payments	10,026
Less: Amount Representing Interest	(1,876)
Present value of Minimum Lease Payments	$ 8,150

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NOTE 8 – COMPENSATED ABSENCES

Compensated Absences

Compensated absences consist of vacation time, sick pay and compensatory time. The following is a summary of activity for 2020 and 2019. $4,123 is considered due within one year for compensated absences as of December 31, 2020.

(all amounts in thousands)

	Beginning Balance	Increase	Decrease	Ending Balance
2020	$ 9,919	$ 4,603	$ 4,123	$ 10,399
2019	$ 10,032	$ 4,645	$ 4,758	$ 9,919

NOTE 9 – DEFINED BENEFIT PENSION PLANS

MSD employees are covered by one of two pension systems: the Ohio Public Employees Retirement System (OPERS) and the City of Cincinnati Retirement System (CRS). OPERS is a cost-sharing multi-employer defined benefit pension plan. CRS is accounted for as a single-employer defined benefit plan.

Net Pension Liability

For purposes of measuring the net pension liability, deferred outflows of resources and deferred inflows of resources related to pensions, and pension expense, information about the fiduciary net position of the pension plans and additions to/deductions from their fiduciary net position have been determined on the same basis as they are reported by the retirement systems. For this purpose, benefit payments (including refunds of employee contributions) are recognized when due and payable in accordance with the benefit terms. The retirement systems report investments at fair value.

The net pension liability reported on the statement of net position represents a liability to employees for pensions. Pensions are a component of exchange transactions, between an employer and its employees, of salaries and benefits for employee services. Pensions are provided to an employee, on a deferred-payment basis, as part of the total compensation package offered by an employer for employee services each financial period. The obligation to sacrifice resources for pensions is a present obligation because it was created as a result of employment exchanges that already have occurred.

The net pension liability represents the MSD's actuarial present value (or with the OPERS cost-sharing, multiple-employer plan, MSD's proportionate share of the pension plan's collective actuarial present value) of projected benefit payments attributable to past periods of service, net of each pension plan's fiduciary net position. The net pension liability calculation is dependent on critical long-term variables, including estimated average life expectancies, earnings on investments, cost of living adjustments and

other variables. While these estimates use the best information available, unknowable future events require adjusting this estimate annually. MSD's share of each plan's unfunded benefits is presented as a long-term *net pension liability* on the accrual basis of accounting.

A. Ohio Public Employees Retirement System (OPERS)

Ohio Revised Code limits the MSD's obligation for liabilities to OPERS to annually required payments. The MSD cannot control benefit terms or the manner in which pensions from the cost-sharing, multiple-employer plan is financed; however, the MSD does receive the benefit of employees' services in exchange for compensation including pension.

GASB Statement No. 68 assumes the liability is solely the obligation of the employer, because (1) they benefit from employee services; and (2) State statute requires all funding to come from these employers. All contributions to date have come solely from these employers (which also includes costs paid in the form of withholdings from employees). State statute requires the pension plan to amortize unfunded liabilities within 30 years. If the amortization period exceeds 30 years, the pension plan's board must propose corrective action to the State legislature. Any resulting legislative change to benefits or funding could significantly affect the net pension liability. Resulting adjustments to net pension liability would be effective when the changes are legally enforceable.

Plan Description – OPERS

A limited number of the MSD employees participate in the Ohio Public Employees Retirement System (OPERS). OPERS administers three separate pension plans. The Traditional Pension Plan is a cost-sharing, multiple-employer defined benefit pension plan. The Member-Directed Plan is a defined contribution plan and the Combined Plan is a cost-sharing, multiple-employer defined benefit pension plan with defined contribution features. While members (e.g., MSD employees) may elect the Member-Directed Plan or the Combined Plan, most employee members are in OPERS' Traditional Pension Plan; therefore, the following disclosures focus on the Traditional Pension Plan.

OPERS provides retirement, disability, survivor and death benefits, and annual cost of living adjustments to members of the Traditional Pension Plan. Authority to establish and amend benefits is provided by Chapter 145 of the Ohio Revised Code (ORC). OPERS issues a stand-alone financial report that includes financial statements, required supplementary information and detailed information about OPERS' fiduciary net position that may be obtained by visiting https://www.opers.org/financial/reports.shtml, by writing to Ohio Public Employees Retirement System, 277 East Town Street, Columbus, OH 43215-4642, or by calling 800-222-7377.

Senate Bill (SB) 343 was enacted into law with an effective date of January 7, 2013. In the legislation, members were categorized into three groups with varying provisions of the law applicable to each group. The following table provides age and service requirements for retirement and the retirement formula applied to final average salary (FAS) for the three-member groups under the Traditional Pension Plan as

per the reduced benefits adopted by SB 343 (see OPERS' CAFR referenced above for additional information):

Group A Eligible to retire prior to January 7, 2013 or five years after January 7, 2013	Group B 20 years of service credit prior to January 7, 2013 or eligible to retire ten years after January 7, 2013	Group C Members not in other Groups and members hired on or after January 7, 2013
State and Local	**State and Local**	**State and Local**
Age and Service Requirements: Age 60 with 60 months of service credit or Age 55 with 25 years of service credit	**Age and Service Requirements:** Age 60 with 60 months of service credit or Age 55 with 25 years of service credit	**Age and Service Requirements:** Age 57 with 25 years of service credit or Age 62 with 5 years of service credit
Formula: 2.2% of FAS multiplied by years of Service for the first 30 years and 2.5% for service years in excess of 30	**Formula:** 2.2% of FAS multiplied by year of service for the first 30 years and 2.5% for service years in excess of 30	**Formula:** 2.2% of FAS multiplied by years of service for the first 35 years and 2.5% for service years in excess of 35

Final average salary (FAS) represents the average of the three highest years of earnings over a member's career for Groups A and B. Group C is based on the average of the five highest years of earnings over a member's career.

Members who retire before meeting the age and years of service credit requirement for unreduced benefits receive a percentage reduction in the benefit amount.

When a benefit recipient has received benefits for 12 months, an annual cost of living adjustment (COLA) is provided. This COLA is calculated on the base retirement benefit at the date of retirement and is not compounded. For those retiring prior to January 7, 2013, the COLA will continue to be a 3% simple annual COLA. For those retiring subsequent to January 7, 2013, beginning in calendar year 2019, the COLA will be based on the average percentage increase in the Consumer Price Index, capped at 3%.

Funding Policy—The ORC provides statutory authority for member and employer contributions. For fiscal year 2020, member contribution rates were 10% of salary and employer contribution rates were 14%. Employer contribution rates are actuarially determined and are expressed as a percentage of covered payroll. The MSD's contractually required contribution was $299,000 for 2020.

Pension Liabilities, Pension Expense, and Deferred Outflows of Resources and Deferred Inflows of Resources Related – OPERS

The net pension liability for OPERS was measured as of December 31, 2019 and the total pension liability used to calculate the net pension liability was determined by an actuarial valuation as of that date. The MSD's proportion of the net pension liability was based on the MSD's share of contributions to the pension plan relative to the contributions of all participating entities. The MSD's proportion, change in proportion and proportionate share of the net pension liability was 0.01564887%, a decrease of 0.000344%, and $3,093,000, respectively. Pension expense for the MSD was $85,000.

At December 31, 2020, the MSD reported deferred outflows of resources and deferred inflows of resources related to pension from the following sources (amounts in thousands):

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net
MSD contributions subsequent to the measurement date	$ 299	$ -	$ 299
Net difference between projected and actual investment earnings	-	(616)	(616)
Difference between expected and actual experience	-	(39)	(39)
Change in assumptions	165	-	165
Change in MSD's proportionate share	-	(117)	(117)
	$ 464	$ (772)	$ (308)

$299,000 reported as deferred outflows of resources related to pension resulting from MSD contributions subsequent to the measurement date will be recognized as a reduction of the net pension liability in the year ending December 31, 2021. Other amounts reported as deferred outflows of resources and deferred inflows of resources related to pension will be recognized in pension expense as follows (amounts in thousands):

Year Ended December 31:	Net Deferred Outflows/ (Inflows) of Resources
2021	$ (163)
2022	(225)
2023	26
2024	(245)
	$ (607)

Actuarial Assumptions – OPERS

Actuarial valuations of an ongoing plan involve estimates of the values of reported amounts and assumptions about the probability of occurrence of events far into the future. Examples include assumptions about future employment, mortality and cost trends. Actuarially determined amounts are subject to continual review or modification as actual results are compared with past expectations and new estimates are made about the future.

Projections of benefits for financial reporting purposes are based on the substantive plan (the plan as understood by the employers and plan members) and include the types of benefits provided at the time

of each valuation. The total pension liability in the December 31, 2019 actuarial valuation was determined using the following actuarial assumptions:

Wage inflation	3.25%
Future salary increases, Including inflation	3.25% to 10.75%
COLA or Ad Hoc COLA	Pre 1/7/2013 retirees: 3% simple; Post 1/7/2013 retirees: 1.4% simple through 2020, then 2.15% simple
Investment rate of return	7.20%
Actuarial cost method	Individual entry age

Pre-retirement mortality rates are based on the RP-2014 Employees mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Post-retirement mortality rates are based on the RP-2014 Health Annuitant mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Post-retirement mortality rates for disabled retirees are based on the RP-2014 Disabled mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Mortality rates for a particular calendar year are determined by applying the MP-2015 mortality improvement scale to all of the above described tables.

The most recent experience study was completed for the five-year period ended December 31, 2015.

The long-term rate of return on defined benefit investment assets was determined using a building-block method in which best-estimate ranges of expected future real rates of return are developed for each major asset class. These ranges are combined to produce the long-term expected real rate of return by weighting the expected future real rates of return by the target asset allocation percentage, adjusted for inflation.

During 2019, OPERS managed investments in three investment portfolios: the Defined Benefit portfolio, the Health Care portfolio, and the Defined Contribution portfolio. The Defined Benefit portfolio contains the investment assets for the Traditional Pension Plan, the defined benefit component of the Combined Plan and the annuitized accounts of the Member-Directed Plan. Within the Defined Benefit portfolio, contributions into the plans are all recorded at the same time, and benefit payments all occur on the first of the month. Accordingly, the money-weighted rate of return is considered to be the same for all plans within the portfolio. The annual money-weighted rate of return expressing investment performance, net of investment expenses and adjusted for the changing amounts actually invested, for the Defined Benefit portfolio was 17.2% for 2019.

The allocation of investment assets with the Defined Benefit portfolio is approved by the Board of Trustees as outlined in the annual investment plan. Plan assets are managed on a total return basis with a long-term objective of achieving and maintaining a fully funded status for the benefits provided through the defined benefit pension plans. The table below displays the Board-approved asset allocation policy for 2019 and the long-term expected real rates of return:

Asset Class	Target Allocation	Weighted Average Long-Term Expected Real Rate of Return (Arithmetic)
Fixed Income	25.00%	1.83%
Domestic Equities	19.00%	5.75%
Real Estate	10.00%	5.20%
Private Equity	12.00%	10.70%
International Equities	21.00%	7.66%
Other Investments	13.00%	4.98%
Total	100.00%	5.61%

Discount Rate. The discount rate used to measure the total pension liability was 7.20%. The projection of cash flows used to determine the discount rate assumed that contributions from plan members and those of the contributing employers are made at the statutorily required rates. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Sensitivity of the MSD's Proportionate Share of the Net Pension Liability to Changes in the Discount Rate. The following table represents the MSD's proportionate share of the net pension liability calculated using the current period discount rate assumption of 7.20%, as well as what the MSD's proportionate share of the net pension liability would be if it were calculated using a discount rate that is one-percentage point lower (6.20%) and one-percentage point higher (8.20%) than the current rate (amounts in thousands):

	1% Decrease (6.20%)	Current Discount Rate (7.20%)	1% Increase (8.20%)
MSD's proportionate share of the net pension liability	$ 5,102	$ 3,093	$ 1,288

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B. City of Cincinnati Retirement System (CRS)

Plan Description – CRS

Employees who do not participate in OPERS participate in CRS. CRS is accounted for as a single-employer defined benefit pension plan. CRS provides retirement and disability benefits, annual cost of living adjustments, and death benefits to plan members and beneficiaries. CRS is considered part of the City of Cincinnati's financial reporting entity and is included in the City's financial report as a pension trust fund.

The financial report that includes financial statements, required supplementary information and detailed information about CRS' fiduciary net position may be obtained by visiting http://www.cincinnati-oh.gov/finance/cafr/. Article XV of the Administrative Code of the City of Cincinnati provides the statutory authority vesting the general administration and responsibility for the proper operation of the System in the Board of Trustees of the City of Cincinnati Retirement System.

Information in the remainder of this footnote is provided for the MSD's portion, being reported as an agency fund of the City, which also participates in and contributes to CRS, with a measurement date of June 30, 2020.

A major plan revision was approved by the City Council on March 16, 2011 and adopted by the CRS's Board. The plan allows for a two and half year transition period from July 1, 2011 to January 1, 2014. Active members who are eligible or become eligible to retire and elect to retire during this transition period can retire with 30 years of creditable service or at age 60 with at least five years of creditable service and will receive benefits according to the current plan as described below.

A Collaborative Settlement Agreement (CSA) was executed on May 7, 2015 and approved by the United States District Court on October 5, 2015. The CSA impacts employees who were retired on or before July 1, 2011 and employees who were in service on July 1, 2011 and who were vested (had 5 years' service credit) on that date. Employees who are members of the CRS who did not meet those criteria remained subject to the plan provisions adopted in Ordinances No 84-2011 and 85-2011.

The CSA implemented a number of changes to the CRS, including, but not limited to:

- Normal retirement eligibility;
- Early retirement eligibility;
- Retiree healthcare eligibility;
- Cost of living adjustments payable to retirees;
- Establishment of a Deferred Retirement Option Program (DROP);
- Creation of a 115 Trust for retiree healthcare benefits;
- Changes to the composition of the Board of Trustees; and
- Payoff of the 2007 Early Retirement Incentive Program (ERIP) liability.

Groups C & D Eligible to retire on or before July 1, 2011; or December 31, 2013	Group E Eligible to retire on or before December 31, 2013	Group F Hired before January 1, 2010 and not eligible for other groups	Group G Hired on or after January 1, 2010
Normal Retirement: Age 60 with 5 years of service, or any age with 30 years of service	**Normal Retirement:** Age 60 with 5 years of service, or any age with 30 years of service	**Normal Retirement:** Age 60 with 5 years of service, or any age with 30 years of service	**Normal Retirement:** Age 67 with 5 years of service, or age 62 with 30 years of service
Early Retirement: Age 55 with 25 years of service	**Early Retirement:** Age 55 with 25 years of service	**Early Retirement:** Age 55 with 25 years of service	**Early Retirement:** Age 57 with 15 years of service
Benefit Formula: 2.5% of AHC times years of service	**Benefit Formula:** 2.5% of AHC times years of service up to greater of 20 years or years of service as of July 1, 2011, and 2.2% thereafter	**Benefit Formula:** 2.5% of AHC times years of service up to greater of 20 years or years of service as of July 1, 2011, and 2.2% thereafter	**Benefit Formula:** 2.2% of AHC times years of service up to 30 years; 2.0% over 30 years

Average Highest Compensation (AHC) represents the average of the highest three consecutive years of earnings for Groups C and D. Group E will have a AHC with two separate components based upon the average of the highest three consecutive years of earnings for service through December 31, 2013 and the highest five consecutive years of earnings for service after January 1, 2014. Group F will have a AHC with two components based upon the average of the highest three consecutive years of earnings for service through June 30, 2011 and the highest five consecutive years of earnings for service after July 1, 2011. The AHC for Group G is based on the average of the highest five consecutive years of earnings. Upon retirement, members will not receive a cost-of-living-adjustment (COLA) for the first three retirement anniversary dates. Thereafter, a 3% simple COLA benefit will be provided. A COLA poverty exception is available for members who meet certain financial requirements.

Members of the Active Employee Class, under the Collaborative Settlement Agreement, who have a minimum of 30 years' service credit are eligible to participate in the deferred retirement option plan (DROP). Upon entry into DROP, the member's monthly pension benefit is calculated as if they retired on that date. DROP participants continue to work as a MSD employee and if eligible, may continue to be enrolled in a MSD sponsored employee healthcare plan. Maximum participation in the DROP is five years. Members who participate in DROP continue to contribute 9% of their pensionable earnings to CRS. The participant's monthly pension benefit amount (calculated as described above), as well as 75% of the participant's required CRS employee contributions, and interest earnings on their DROP account balance, accumulate tax-deferred in an account held in trust by the CRS. Participants do not have access to the funds in their DROP account while employed and participating in the DROP. The balance of the participant's DROP account is paid out in a lump sum or to another tax-qualified account (such as an IRA or 457 Deferred Compensation Plan) selected by the participant within 120 days of their retirement effective date.

Membership in CRS as of the June 30, 2020 measurement date was as follows:

Retirees and beneficiaries (optionees) receiving benefits	4,054
Terminated plan members and beneficiaries (optionees) Entitled to future benefits	225
Deferred retirement option plan (DROP) participants	222
Active plan members:	
Full-time	2,903
Part-time	1,143
Total	8,547
Inactive participants**	8,913

** Participants who are former employees who have an employee account balance in the plan but are not otherwise vested in an employee provided benefit.

Funding Policy—Each member contributes at a rate of 9.0% of his pensionable wages for 2020. The percent contributed by employees is provided by Chapter 203 Section 73 of the Cincinnati Municipal Code. The MSD makes employer contributions based on a percentage of the covered payroll of all CRS members. For 2020, the contribution rate was 16.25%. The MSD's contributions to the City of Cincinnati Retirement System's Pension Fund for the year ending December 31, 2020 were $6,531,000.

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

The net pension liability was measured as of June 30, 2020, and the total pension liability used to calculate the net pension liability was determined by an actuarial valuation as of December 31, 2019. The MSD reported a net pension liability of $425,757,000 and pension expense of $148,466,000.

At December 31, 2020, the MSD reported deferred outflows of resources related to pension from the following sources (amounts in thousands):

	Deferred Outflows of Resources
MSD contributions subsequent to the measurement date	$ 3,240
Differences between expected and actual experience	2,484
Net difference between projected and actual investment earnings	23,467
Change in proportion	368
Change in assumptions	74,204
	$ 103,763

$3,240,000 reported as deferred outflows of resources related to pension resulting from MSD contributions subsequent to the measurement date will be recognized as a reduction of the net pension liability in the year ended December 31, 2021. Other amounts reported as deferred outflows of resources related to pension will be recognized in pension expense as follows (amounts in thousands):

Year Ended December 31:	Deferred Outflows of Resources
2021	$ 80,581
2022	6,941
2023	7,481
2023	5,520
	$ 100,523

Actuarial Assumptions: Total pension liability was determined by the following actuarial valuations, using the following actuarial assumptions, applied to applicable periods included in the measurement:

Inflation	2.75%
Salary increases, including inflation	3.75% to 7.50%
Long-term investment rate of return, net of pension plan investment expense, including inflation	7.50%
Municipal bond index rate:	
Measurement date	2.21%
Prior measurement date	3.50%
Single equivalent interest rate, net of pension plan investment expense, including inflation	
Measurement date	3.56%
Prior measurement date	5.56%

Active member mortality rates were based on the RP-2014 Mortality Table, with generational mortality improvement projections using the MP-2017 scale. Health inactive member mortality rates were based on the RP-2014 Mortality Table, with generational mortality improvement projections using the MP-2017 scale and set forward two years for both males and females. Disabled inactive member mortality rates were based on the RP-2014 Disabled Retiree Mortality Table, with generational improvement projections using the MP-2017 scale.

The actuarial assumptions used in the December 31, 2019 valuation were based on the results of the last actuarial experience study performed for the period January 1, 2012 to December 31, 2016, adopted on February 28, 2018.

Long Term Expected Rate of Return. The long-term expected rate of return on pension plan investments was determined using a log-normal distribution analysis in which best-estimate ranges of expected future

real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. The target asset allocation and best estimates of arithmetic real rates of return for each major class are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return*
Core Bonds	14.00 %	2.80 %
High Yield Bonds	3.00 %	4.90 %
Large-Cap Value Equity	7.00 %	7.20 %
Large-Cap Growth Equity	5.00 %	7.10 %
Mid-Cap Value Equity	4.00 %	7.50 %
Mid-Cap Core Equity	4.00 %	7.50 %
Small-Cap Value Equity	7.50 %	8.00 %
Non-U.S. Developed Large Cap	10.00 %	7.40 %
Non-U.S. Small Cap	5.00 %	8.10 %
Emerging Markets All-Cap	5.00 %	8.50 %
EM Small-Cap	3.00 %	8.50 %
Real Estate Core Equity	10.00 %	7.40 %
Infrastructure	7.50 %	7.80 %
Risk Parity	5.00 %	4.10 %
Private Equity	10.00 %	11.10 %
Total	100.00 %	

* Geometric mean

Discount Rate. The discount rate used to measure the total pension liability was 3.56% as of June 30, 2020. The projection of cash flows used to determine the discount rate assumed that employee contributions will be made at the current contribution rate and that employer contributions will be made as set out in the CSA. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current members through 2041. Projected benefit payments are discounted at the long-term expected return on assets of 7.50% to the extent the fiduciary net position is available to make the payments (through 2041) and at the municipal bond rate of 2.21% (Bond Buyer GO 20-year Municipal Bond Index as of June 30, 2020) to the extent they are not available (after 2041). Consequently, the single equivalent rate used to determine the total pension liability as of June 30, 2020 is 3.56%. By comparison, the single equivalent rate used to determine the total pension liability as of June 30, 2019 was 5.56%.

Sensitivity of the Employer's Proportionate Share of the Net Pension Liability to Changes in the Discount Rate: The following chart represents the MSD financial reporting entity's proportionate share of the net pension liability calculated using the current period discount rate assumption of 3.56%, as well as the sensitivity to a 1% increase and 1% decrease in the current discount rate (amounts in thousands):

	1% Decrease (2.56%)	Current Discount Rate (3.56%)	1% Increase (4.56%)
MSD's Net Pension Liability	$ 526,941	$ 425,757	$ 342,841

Change in the Net Pension Liability: Changes in the MSD financial reporting entity's net pension liability for the measurement year ended June 30, 2020 were as follows (amounts in thousands):

	Total Pension Liability	Plan Fiduciary Net Position	Net Pension Liability
Balances at June 30, 2019	$ 535,403	$ 299,179	$ 236,224
Changes for the year:			
Service cost	7,108	-	7,108
Interest	30,825	-	30,825
Difference between expected and actual experience	5,073	-	5,073
Change in assumptions	151,500	-	151,500
Contributions - employer	-	6,531	(6,531)
Contributions - employee	-	3,775	(3,775)
Net investment income (loss)	-	(3,973)	3,973
Benefit payments, including refunds of employee contributions	(33,311)	(33,311)	-
Administrative expense	-	(355)	355
Other changes	-	(1,005)	1,005
Net changes	161,195	(28,338)	189,533
Balances at June 30, 2020	$ 696,598	$ 270,841	$ 425,757

The total pension liability (TPL) at the end of the measurement year, June 30, 2020, is measured as of the valuation date of December 31, 2019 and projected to June 30, 2020. Valuations will be completed every year. Each valuation will be rolled forward six months to provide the GAAP basis liability. There were assumption changes during the period, which are reflected in the amounts. The TPL and service cost have been determined using the entry age actuarial cost method as required by GASB Statement No. 67.

NOTE 10 – DEFINED BENEFIT OTHER POSTEMPLOYMENT BENEFIT (OPEB) PLANS

The two retirement systems MSD employees participate in provide defined benefit postemployment benefits other than pension. The Ohio Public Employees Retirement System (OPERS) is a cost-sharing multiple-employer defined benefit OPEB plans. The City of Cincinnati Retirement System (CRS) is accounted for as a single-employer defined benefit OPEB plan.

Net OPEB Liability/ (Asset)

For purposes of measuring the net OPEB liability/(asset), deferred outflows of resources and deferred inflows of resources related to OPEB, and OPEB expense, information about the fiduciary net position of the OPEB plans and additions to/deductions from their fiduciary net position have been determined on the same basis as they are reported by the retirement systems. For this purpose, benefit payments (including refunds of employee contributions) are recognized when due and payable in accordance with the benefit terms. The retirement systems report investments at fair value.

The net OPEB liability reported on the statement of net position represents a liability to employees for OPEB. The net OPEB asset reported on the statement of net position represents an asset to fund employee OPEB. OPEB is a component of exchange transactions—between an employer and its employees—of salaries and benefits for employee services. OPEB is provided to an employee—on a deferred-payment basis—as part of the total compensation package offered by an employer for employee services each financial period. The obligation to sacrifice resources for OPEB is a present obligation because it was created as a result of employment exchanges that already have occurred.

The net OPEB liability/(asset) represents the MSD's actuarial present value (or with the OPERS cost-sharing, multiple-employer plan, MSD's proportionate share of the OPEB plan's collective actuarial present value) of projected benefit payments attributable to past periods of service, net of each OPEB plan's fiduciary net position. The net OPEB liability/(asset) calculation is dependent on critical long-term variables, including estimated average life expectancies, earnings on investments, cost of living adjustments, cost trends and other variables. While these estimates use the best information available, unknowable future events require adjusting this estimate annually.

The MSD's share of each plan's unfunded benefits is presented as a long-term *net other post-employment benefit liability* or fully-funded benefits as long-term *net OPEB asset* on the accrual basis of accounting.

A. Ohio Public Employees Retirement System (OPERS)

Ohio Revised Code limits the MSD's obligation for liabilities to OPERS to annual required payments. The MSD cannot control benefit terms or the manner in which OPEB from the cost-sharing, multiple-employer plan is financed; however, the MSD does receive the benefit of employees' services in exchange for compensation including OPEB.

GASB Statement No. 75 assumes the liability is solely the obligation of the employer, because they benefit from employee services. OPEB contributions come from these employers and health care plan enrollees which pay a portion of the health care costs in the form of a monthly premium. The Ohio Revised Code

permits but does not require the cost-sharing, multiple-employer retirement system to provide health care to eligible benefit recipients. Any change to benefits or funding could significantly affect the net OPEB liability. Resulting adjustments to the net OPEB liability would be effective when the changes are legally enforceable. The retirement systems may allocate a portion of the employer contributions to provide for these OPEB benefits.

Plan Description— OPERS

The MSD contributes to the health care plans administered by OPERS. OPERS is a cost-sharing, multiple-employer public employee retirement system comprised of three separate pension plans; the Traditional Pension Plan, a defined benefit plan; the Combined Plan, a combination defined benefit/defined contribution plan; and the Member-Directed Plan, a defined contribution plan.

OPERS maintains a cost-sharing, multiple-employer defined benefit post-employment health care trust, which funds multiple health care plans including medical coverage, prescription drug coverage and deposits to a Health Reimbursement Arrangement to qualifying benefit recipients of both the traditional pension and combined plans. This trust is also used to fund health care for member-directed plan participants, in the form of a Retiree Medical Account (RMA). At retirement or refund, member-directed plan participants may be eligible for reimbursement of qualified medical expenses for their vested RMA balance.

In order to quality for postemployment health care coverage, age and service retirees under the traditional pension and combined plans must have twenty or more years of qualifying Ohio service credit. Health care coverage for disability benefit recipients and qualified survivor benefit recipients is available. The health care coverage provided by OPERS meets the definition of another post-employment benefit (OPEB) as described in GASB Statement No. 75. See OPERS' CAFR referenced below for additional information.

The Ohio Revised Code permits, but does not require OPERS to provide health care to its eligible benefit recipients. Authority to establish and amend health care coverage is provided to the Board in Chapter 145 of the Ohio Revised Code.

Disclosures for the health care plan are presented separately in the OPERS financial report. Interested parties may obtain a copy by visiting https://www.opers.org/financial/reports.shtm, by writing to OPERS, 277 East Town Street, Columbus, Ohio 43215-4642, or by calling (614) 222-5601 or 800-222-7377.

Funding Policy—The Ohio Revised Code provides the statutory authority requiring public employers to fund postemployment health care through their contributions to OPERS. When funding is approved by OPERS' Board of Trustees, a portion of each employer's contribution to OPERS is set aside to fund OPERS health care plans. Beginning in 2018, health care is not being funded.

Employer contribution rates are expressed as a percentage of the earnable salary of active members. In 2020, state and local employers contributed at a rate of 14% of earnable salary. These are the maximum employer contribution rates permitted by the Ohio Revised Code. Active member contributions do not fund health care.

Each year, the OPERS Board determines the portion of the employer contribution rate that will be set aside to fund health care plans. The portion of Traditional Pension and Combined plans' employer contributions allocated to health care was zero in 2020. The OPERS Board is also authorized to establish rules for the retiree or their surviving beneficiaries to pay a portion of the health care provided. Payment amounts vary depending on the number of covered dependents and the coverage selected. The employer contribution as a percentage of covered payroll deposited into the RMA for participants in the Member-Directed Plan for 2020 was 4%.

OPEB Liabilities, OPEB Expense, and Deferred Outflows and Inflows of Resources Related to OPEB—OPERS

The net OPEB liability and total OPEB liability for OPERS were determined by an actuarial valuation as of December 31, 2018, rolled forward to the measurement date of December 31, 2019, by incorporating the expected value of health care cost accruals, the actual health care payment, and interest accruals during the year. The MSD's proportion of the net OPEB liability was based on the MSD's share of contributions to the respective retirement system relative to the contributions of all participating entities. The MSD's proportion change in proportion and proportionate share of the net OPEB liability was 0.01497864%, a decrease of 0.000523%, and $2,069,000, respectively. OPEB expense for the MSD was $148,000.

At December 31, 2020, the MSD reported deferred outflows of resources and deferred inflows of resources related to OPEB from the following sources (amounts in thousands):

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net
MSD contributions subsequent to the measurement date	$ 2	$ -	$ 2
Net difference between projected and actual investment earnings	-	(105)	(105)
Difference between expected and actual experience	-	(189)	(189)
Change in assumptions	327	-	327
Change in MSD's proportionate share	-	(91)	(91)
	$ 329	$ (385)	$ (56)

$2,000 reported as deferred outflows of resources related to OPEB resulting from MSD contributions subsequent to the measurement date will be recognized as a reduction of the net OPEB liability in the year ended December 31, 2021. Other amounts reported as deferred outflows and inflows of resources related to OPEB will be recognized in OPEB expense as follows (amounts in thousands):

Year Ended December 31:	Net Deferred Outflows/ (Inflows) of Resources	Deferred Outflows of Resources	Deferred Inflows of Resources
2021	$ (15)	$ 196	$ (211)
2022	2	131	(129)
2023	(45)	-	(45)
	$ (58)	$ 327	$ (385)

Actuarial Assumptions—OPERS

Actuarial valuations of an ongoing plan involve estimates of the value of reported amounts and assumptions about the probability of occurrence of events far into the future. Examples include assumptions about future employment, mortality, and cost trends. Actuarially determined amounts are subject to continual review or modification as actual results are compared with past expectations and new estimates are made about the future.

Projections of health care costs for financial reporting purposes are based on the substantive plan and include the types of coverages provided at the time of each valuation and the historical pattern of sharing of costs between OPERS and plan members. The total OBEB liability was determined by an actuarial valuation as of December 31, 2018, rolled forward to the measurement date of December 31, 2019. The actuarial valuation used the following actuarial assumptions applied to all prior periods included in the measurement in accordance with the requirements of GASB Statement No. 74:

Wage inflation	3.25%
Projected salary increases	3.25% to 10.75%, including wage inflation
Singe discount rate:	
Current measurement period	3.16%
Prior measurement period	3.96%
Investment rate of return	6.00%
Municipal bond rate:	
Current measurement period	2.75%
Prior measurement period	3.71%
Health care cost trend rate:	
Current measurement period	10.5% initial, 3.50% ultimate in 2030
Prior measurement period	10.0% initial, 3.25% ultimate in 2029
Actuarial cost method	Individual entry age

Pre-retirement mortality rates are based on the RP-2014 Employees mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Post-retirement mortality rates are based on the RP-2014 Healthy Annuitant mortality table for males and females, adjusted for improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Post-retirement mortality rates for

disabled retirees are based on the RP-2014 Disabled mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Mortality rates for a particular calendar year are determined by applying the MP-2015 mortality improvement scale to all of the above tables.

The most recent experience study was completed for the five-year period ended December 31, 2015.

The long-term expected rate of return on health care investment assets was determined using a building-block method in which best-estimate ranges of expected future real rates of return are developed for each major asset class. These ranges are combined to produce the long-term expected real rate of return by weighting the expected future real rates of return by the target asset allocation percentage, adjusted for inflation.

During 2019, OPERS managed investments in three investment portfolios: the Defined Benefit portfolio, the Health Care portfolio and the Defined Contribution portfolio. The Health Care portfolio includes the assets for health care expenses for the Traditional Pension Plan, Combined Plan and Member-Directed Plan eligible members. Within the Health Care portfolio, contributions into the plans are assumed to be received continuously throughout the year based on the actual payroll payable at the time contributions are made, and health care-related payments are assumed to occur mid-year. Accordingly, the money-weighted rate of return is considered to be the same for all plans within the portfolio. The annual money-weighted rate of return expressing investment performance, net of investment expenses and adjusted for the changing amounts actually invested, for the Health Care portfolio was 19.7% for 2019.

The allocation of investment assets within the Health Care portfolio is approved by the OPERS Board as outlined in the annual investment plan. Assets are managed on a total return basis with a long-term objective of continuing to offer a sustainable health care program for current and future retirees. OPERS' primary goal is to achieve and maintain a fully funded status for benefits provided through the defined pension plans. Health care is a discretionary benefit. The table below displays the OPERS Board-approved asset allocation policy for 2019 and the long-term expected real rates of return.

Asset Class	Target Allocation	Weighted Average Long-Term Expected Real Rate of Return (Arithmetic)
Fixed Income	36.00%	1.53%
Domestic Equities	21.00%	5.75%
REITs	6.00%	5.69%
International Equities	23.00%	7.66%
Other Investments	14.00%	4.90%
Total	100.00%	4.55%

Discount Rate. A single discount rate of 3.16% was used to measure the OPEB liability on the measurement date of December 31, 2019. Projected benefit payments are required to be discounted to their actuarial present value using a single discount rate that reflects (1) a long-term expected rate of return on OPEB plan investments (to the extent that the health care fiduciary net position is projected to be sufficient to pay benefits), and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate are not met). This single discount rate was based on an expected rate of return on the health care investment portfolio of 6.00% and a municipal bond rate of 2.75%. The projection of cash flows used to determine this single discount rate assumed that employer contributions will be made at rates equal to the actuarially determined contribution rate. Based on these assumptions, the health care fiduciary net position and future contributions were sufficient to finance health care costs through 2034. As a result, the long-term expected rate of return on health care investments was applied to projected costs through the year 2034, and the municipal bond rate was applied to all health care costs after that date.

Sensitivity of the MSD's Proportionate Share of the Net OPEB Liability to Changes in the Discount Rate and Changes in the Health Care Cost Trend Rates. The following table present the net OPEB liability calculated using the single discount rate of 3.16% and the expected net OPEB liability if it were calculated using a discount rate that is 1.0% lower or 1.0% higher than the current rate (amounts in thousands):

	1% Decrease (2.16%)	Current Discount Rate (3.16%)	1% Increase (4.16%)
MSD' proportionate share of the net OPEB liability	$ 2,708	$ 2,069	$ 1,558

Sensitivity of the City's Proportionate Share of the Net OPEB Liability to Changes in the Health Care Cost Trend Rate. Changes in the health care cost trend rate may also have a significant impact on the net OPEB liability. The following table presents the net OPEB liability calculated using the assumed trend rates, and the expected net OPEB liability if it were calculated using a health care cost trend rate that is 1.0% lower or 1.0% higher than the current rate.

Retiree health care valuations use a health care cost-trend assumption that changes over several years built into the assumption. The near-term rates reflect increases in the current cost of health care; the trend starting in 2020 is 10.50%. If this trend continues for future years, the projection indicates that years from now virtually all expenditures will be for health care. A more reasonable alternative is that in the not-too-distant future, the health plan cost trend will decrease to a level at, or near, wage inflation. On this basis, the actuaries' project premium rate increases will continue to exceed wage inflation for approximately the next decade, but by less each year, until leveling off at an ultimate rate, assumed to be 3.50% in the most recent valuation.

	1% Decrease	Current Health Care Cost Trend Rate	1% Increase
MSD' proportionate share of the net OPEB liability	$ 2,008	$ 2,069	$ 2,129

Changes Subsequent to the Measurement Date. On January 15, 2020, the Board approved several changes to the health care plan offered to Medicare and pre-Medicare retirees in efforts to decrease costs and increase the solvency of the health care plan. These changes are effective January 1, 2022 and include changes to base allowances and eligibility for Medicare retirees, as well as replacing OPERS-sponsored medical plans for pre-Medicare retirees with monthly allowances, similar to the program for Medicare retirees. These changes are not reflected in the current measurement period, but are expected to decrease the associated OPEB liability

B. City of Cincinnati Retirement System (CRS)

Plan Description – CRS

CRS provides health care coverage to eligible retirees, their spouse and dependent children and is accounted for as a single-employer defined benefit OPEB plan. Active members in Group C who have earned fifteen years of membership service at the time of termination are eligible upon retirement. Other active members are eligible for retiree health care upon their retirement after reaching age 60 with 20 years of membership service, or any age with 30 years of service of which 20 years must be earned with CRS. Active members whose most recent membership enrollment date is on or after January 1, 2016 are not eligible for retiree health care benefits upon retirement.

CRS offers medical and prescription benefits to retirees before and during Medicare eligibility. Prescription benefits for Medicare eligible participants are provided through a Medicare Part D Employer Group Waiver Plan. CRS administers three health care plans that differ by deductibles, co-pays and out-of-pocket maximums. Two plans are closed groups. The third plan for eligible members who retire on or after January 1, 2016 follows the most advantageous plan offered to active MSD employees.

Membership in CRS as of the June 30, 2020 measurement date was as follows:

Retirees and beneficiaries (optionees) receiving benefits*	4,926
Terminated plan members and beneficiaries (optionees) Entitled to future benefits	247
Deferred retirement option plan (DROP) participants	217
Active plan members:	
Full-time	2,151
Part-time	330
Total	7,871

* OPEB members include 1,361 spouses currently receiving retiree health benefits.

CRS is considered part of the City of Cincinnati's financial reporting entity and is included in the City's financial report as part of the pension trust fund. The financial report that includes the financial statements, required supplementary information and detailed information about CRS' fiduciary net position may be obtained by visiting http://cincinnati-oh.gov/finance/cafr/. Information in the remainder of this footnote is provided for the MSD's portion, being reported as an agency fund of the City, which also participates in and contributes to the CRS, with a measurement date of June 30, 2020.

Funding Policy — Most retirees are subject to premiums that range from 0% to 10%. Other retiree premiums range from 5% to 75% depending on their date of hire, years of service and age at retirement. All members electing to participant in the dental and/or vision plan are required to pay the full cost of coverage. As such, it was assumed that CRS has no liability under GASB Statement No. 74 for these benefits.

OPEB (Asset), OPEB Expense, and Deferred Outflows and Inflows of Resources Related to OPEB—CRS

The MSD's net OPEB (asset) was measured as of June 30, 2020, and the total OPEB liability used to calculate the net OPEB asset was determined by an actuarial valuation as of December 31, 2019. The MSD reported a net OPEB asset of $14,700,000 and negative OPEB expense of $35,922,000.

At December 31, 2020, the MSD reported deferred inflows of resources related to OPEB from the following sources (amounts in thousands):

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net
Differences between expected and actual experience	$ 1,206	$ (8,151)	$ (6,945)
Net difference between projected and actual investment earnings	6,744	-	6,744
Change in proportion	-	(479)	(479)
Change in assumptions	9,899	(9,694)	205
	$ 17,849	$ (18,324)	$ (475)

Amounts reported as deferred inflows of resources will be recognized in OPEB expense as follows (amounts in thousands):

Year Ended December 31:	Net Deferred Outflows/ (Inflows) of Resources
2021	$ (904)
2022	(337)
2023	(816)
2024	1,582
	$ (475)

Actuarial Assumptions. The total OPEB liability in the following actuarial valuations were determined using the following actuarial assumptions, applied to the applicable periods included in the measurement:

Inflation:	
CPI	2.75%
Medical CPI	3.25%
Salary increases, including wage inflation	3.75% - 7.50%
Long-term investment rate of return	7.50%
Municipal bond index rate:	
Measurement date	2.21%
Prior measurement date	3.50%
Year of projected depletion:	
Measurement date	Projected future net position will not be depleted
Prior measurement date	2040
Single equivalent interest rate, net of OPEB plan investment expense, including price inflation	
Measurement date	7.50%
Prior measurement date	5.07%
Health care cost trends:	
Medicare supplement claims	
Pre-Medicare	8.00% for 2019, decreasing to an ultimate rate of 4.00% by 2034.
Post-Medicare	4.87% / 4.79% for Non-Model and Model Plans, respectively, for 2019, decreasing to an ultimate rate of 4.00% by 2034.

The demographic actuarial assumptions used in the December 31, 2019 valuation were based on the results of the most recent actuarial experience study, adopted by the Board on March 1, 2018.

Pre-retirement mortality rates were based on RP-2014 healthy employee dataset mortality with fully generational projected mortality improvements using MP-2017. RP-2014 healthy employee dataset mortality rates for males and females have been set forward 2 years. Post-retirement mortality rates for health lives were based on RP-2014 total dataset mortality with fully generational projected mortality improvements using MP-2017. RP-2014 total dataset mortality rates for males and females have been set forward 2 years. For disabled lives, RP-2014 disabled retiree mortality with fully generational projected mortality improvements using MP-2017.

Of the CSA employee members eligible for DROP benefits, 60% are assumed to decline participation and 40% are assumed to be elect participation. Those electing to participate are assumed to remain in DROP for 3 years.

Of the vested members who terminate, it is assumed that 60% will leave their contributions in the plan in order to be eligible for a benefit at their normal retirement date while remaining 40% elect to withdraw their contributions.

Long Term Expected Rate of Return. Several factors were considered in evaluating the long-term rate of return assumption, including CRS' current asset allocations and a log-normal distribution analysis using the best-estimate ranges of expected future real rates of return (expected return, net of investment expense and inflation) for each major asset class compiled by Horizon Actuarial Services, LLC in its *"Survey of Capital Market Assumptions, 2017 Edition"*. The long-term expected rate of return was determined by weighting the expected future real rates of return by the target asset allocation percentage and then adding expected inflation. The assumption is not expected to change absent a significant change in the asset allocation, a change in the inflation assumption, or a fundamental change in the market that alters expected returns in future years.

The target asset allocation and best estimates of arithmetic real rates of return for each major asset class are summarized as follows:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return*
Core Bonds	14.00 %	2.80 %
High Yield Bonds	3.00 %	4.90 %
Large-Cap Value Equity	7.00 %	7.20 %
Large-Cap Growth Equity	5.00 %	7.10 %
Mid-Cap Value Equity	4.00 %	7.50 %
Mid-Cap Core Equity	4.00 %	7.50 %
Small-Cap Value Equity	7.50 %	8.00 %
Non-U.S. Developed Large Cap	10.00 %	7.40 %
Non-U.S. Small Cap	5.00 %	8.10 %
Emerging Markets All-Cap	5.00 %	8.50 %
EM Small-Cap	3.00 %	8.50 %
Real Estate Core Equity	10.00 %	7.40 %
Infrastructure	7.50 %	7.80 %
Risk Parity	5.00 %	4.10 %

Private Equity	10.00 %	11.10 %
Total	100.00 %	

* Geometric mean

Determination of Discount Rate (SEIR). The plan uses the Bond Buyer G.O. 20 Year Bond Municipal Bond Index to satisfy the requirements under paragraph 48 of GASB Statement No. 74. As this Index is issued weekly, the value closest to, but after the reporting date is used in determining the appropriate rate. Based on this practice, the municipal bond index rate at June 27, 2019 was 3.50% and 2.21% at June 30, 2020.

The discount rate used to measure the total OPEB liability as of June 30, 2020 was 7.50%. The projection of cash flows used to determine the discount rate was performed in accordance with GASB Statement No. 74. The projection's basis was an actuarial valuation performed as of December 31, 2019. In addition to the actuarial methods and assumptions of the December 31, 2019 actuarial valuation, the following actuarial methods and assumptions were used in the projection of cash flows:

- No future employee contributions were assumed to be made.
- No future employer contributions were assumed to be made.

Based on these assumptions, CRS' fiduciary net position was projected to never be depleted, as a result, the long-term expected rate of return was used in the determination of the single equivalent interest rate (SEIR). Here, the long-term expected rate of return of 7.50% on plan investments was applied to all periods, resulting in a SEIR at the measurement date of 7.50%

Sensitivity of the net OPEB (asset) to changes in the discount rate and healthcare cost trend rates. The following presents the net OPEB (asset) of the MSD, as well as what the MSD's net OPEB (asset) would be if it were calculated using a discount rate that is 1% lower or 1% higher than the current discount rate. Similarly, the following also presents what the MSD's net OPEB (asset) would be if it were calculated using a healthcare cost trend rate that is 1% lower or 1% higher than the current rate (amounts in thousands):

	Healthcare Cost Trend Rates		
MSD' Net OPEB (Asset)	1% Decrease	Current Rate	1% Increase
1% Increase (8.50%)		$ (21,383)	
Current Discount Rate (7.50%)	$ (22,168)	(14,700)	$ (5,861)
1% Decrease (6.50%)		$ (6,822)	

Change in Net OPEB Liability/(Asset). Changes in the MSD's financial reporting entity's net OPEB liability/(asset) for the measurement year ended June 30, 2020 were as follows (amounts in thousands):

	Total OPEB Liability	Plan Fiduciary Net Position	Net OPEB Liability/ (Asset)
Balances at June 30, 2019	$ 120,403	$ 89,174	$ 31,229
Changes for the year:			
Service cost	1,381	-	1,381
Interest	6,168	-	6,168
Benefit changes	(32,814)	-	(32,814)
Difference between expected and actual experience	(10,869)	-	(10,869)
Change in assumptions	(11,168)	-	(11,168)
Net investment income (loss)	-	(1,139)	1,139
Benefit payments, including refunds of employee contributions	(5,104)	(5,104)	-
Administrative expense	-	(102)	102
Other changes	-	(132)	132
Net changes	(52,406)	(6,477)	(45,929)
Balances at June 30, 2020	$ 67,997	$ 82,697	$ (14,700)

The total OPEB liability as of June 30, 2020 is based on the actuarial valuation results as of December 31, 2019. The total OPEB liability as of June 30, 2020 was determined using standard projection (roll forward) techniques. The roll forward calculation adds the normal cost (also called the service cost) for the projection period—for experience and assumption changes, the first half of 2020, subtracts the expected net benefit payments for the period, and then applies the SEIR used to measure the total OPEB liability as of the valuation date. The roll forward calculation for the expected change is determined using a similar procedure, except that the total OPEB liability and service cost are based on GASB Statement No. 75 results as of the prior measurement date, one year projection period used, and actual net benefit payments are subtracted. The difference between this expected total OPEB liability and the projected total OPEB liability as of June 30, 2020 before reflecting any changes of assumptions or other inputs is the experience (gain) or loss for the period.

NOTE 11 - RELATED PARTY TRANSACTIONS

Cincinnati Water Works provides billing and collection services on customers' accounts for MSD. Fees for these services for 2020 and 2019 were $6,693,664 and $6,653,277, respectively. Fees are also paid to other municipalities and villages within Hamilton County for collection of sewerage bills.

The City of Cincinnati provides "overhead" services to MSD, such as check disbursement, investment and legal services, etc. The fees for these services for 2020 and 2019 were $2,582,066 and $2,376,100, respectively. In addition, the City's Municipal Garage provides gasoline and repairs vehicles for MSD. Fees for these services were $1,591,354 and $1,639,842 for 2020 and 2019, respectively.

NOTE 12 - COMMITMENTS AND CONTINGENCIES

The City of Cincinnati and the Board of County Commissioners of Hamilton County, Ohio are parties to a Global Consent Decree, which was lodged in 2003 with the U.S. District Court for the Southern District of Ohio, Western Division. This decree focuses on combined sewer overflows, the implementation of the Sanitary Sewer Overflow Correction plan established in the Interim Partial Consent Decree, and other wet weather issues. The court approved the decrees on June 9, 2004. In August 2010, MSD's Revised Wet Weather Improvement Plan was approved by the federal government. The commitment was for MSD to complete a Phase 1 group of projects totaling $1.145 billion (in 2006 dollars). Work on Phase 1 is over 94% complete and $129 million under budget. Consent decree documents are posted on the MSD web site, msdgc.org, under consent decree.

As part of MSD's capital improvement program, MSD has entered into a number of contracts for construction, design, and other services. Commitments under these contracts aggregate approximately $99.9 million as of December 31, 2019, and $98.7 million as of December 31, 2020.

The State of Ohio Auditor's office released a Special Audit for the years 2009-2015. The Findings for Recovery amounted to $779,164, of which $22,619 and $212,635 was recovered in 2019 and 2018, respectively. In 2019, the balance owed to MSD was turned over to the Hamilton County Prosecutor's office for review and disposition.

NOTE 13 - RISK MANAGEMENT

MSD is part of the City of Cincinnati Risk Management Program. The City purchases commercial insurance to cover losses due to: theft of, damage to, or destruction of assets and purchases general liability insurance for specific operations and professional liability insurance for certain operations. All other risks of loss are self-insured. Separately, MSD carries property insurance pursuant to an all-risk policy on MSD's buildings and equipment per the revenue bond trust agreement. There has been no reduction in insurance coverage from coverage in 2003. Insurance settlements for claims resulting from risks covered by commercial insurance have not exceeded the insurance coverage in any of the past four years.

NOTE 14 – PREPAID EXPENSES AND OTHER

The City of Cincinnati offered an Early Retirement Incentive Program (ERIP) in 2007. The City Retirement System was paid MSD's share of the remaining liability in the amount of $8,723,061. This amount represents in full the liability for 2015-2023 years. The payment was processed and paid in March, 2016. The remaining prepaid expense balance was $1,273,061 for 2020 and $2,523,061 for 2019.

Prepaid Insurance was $214,140, and Accrued Interest Receivable was $1,961,715 at December 31, 2020, for a total Prepaid Expenses and Other of $3,448,916.

NOTE 15 - SUBSEQUENT EVENTS

The United States and the State of Ohio declared a state of emergency in March 2020 due to the COV-19 pandemic. The financial impact of COVID-19 and the ensuing emergency measures will impact subsequent periods of the District. The District's investment portfolio and investments of the pension and other employee benefit plan in which the District participates have incurred a significant decline in fair value, consistent with the general decline in financial markets. However, because the values of individual investments fluctuate with market conditions, and due to market volatility, the amount of losses that will be recognized in subsequent periods, if any, cannot be determined. In addition, the impact of the District's future operating costs, revenues, and any recovery from emergency funding, either federal or state, cannot be estimated.

There is a separate Consent Decree for the City Retirement System Plan court case, which may require additional employer share of pension contribution payments, however the exact dollar amount is unknown at this time.

There was an incident on June 15, 2019, in which a newly constructed MSD stormwater infrastructure failed. The City and County are working with homeowners in resolving the situation. Individual damage claims amounts for this event are unknown at this time, and will be resolved in the coming months.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of the MSD's Proportionate Share of the Net Pension Liability
Ohio Public Employees Retirement System - Traditional Pension Plan
Last Seven Years (1) (2)
Table 1
(Amounts in thousands)

	MSD's Proportion of the Net Pension Liability	MSD's Proportionate Share of the Net Pension Liability	MSD's Covered Payroll	MSD's Proportionate Share of the Net Pension Liability as a Percentage of its Covered Payroll	Plan Fiduciary Net Position as a Percentage of the Total Pension Liability
2014	0.01499479%	$ 1,766	$ 2,443	72.29%	86.36%
2015	0.01517751%	1,825	2,479	73.62%	86.45%
2016	0.01475990%	2,541	2,336	108.78%	81.08%
2017	0.01727562%	3,923	2,200	178.32%	77.25%
2018	0.01708312%	2,680	2,377	112.75%	84.66%
2019	0.01599242%	4,380	2,257	194.06%	74.70%
2020	0.01564887%	3,093	2,136	144.80%	82.17%

(1) Amounts presented for each year were determined as of MSD's measurement date, which is the prior year-end.
(2) Information prior to 2014 is not available.

Notes to Schedule:

Change in assumptions . In 2017, changes in assumptions were made based upon an updated experience study that was completed for the five-year period ended December 31, 2015. Significant changes included a reduction of the discount rate from 8.0% to 7.5%, a reduction in the wage inflation rate from 3.75% to 3.25%, and transition from the RP-2000 mortality tables to the RP-2014 mortality tables.

In 2019, a reduction of the discount rate was made from 7.5% to 7.2%.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of MSD's Pension Contributions
Ohio Public Employees Retirement System - Traditional Pension Plan
Last Ten Calendar Years
Table 2
(Amounts in thousands)

	Contractually Required Contributions	Contributions in Relation to the Contractually Required Contributions	Contribution Deficiency (Excess)	MSD's Covered Payroll	Contributions as a Percentage of Covered Payroll
2011	$ 237	$ (237)	$ -	$ 2,371	10.00%
2012	275	(275)	-	2,750	10.00%
2013	318	(318)	-	2,443	13.00%
2014	297	(297)	-	2,479	12.00%
2015	280	(280)	-	2,336	12.00%
2016	264	(264)	-	2,200	12.00%
2017	309	(309)	-	2,377	13.00%
2018	316	(316)	-	2,257	14.00%
2019	299	(299)	-	2,136	14.00%
2020	299	(299)	-	2,136	14.00%

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of the MSD's Proportionate Share of the Net OPEB Liability
Ohio Public Employees Retirement System - Traditional Pension Plan
Last Four Years (1) (2)
Table 3
(Amounts in thousands)

	MSD's Proportion of the Net OPEB Liability	MSD's Proportionate Share of the Net OPEB Liability	MSD's Covered Payroll	MSD's Proportionate Share of the Net OPEB Liability as a Percentage of its Covered Payroll	Plan Fiduciary Net Position as a Percentage of the Total OPEB Liability
2017	0.01786139%	$ 1,804	$ 2,200	82.00%	54.05%
2018	0.01664978%	1,808	2,377	76.06%	54.14%
2019	0.01550127%	2,021	2,257	89.54%	46.33%
2020	0.01497864%	2,069	2,136	96.86%	47.80%

(1) Amounts presented for each year were determined as of MSD's measurement date, which is the prior year-end.
(2) Information prior to 2017 is not available.

Notes to Schedule:

Change in assumptions. In 2018, the single discount rate changed from 4.23% to 3.85%.

In 2019, the single discount rate changed from 3.85% to 3.96%, the investment rate of return changed from 6.50% to 6.00%, and the health care cost trend rate changed from 7.50% initial to 10.00% initial.

In 2020, the single discount rate changed from 3.96% to 3.16% and the health care cost trend rate changed from 10.0% initial, 3.25% ultimate in 2029 to 10.5% initial, 3.50% ultimate in 2030.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of MSD's OPEB Contributions
Ohio Public Employees Retirement System - Traditional Pension Plan
Last Ten Calendar Years
Table 4
(Amounts in thousands)

	Contractually Required Contributions	Contributions in Relation to the Contractually Required Contributions	Contribution Deficiency (Excess)	MSD's Covered Payroll	Contributions as a Percentage of Covered Payroll
2011	$ 95	$ (95)	$ -	$ 2,371	4.00%
2012	110	(110)	-	2,750	4.00%
2013	24	(24)	-	2,443	1.00%
2014	50	(50)	-	2,479	2.00%
2015	47	(47)	-	2,336	2.00%
2016	44	(44)	-	2,200	2.00%
2017	24	(24)	-	2,377	1.00%
2018*	3	(3)	-	2,257	0.13%
2019*	2	(2)	-	2,136	0.09%
2020	2	(2)	-	2,136	0.09%

* - Updated based on revised information.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of MSD's Changes in Net Pension Liability and Related Ratios
Cincinnati Retirement System
Last Seven Years (1) (2)
Table 5
(Amounts in thousands)

	2020	2019	2018	2017	2016
Total pension liability					
Service cost	$ 7,108	$ 4,489	$ 4,260	$ 3,764	$ 5,639
Interest	30,825	32,602	30,470	29,256	25,454
Benefit changes	-	-	-	5,344	(13,545)
Difference between expected and actual experience	5,073	8,698	5,577	649	734
Changes of assumptions	151,500	101,687	9,403	-	(111,431)
Benefit payments and refunds	(33,311)	(32,110)	(31,436)	(30,612)	(29,102)
Other	-	-	-	-	(35,654)
Net change in total pension liability	161,195	115,366	18,274	8,401	(157,905)
Total pension liability - beginning	535,403	420,037	401,763	393,362	551,267
Total pension liability - ending (a)	696,598	535,403	420,037	401,763	393,362
Plan net position					
Contributions - employer	6,531	6,381	6,080	5,647	4,639
Contributions - member	3,775	3,677	3,521	3,246	1,599
Contributions - ERIP payoff	-	-	-	-	8,723
Net investment income (loss)	(3,973)	14,394	26,180	38,292	(2,065)
Benefit payments and refunds	(33,311)	(32,110)	(31,436)	(30,612)	(29,102)
Administrative expense	(355)	(278)	(277)	(288)	(962)
Other	(1,005)	(1,439)	(1,893)	(3,065)	24,110
Net change in plan net position	(28,338)	(9,375)	2,175	13,220	6,942
Plan net position - beginning	299,179	308,554	306,379	293,159	286,217
Plan net position - ending (b)	270,841	299,179	308,554	306,379	293,159
Net pension liability - ending (a) - (b)	$ 425,757	$ 236,224	$ 111,483	$ 95,384	$ 100,203
Ratio of plan net position to total pension liability	38.88%	55.88%	73.46%	76.26%	74.53%
Covered payroll	$ 41,462	$ 40,764	$ 37,809	$ 34,942	$ 31,809
Net pension liability as a percentage of covered payroll	1026.86%	579.49%	294.86%	272.98%	315.01%

(continued)

(1) Information prior to 2014 was not available. MSD will continue to present information for years available until a full ten-year trend is available.
(2) The measurement year is from July 1 through June 30.

See Notes to the Required Supplementary Pension Information.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of MSD's Changes in Net Pension Liability and Related Ratios
Cincinnati Retirement System
Last Seven Years (1) (2)
Table 5 (continued)
(Amounts in thousands)

	2015	2014
Total pension liability		
Service cost	$ 5,346	$ 4,919
Interest	28,680	28,146
Benefit changes	-	-
Difference between expected and actual experience	(2,698)	-
Changes of assumptions	30,007	(3,381)
Benefit payments and refunds	(31,057)	(29,953)
Other	-	-
Net change in total pension liability	30,278	(269)
Total pension liability - beginning	520,989	521,258
Total pension liability - ending (a)	551,267	520,989
Plan net position		
Contributions - employer	5,596	7,252
Contributions - member	3,115	2,761
Contributions - ERIP payoff	-	-
Net investment income	9,455	49,002
Benefit payments and refunds	(31,057)	(29,953)
Administrative expense	(302)	(261)
Other	-	-
Net change in plan net position	(13,193)	28,801
Plan net position - beginning	299,410	270,609
Plan net position - ending (b)	286,217	299,410
Net pension liability - ending (a) - (b)	$ 265,050	$ 221,579
Ratio of plan net position to total pension liability	51.92%	57.47%
Covered payroll	$ 31,232	$ 30,550
Net pension liability as a percentage of covered payroll	848.65%	725.30%

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of MSD's Pension Contributions
Cincinnati Retirement System
Last Ten Calendar Years
Table 6
(Amounts in thousands)

	Actuarially Determined Employer Contributions	Actual Employer Contributions	Contribution Deficiency (Excess)	MSD's Covered Payroll	Contributions as a Percentage of Covered Payroll
2011	$ 10,792	$ (6,128)	$ 4,664	$ 31,651	19.36%
2012	9,923	(6,676)	3,247	33,671	19.83%
2013	13,051	(6,179)	6,872	31,369	19.70%
2014	16,087	(5,303)	10,784	30,550	17.36%
2015	13,756	(4,328)	9,428	31,232	13.86%
2016	12,356	(5,169)	7,187	31,809	16.25%
2017	8,541	(5,941)	2,600	34,942	17.00%
2018	10,879	(6,226)	4,653	38,536	16.16%
2019	11,541	(6,455)	5,086	40,053	16.12%
2020	12,226	(6,521)	5,705	40,289	16.19%

See Notes to the Required Supplementary Pension Information.

Metropolitan Sewer District (MSD),Hamilton County, Ohio
Required Supplementary Information
Notes to the Required Pension Information
Cincinnati Retirement System
Table 7

Actuarial Assumptions:

Actuarially determined contribution rates are calculated as of June 30, one year prior to the end of the fiscal year in which contributions are reported.

Actuarial cost method	Entry age
Amortization method	Level dollar
Amortization period	Open 30 year period
Asset valuation method	Five-year smoothed market value
Inflation	2.75%
Salary increases, including wage inflation	3.75% to 7.50%
Investment rate of return	7.50%, net of pension plan investment expense, and including inflation
Municipal bond index rate	2.21%
Single equivalent discount rate	3.56%

Changes of Benefit Terms:

In 2017, there were several changes in benefit provisions as a result of Ordinance 336-2016 adopted by the City Council on October 26, 2016. In addition to incorporating many of the changes mandated by the Collaborative Settlement Agreement (CSA), the Ordinance also:

- Established benefit and eligibility provisions for Group E and F members not covered under the CSA similar to employees who are covered under the CSA.
- Established a universal cost-of-living adjustment (COLA) suspension period for all members.
- Established a universal 3% simple COLA rate for all members

In 2016, there were several changes in benefit provisions as a result of the Collaborative Settlement Agreement (CSA) between the City and various plaintiff groups representing certain active and retired members of CRS as approved by the Court on October 5, 2015 and generally effective January 1, 2016.

Changes in Actuarial Assumptions and Methods:

In 2018, actuarial assumptions and methods were changed based on the results of the actuarial experience study dated February 28, 2018. These changes include reducing the price inflation assumption from 3.00% to 2.75%; updating the retirement, withdrawal and disability rates, updating the mortality rates for all members to a generational approach using the RP-2014 morality tables, updating the merit salary scale; increasing the assumed administrative expense as a percentage of payroll added to the normal cost from 0.75% to 0.80%; updating the assumed proportion of deferred vested members who elect to receive a deferred benefit and who will elect to withdraw their contributions; and updating the assumed percentage of members who are married for the purposes of valuing pre-retirement survivor benefits.

In 2019, the System's fiduciary net position was projected to be available to make projected future benefit payment for current members through 2046. Projected benefit payments beyond 2046 were discounted at the municipal bond rate of 3.50%, resulting in a single equivalent discount rate of 5.56%.

In 2020, the System's fiduciary net position was projected to be available to make projected future benefit payment for current members through 2041. Projected benefit payments beyond 2041 were discounted at the municipal bond rate of 2.21%, resulting in a single equivalent discount rate of 3.56%.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of MSD's Changes in Net OPEB Liability/(Asset) and Related Ratios
Cincinnati Retirement System
Last Three Years (1) (2)
Table 8
(Amounts in thousands)

	2020	2019	2018
Total OPEB liability			
Service cost	$ 1,381	$ 1,155	$ 945
Interest	6,168	6,480	5,841
Benefit changes	(32,814)	-	-
Difference between expected and actual experience	(10,869)	475	3,030
Changes of assumptions	(11,168)	12,822	7,173
Benefit payments	(5,104)	(5,881)	(4,962)
Net change in total OPEB liability	(52,406)	15,051	12,027
Total OPEB liability - beginning	120,403	105,352	93,325
Total OPEB liability - ending (a)	67,997	120,403	105,352
Plan net position			
Net investment income (loss)	(1,139)	4,080	7,354
Benefit payments	(5,104)	(5,881)	(4,962)
Administrative expense	(102)	(79)	(78)
Other	(132)	(206)	(78)
Net change in plan net position	(6,477)	(2,086)	2,236
Plan net position - beginning	89,174	91,260	89,024
Plan net position - ending (b)	82,697	89,174	91,260
Net OPEB liability/(asset) - ending (a) - (b)	$ (14,700)	$ 31,229	$ 14,092
Ratio of plan net position to total OPEB liability/(asset)	121.62%	74.06%	86.62%
Covered employee payroll	$ 31,926	$ 33,066	$ 33,158
Net OPEB liability/(asset) as a percentage of covered employee payroll	(46.04%)	94.44%	42.50%

(1) Information prior to 2018 was not available. MSD will continue to present information for years available until a full ten-year trend is available.
(2) The measurement year is from July 1 through June 30.

See Notes to the Required Supplementary OPEB Information.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of MSD's OPEB Contributions
Cincinnati Retirement System
Last Five Calendar Years (1)
Table 9
(Amounts in thousands)

	Actuarially Determined Employer Contributions	Actual Employer Contributions	Contribution Deficiency (Excess)	MSD's Covered Employee Payroll	Contributions as a Percentage of Covered Employee Payroll
2016	$ 248	$ -	$ 248	$ 31,384	0.00%
2017	714	-	714	32,369	0.00%
2018	534	-	534	32,440	0.00%
2019	974	-	974	32,794	0.00%
2020	537	-	537	31,951	0.00%

(1) Information prior to 2016 is not available.

See Notes to the Required Supplementary OPEB Information.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Notes to the Required OPEB Information
Cincinnati Retirement System
Table 10

Actuarial Assumptions:

Actuarially determined contribution rates are calculated as of June 30, one year prior to the end of the fiscal year in which contributions are reported.

Actuarial cost method	Entry age
Amortization method	Level dollar
Amortization period	Open 30 year period
Asset valuation method	Five-year smoothed market value
Inflation	CPI: 2.75%; Medical CPI: 3.25%
Salary increases, including wage inflation	3.75% to 7.50%
Investment rate of return	7.50%, net of pension plan investment expense, and including inflation
Initial health care cost trend rates	
Pre Medicare	8.00%
Medicare	4.87% (Non-Model Plan) / 4.79% (Model Plan)
Ultimate health care cost trend rates	
Pre Medicare	4.00%
Medicare	4.00%
Year ultimate health care cost trend rates reached	
Pre Medicare	2034
Medicare	2034

Change of Benefit Terms:

In 2020, the Plan moved all Medicare Part A and Part B eligible, and Medicare Part B only eligible Plan participants to the new fully insured Medicare Advantage plan offered by Anthem, effective January 1, 2020.

In 2017, the Plan changes included in Ordinance 336-2016 were adopted by the City Council on October 26, 2016. In addition to incorporating many of the changes mandated by the CSA, the Ordinance also:

- Excluded members hired after December 31, 2015 from eligibility to receive retiree health benefits;
- Established benefit and eligibility provisions for Group E and F members, not covered under the CSA, similar to employees who are covered under the CSA.
- Specified eligibility and postemployment contribution requirements for the retiree health benefits payable to members and beneficiaries entitled to deferred benefits.
- Modified eligibility and postemployment contribution requirements to retiree health benefits paid as the result of an in-service death.

In 2016, there were several changes in benefit provisions as a result of the Collaborative Settlement Agreement (CSA) between the City and various plaintiff groups representing certain active and retired members of CRS as approved by the Court on October 5, 2015 and generally effective January 1, 2016.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Notes to the Required OPEB Information
Cincinnati Retirement System
Table 10 (continued)

Changes in Actuarial Assumptions and Methods:

In 2020, the expected long-term rate of return of 7.50% was used for the discount rate with the projected future net position not being depleted. The claims assumptions and retiree contributions were updated to reflect actual 2020 premiums.

The medical trend assumptions were updated to include several factors. First, the initial trends for the Medicare Advantage plans were set at 0% for medical and 7% for drug, while the trends for the contribution rates for the plans were set at a -5.7% to account for the health insurance tax reduction. The ultimate health care trend was set at 4%, with each trend period set at 15 years.

The claim cost curves were updated based on the experience of the retirees in the Secure, Select and Model plans. The data provided claim experience for all covered members (retirees, covered spouses, and covered children) by age. Additional information was provided for the new Medicare Advantage Plans, which were applied to the 2020 claim curves above.

The percentage of members to not qualify for premium-free Medicare Part A coverage was lowered from 15% to 10%.

In 2019, the December 31, 2018 valuation included a change in the Municipal Bond Index Rate from 3.89% to 3.50%; a decrease in the discount rate (SEIR) from 6.13% to 5.07%, part-time employees were included in the Plan's population, and the health care cost trend rates were updated to reflect the current market place.

In 2018, actuarial assumptions and methods were changed based on recent plan experience done concurrently with the December 31, 2017 valuation, including a change in the Municipal Bond Index Rate from 3.65% to 3.89%; a decrease in the discount rate (SEIR) from 6.31% to 6.13%, a decrease in the price inflation assumption from 3.00% to 2.75%, an update of the retirement, withdrawal, and disability rates; an update of the mortality rates for all members to a generational approach using the RP-2014 mortality tables; an update of the merit salary scales; and updates to the following to better reflect the anticipated experience of the plan: assumed rates of health care inflation, assumed rats of health benefit plan participation, contribution rates for the Select Plan and the Model Plan, and DROP participation rates.

In 2017, future contribution rates for retiree health benefit recipients are now based upon the projected retiree health care costs associated with each projection year's closed group of participants.

OHIO AUDITOR OF STATE
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INDEPENDENT AUDITOR'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING AND ON COMPLIANCE AND OTHER MATTERS REQUIRED BY *GOVERNMENT AUDITING STANDARDS*

Metropolitan Sewer District of Greater Cincinnati
Hamilton County
1605 Gest Street
Cincinnati, Ohio 45204

To the Hamilton County Board of Commissioners:

We have audited, in accordance with auditing standards generally accepted in the United States and the Comptroller General of the United States' *Government Auditing Standards*, the financial statements of the Metropolitan Sewer District of Greater Cincinnati, Hamilton, (the District) as of and for the years ended December 31, 2020 and 2019, and the related notes to the financial statements, which collectively comprise the District's basic financial statements and have issued our report thereon dated May 27, 2021. We also noted the financial impact of COVID-19 and the continuing emergency measures which may impact subsequent periods of the District.

Internal Control Over Financial Reporting

As part of our financial statement audit, we considered the District's internal control over financial reporting (internal control) as a basis for designing audit procedures appropriate in the circumstances to the extent necessary to support our opinion on the financial statements, but not to the extent necessary to opine on the effectiveness of the District's internal control. Accordingly, we have not opined on it.

A *deficiency in internal control* exists when the design or operation of a control does not allow management or employees, when performing their assigned functions, to prevent, or detect and timely correct misstatements. A *material weakness* is a deficiency, or combination of internal control deficiencies resulting in a reasonable possibility that internal control will not prevent or detect and timely correct a material misstatement of the District's financial statements. A *significant deficiency* is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all internal control deficiencies that might be material weaknesses or significant deficiencies. Given these limitations, we did not identify any deficiencies in internal control that we consider material weaknesses. However, unidentified material weaknesses may exist.

Compliance and Other Matters

As part of reasonably assuring whether the District's financial statements are free of material misstatement, we tested its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could directly and materially affect the financial statements. However, opining on compliance with those provisions was not an objective of our audit and accordingly, we do not express an opinion. The results of our tests disclosed no instances of noncompliance or other matters we must report under *Government Auditing Standards*.

Purpose of this Report

This report only describes the scope of our internal control and compliance testing and our testing results, and does not opine on the effectiveness of the District's internal control or on compliance. This report is an integral part of an audit performed under *Government Auditing Standards* in considering the District's internal control and compliance. Accordingly, this report is not suitable for any other purpose.



Keith Faber
Auditor of State
Columbus, Ohio
May 27, 2021

OHIO AUDITOR OF STATE
KEITH FABER

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

HAMILTON COUNTY

AUDITOR OF STATE OF OHIO CERTIFICATION

This is a true and correct copy of the report, which is required to be filed pursuant to Section 117.26, Revised Code, and which is filed in the Office of the Ohio Auditor of State in Columbus, Ohio.

Certified for Release 6/22/2021

88 East Broad Street, Columbus, Ohio 43215
Phone: 614-466-4514 or 800-282-0370

This report is a matter of public record and is available online at
www.ohioauditor.gov

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI
HAMILTON COUNTY

REGULAR AUDIT

FOR THE YEAR ENDED DECEMBER 31, 2021

OHIO AUDITOR OF STATE
KEITH FABER

METROPOLITAN SEWER OF GREATER CINCINNATI
HAMILTON COUNTY
DECEMBER 31, 2021

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OHIO AUDITOR OF STATE
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INDEPENDENT AUDITOR'S REPORT

Metropolitan Sewer District of Greater Cincinnati
Hamilton County
1605 Gest Street
Cincinnati, Ohio 45204

To the Hamilton County Board of Commissioners:

Report on the Audit of the Financial Statements

Opinions

We have audited the financial statements of the Metropolitan Sewer District of Greater Cincinnati, Hamilton County, Ohio (the District), as of and for the years ended December 31, 2021 and 2020, and the related notes to the financial statements, which collectively comprise the District's basic financial statements as listed in the table of contents.

In our opinion, the accompanying financial statements referred to above present fairly, in all material respects, the financial position of the Metropolitan Sewer District of Greater Cincinnati, Hamilton County, Ohio as of December 31, 2021 and 2020, and the changes in financial position and its cash flows for the year then ended in accordance with the accounting principles generally accepted in the United States of America.

Basis for Opinions

We conducted our audit in accordance with auditing standards generally accepted in the United States of America (GAAS) and the standards applicable to financial audits contained in *Government Auditing Standards,* issued by the Comptroller General of the United States. Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Financial Statements* section of our report. We are required to be independent of the District, and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Emphasis of Matter

As discussed in Note 15 to the financial statements, the financial impact of COVID-19 and the continuing emergency measures may impact subsequent periods of the District. Our opinion is not modified with respect to this matter.

Responsibilities of Management for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with accounting principles generally accepted in the United States of America, and for 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.

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the District's ability to continue as a going concern for twelve months beyond the financial statement date, including any currently known information that may raise substantial doubt shortly thereafter.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinions. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with GAAS and *Government Auditing Standards* will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the financial statements.

In performing an audit in accordance with GAAS and *Government Auditing Standards*, we

- exercise professional judgment and maintain professional skepticism throughout the audit.
- identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements.
- obtain an understanding of internal control relevant to the audit 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 District's internal control. Accordingly, no such opinion is expressed.
- evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements.
- conclude whether, in our judgment, there are conditions or events, considered in the aggregate, that raise substantial doubt about the District's ability to continue as a going concern for a reasonable period of time.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control-related matters that we identified during the audit.

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the *management's discussion and analysis*, and schedules of net pension and other post-employment benefit liabilities and pension and other post-employment benefit contributions be presented to supplement the basic financial statements. Such information is the responsibility of management and, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the basic 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.

Other Reporting Required by Government Auditing Standards

In accordance with *Government Auditing Standards*, we have also issued our report dated May 19, 2022, on our consideration of the District's internal control over financial reporting and our tests of its compliance with certain provisions of laws, regulations, contracts and grant agreements and other matters. The purpose of that report is solely 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 effectiveness of the District's 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 District's internal control over financial reporting and compliance.



Keith Faber
Auditor of State
Columbus, Ohio
May 19, 2022

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MANAGEMENT DISCUSSION AND ANALYSIS
(UNAUDITED)

This section of the Metropolitan Sewer District's annual financial report presents our discussion and analysis of the District's financial performance during the fiscal years ended December 31, 2021 and December 31, 2020. Please read it in conjunction with the District's basic financial statements and footnotes, beginning on page XX.

FINANCIAL HIGHLIGHTS FOR THE YEAR

- Assets and deferred outflows exceeded liabilities and deferred inflows by $1,191 million at the close of the 2021 fiscal year.
- The District's net position increased by $114,871 million in 2021, or 10.7%.
- During fiscal year 2021, the District's total assets increased $24.7 million to $2,391 million, a 1.0% increase.
- Total long-term liabilities decreased $368 million to $956 million in fiscal year 2021.
- The District's debt service coverage ratio remains strong at 1.8 for fiscal year 2021.

FINANCIAL STATEMENTS OVERVIEW

Financial Reporting Entity– The Metropolitan Sewer District of Greater Cincinnati is a Hamilton County enterprise fund managed and operated by the City of Cincinnati. The District is operated pursuant to the authority of the Revised Code authorizing the formation of joint sewer districts, agreements between counties and municipal corporations. The District provides sewage treatment within a service area of approximately 400 square miles and encompasses portions of four counties in southwestern Ohio. The District provides wastewater removal and treatment to over 220,000 residential, commercial and industrial sewer connections and operates and maintains over 3,000 miles of sanitary and combined sewers, seven major wastewater treatment plants and 100 pump stations. As an enterprise fund, operations are reported on the full accrual basis of accounting: revenues are recognized when earned, and expenses are recognized when incurred. The County issues a separate Comprehensive Annual Financial Report which includes the District as a separate enterprise fund of the County. The financial statements of the District report information about the District using accounting methods similar to those used by private-sector companies. These statements provide both long-term and short-term information about the District's overall financial status.

Financial Statement Structure --

In addition to the Independent Auditor's Report, the annual financial report consists of three segments:

- The Management's Discussion and Analysis provides explanations for, and analysis of the District's financial activities based upon currently known facts, conditions, and decisions of the District's management. While primarily focused on current year results compared with prior years, this discussion also addresses certain long-term issues, which may, in management's opinion, impact the District's financial performance.
- Basic Financial Statements, which depict the District's financial position as of December 31, 2021 and 2020, along with earnings performance and cash flow information. These statements include

the Statement of Net Position, the Statement of Revenues, Expenses, and Changes in Net Position and the Statement of Cash Flows.

- The accompanying notes explain some of the financial statement data and provide more detailed information.

Required Basic Financial Statements -- The Statement of Net Position is the first required statement; it includes the District's assets and liabilities and provides information about the nature and amounts of investments in resources (assets) and nature and extent of obligations (liabilities) with the difference being reported as net position. It also provides the basis for computing the rates of return, evaluating the capital structure of the District, and assessing the liquidity and financial flexibility of the District. Over time, increases or decreases in the District's net position is one indicator of whether its financial health is improving or deteriorating. Other non-financial factors such as changes in economic conditions, population growth, and new or changed legislation also need to be considered in assessing the District's financial condition. The Statement of Revenues, Expenses, and Change in Net Position is the second required financial statement which demonstrates the changes in net position from one fiscal period to the next by accounting for revenues and expenditures and measuring the financial results of operations. This statement measures the profitability (i.e. change in net position) of the District's operations over the past year and can be used to determine whether the District has successfully recovered all of its costs through its user fees and other charges. The final required financial statement is the Statement of Cash Flows. The primary purpose of this statement is to provide information about the District's cash receipts, cash payments, and net changes in cash and cash equivalents resulting from operations, investing, and capital and noncapital financing activities. It also provides information regarding sources of cash, uses of cash, and changes in cash balances during the reporting period.

Notes to the audited financial statements contain information essential to understanding them, such as the District's significant accounting policies and information about certain financial statement account balances.

FINANCIAL ANALYSIS

Table A below shows that in fiscal year 2021, 86.4% of the District's net position reflects its investment in capital assets (e.g., buildings, sewer laterals, and equipment), less related debt still outstanding used to acquire those assets. These capital assets are used primarily in the collection and treatment of wastewater throughout the District's service area.

- The related liabilities will be repaid with resources provided by system users through rates and fees. Long-term debt (net of the current portion) decreased by $53.1 million in 2021, or -5.98%, and decreased by $34.2 million in 2020, or -3.85%.
- Net position increased $114.9 million in 2021 and decreased $59.9 million in 2020. Percentage increase/decreases over the two-year period of 10.7%, and -5.3%, respectively. Total expenses in both years were due to fluctuations attributable to accounting for pensions.

Table A
Condensed Summary of Net Position
(In Thousands)

	2021	Percentage Increase (Decrease) over 2020	2020	Percentage Increase (Decrease) over 2019	2019	Percentage Increase (Decrease over 2018
Current and other assets	$ 94,712	18.8%	$ 79,756	19.6%	$ 66,692	-2.5%
Noncurrent (restricted) Assets	$ 429,415	-6.5%	$ 459,288	-10.9%	$ 515,270	-2.6%
Capital assets, net	$1,867,200	2.2%	$ 1,827,577	4.0%	$ 1,757,052	5.1%
Total assets	2,391,327	1.0%	2,366,621	1.2%	2,339,014	3.6%
Deferred Outflows	$ 24,169	-81.4%	$ 129,753	44.6%	$ 89,737	200.2%
Current liabilities	$ 83,657	9.4%	$ 76,484	-9.7%	$ 84,745	2.8%
Noncurrent liabilities	$ 956,132	-27.8%	$ 1,324,567	10.3%	$ 1,200,583	13.5%
Total liabilities	$1,039,789	-25.8%	$ 1,401,051	9.0%	$ 1,285,328	12.7%
Deferred Inflows	$ 184,994	849.6%	$ 19,481	152.1%	$ 7,756	-53.6%
Net investment in capital assets	$1,029,342	8.9%	$ 944,971	11.6%	$ 847,027	11.2%
Restricted	$ 4,482	-2.0%	$ 4,573	-36.2%	$ 7,172	1.5%
Unrestricted	$ 156,889	24.2%	$ 126,298	-55.1%	$ 281,498	-24.5%
Total Net Position	$1,190,713	10.7%	$ 1,075,842	-5.3%	$ 1,135,697	-5.0%

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Table B below shows total operating revenues for fiscal year 2021 of $266.0 million, an increase of $8.5 million, or 3.3%. Operating revenues were $257.5 million, a decrease of $14.8 million, or -5.4% in 2020. Meanwhile, total expenses decreased $180.5 million, or 53.8%, in 2021 and increased $33 million, or 10.9%, in 2020. Decreases/Increases in total expenses in both those years was due to fluctuations attributable to accounting for pensions.

Table B
Condensed Summary of Revenues
Expenses and Changes in Net Position
(In Thousands)

	2021	Percentage Increase (Decrease) over 2020	2020	Percentage Increase (Decrease) over 2019	2019	Percentage Increase (Decrease) over 2018
Operating revenues	$ 266,026	3.3%	$ 257,484	-5.4%	$ 272,273	-2.0%
Nonoperating revenues	(179)	-101.3%	13,930	-23.1%	18,121	25.0%
Total revenues	265,847	-2.1%	271,414	-6.5%	290,394	1.0%
Depreciation and amortization expense	$ 67,813	2.1%	$ 66,437	-0.3%	$ 66,628	2.3%
Other operating expenses	119,506	-4.6%	125,252	-0.1%	125,343	5.9%
Pension Expense	(59,287)	-152.0%	114,027	52.2%	74,942	992.3%
Nonoperating expenses	27,078	-9.5%	29,934	-16.4%	35,810	-1.9%
Total expenses	$ 155,110	-53.8%	$ 335,650	10.9%	$ 302,723	33.5%
Income from operations	$ 110,737	-272.4%	$ (64,236)	-120.4%	$ (12,329)	-12.0%
Capital contributions	$ 4,134	-5.6%	$ 4,381	-29.3%	$ 6,195	26.6%
Change in net position	$ 114,871	-291.9%	$ (59,855)	875.8%	$ (6,134)	-109.4%
Total Net Position, beginning	1,075,842	-5.3%	1,135,697	-0.5%	1,141,831	6.1%
Total Net Position, ending	$1,190,713	10.7%	$ 1,075,842	-5.3%	$ 1,135,697	-5.0%

- Operating expenses, excluding depreciation, amortization and net pension expense, decreased by $5.7 million to $119.5 million in 2021 from $125.3 million in 2020. The decrease was due to a decrease in Purchased Services and Other Operating expenses. 2020 saw a decrease of $.9 million, or -0.1%, over the prior year. The decrease was due to utilities, fuel, supplies, purchased services and other expenses.
- Salary and wages decreased $2.9 million to $54.8 million in 2021 compared to $57.7 million in 2020. This was a combination of Salary and Wages and Benefits.
- Depreciation expense increased $1.3 million, or 2.1%, in 2021. Depreciation expense decreased $.2 million, -0.3%, in 2020 compared to the prior year.

- Non-operating expenses for 2021 were $27.1 million, a decrease of $2.9 million or -9.5%. 2020 decreased $5.9 million, or -16.4%, due to changes in interest expense and the fair value of investments.
- The City of Cincinnati offered an Early Retirement Incentive Program (ERIP) in 2007. In 2016, District paid the City $8,723,061, its share of the remaining liability to the City Retirement System. This amount represents in full the liability for the years 2015-2021 and is being amortized over 7 years. ERIP amortization expense was $1,273 million in 2021 final year, and $1,250 million in 2020.

Table C reflects year-end capital balances. As of December 31, the District's investment in capital assets (net of accumulated depreciation) amounted to $1,867 million in 2021, $1,828 million in 2020. Capital assets increased $100 million, or 3.4%, on system improvement projects, land acquired for those projects and equipment replacement in 2021. Capital contributions were $4.1 million and $4.4 million in 2021 and 2020, respectively.

Capital construction and sewer improvement projects were 37.3% in 2021 and 33.1% of the program in 2020. Additional information on the District's capital assets can be found in Note 5 to the financial statements.

Table C
Capital Assets
(In Thousands)

	2021	Percentage Increase (Decrease) over 2020	2020	Percentage Increase (Decrease) over 2019	2019	Percentage Increase (Decrease) over 2018
Land	$ 12,313	20.9%	$ 10,188	0.0%	10,188	0.0%
Buildings	356,939	0.1%	356,666	0.0%	356,666	0.2%
Equipment	751,084	3.4%	726,265	4.3%	696,317	2.0%
Sewer Laterals	1,420,974	5.4%	1,348,645	3.0%	1,309,864	1.3%
Construction in progress	489,374	0.2%	488,533	14.1%	428,108	35.7%
Subtotal	$3,030,684	3.4%	$ 2,930,297	4.6%	$ 2,801,143	5.4%
Less accumulated depreciation	1,163,484	5.5%	1,102,720	5.6%	1,044,091	6.0%
Net capital assets	$1,867,200	2.2%	$ 1,827,577	4.0%	$ 1,757,052	5.1%

Bond Issuances

The District finances its construction program through a combination of revenue bonds, state revolving loans through the State of Ohio and cash, with the primary source being tax-exempt revenue bonds. The District's revenue bond rates are:

- Moody's Investors Services Aa2
- Standard & Poor's Corporation AA+

Revenue bond service Debt Coverage in 2021 was 289% and 271% in 2020, compared to an Agency policy of 150% (25% higher than indenture requirements). The total debt coverage for 2021 was 183% and 177% in 2020, compared to the indenture requirement of 125%.

Rate Increase - Hamilton County Commissioners have not approved a rate increase of the District's sewer fee for 2016 - 2022. The District's large capital program to meet Federal EPA requirements will likely necessitate a rate increase in the near future.

GASB 68

During 2015, the Metropolitan Sewer District of Greater Cincinnati adopted GASB Statement 68, "Accounting and Financial Reporting for Pensions—an Amendment of GASB Statement 27," which significantly revised accounting for pension costs and liabilities. For reasons discussed below, many end users of this financial statement will gain a clearer understanding of the Metropolitan Sewer District of Greater Cincinnati's actual financial condition by adding deferred inflows related to pension and the net pension liability to the reported net position and subtracting deferred outflows related to pension.

Governmental Accounting Standards Board standards are national and apply to all government financial reports prepared in accordance with generally accepted accounting principles. When accounting for pension costs, GASB 27 focused on a funding approach. This approach limited pension costs to contributions annually required by law, which may or may not be sufficient to fully fund each plan's *net pension liability*. GASB 68 takes an earnings approach to pension accounting; however, the nature of Ohio's statewide pension systems and state law governing those systems requires additional explanation in order to properly understand the information presented in these statements.

Under the standards required by GASB 68, the net pension liability equals the Metropolitan Sewer District of Greater Cincinnati's proportionate share of each plan's collective:

1. Present value of estimated future pension benefits attributable to active and inactive employees' past service.
2 Minus plan assets available to pay these benefits.

GASB notes that pension obligations, whether funded or unfunded, are part of the "employment exchange" – that is, the employee is trading his or her labor in exchange for wages, benefits, and the

promise of a future pension. GASB noted that the unfunded portion of this pension promise is a present obligation of the government, part of a bargained-for benefit to the employee and should accordingly be reported by the government as a liability since they received the benefit of the exchange. However, the Metropolitan Sewer District of Greater Cincinnati is not responsible for certain key factors affecting the balance of this liability. The Metropolitan Sewer District of Greater Cincinnati employees are covered by two pension systems. They are the City of Cincinnati Retirement System (CRS), and the Ohio Public Employees Retirement System (OPERS). The City of Cincinnati Retirement System (CRS) is accounted for as a single employer defined benefit pension plan. For CRS, the employee shares the obligation of funding pension benefits with the employer. Both employer and employee contribution rates are set by the City of Cincinnati ordinance. The CRS system provides retirement and disability benefits, annual cost of living adjustments, and death benefits to plan members and beneficiaries. The City of Cincinnati makes employer contributions based on a percentage of covered payroll of all CRS members. For Ohio PERS, the employee shares the obligation of funding pension benefits with the employer. Both employer and employee contribution rates are capped by State statute. A change in these caps requires action of both Houses of the General Assembly and approval of the Governor. Benefit provisions are also determined by State statute. The employee enters the employment exchange with the knowledge that the employer's promise is limited not by contract but by law. The employer enters the exchange also knowing that there is a specific, legal limit to its contribution to the pension system. In Ohio, there is no legal means to enforce the unfunded liability of the pension system *as against the public employer.* State law operates to mitigate/lessen the moral obligation of the public employer to the employee, because all parties enter the employment exchange with notice as to the law. The pension system is responsible for the administration of the plan.

Most long-term liabilities have set repayment schedules or, in the case of compensated absences (i.e. sick and vacation leave), are satisfied through paid time-off or termination payments. There is no repayment schedule for the net pension liability. As explained above, changes in pension benefits, contribution rates, and return on investments affect the balance of the net pension liability but are outside the control of the local government. In the event that contributions, investment returns, and other changes are insufficient to keep up with required pension payments, State statute does not assign/identify the responsible party for the unfunded portion. Due to the unique nature of how the net pension liability is satisfied, this liability is separately identified within the long-term liability section of the statement of net position.

In accordance with GASB 68, the Metropolitan Sewer District of Greater Cincinnati's statements prepared on an accrual basis of accounting include an annual pension expense for their proportionate share of each plan's *change* in net pension liability not accounted for as deferred inflows/outflows.

The COVID-19 Crisis has District reassessing the 2022 budget expenditures.

For additional information on the Management Discussion and Analysis please contact:

Metropolitan Sewer District of Greater Cincinnati
Office of the Director
1600 Gest Street, Cincinnati, OH 45204

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Metropolitan Sewer District
Statement of Net Position
For The Periods Ended December 31, 2021 And December 31, 2020
(All amounts expressed in thousands)

	2021	2020
ASSETS		
Current assets:		
Cash, cash equivalents and pooled investments held by the City of Cincinnati (Note 2)	$ 19,918	$ 20,876
Accounts receivable (Note 3)	41,438	40,575
Prepaid expenses and other (Note 14)	1,543	3,449
Total current assets	62,899	64,900
Noncurrent assets:		
Restricted assets:		
Cash, cash equivalents, and pooled investments held by the City of Cincinnati		
Construction account (Note 2)	57,193	25,610
Amount to be transferred to surplus account (Note 2)	66,352	61,485
Held by trustee: (Note 4)		
Cash and cash equivalents (Note 2)	4,537	69,663
Investments - Held to maturity (Note 2)	301,333	302,530
Total restricted assets	429,415	459,288
Other assets:		
Other	31,813	14,856
Total other assets	31,813	14,856
Capital assets: (Note 5)		
Land	12,313	10,188
Buildings	356,939	356,666
Sewer Laterals	1,420,974	1,348,645
Equipment	751,084	726,265
Construction in progress	489,374	488,533
Total capital assets	3,030,684	2,930,297
Less:		
Accumulated depreciation	(1,163,484)	(1,102,720)
Net capital assets	1,867,200	1,827,577
Total noncurrent assets	2,328,428	2,301,721
Total assets	2,391,327	2,366,621
Deferred outflow of resources		
Deferred charges on refunding	6,021	7,348
Deferred Pension Outflows	18,148	122,405
Total Deferred Outflow of Resources	24,169	129,753

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

Metropolitan Sewer District
Statement of Net Position
For The Periods Ended December 31, 2021 And December 31, 2020
(All amounts expressed in thousands)

	2021	2020
LIABILITIES		
Current liabilities:		
Payable from current assets:		
Current portion of long-term debt (Note 6)	54,118	51,046
Current portion of compensated absences (Note 8)	4,692	4,123
Accounts payable	6,687	5,880
Accrued payroll expenses	2,638	2,957
Total current liabilities payable from current assets	68,135	64,006
Payable from restricted assets:		
Construction accounts payable	13,694	10,505
Accrued interest payable	1,828	1,973
Total current liabilities payable from restricted assets	15,522	12,478
Total current liabilities	83,657	76,484
Noncurrent liabilities:		
Accrued compensated absences (Note 8)	4,267	6,276
Long-term debt (Note 6)	834,319	887,372
Net Pension Liability CRS (Note 9)	115,415	425,757
Net Pension Liability OPERS	2,131	3,093
Net Other Post Employment Benefit Liability (Note 10)	0	2,069
Total noncurrent liabilities	956,132	1,324,567
Total liabilities	1,039,789	1,401,051
Deferred Inflow of resources		
Deferred Pension Inflows (Note 10)	184,994	19,481
Net position:		
Net investment in capital assets	1,029,342	944,971
Restricted	4,482	4,573
Unrestricted (Note 15)	156,889	126,298
Total Net Position	$ 1,190,713	$ 1,075,842

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

Metropolitan Sewer District
Statement of Revenue, Expenses and Changes in Fund Net Position
For The Periods Ended December 31, 2021 And December 31, 2020
(All amounts expressed in thousands)

	2021	2020
REVENUES		
Operating revenues:		
Sewerage service charges	$ 243,605	$ 231,510
Sewer surcharges	17,856	22,331
All other revenues	4,565	3,643
Total operating revenues	266,026	257,484
EXPENSES		
Operating expenses:		
Personnel services:		
Salary and Wages	54,812	57,703
Pension Expense	(59,287)	114,027
Purchased services	33,882	35,998
Utilities, fuel and supplies	20,477	20,219
Depreciation and amortization	67,813	66,437
Other expenses	10,335	11,332
Total operating expenses	128,032	305,716
Operating income	137,994	(48,232)
NONOPERATING		
Nonoperating revenues (expenses):		
Interest income	4,463	9,323
Change in fair value of investments	(4,642)	4,607
Interest expense	(27,078)	(29,934)
Total nonoperating revenues (expenses)	(27,257)	(16,004)
Income (loss) before contributions	110,737	(64,236)
-		
Capital contributions	4,134	4,381
Change in net position	114,871	(59,855)
Total net position, beginning	1,075,842	1,135,697
Total net position, ending	$ 1,190,713	$ 1,075,842

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

Metropolitan Sewer District
Statement of Cash Flows
For The Periods Ended December 31, 2021 And December 31, 2020

	2021	2020
Cash flows from Operating Activities:		
Cash received from customers	$ 258,984	$ 255,121
Cash payments for goods and services	(63,867)	(66,325)
Cash payments for personnel costs	(56,527)	(56,498)
Other operating revenues	3,348	3,136
Net Cash Provided by Operating Activities	141,938	135,434
Cash Flows from Capital and Related Financing Activities:		
Principal and interest payments on long-term debt	(81,043)	(80,624)
Acquisition and construction of capital assets	(97,719)	(126,440)
Loan proceeds	2,936	1,942
Transfer into construction account from trustee investment account	126,366	82,711
Transfer from operating cash account to trustee investment account	(61,485)	(64,881)
Tap-in fees	2,891	2,878
Proceeds from the sale of capital assets	120	285
Net Cash (Used) by Capital and Related Financing Activities	(107,934)	(184,129)
Cash Flows from Investing Activities:		
Purchase of government securities	(60,484)	(25,512)
Net increase (decrease) in fair value of cash and investments	(4,642)	4,607
Interest earned on investments	1,488	3,416
Net Cash Provided (Used) by Investing Activities	(63,638)	(17,489)
Net Increase (Decrease) in Cash and Cash Equivalents	(29,634)	(66,184)
Cash and Cash Equivalents at January 1	177,634	243,818
Cash and Cash Equivalents at December 31	$ 148,000	$ 177,634
Reconciliation of Operating Income to Net Cash Provided by Operating Activities:		
Income from operations	$ 137,994	$ (48,232)
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation and amortization	67,813	66,437
Capital Expenses moved to Operating	40	2,018
Operating Expenses moved to Capital	0	0
Changes in assets and liabilities:		
Net change in customer accounts receivable	(863)	751
Net change in prepaid assets	(633)	(464)
Net change in other assets	(16,957)	(14,700)
Net change in operating accounts payable	807	4
Net change in accrued payroll and related expenses	(2,062)	2,265
Net Pension Liability	(311,304)	188,246
Net Other Post Employment Benefit Liability (Note 10)	(2,069)	(31,181)
Net Change in cash received from customers	(8)	980
Net Change in Deferred Charges on Refunding Outflows	1,327	1,327
Net Change in Deferred Pension Outflows	104,257	(41,343)
Net Change in Deferred Pension Inflows (Note 10)	165,513	11,755
Net Change in Capital Expenses 7600 moved to Fixed Assets in Fund 701	(1,917)	(2,429)
Net Cash Provided by Operating Activities	$ 141,938	$ 135,434
Non-cash Transactions:		
Structures donated as contributed capital in aid of construction	$ 2,546	$ 3,456
Acquisition and construction of capital asset paid directly by WPCLF loan proceeds	3,314	18,142
Construction accounts payable related to acquisition of capital assets	13,694	10,505

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

NOTES TO THE FINANCIAL STATEMENTS
FOR THE YEARS ENDED DECEMBER 31, 2021 AND 2020

NOTE 1 - ACCOUNTING POLICIES

A summary of the significant accounting policies applied in the accompanying financial statements follows:

Organization

The Metropolitan Sewer District of Greater Cincinnati (District), an enterprise fund of the County of Hamilton, Ohio, collects and treats industrial and residential wastewater for municipalities and unincorporated areas of Hamilton County. District was formed on April 10, 1968, pursuant to resolutions of the Board of County Commissioners of Hamilton County and Ordinances of the City of Cincinnati, providing for a consolidation of the City Sewer Department and the County Sewer District. The two entities executed an agreement with an initial 50-year term. Per the agreement, the City is responsible for operational management. The original agreement was set to expire in April 2018 but has since been extended indefinitely by the Federal District Court. The parties remain in mediation in Federal District Court to resolve their remaining disputes.

Under a contract with the City of Cincinnati, the Board designated the City as its agent for the maintenance and operation of District. The annual budget, prepared on a non-GAAP budgetary basis of accounting, is approved by the Board and administered by the City. Budgetary control is exercised at the divisional level, and between personnel and all other costs. The County issues a separate Comprehensive Annual Financial Report which includes District as a separate enterprise fund of the County.

Basis of Accounting

The accompanying financial statements were prepared on the accrual basis of accounting, whereby revenues and expenses are recognized in the period earned or incurred.

Use of Estimates

The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions 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.

Statement of Cash Flows

For purposes of the Statements of Cash Flows, all highly liquid investments with a maturity of three months or less when purchased are considered to be cash equivalents. Pooled cash and investments held by the City of Cincinnati are considered cash equivalents by District.

Investments

District is required by Ohio law to invest in only United States obligations; federal agency securities; Ohio bonds and other obligations or such obligations of political subdivisions of the state, provided that the subdivisions are located within Hamilton County; time certificates of deposit or deposit accounts in an eligible institution; and no load money market mutual funds consisting only of investments mentioned above. Investments are required to mature within five years from the date of settlement, unless the investment is matched to a specific obligation or debt of District.

GASB Statement No. 72, *Fair Value Measurement and Application*, addresses accounting and financial reporting issues related to fair value measurements. This Statement provides guidance for determining a fair value measurement for financial reporting purposes for applying fair value to certain investments and disclosures related to all fair value measurements.

Prepaids

Payments made for services that will benefit periods beyond fiscal year end December 31, 2021, are recorded as prepaids using the consumption method. A current asset for the prepaid amount is recorded at the time of the purchase and an expense is reported in the year in which services are consumed.

Inventory

Supplies and materials are stated at the lower of cost or market on a first-in, first-out (FIFO) basis.

Capital Assets

Capital assets include land, construction in progress, buildings, sewer laterals and mains, studies and equipment. Capital assets are defined as assets with an initial, individual cost of more than $5,000.

Capital assets are stated at historical cost for assets acquired after District's inception in 1968. Assets which were acquired prior to 1968 and not identifiable with specific historical costs are not included in the capital assets balance. Assets acquired by District through contributions, such as contributions from land developers and federal and state grants, are capitalized and recorded in the plant records at the contributors' reported cost. Construction costs include the cost of in-force labor. See Note 5 for more information on capital assets.

Land acquired for District's use is titled to either the City of Cincinnati or Hamilton County. The cost of this land has been recorded on the books of District since it has the full benefit of the land as an economic resource.

Depreciation expense is computed on the straight-line method over the estimated useful lives of the respective assets. The estimated lives are as follows:

Building	40 years
Sewer Laterals	40 years
Equipment	5-25 years

Any gain or loss arising from the disposal of capital assets has been credited or charged to income.

Unamortized Financing Costs

The unamortized financing costs include insurance, consulting and attorney fees incurred in connection with the revenue bond obligations. These amounts are being amortized on the straight-line method over the lives of the revenue bonds. Bond premiums and discounts are being amortized on the interest method over the lives of the revenue bonds.

Deferred Outflows/Inflows of Resources

In addition to assets, the statement of financial position will sometimes report a separate section for deferred outflows of resources. Deferred outflows of resources represent a consumption of net position that applies to a future period and will not be recognized as an outflow of resources (expense) until then. For District, deferred outflows of resources are reported on the statement of net position for deferred charges on refunding, pension and other postemployment benefits (OPEB). A deferred charge on refunding results from the difference in the carrying value of refunded debt and its reacquisition price. This amount is deferred and amortized over the shorter of the life of the refunded or refunding debt. The deferred outflows of resources related to pension and OPEB are explained in Notes 9 and 10.

In addition to liabilities, the statement of financial position reports a separate section for deferred inflows of resources. Deferred inflows of resources represent an acquisition of net position that applies to a future period and will not be recognized until that time. For District, deferred inflows of resources have been recorded in the statement of net position for pension and OPEB, as explained in Notes 9 and 10.

Pension/OPEB Plans

Employees participate in either the City of Cincinnati's Retirement System or the Ohio Public Employees Retirement System. For purposes of measuring net pension liabilities and net OPEB assets, deferred outflows of resources and deferred inflows of resources related to pension and OPEB, and pension and OPEB expense, information about the fiduciary net position of the pension and OPEB plans and additions to/deductions from their fiduciary net position have been determined on the same basis as they are reported by the retirement systems. For this purpose, benefit payments (including refunds of employee contributions) are recognized when due and payable in accordance with the benefit terms. The retirement systems report investments at fair values.

Compensated Absences

Compensated absences include accrued vacation time, sick leave, compensatory time and other related payments. Compensatory time and vacation time are paid out in full upon termination and are expensed in the year earned. Sick leave is paid out at various levels. The liability for sick leave is computed with the Termination Payment Method using an historical average of total years worked and total amount paid. The current amounts are an average of the annual expenditures. The entire compensated absence liability is reported on the financial statements.

Net Position

Net positions are the difference between assets, deferred outflows, deferred inflows, and liabilities. Net investment in capital assets are capital assets less accumulated depreciation and any outstanding long-term debt related to the acquisition, construction or improvement of those assets. Net positions are reported as restricted when there are legal limitations that are imposed on their use by county legislation or external restrictions by other governments, creditors or grantors. Restricted net positions of the District relate to debt service.

District applies restricted resources when an expense is incurred for purposes for which both restricted and unrestricted net positions are available. District does not have net position restricted by enabling legislation.

Operating Revenues and Expenses

Operating revenues are those revenues that are generated directly from the primary activity of the proprietary fund. For the District, these revenues are charges for services for wastewater treatment. Operating expenses are necessary costs incurred to provide the service that is the primary activity of the fund.

Contributions of Capital

Contributions of capital arise from outside contributions of capital assets or outside contributions of resources restricted to capital acquisition and construction.

Customer Assistance Program (CAP)

A Customer Assistance Program (CAP) was approved by the Board of Commissioners in April 2019 to take effect on July 31, 2019. This program is a 25% discount on sewer bills offered to low-income seniors over the age of 65. Depending on the number of customers that apply, the District estimates this could affect revenue in the amount of $250,000 up to $2.2 million, with 100% participation.

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NOTE 2 - DEPOSITS AND INVESTMENTS

Deposits

State statutes classify monies held by the District into three categories.

Active deposits are public deposits necessary to meet current demands on the treasury. Such monies must be maintained either as cash in the District's Treasury, in commercial accounts payable or withdrawable on demand, including negotiable order of withdrawal (NOW) accounts, or in money market deposit accounts.

Inactive deposits are public deposits that the District has identified as not required for use within the current two-year period of designation of depositories. Inactive deposits must either be evidenced by certificates of deposit maturing not later than the end of the current period of designation of depositories, or by savings or deposit accounts including, but not limited to, passbook accounts.

Interim deposits are deposits of interim monies. Interim monies are those monies which are not needed for immediate use, but which will be needed before the end of the current period of designation of depositories. Interim deposits must be evidenced by time certificates of deposit maturing not more than one year from the date of deposit or by savings or deposit accounts including passbook accounts.

Protection of the District's deposits is provided by the Federal Deposit Insurance Corporation (FDIC), by eligible securities pledged by financial institution as security for repayment, by surety company bonds deposited with the finance director by the financial institution or by a single collateral pool established by the financial institution to secure the repayment of all public monies deposited with the institution.

Custodial credit risk is the risk that in the event of a bank failure, the government's deposits may not be returned to it. The District's policy for deposits is collateral is required for demand deposits and certificates of deposit at 105 percent, or 102 percent if the financial institution participates in the Treasurer of State's Ohio Pooled Collateral System, of all deposits not covered by federal deposit insurance. Obligations that may be pledged as collateral are obligations of the United States and its agencies and obligations of the State and its municipalities, school districts, and district corporations. Obligations pledged to secure deposits must be delivered to a bank other than the institution in which the deposit is made. Written custodial agreements are required. The District is required to categorize deposits and investments according to GASB Statement No. 3 *Deposits with Financial Institutions, Investments, and Reverse Purchase Agreements*. The carrying value of the District's cash and cash equivalent deposits was $143,463,000 and $107,971,000 at December 31, 2021 and 2020, respectively.

Amounts held by the City of Cincinnati are invested on District's behalf in accordance with the Cincinnati Municipal Code. Amounts held by the City are collateralized as part of the City's cash and investment balances. For GASB 40 disclosure requirements, refer to the financial statements as of June 30, 2021, for the City of Cincinnati.

Although the pledging bank has an investment and securities pool used to collateralize all public deposits, which are held in the financial institution's name, noncompliance with federal requirements could

potentially subject the District to a successful claim by the FDIC. The deposits not covered by federal depository insurance are considered uninsured and uncollateralized and subject to custodial credit risk.

Investments

State Statute, board of county commissioners resolutions, and the 1985 Trust Indenture as amended authorize the District to invest in obligations of U. S. Treasury, agencies and instrumentalities, certificates of deposit, repurchase agreements, money market deposit accounts, municipal depository funds, super NOW accounts, sweep accounts, separate trading of registered interest and principal of securities, mutual funds, bonds and other obligations of this State, and the State Treasurer's investment pool. Repurchase agreements are limited to 30 days and the market value of the securities must exceed the principal value of the agreement by at least 2 percent and be marked to market daily. Investments in stripped principal or interest obligations reverse repurchase agreements and derivatives are prohibited. The issuance of taxable notes for the purpose of arbitrage, the use of leverage and short selling are also prohibited. An investment must mature within five years from the date of purchase unless matched to a specific obligation or debt of the District and must be purchased with the expectation that it will be held to maturity. Investments may only be made through specified dealers and institutions. Payment for investments may be made only upon delivery of the securities representing the investments to the finance director or, if the securities are not represented by a certificate, upon receipt of confirmation of transfer from the custodian. The District has no investment policy that addresses interest rate risk.

Custodial Credit Risk – For an investment, custodial credit risk is the risk that, in the event of the failure of the counterparty the District will not be able to recover the value of its investments or collateral securities that are in the possession of an outside party. The Federal National Mortgage Association Notes, Federal Home Loan Mortgage Corporation Notes, and the Federal Home Loan Bank Notes are exposed to custodial credit risk in that they are uninsured, unregistered, and held by the counterparty's trust department or agent but not in the District's name. The District has no investment policy dealing with investment custodial risk beyond the requirement in state statute that prohibits payment for investments prior to the delivery of the securities representing such investments to the Treasurer or qualified trustee.

Funds held by the trustee are eligible investments as defined by the Trust Agreement and are in the name of the trustee for the benefit of District.

Investments made by District are summarized below. Trustee account investments are categorized according to credit risk into the following categories: (1) insured or registered, or securities held by District or its agent (bank trust department) in the District's name; or (2) uninsured and unregistered, with securities held by the counterparty's trust department or agent in the District's name; or (3) uninsured, unregistered securities held by the counterparty, or its trust department or agent but not in District's name. Money market funds are unclassified investments since they are not evidenced by securities that exist in physical or book entry form. As stated in GASB Statement No. 40, obligations of the U. S. government or obligations explicitly guaranteed by the U. S. government are not considered to have credit risk and do not require disclosure of credit quality.

The money market funds are invested in a treasury obligation fund with a Moody's credit rating of Aaa.

Concentration of Credit Risk: The Metropolitan Sewer District uses the City of Cincinnati's Investment Policy which addresses concentration of credit risk by requiring investments to be diversified to reduce risk of loss resulting from over concentration of assets in a specific issue or class of security. The following table includes the percentage of each investment type held by District at December 31, 2021.

Investment Type	Fair Value	% of Total
Deposits held by the City of Cincinnati	$143,463	31.92
U.S. Agency Securities	172,549	38.40
U.S. Treasury Securities	128,829	28.67
Money Market Funds	4,537	1.01
	$449,378	100.00

The classification of cash and cash equivalents and investments on the financial statements is based on criteria set forth in GASB Statement No. 9. A reconciliation between the classifications of cash and investments of the financial statements and the classification per GASB Statement No. 3 is as follows:

(all amounts in thousands)

December 31, 2021	Cash and Cash Equivalents	Investments
GASB Statement No. 9	$148,000	$301,378
Money Market Funds	(4,537)	4,537
Total	$143,463	$305,915

(all amounts in thousands)

December 31, 2020	Cash and Cash Equivalents	Investments
GASB Statement No. 9	$177,636	$302,527
Money Market Funds	(69,665)	69,665
Total	$107,971	$372,192

Fair Value Measurements: District categorizes its fair value measurements within the fair value hierarchy establish by GASB Statement No. 72. District has the following recurring fair value measurements as of December 31, 2021:

Investments by Fair Value Level	Fair Value	Fair Value Measurements Using *(amounts in thousands)* Quoted Price In Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)
U.S. Treasury Securities	$128,829	128,829	
U.S. Agency Securities	$172,549		172,549
	$301,378	$ 128,829	$ 172,549

U.S. Treasury securities classified in Level 1 of the fair value hierarchy are valued using quoted market prices. U.S. Agency securities classified in Level 2 of the fair value hierarchy are valued using pricing sources as provided by investment managers.

NOTE 3 - ACCOUNTS RECEIVABLE

Accounts receivable consist of the following:

(all amounts in thousands)

	2021	2020
Sewer charges and surcharges:		
Unbilled amount	$21,407	$20,702
Billed amount	33,170	28,015
Less Allowance for doubtful accounts	(14,932)	(10,015)
Other	1,793	1,873
Total	$41,438	$40,575

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NOTE 4 - RESTRICTED ASSETS

The Trust Agreement for the Series A Revenue Bonds (see Long-Term Debt Note) requires the establishment of certain trust accounts including a Bond Account, Bond Reserve Account, and a Surplus Account to be held by the Trustee. The Bond Account will be used to accumulate periodic principal and interest payments. The Bond Reserve Account will be funded in an amount equal to the highest annual future debt service requirement. The Surplus Account is available to be used for any other Sewer System purpose. The Trust Agreement also requires the creation of a Construction Account to be held by the City to pay for project costs. At December 31, 2021 and 2020 the following balances (at fair value) were maintained in the trust accounts:

(all amounts in thousands)

	2021	2020
Held by trustee:		
Reserve	$44,890	$50,163
Bond retirement	4,537	4,573
Surplus	256,443	317,457
Total	$305,870	$372,193

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NOTE 5 - CAPITAL ASSETS

(all amounts in thousands)

December 31, 2021	Beginning Balance	Increase	Decrease	Ending Balance
Capital Assets, not being depreciated:				
Land	$ 10,188	$ 2,125		$ 12,313
Construction in progress	488,533	104,032	(103,191)	489,374
	$ 498,721	$ 106,157	$(103,191)	$ 501,687
Capital Assets, being depreciated:				
Buildings	356,666	273	-	356,939
Equipment	726,265	25,554	(735)	751,084
Sewer Laterals	1,348,645	78,642	(6,313)	1,420,974
	2,431,576	104,469	(7,048)	2,528,997
Total Capital Assets	2,930,297	210,626	(110,239)	3,030,684
Less accumulated depreciation:				
Buildings	170,678	7,285		177,963
Equipment	366,400	20,507	(735)	386,172
Sewer Laterals	565,642	33,707		599,349
Total Accumulated Depreciation	1,102,720	61,499	(735)	1,163,484
Net Capital Assets	$ 1,827,577	$ 149,127	$(109,504)	$ 1,867,200

Capital Asset category Sewer Laterals is comprised of two asset types, one is Sewer Lateral which are depreciated and Study Assets which are amortized.

In 2021, Capital Assets depreciation expense was $61,499,000 and Study Assets amortization expense was $6,314,000 for a total depreciation and amortization expense of $67,813,000 for the year.

NOTES TO THE FINANCIAL STATEMENTS
FOR THE YEARS ENDED DECEMBER 31, 2021 AND 2020

(all amounts in thousands)

December 31, 2020	Beginning Balance	Increase	Decrease	Ending Balance
Capital Assets, not being depreciated:				
Land	$ 10,188			$ 10,188
Construction in progress	428,108	135,713	(75,288)	488,533
	$ 438,296	$ 135,713	$ (75,288)	$ 498,721
Capital Assets, being depreciated:				
Buildings	356,666		-	356,666
Equipment	696,317	31,177	(1,229)	726,265
Sewer Laterals	1,309,864	45,373	(6,592)	1,348,645
	2,362,847	76,550	(7,821)	2,431,576
Total Capital Assets	2,801,143	212,263	(83,109)	2,930,297
Less accumulated depreciation:				
Buildings	163,280	7,398		170,678
Equipment	347,685	19,932	(1,217)	366,400
Sewer Laterals	533,126	32,516		565,642
Total Accumulated Depreciation	1,044,091	59,846	(1,217)	1,102,720
Net Capital Assets	$ 1,757,052	$ 152,417	$ (81,892)	$ 1,827,577

Capital Asset category Sewer Laterals is comprised of two asset types, one is Sewer Lateral which are depreciated and Study Assets which are amortized.

In 2020, Capital Assets depreciation expense was $59,845,000 and Study Assets amortization expense was $6,592,000 for a total depreciation and amortization expense of $66,437,000 for the year.

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NOTE 6 - LONG-TERM DEBT

Long-term debt consisted of the following:

	(all amounts in thousands) Principal Issue	Interest Rate %	Year of Maturity	2021	2020
Revenue Bonds					
2020	74,525	5.00	2035	$ 70,505	$ 74,525
2019 - Direct Placement	107,970	4.00-5.00	2034	102,320	107,970
2015	52,520	3.00-5.00	2025	7,790	11,460
2014	162,650	4.00-5.00	2032	115,470	124,365
2013 (a)	258,695	0.45-5.00	2038	142,700	150,465
				438,785	468,785
Ohio Water and Sewer Rotary Commission	-	-	-	50	50
Ohio Public Works Commission	-	0.00-3.00	2041	281	355
Water Pollution Control Loan Fund	-	2.50-3.50		366,666	379,947
Capital Lease Payable	15,000	2.00-5.00	2029	7,405	8,150
Total obligations				813,187	857,287
Bond Premiums				75,250	81,131
Deferred loss on defeasance				(6,021)	(7,348)
Current maturities				(54,118)	(51,046)
Long-term portion				$ 828,298	$ 880,024

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Principal and interest payments on long-term debt for the next five years and thereafter are as follows:

(all amounts in thousands)

	Revenue Bonds		Direct Placement Bonds		WPCLF*		OPWC		Capital Lease	
Year	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest
2022	$ 25,365	$ 16,823	$ 5,865	$ 5,116	$ 22,069	$ 7,493	$ 39	$ 2	$ 780	$ 316
2023	26,615	15,555	6,150	4,823	22,618	6,978	40	1	825	240
2024	27,945	14,224	6,450	4,515	23,113	6,448	25	-	860	207
2025	29,345	12,828	6,760	4,192	22,999	5,898	10	-	895	173
2026	31,590	11,360	7,090	3,855	23,150	5,355	11	-	930	137
2027-2031	124,270	34,993	40,535	13,639	115,034	18,590	52	-	3,115	211
2032-2036	55,355	11,736	29,470	2,995	67,066	7,741	52	-	-	-
2037-2041	15,980	1,208	-	-	27,212	4,015	52	-	-	-
2042-2046					22,698	2,393	-			
2047-2051					20,707	765				
	$336,465	$ 118,727	$102,320	$ 39,135	$ 366,666	$ 65,676	$ 281	$ 3	$ 7,405	$ 1,284

* This represents the WPCLF loan balances outstanding at 12/31/2021. The total WPCLF loan availability is $406,047.

Bond discount, premium, and loss on defeasance activity for the year:

December 31, 2021	Beginning Balance	Amortized	Refunded	Issued	Ending Balance
Bond Premium	$ 81,131	$ (5,881)	$ -	$ -	$ 75,250
Loss on defeasance	(7,348)	1,327	-	-	(6,021)
Total	$ 73,783	$ (4,554)	$ -	$ -	$ 69,229

December 31, 2020	Beginning Balance	Amortized	Refunded	Issued	Ending Balance
Bond Premium	$ 67,951	$ (5,690)	$ 18,870	$ -	$ 81,131
Loss on defeasance	(8,675)	1,327	-	-	(7,348)
Total	$ 59,276	$ (4,363)	$ 18,870	$ -	$ 73,783

Long-term debt activity for the year:

(all amounts in thousands)

December 31, 2021	Beginning Balance	Additions	Reductions	Ending Balance
Revenue Bonds	$ 360,815	$ -	$ 24,350	$ 336,465
Revenue Bonds - Direct Placement	$ 107,970		$ 5,650	$ 102,320
Ohio Water and Sewer Rotary Commission	50	-	-	$ 50
Ohio Public Works Commission	355	-	74	$ 281
Water Pollution Control Loan Fund	379,946	6,863	20,143	$ 366,666
Capital Lease Payable	8,150	-	745	7,405
Total	$ 857,286	$ 6,863	$ 50,962	$ 813,187

December 31, 2020	Beginning Balance	Additions	Reductions	Ending Balance
Revenue Bonds	$ 410,505	$ 74,525	$ 124,215	$ 360,815
Revenue Bonds - Direct Placement	$ 107,970			$ 107,970
Ohio Water and Sewer Rotary Commission	50	-	-	$ 50
Ohio Public Works Commission	514	-	159	$ 355
Water Pollution Control Loan Fund	376,198	21,557	17,809	$ 379,946
Capital Lease Payable	8,870	-	720	8,150
Total	$ 904,107	$ 96,082	$ 142,903	$ 857,286

Revenue Bonds – Direct Placement

Effective November 26, 2019, District issued $107,970,000 Series A, Direct Placement Bond dated November 26, 2019. The proceeds from the 2019 Series A Bonds were used to defease the 2009B Revenue Bonds and pay for cost of issuance. The 2019 Series A Bonds were issued at a premium of $23,045,166. The 2019A Bonds are special obligations of the District, payable solely from the new revenues of the District and were issued on parity with the 2009 and 2010, 2013, 2014, 2015 bonds, secured equally and ratably under the Trust Agreement.

Revenue Bonds

a) Effective November 17, 2020, District issued $74,525,000 Series A, Sewer System Refunding Revenue Bonds dated November 17, 2020. The proceeds from the 2020 Series A Bonds were used to defease portions of the 2010A and 2010B revenue bonds and pay for the cost of issuance. The 2020 A bonds are special obligations of the District, payable solely from the net revenues of the District and were issued on parity with the 2010, 2013, 2014, 2015, 2019 bonds secured equally and ratable under the Trust Agreement.

A portion of the proceeds was used to purchase U.S. Government Securities which were deposited in an irrevocable trust with an escrow agent to provide for all future debt service to

refund $101,000,000 of outstanding 2010A and 2010B Bonds. As a result, these bonds are considered defeased and the liability of those bonds removed from the balance sheet.

Although the refunding resulted in the recognition of an account premium of $18,870,385, District has, in effect, reduced its aggregate debt service payments by $18,190,000, and obtained a present value of savings of $13,091,284.

b) Effective March 3, 2015, District issued $52,520,000 Series A, Sewer System Refunding Revenue Bonds dated March 3, 2015. The proceeds from the 2015 Series A Bonds were used to defease portions of the 2005A revenue bonds and pay for the cost of issuance. The 2015A bonds are special obligations of the District, payable solely from the net revenues of the District and were issued on parity with the 1997, 2000, 2001, 2003A, 2003B, 2004, 2005A, 2005B, 2006, 2007, 2009A, and 2009B bonds, secured equally and ratably under the Trust Agreement.

A portion of the proceeds was used to purchase U.S. Government Securities which were deposited in an irrevocable trust with an escrow agent to provide for all future debt service to refund $60,360,000 of outstanding 2005A Bonds. As a result, these bonds are considered defeased and the liability for those bonds removed from the balance sheet.

Although the refunding resulted in the recognition of an accounting loss of $1,464,000 in accordance with GASB 23, Accounting and Financial Reporting for Refunding of Debt Reported by Proprietary Activities, District has, in effect, reduced its aggregate debt service payments by $16,845,000, and obtained a present value of savings of $6,363,000.

c) Effective November 19, 2014, District issued $162,650,000 Series A, Sewer System Refunding Revenue Bonds dated November 19, 2014. The proceeds from the 2014 Series A Bonds were used to defease portions of the 2003, 2005, and 2006 revenue bonds and pay for the cost of issuance. The 2014A bonds are special obligations of the District, payable solely from the net revenues of the District and were issued on parity with the 1997, 2000, 2001, 2003A, 2003B, 2004, 2005A, 2005B, 2006, 2007, 2009A, and 2009B bonds, secured equally and ratably under the Trust Agreement.

A portion of the proceeds was used to purchase U.S. Government Securities which were deposited in an irrevocable trust with an escrow agent to provide for all future debt service to refund $750,000 of outstanding 2003 Series A Bonds, $61,190,000, of outstanding 2005 Series B Bonds, $60,620,000 of outstanding 2006 Series A Bonds, $52,505,000 of outstanding 2007 Series A Bonds, and $6,790,000 of outstanding 2009 Series A Bonds. As a result, these bonds are considered defeased and the liability for those bonds removed from the balance sheet.

Although the refunding resulted in the recognition of an accounting loss of $14,949,000 in accordance with GASB 23, Accounting and Financial Reporting for Refunding of Debt Reported by Proprietary Activities, District has, in effect, reduced its aggregate debt service payments by $70,966,000, and obtained a present value of savings of $24,543,000.

d) Effective July 31, 2013, District issued $178,760,000 Series A, Sewer System Refunding Revenue Bonds and $79,935,000 Series B, Sewer System Refunding Revenue Bonds dated July 31, 2013. A portion of the proceeds from the 2013 Series A and 2013 Series B Bonds were used to defease portions of the 2003 and 2004 revenue bonds and pay for the cost of issuance. The 2013A bonds are special obligations of the District, payable solely from the net revenues of the District and were issued on parity with the 1997, 2000, 2001, 2003A, 2003B, 2004, 2005A, 2005B, 2006, 2007, 2009A, 2009B, 2010A, and 2010B bonds, secured equally and ratably under the Trust Agreement.

A portion of the proceeds was used to purchase U.S. Government Securities which were deposited in an irrevocable trust with an escrow agent to provide for all future debt service to refund $112,720,000 of outstanding 2003 Series A Bonds, and $28,470,000 of outstanding 2004 Series A Bonds. As a result, these bonds are considered defeased and the liability for those bonds removed from the balance sheet.

The remaining proceeds from the 2013 Series A and 2013 Series B bonds were used to permanently fund certain previous capital expenditures and fund the new bond reserve requirements.

e) Effective November 3, 2010, District issued $43,595,000 Series A, Sewer System Refunding Revenue Bonds dated November 3, 2010. The proceeds from the 2010 Series A Bonds were used to defease portions of the 2000, 2001, and 2003 revenue bonds and pay for the cost of issuance. The 2010A bonds are special obligations of the District, payable solely from the net revenues of the District and were issued on parity with the 1997, 2000, 2001, 2003A, 2003B, 2004, 2005A, 2005B, 2006, 2007, 2009A, and 2009B bonds, secured equally and ratably under the Trust Agreement.

A portion of the proceeds was used to purchase U.S. Government Securities which were deposited in an irrevocable trust with an escrow agent to provide for all future debt service to refund $2,730,000 of outstanding 2000 Series A Bonds, $25,290,000 of outstanding 2001 Series A Bonds, and $17,035,000 of outstanding 2003 Series A Bonds. As a result, these bonds are considered defeased and the liability for those bonds removed from the balance sheet.

Although the refunding resulted in the recognition of an accounting loss of $3,379,000 in accordance with GASB 23, the District in effect reduced its aggregate debt service payments by $8,824,000 and obtained and economic gain (difference between the present values of the old and new debt service payments) of $5,304,000.

Effective November 3, 2010, District issued $87,080,000 Series B Sewer System Improvement Revenue Bonds (Build America Bonds) dated November 3, 2010. The proceeds from the 2010 Series B bonds were used to permanently fund certain previous capital expenditures, fund the new bond reserve requirements and pay the cost of issuance. The 2010 Series B bonds are special obligations of the District, payable solely from the net revenues of the District and were issued on a parity with the 1997, 2000, 2001, 2003A, 2003B, 2004, 2005A, 2005B, 2006, 2007, 2009A, and 2009B bonds, secured equally and ratably under the Trust Agreement.

The 2010 and 2009 bonds may be redeemed prior to their maturities in accordance with provisions of the bond resolutions. The redemption process for the bonds includes declining premiums up to 2 percent of principal.

At December 31, 2021, and December 31, 2020 the amount of defeased debt outstanding was $296,085,000 and $318,320,000, respectively.

Maturities for bonds over the next five years and thereafter are shown below:

(all amounts in thousands)

Year	2020 Bonds	2019 Bonds	2015 Bonds	2014 Bonds	2013 Bonds	Total
2022	6,070	5,865	1,810	9,330	8,155	$ 31,230
2023	6,360	6,150	1,900	9,795	8,560	$ 32,765
2024	6,675	6,450	1,990	10,285	8,995	$ 34,395
2025	7,000	6,760	2,090	10,810	9,445	$ 36,105
2026	7,335	7,090	-	11,595	12,660	$ 38,680
2027-2032	18,660	40,535	-	60,435	45,175	$164,805
2032-2036	18,405	29,470	-	3,220	33,730	$ 84,825
2037-2042					15,980	$ 15,980
	$ 70,505	$102,320	$ 7,790	$ 115,470	$142,700	$438,785

Under the terms of the amended revenue bond trust indenture, District has agreed to certain covenants, among other things, to restrict additional borrowing, maintain rates sufficient to meet debt service requirements and maintain specified fund balances under trust agreements.

The Revenue bond issues as discussed above contain covenants which require District to maintain a level of debt service coverage. The following calculation reflects District's debt service coverage.

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NOTES TO THE FINANCIAL STATEMENTS
FOR THE YEARS ENDED DECEMBER 31, 2021 AND 2020

(all amounts in thousands)

	2021	2020
Revenues:		
Total operating revenues	$ 266,026	$ 257,484
Interest income	4,463	9,323
Tap-in/connection fees	2,607	3,457
Total pledged revenue	273,096	270,264
Total operating and maintenance expenses less depreciation and amortization, pension expense	119,506	125,252
Net income available for debt service (a)	$ 153,590	$ 145,012
Principal and interest requirement on revenue bonds (b)	$ 53,169	$ 53,528
Principal and interest requirements on obligations (c)	$ 83,868	$ 82,081
Debt service coverage		
Revenue bonds (a) divided by (b)	289%	271%
All obligations (a) divided by (c)	183%	177%
Maximum debt service coverage required on revenue bonds	125%	125%

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Ohio Water Development Authority Contracts

All contracts between the Ohio Water Development Authority (OWDA) and the Metropolitan Sewer District require District to prescribe and charge such rates for sewer usage which are sufficient (after expenses of operation and maintenance) to pay principal and interest on OWDA contracts. The principal is repayable in equal semi-annual installments to maturity.

Water Pollution Control Loan Fund

The District has received low interest loan commitments from the Ohio Water Pollution Control Loan fund for certain qualified projects. As the projects progress the commitments are drawn down. The principal is repayable in semi-annual installments to the date of maturity for each project.

Ohio Water and Sewer Rotary Commission

Advances from Ohio Water and Sewer Rotary Commission represent tap-in fees and acreage assessments to be forwarded to the Commission upon collection from customers. Such advances do not bear interest unless they are determined to be in default.

Ohio Public Works Commission

The District has entered into agreements with the Ohio Public Works Commission (OPWC) for financing of certain qualified capital projects. As the projects progress the commitments are drawn down as funds are paid by OPWC directly to the contractors. The principal is repayable in semi-annual installments to the date of maturity for each project.

Interest on Long-Term Obligations

The following interest costs were incurred and expensed or capitalized as part of the cost of District's additions to capital assets.

(all amounts in thousands)

	2021	2020
Interest incurred	$ 27,078	$ 29,934
Less interest capitalization	-	-
Interest expense	$ 27,078	$ 29,934

District has implemented the GASB 89 Accounting for Interest Cost incurred before the end of a construction period in 2018.

NOTE 7 – CAPITAL LEASE

The District entered into a capital lease for a new engineering building in 2010. The lease obligation meets the criteria of a capital lease. The leased asset was capitalized at the amount of the present value of the minimum lease payments at inception of the lease. Capital asset acquired under capital lease is as follows:

Buildings	$15,000,000

The following is a schedule of the future minimum lease payments required under the capital lease and the present value of the minimum lease payments as of fiscal year end.

(all amounts in thousands)

Fiscal Year Ending December 31,	Long-Term Debt
2022	$ 1,096
2023	1,065
2024	1,067
2025	1,067
2026	1,068
2027-2029	3,326
Total Minimum Lease Payments	8,689
Less: Amount Representing Interest	(1,284)
Present value of Minimum Lease Payments	$ 7,405

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NOTE 8 – COMPENSATED ABSENCES

Compensated Absences

Compensated absences consist of vacation time, sick pay and compensatory time. The following is a summary of activity for 2021 and 2020. $4,692 is considered due within one year for compensated absences as of December 31, 2021.

(all amounts in thousands)

	Beginning Balance	Increase	Decrease	Ending Balance
2021	$ 10,399	$ 5,158	$ 6,598	$ 8,959
2020	$ 9,919	$ 4,603	$ 4,758	$ 10,399

NOTE 9 – DEFINED BENEFIT PENSION PLANS

District employees are covered by one of two pension systems: the Ohio Public Employees Retirement System (OPERS) and the City of Cincinnati Retirement System (CRS). OPERS is a cost-sharing multi-employer defined benefit pension plan. CRS is accounted for as a single-employer defined benefit plan.

Net Pension Liability

For purposes of measuring the net pension liability, deferred outflows of resources and deferred inflows of resources related to pensions, and pension expense, information about the fiduciary net position of the pension plans and additions to/deductions from their fiduciary net position have been determined on the same basis as they are reported by the retirement systems. For this purpose, benefit payments (including refunds of employee contributions) are recognized when due and payable in accordance with the benefit terms. The retirement systems report investments at fair value.

The net pension liability reported on the statement of net position represents a liability to employees for pensions. Pensions are a component of exchange transactions, between an employer and its employees, of salaries and benefits for employee services. Pensions are provided to an employee, on a deferred-payment basis, as part of the total compensation package offered by an employer for employee services each financial period. The obligation to sacrifice resources for pensions is a present obligation because it was created as a result of employment exchanges that already have occurred.

The net pension liability represents the District's actuarial present value (or with the OPERS cost-sharing, multiple-employer plan, District's proportionate share of the pension plan's collective actuarial present value) of projected benefit payments attributable to past periods of service, net of each pension plan's fiduciary net position. The net pension liability calculation is dependent on critical long-term variables,

including estimated average life expectancies, earnings on investments, cost of living adjustments and other variables. While these estimates use the best information available, unknowable future events require adjusting this estimate annually. District's share of each plan's unfunded benefits is presented as a long-term *net pension liability* on the accrual basis of accounting.

A. Ohio Public Employees Retirement System (OPERS)

Ohio Revised Code limits the District's obligation for liabilities to OPERS to annually required payments. The District cannot control benefit terms or the manner in which pensions from the cost-sharing, multiple-employer plan is financed; however, the District does receive the benefit of employees' services in exchange for compensation including pension.

GASB Statement No. 68 assumes the liability is solely the obligation of the employer, because (1) they benefit from employee services; and (2) State statute requires all funding to come from these employers. All contributions to date have come solely from these employers (which also includes costs paid in the form of withholdings from employees). State statute requires the pension plan to amortize unfunded liabilities within 30 years. If the amortization period exceeds 30 years, the pension plan's board must propose corrective action to the State legislature. Any resulting legislative change to benefits or funding could significantly affect the net pension liability. Resulting adjustments to net pension liability would be effective when the changes are legally enforceable.

Plan Description – OPERS

A limited number of the District employees participate in the Ohio Public Employees Retirement System (OPERS). OPERS administers three separate pension plans. The Traditional Pension Plan is a cost-sharing, multiple-employer defined benefit pension plan. The Member-Directed Plan is a defined contribution plan and the Combined Plan is a cost-sharing, multiple-employer defined benefit pension plan with defined contribution features. While members (e.g., District employees) may elect the Member-Directed Plan or the Combined Plan, most employee members are in OPERS' Traditional Pension Plan; therefore, the following disclosures focus on the Traditional Pension Plan.

OPERS provides retirement, disability, survivor and death benefits, and annual cost of living adjustments to members of the Traditional Pension Plan. Authority to establish and amend benefits is provided by Chapter 145 of the Ohio Revised Code (ORC). OPERS issues a stand-alone financial report that includes financial statements, required supplementary information and detailed information about OPERS' fiduciary net position that may be obtained by visiting https://www.opers.org/financial/reports.shtml, by writing to Ohio Public Employees Retirement System, 277 East Town Street, Columbus, OH 43215-4642, or by calling 800-222-7377.

Senate Bill (SB) 343 was enacted into law with an effective date of January 7, 2013. In the legislation, members were categorized into three groups with varying provisions of the law applicable to each group. The following table provides age and service requirements for retirement and the retirement formula applied to final average salary (FAS) for the three-member groups under the Traditional Pension Plan as

per the reduced benefits adopted by SB 343 (see OPERS' ACFR referenced above for additional information):

Group A Eligible to retire prior to January 7, 2013 or five years after January 7, 2013	Group B 20 years of service credit prior to January 7, 2013 or eligible to retire ten years after January 7, 2013	Group C Members not in other Groups and members hired on or after January 7, 2013
State and Local	**State and Local**	**State and Local**
Age and Service Requirements: Age 60 with 60 months of service credit or Age 55 with 25 years of service credit	**Age and Service Requirements:** Age 60 with 60 months of service credit or Age 55 with 25 years of service credit	**Age and Service Requirements:** Age 57 with 25 years of service credit or Age 62 with 5 years of service credit
Formula: 2.2% of FAS multiplied by years of Service for the first 30 years and 2.5% for service years in excess of 30	**Formula:** 2.2% of FAS multiplied by year of service for the first 30 years and 2.5% for service years in excess of 30	**Formula:** 2.2% of FAS multiplied by years of service for the first 35 years and 2.5% for service years in excess of 35

Final average salary (FAS) represents the average of the three highest years of earnings over a member's career for Groups A and B. Group C is based on the average of the five highest years of earnings over a member's career.

Members who retire before meeting the age and years of service credit requirement for unreduced benefits receive a percentage reduction in the benefit amount.

When a benefit recipient has received benefits for 12 months, an annual cost of living adjustment (COLA) is provided. This COLA is calculated on the base retirement benefit at the date of retirement and is not compounded. For those retiring prior to January 7, 2013, the COLA will continue to be a 3% simple annual COLA. For those retiring subsequent to January 7, 2013, beginning in calendar year 2019, the COLA will be based on the average percentage increase in the Consumer Price Index, capped at 3%.

Funding Policy—The ORC provides statutory authority for member and employer contributions. For fiscal year 2021, member contribution rates were 10% of salary and employer contribution rates were 14%. Employer contribution rates are actuarially determined and are expressed as a percentage of covered payroll. The District's contractually required contribution was $273,000 for 2021.

Pension Liabilities, Pension Expense, and Deferred Outflows of Resources and Deferred Inflows of Resources Related – OPERS

The net pension liability for OPERS was measured as of December 31, 2020 and the total pension liability used to calculate the net pension liability was determined by an actuarial valuation as of that date. The District's proportion of the net pension liability was based on the District's share of contributions to the pension plan relative to the contributions of all participating entities. The District's proportion, change in proportion and proportionate share of the net pension liability was 0.01439087%, a decrease of 0.0001258%, and $2,131,000, respectively. Pension expense for the District was a negative $408,000.

At December 31, 2021, the District reported deferred outflows of resources and deferred inflows of resources related to pension from the following sources (amounts in thousands):

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net
District contributions subsequent to the measurement date	$ 273	$ -	$ 273
Net difference between projected and actual investment earnings	-	(831)	(831)
Difference between expected and actual experience	-	(90)	(90)
Change in District's proportionate share	-	(214)	(214)
	$ 273	$ (1,135)	$ (862)

$273,000 reported as deferred outflows of resources related to pension resulting from District contributions subsequent to the measurement date will be recognized as a reduction of the net pension liability in the year ending December 31, 2022. Other amounts reported as deferred outflows of resources and deferred inflows of resources related to pension will be recognized in pension expense as follows (amounts in thousands):

Year Ended December 31:	Net Deferred Outflows/ (Inflows) of Resources
2022	$ (502)
2023	(181)
2024	(339)
2025	(113)
	$ (1,135)

Actuarial Assumptions – OPERS

Actuarial valuations of an ongoing plan involve estimates of the values of reported amounts and assumptions about the probability of occurrence of events far into the future. Examples include assumptions about future employment, mortality and cost trends. Actuarially determined amounts are subject to continual review or modification as actual results are compared with past expectations and new estimates are made about the future.

Projections of benefits for financial reporting purposes are based on the substantive plan (the plan as understood by the employers and plan members) and include the types of benefits provided at the time

of each valuation. The total pension liability in the December 31, 2020 actuarial valuation was determined using the following actuarial assumptions:

Wage inflation	3.25%
Future salary increases, Including inflation	3.25% to 10.75%
COLA or Ad Hoc COLA	Pre 1/7/2013 retirees: 3% simple; Post 1/7/2013 retirees: 0.5% simple through 2021, then 2.15% simple
Investment rate of return	7.20%
Actuarial cost method	Individual entry age

Pre-retirement mortality rates are based on the RP-2014 Employees mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Post-retirement mortality rates are based on the RP-2014 Health Annuitant mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Post-retirement mortality rates for disabled retirees are based on the RP-2014 Disabled mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Mortality rates for a particular calendar year are determined by applying the MP-2015 mortality improvement scale to all of the above-described tables.

The most recent experience study was completed for the five-year period ended December 31, 2015.

The allocation of investment assets within the Defined Benefit portfolio is approved by the Board of Trustees in the annual investment plan. Plan assets are managed on a total return basis with a long-term objective of achieving and maintaining a fully funded status for the benefits provided through the defined benefit pension plans. The long-term expected rate of return on defined benefit investment assets was determined using a building-block method in which best-estimate ranges of expected future rates of return are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future rates of return by the target asset allocation percentage, adjusted for inflation. Best estimates of arithmetic rates of return were provided by the Board's investment consultant. For each major asset class that is included in the Defined Benefit portfolio's target asset allocation as of December 31, 2020, these best estimates are summarized in the following table:

Asset Class	Target Allocation	Weighted Average Long-Term Expected Real Rate of Return
Fixed Income	25.00%	1.32%
Domestic Equities	21.00%	5.64%
Real Estate	10.00%	5.39%
Private Equity	12.00%	10.42%
International Equities	23.00%	7.36%
Other Investments	9.00%	4.75%
Total	100.00%	5.43%

Discount Rate. The discount rate used to measure the total pension liability was 7.20%. The projection of cash flows used to determine the discount rate assumed that contributions from plan members and those of the contributing employers are made at the statutorily required rates. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Sensitivity of the District's Proportionate Share of the Net Pension Liability to Changes in the Discount Rate. The following table represents the District's proportionate share of the net pension liability calculated using the current period discount rate assumption of 7.20%, as well as what the District's proportionate share of the net pension liability would be if it were calculated using a discount rate that is one-percentage point lower (6.20%) and one-percentage point higher (8.20%) than the current rate (amounts in thousands):

	1% Decrease (6.20%)	Current Discount Rate (7.20%)	1% Increase (8.20%)
MSD's proportionate share of the net pension liability	$ 4,065	$ 2,131	$ 523

Changes Subsequent to the Measurement Date. In September 2021, the Board approved several changes to the pension plan based on the completed five-year experience study covering the period 2016-2020. In addition to other changes, the Board approved to decrease the assumed pension investment rate of return from 7.20% to 6.90%. These changes are not reflected in the current measurement period but are expected to increase the associated pension liability.

B. City of Cincinnati Retirement System (CRS)

Plan Description – CRS

Employees who do not participate in OPERS participate in CRS. CRS is accounted for as a single-employer defined benefit pension plan. CRS provides retirement and disability benefits, annual cost of living adjustments, and death benefits to plan members and beneficiaries. CRS is considered part of the City of Cincinnati's financial reporting entity and is included in the City's financial report as a pension trust fund.

The financial report that includes financial statements, required supplementary information and detailed information about CRS' fiduciary net position may be obtained by visiting http://cincinnati-oh.gov/finance/financial-reports/. Article XV of the Administrative Code of the City of Cincinnati provides the statutory authority vesting the general administration and responsibility for the proper operation of the System in the Board of Trustees of the City of Cincinnati Retirement System.

Information in the remainder of this footnote is provided for the District's portion, being reported as an agency fund of the City, which also participates in and contributes to CRS, with a measurement date of June 30, 2021.

A major plan revision was approved by the City Council on March 16, 2011 and adopted by the CRS's Board. The plan allows for a two- and half-year transition period from July 1, 2011 to January 1, 2014. Active members who are eligible or become eligible to retire and elect to retire during this transition period can retire with 30 years of creditable service or at age 60 with at least five years of creditable service and will receive benefits according to the current plan as described below.

A Collaborative Settlement Agreement (CSA) was executed on May 7, 2015 and approved by the United States District Court on October 5, 2015. The CSA impacts employees who were retired on or before July 1, 2011 and employees who were in service on July 1, 2011 and who were vested (had 5 years' service credit) on that date. Employees who are members of the CRS who did not meet those criteria remained subject to the plan provisions adopted in Ordinances No 84-2011 and 85-2011.

The CSA implemented a number of changes to the CRS, including, but not limited to:

- Normal retirement eligibility;
- Early retirement eligibility;
- Retiree healthcare eligibility;
- Cost of living adjustments payable to retirees;
- Establishment of a Deferred Retirement Option Program (DROP);
- Creation of a 115 Trust for retiree healthcare benefits;
- Changes to the composition of the Board of Trustees; and
- Payoff of the 2007 Early Retirement Incentive Program (ERIP) liability.

Groups C & D Eligible to retire on or before July 1, 2011; or December 31, 2013	Group E Eligible to retire on or before December 31, 2013	Group F Hired before January 1, 2010 and not eligible for other groups	Group G Hired on or after January 1, 2010
Normal Retirement: Age 60 with 5 years of service, or any age with 30 years of service	**Normal Retirement:** Age 60 with 5 years of service, or any age with 30 years of service	**Normal Retirement:** Age 60 with 5 years of service, or any age with 30 years of service	**Normal Retirement:** Age 67 with 5 years of service, or age 62 with 30 years of service
Early Retirement: Age 55 with 25 years of service	**Early Retirement:** Age 55 with 25 years of service	**Early Retirement:** Age 55 with 25 years of service	**Early Retirement:** Age 57 with 15 years of service
Benefit Formula: 2.5% of AHC times years of service	**Benefit Formula:** 2.5% of AHC times years of service up to greater of 20 years or years of service as of July 1, 2011, and 2.2% thereafter	**Benefit Formula:** 2.5% of AHC times years of service up to greater of 20 years or years of service as of July 1, 2011, and 2.2% thereafter	**Benefit Formula:** 2.2% of AHC times years of service up to 30 years; 2.0% over 30 years

Average Highest Compensation (AHC) represents the average of the highest three consecutive years of earnings for Groups C and D. Group E will have a AHC with two separate components based upon the average of the highest three consecutive years of earnings for service through December 31, 2013 and the highest five consecutive years of earnings for service after January 1, 2014. Group F will have a AHC with two components based upon the average of the highest three consecutive years of earnings for service through June 30, 2011 and the highest five consecutive years of earnings for service after July 1, 2011. The AHC for Group G is based on the average of the highest five consecutive years of earnings. Upon retirement, members will not receive a cost-of-living-adjustment (COLA) for the first three retirement anniversary dates. Thereafter, a 3% simple COLA benefit will be provided. A COLA poverty exception is available for members who meet certain financial requirements.

In fiscal year 2021, an Early Retirement Incentive Program (ERIP) was offered to employees who met certain eligibility requirements. The ERIP provided two additional years of membership service credit to full-time employees who had 28 years or more of service credit (and were at least age 62 for Group G) or who had at least five years of service credit and were at least age 60 (or at least age 67 for Group G) by December 31, 2020. Only employees in CRS were eligible. The additional actuarial accrued liability associated with the fiscal year 2021 ERIP was approximately $24,671,000 and is to be funded by separate contributions made by the Plan over a 15-year period. The anticipated first payment is January 1, 2022.

Members of the Active Employee Class, under the Collaborative Settlement Agreement, who have a minimum of 30 years' service credit are eligible to participate in the deferred retirement option plan (DROP). Upon entry into DROP, the member's monthly pension benefit is calculated as if they retired on that date. DROP participants continue to work as a District employee and if eligible, may continue to be enrolled in a District sponsored employee healthcare plan. Maximum participation in the DROP is five years. Members who participate in DROP continue to contribute 9% of their pensionable earnings to CRS.

The participant's monthly pension benefit amount (calculated as described above), as well as 75% of the participant's required CRS employee contributions, and interest earnings on their DROP account balance, accumulate tax-deferred in an account held in trust by the CRS. Participants do not have access to the funds in their DROP account while employed and participating in the DROP. The balance of the participant's DROP account is paid out in a lump sum or to another tax-qualified account (such as an IRA or 457 Deferred Compensation Plan) selected by the participant within 120 days of their retirement effective date.

Membership in CRS as of the June 30, 2021, measurement date was as follows:

Retirees and beneficiaries (optionees) receiving benefits	4,225
Terminated plan members and beneficiaries (optionees) Entitled to future benefits	222
Deferred retirement option plan (DROP) participants	234
Active plan members:	
Full-time	2,631
Part-time	1,078
Total	8,390
Inactive participants**	9,234

** Participants who are former employees who have an employee account balance in the plan but are not otherwise vested in an employee provided benefit.

Funding Policy—Each member contributes at a rate of 9.0% of his pensionable wages for 2021. The percent contributed by employees is provided by Chapter 203 Section 73 of the Cincinnati Municipal Code. The District makes employer contributions based on a percentage of the covered payroll of all CRS members. For 2021, the contribution rate was 16.25%. The District's contributions to the City of Cincinnati Retirement System's Pension Fund for the year ending December 31, 2021, were $6,400,000.

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

The net pension liability was measured as of June 30, 2021, and the total pension liability used to calculate the net pension liability was determined by an actuarial valuation as of December 31, 2020. The District reported a net pension liability of $115,415,000 and negative pension expense of $56,441,000.

At December 31, 2021, the District reported deferred outflows of resources and deferred inflows of resources related to pension from the following sources (amounts in thousands):

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net
District contributions subsequent to the measurement date	$ 3,902	$ -	$ 3,902
Differences between expected and actual experience	7,553	-	7,553
Net difference between projected and actual investment earnings	-	(34,808)	(34,808)
Change in proportion	-	(3,181)	(3,181)
Change in assumptions	-	(123,604)	(123,604)
	$ 11,455	$ (161,593)	$ (150,138)

$3,902,000 reported as deferred outflows of resources related to pension resulting from District contributions subsequent to the measurement date will be recognized as a reduction of the net pension liability in the year ended December 31, 2022. Other amounts reported as deferred outflows of resources and deferred inflows of resources related to pension will be recognized in pension expense as follows (amounts in thousands):

Year Ended December 31:	Net Deferred Outflows/ (Inflows) of Resources
2022	$ (126,019)
2023	(6,258)
2024	(8,178)
2025	(13,585)
	$ (154,040)

Actuarial Assumptions: Total pension liability was determined by the following actuarial valuations, using the following actuarial assumptions, applied to applicable periods included in the measurement :

Inflation	2.75%
Salary increases, including inflation	3.75% to 7.50%
Long-term investment rate of return, net of pension plan investment expense, including inflation	7.50%
Municipal bond index rate:	
Prior measurement date	2.21%

Single equivalent interest rate, net of pension plan investment expense, including inflation	
Measurement date	7.50%
Prior measurement date	3.56%

Active member mortality rates were based on the RP-2014 Mortality Table, with generational mortality improvement projections using the MP-2017 scale. Health inactive member mortality rates were based on the RP-2014 Mortality Table, with generational mortality improvement projections using the MP-2017 scale and set forward two years for both males and females. Disabled inactive member mortality rates were based on the RP-2014 Disabled Retiree Mortality Table, with generational improvement projections using the MP-2017 scale.

The actuarial assumptions used in the December 31, 2020, valuation were based on the results of the last actuarial experience study performed for the period January 1, 2012 to December 31, 2016, adopted on February 28, 2018.

Long Term Expected Rate of Return. The long-term expected rate of return on pension plan investments was determined using expected return and volatility figures which were developed by Marquette Associates using their asset allocation software. The program simulates a variety of economic environments based on macroeconomic variables, and this simulation allows us to model the underlying probabilities of capital market returns. By running the monthly simulations over a 10-year basis and performing 1,000 trials, they develop results for expectations of capital market performance. Expected risk and return values for all asset classes are updated every six months, as the underlying data and assumptions reflect current market values and trends.

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

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return*
Core Bonds	12.00 %	1.89 %
High Yield	2.00 %	4.18 %
Private Debt	3.00 %	9.54 %
All Cap U.S. Equity	18.50 %	7.48 %
Large-Cap Value Equity	3.50 %	7.18 %
Mid-Cap Value Equity	2.00 %	7.56 %
Small-Cap Value Equity	3.50 %	8.24 %
Non-U.S. All Cap	20.00 %	7.93 %
Emerging Markets-Small Cap	3.00 %	8.47 %
Real Estate Core Equity	7.50 %	6.07 %
Infrastructure	10.00 %	7.05 %
Risk Parity	5.00 %	4.94 %
Private Equity-FOF	10.00 %	11.34 %
Total	100.00 %	

* Geometric mean

Discount Rate. The discount rate used to measure the total pension liability was 7.50% as of June 30, 2021. The projection of cash flows used to determine the discount rate assumed that employee contributions will be made at the current contribution rate and that employer contributions will be made as set out in the CSA. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current members. Projected benefit payments are discounted at the long-term expected return on assets of 7.50%. By comparison, the single equivalent rate used to determine the total pension liability as of June 30, 2020, was 3.56%.

Sensitivity of the Employer's Proportionate Share of the Net Pension Liability to Changes in the Discount Rate: The following chart represents the District financial reporting entity's proportionate share of the net pension liability calculated using the current period discount rate assumption of 7.50%, as well as the sensitivity to a 1% increase and 1% decrease in the current discount rate (amounts in thousands):

	1% Decrease (6.50%)	Current Discount Rate (7.50%)	1% Increase (8.50%)
District's Net Pension Liability	$ 164,082	$ 115,415	$ 74,194

Change in the Net Pension Liability: Changes in the District financial reporting entity's net pension liability for the measurement year ended June 30, 2021, were as follows (amounts in thousands):

	Total Pension Liability	Plan Fiduciary Net Position	Net Pension Liability
Balances at June 30, 2020.	$ 696,598	$ 270,841	$ 425,757
Changes for the year:			
Service cost	11,344	-	11,344
Interest	24,870	-	24,870
Benefit changes	4,537	-	4,537
Difference between expected and actual experience	15,853	-	15,853
Change in assumptions	(259,433)	-	(259,433)
Contributions - employer	-	6,400	(6,400)
Contributions - employee	-	3,723	(3,723)
Net investment income (loss)	-	88,994	(88,994)
Benefit payments, including refunds of employee contributions	(34,438)	(34,438)	-
Administrative expense	-	(334)	334
Other changes	-	8,730	(8,730)
Net changes	(237,267)	73,075	(310,342)
Balances at June 30, 2021	$ 459,331	$ 343,916	$ 115,415

The total pension liability (TPL) at the end of the measurement year, June 30, 2021, is measured as of the valuation date of December 31, 2020, and projected to June 30, 2021. Valuations will be completed every year. Each valuation will be rolled forward six months to provide the GAAP basis liability. There were assumption changes during the period, which are reflected in the amounts. The TPL and service cost have been determined using the entry age actuarial cost method as required by GASB Statement No. 67.

NOTE 10 – DEFINED BENEFIT OTHER POSTEMPLOYMENT BENEFIT (OPEB) PLANS

The two retirement systems District employees participate in provide defined benefit postemployment benefits other than pension. The Ohio Public Employees Retirement System (OPERS) is a cost-sharing multiple-employer defined benefit OPEB plans. The City of Cincinnati Retirement System (CRS) is accounted for as a single-employer defined benefit OPEB plan.

Net OPEB Assets

For purposes of measuring the net OPEB assets, deferred outflows of resources and deferred inflows of resources related to OPEB, and OPEB expense, information about the fiduciary net position of the OPEB plans and additions to/deductions from their fiduciary net position have been determined on the same basis as they are reported by the retirement systems. For this purpose, benefit payments (including

refunds of employee contributions) are recognized when due and payable in accordance with the benefit terms. The retirement systems report investments at fair value.

The net OPEB asset reported on the statement of net position represents an asset to fund employee OPEB. OPEB is a component of exchange transactions—between an employer and its employees—of salaries and benefits for employee services. OPEB is provided to an employee—on a deferred-payment basis—as part of the total compensation package offered by an employer for employee services each financial period. The obligation to sacrifice resources for OPEB is a present obligation because it was created as a result of employment exchanges that already have occurred.

The net OPEB asset represents the District's actuarial present value (or with the OPERS cost-sharing, multiple-employer plan, District's proportionate share of the OPEB plan's collective actuarial present value) of projected benefit payments attributable to past periods of service, net of each OPEB plan's fiduciary net position. The net OPEB asset) calculation is dependent on critical long-term variables, including estimated average life expectancies, earnings on investments, cost of living adjustments, cost trends and other variables. While these estimates use the best information available, unknowable future events require adjusting this estimate annually.

The District's share of each fully-funded benefits as long-term *net OPEB assets* on the accrual basis of accounting.

A. Ohio Public Employees Retirement System (OPERS)

Ohio Revised Code limits the District's obligation for liabilities to OPERS to annual required payments. The District cannot control benefit terms or the manner in which OPEB from the cost-sharing, multiple-employer plan is financed; however, the District does receive the benefit of employees' services in exchange for compensation including OPEB.

GASB Statement No. 75 assumes the liability is solely the obligation of the employer, because they benefit from employee services. OPEB contributions come from these employers and health care plan enrollees which pay a portion of the health care costs in the form of a monthly premium. The Ohio Revised Code permits but does not require the cost-sharing, multiple-employer retirement system to provide health care to eligible benefit recipients. Any change to benefits or funding could significantly affect the net OPEB asset. Resulting adjustments to the net OPEB asset would be effective when the changes are legally enforceable. The retirement systems may allocate a portion of the employer contributions to provide for these OPEB benefits.

Plan Description— OPERS

The District contributes to the health care plans administered by OPERS. OPERS is a cost-sharing, multiple-employer public employee retirement system comprised of three separate pension plans; the Traditional Pension Plan, a defined benefit plan; the Combined Plan, a combination defined benefit/defined contribution plan; and the Member-Directed Plan, a defined contribution plan.

OPERS maintains a cost-sharing, multiple-employer defined benefit post-employment health care trust, which funds multiple health care plans including medical coverage, prescription drug coverage and deposits to a Health Reimbursement Arrangement to qualifying benefit recipients of both the traditional pension and combined plans. This trust is also used to fund health care for member-directed plan participants, in the form of a Retiree Medical Account (RMA). At retirement or refund, member-directed plan participants may be eligible for reimbursement of qualified medical expenses for their vested RMA balance.

In order to quality for postemployment health care coverage, age and service retirees under the traditional pension and combined plans must have twenty or more years of qualifying Ohio service credit. Health care coverage for disability benefit recipients and qualified survivor benefit recipients is available. The health care coverage provided by OPERS meets the definition of another post-employment benefit (OPEB) as described in GASB Statement No. 75. See OPERS' ACFR referenced below for additional information.

The Ohio Revised Code permits but does not require OPERS to provide health care to its eligible benefit recipients. Authority to establish and amend health care coverage is provided to the Board in Chapter 145 of the Ohio Revised Code.

Disclosures for the health care plan are presented separately in the OPERS financial report. Interested parties may obtain a copy by visiting https://www.opers.org/financial/reports.shtm, by writing to OPERS, 277 East Town Street, Columbus, Ohio 43215-4642, or by calling (614) 222-5601 or 800-222-7377.
Funding Policy—The Ohio Revised Code provides the statutory authority requiring public employers to fund postemployment health care through their contributions to OPERS. When funding is approved by OPERS' Board of Trustees, a portion of each employer's contribution to OPERS is set aside to fund OPERS health care plans. Beginning in 2018, health care is not being funded.

Employer contribution rates are expressed as a percentage of the earnable salary of active members. In 2021, state and local employers contributed at a rate of 14% of earnable salary. These are the maximum employer contribution rates permitted by the Ohio Revised Code. Active member contributions do not fund health care.

Each year, the OPERS Board determines the portion of the employer contribution rate that will be set aside to fund health care plans. The portion of Traditional Pension and Combined plans' employer contributions allocated to health care was zero in 2021. The OPERS Board is also authorized to establish rules for the retiree or their surviving beneficiaries to pay a portion of the health care provided. Payment amounts vary depending on the number of covered dependents and the coverage selected. The employer contribution as a percentage of covered payroll deposited into the RMA for participants in the Member-Directed Plan for 2021 was 4%.

OPEB Asset, OPEB Expense, and Deferred Outflows and Inflows of Resources Related to OPEB—OPERS

The net OPEB asset and total OPEB liability for OPERS were determined by an actuarial valuation as of December 31, 2019, rolled forward to the measurement date of December 31, 2020, by incorporating the expected value of health care cost accruals, the actual health care payment, and interest accruals during

the year. The District's proportion of the net OPEB asset was based on the District's share of contributions to the respective retirement system relative to the contributions of all participating entities. The District's proportion change in proportion and proportionate share of the net OPEB asset was 0.01403706%, a decrease of 0.000942%, and $250,000, respectively. OPEB expense for the District was negative $1,620,000.

At December 31, 2021, the District reported deferred outflows of resources and deferred inflows of resources related to OPEB from the following sources (amounts in thousands):

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net
District contributions subsequent to the measurement date	$ 3	$ -	$ 3
Net difference between projected and actual investment earnings	-	(134)	(134)
Difference between expected and actual experience	-	(226)	(226)
Change in assumptions	123	(405)	(282)
Change in District's proportionate share	-	(116)	(116)
	$ 126	$ (881)	$ (755)

$3,000 reported as deferred outflows of resources related to OPEB resulting from District contributions subsequent to the measurement date will be recognized as an increase of the net OPEB asset in the year ended December 31, 2022. Other amounts reported as deferred outflows and inflows of resources related to OPEB will be recognized in OPEB expense as follows (amounts in thousands):

Year Ended December 31:	Net Deferred Outflows/ (Inflows) of Resources
2022	$ (415)
2023	(269)
2024	(58)
2025	(16)
	$ (758)

Actuarial Assumptions—OPERS

Actuarial valuations of an ongoing plan involve estimates of the value of reported amounts and assumptions about the probability of occurrence of events far into the future. Examples include assumptions about future employment, mortality, and cost trends. Actuarially determined amounts are subject to continual review or modification as actual results are compared with past expectations and new estimates are made about the future.

Projections of health care costs for financial reporting purposes are based on the substantive plan and include the types of coverages provided at the time of each valuation and the historical pattern of sharing of costs between OPERS and plan members. The total OPEB liability was determined by an actuarial valuation as of December 31, 2019, rolled forward to the measurement date of December 31, 2020. The actuarial valuation used the following actuarial assumptions applied to all prior periods included in the measurement in accordance with the requirements of GASB Statement No. 74:

Wage inflation	3.25%
Projected salary increases	3.25% to 10.75%, including wage inflation
Singe discount rate:	
Current measurement period	6.00%
Prior measurement period	3.16%
Investment rate of return	6.00%
Municipal bond rate:	
Current measurement period	2.00%
Prior measurement period	2.75%
Health care cost trend rate:	
Current measurement period	8.5% initial, 3.50% ultimate in 2035
Prior measurement period	10.5% initial, 3.50% ultimate in 2030
Actuarial cost method	Individual entry age

Pre-retirement mortality rates are based on the RP-2014 Employee's mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Post-retirement mortality rates are based on the RP-2014 Healthy Annuitant mortality table for males and females, adjusted for improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Post-retirement mortality rates for disabled retirees are based on the RP-2014 Disabled mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Mortality rates for a particular calendar year are determined by applying the MP-2015 mortality improvement scale to all of the above tables.

The most recent experience study was completed for the five-year period ended December 31, 2015.

During 2019, OPERS managed investments in three investment portfolios: the Defined Benefit portfolio, the Health Care portfolio and the Defined Contribution portfolio. The Health Care portfolio includes the assets for health care expenses for the Traditional Pension Plan, Combined Plan and Member-Directed

Plan eligible members. Within the Health Care portfolio, contributions into the plans are assumed to be received continuously throughout the year based on the actual payroll payable at the time contributions are made, and health care-related payments are assumed to occur mid-year. Accordingly, the money-weighted rate of return is considered to be the same for all plans within the portfolio. The annual money-weighted rate of return expressing investment performance, net of investment expenses and adjusted for the changing amounts actually invested, for the Health Care portfolio was 19.7% for 2019.

The allocation of investment assets within the Health Care portfolio is approved by the Board as outlined in the annual investment plan. Assets are managed on a total return basis with a long-term objective of continuing to offer a sustainable health care program for current and future retirees. The System's primary goal is to achieve and maintain a fully funded status for benefits provided through the defined benefit pension plans. Health care is a discretionary benefit. The long-term expected rate of return on health care investment assets was determined using a building-block method in which best-estimate ranges of expected future rates of return are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future rates of return by the target asset allocation percentage, adjusted for inflation. Best estimates of arithmetic rates of return were provided by the Board's investment consultant. For each major asset class that is included in the Health Care portfolio's target asset allocation as of December 31, 2020, these best estimates are summarized in the following table:

Asset Class	Target Allocation	Weighted Average Long-Term Expected Real Rate of Return (Arithmetic)
Fixed Income	34.00%	1.07%
Domestic Equities	25.00%	5.64%
REITs	7.00%	6.48%
International Equities	25.00%	7.36%
Other Investments	9.00%	4.02%
Total	100.00%	4.43%

Discount Rate. A single discount rate of 6.00% was used to measure the OPEB liability on the measurement date of December 31, 2020. Projected benefit payments are required to be discounted to their actuarial present value using a single discount rate that reflects (1) a long-term expected rate of return on OPEB plan investments (to the extent that the health care fiduciary net position is projected to be sufficient to pay benefits), and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate are not met). This single discount rate was based on an expected rate of return on the health care investment portfolio of 6.00% and a municipal bond rate of 2.00%. The projection of cash flows used to determine this single discount rate assumed that employer contributions will be made at rates equal to the actuarially determined contribution rate. Based on these

assumptions, the health care fiduciary net position and future contributions were sufficient to finance health care costs through 2120. As a result, the actuarial assumed long-term expected rate of return on health care investments was applied to projected costs through the year 2120, the duration of the projection period through which projected health care payments are fully funded.

Sensitivity of the District's Proportionate Share of the Net OPEB Asset to Changes in the Discount Rate and Changes in the Health Care Cost Trend Rates. The following table present the net OPEB asset calculated using the single discount rate of 6.00% and the expected net OPEB asset if it were calculated using a discount rate that is 1.0% lower or 1.0% higher than the current rate (amounts in thousands):

	1% Decrease (5.0%)	Current Discount Rate (6.0%)	1% Increase (7.0%)
District' proportionate share of the net OPEB asset	$ 62	$ 250	$ 405

Sensitivity of the District's Proportionate Share of the Net OPEB Asset to Changes in the Health Care Cost Trend Rate. Changes in the health care cost trend rate may also have a significant impact on the net OPEB asset. The following table presents the net OPEB asset calculated using the assumed trend rates, and the expected net OPEB asset if it were calculated using a health care cost trend rate that is 1.0% lower or 1.0% higher than the current rate.

Retiree health care valuations use a health care cost-trend assumption that changes over several years built into the assumption. The near-term rates reflect increases in the current cost of health care; the trend starting in 2021 is 8.50%. If this trend continues for future years, the projection indicates that years from now virtually all expenditures will be for health care. A more reasonable alternative is that in the not-too-distant future, the health plan cost trend will decrease to a level at, or near, wage inflation. On this basis, the actuaries' project premium rate increases will continue to exceed wage inflation for approximately the next decade, but by less each year, until leveling off at an ultimate rate, assumed to be 3.50% in the most recent valuation.

	1% Decrease	Current Health Care Cost Trend Rate	1% Increase
District' proportionate share of the net OPEB asset	$ 256	$ 250	$ 243

B. City of Cincinnati Retirement System (CRS)

Plan Description – CRS

CRS provides health care coverage to eligible retirees, their spouse and dependent children and is accounted for as a single-employer defined benefit OPEB plan. Active members in Group C who have earned fifteen years of membership service at the time of termination are eligible upon retirement. Other active members are eligible for retiree health care upon their retirement after reaching age 60 with 20 years of membership service, or any age with 30 years of service of which 20 years must be earned with CRS. Active members whose most recent membership enrollment date is on or after January 1, 2016 are not eligible for retiree health care benefits upon retirement.

CRS offers medical and prescription benefits to retirees before and during Medicare eligibility. Prescription benefits for Medicare eligible participants are provided through a Medicare Part D Employer Group Waiver Plan. CRS administers three health care plans that differ by deductibles, co-pays and out-of-pocket maximums. Two plans are closed groups. The third plan for eligible members who retire on or after January 1, 2016, follows the most advantageous plan offered to active District employees.

Membership in CRS as of the June 30, 2021, measurement date was as follows:

Retirees and beneficiaries (optionees) receiving benefits*	5,110
Terminated plan members and beneficiaries (optionees) Entitled to future benefits	249
Deferred retirement option plan (DROP) participants	209
Active plan members:	
Full-time	1,767
Part-time	279
Total	7,614

* OPEB members include 1,427 spouses currently receiving retiree health benefits.

CRS is considered part of the City of Cincinnati's financial reporting entity and is included in the City's financial report as part of the pension trust fund. The financial report that includes the financial statements, required supplementary information and detailed information about CRS' fiduciary net position may be obtained by visiting http://cincinnati-oh.gov/finance/financial-reports/. Information in the remainder of this footnote is provided for the District's portion, being reported as an agency fund of the City, which also participates in and contributes to the CRS, with a measurement date of June 30, 2021.

Funding Policy — Most retirees are subject to premiums that range from 0% to 10%. Other retiree premiums range from 5% to 75% depending on their date of hire, years of service and age at retirement. All members electing to participant in the dental and/or vision plan are required to pay the full cost of coverage. As such, it was assumed that CRS has no liability under GASB Statement No. 74 for these benefits.

OPEB (Asset), OPEB Expense, and Deferred Outflows and Inflows of Resources Related to OPEB—CRS

The District's net OPEB (asset) was measured as of June 30, 2021, and the total OPEB liability used to calculate the net OPEB asset was determined by an actuarial valuation as of December 31, 2020. The District reported a net OPEB asset of $31,407,000 and negative OPEB expense of $2,091,000.

At December 31, 2021, the District reported deferred outflows of resources and deferred inflows of resources related to OPEB from the following sources (amounts in thousands):

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net
Differences between expected and actual experience	$ 571	$ (5,322)	$ (4,751)
Net difference between projected and actual investment earnings	-	(10,332)	(10,332)
Change in proportion	226	(261)	(35)
Change in assumptions	5,497	(5,470)	27
	$ 6,294	$ (21,385)	$ (15,091)

Amounts reported as deferred outflows of resources and deferred inflows of resources will be recognized in OPEB expense as follows (amounts in thousands):

Year Ended December 31:	Net Deferred Outflows/ (Inflows) of Resources
2022	$ (4,175)
2023	(4,644)
2024	(2,291)
2025	(3,981)
	$ (15,091)

Actuarial Assumptions. The total OPEB liability in the following actuarial valuations were determined using the following actuarial assumptions, applied to the applicable periods included in the measurement:

Inflation:	
CPI	2.75%
Medical CPI	3.25%
Salary increases, including wage inflation	3.75% - 7.50%
Long-term investment rate of	

return	7.50%
Municipal bond index rate:	
Measurement date	2.16%
Prior measurement date	2.21%
Single equivalent interest rate, net of OPEB plan investment expense, including price inflation	
Measurement date	7.50%
Prior measurement date	7.50%
Health care cost trends:	
Medicare supplement claims	
Pre-Medicare	7.73% for 2020, decreasing to an ultimate rate of 4.00% by 2034.
Post-Medicare	8.73% / 8.80% for Non-Model and Model Plans, respectively, for 2020, decreasing to an ultimate rate of 4.00% by 2034.

The demographic actuarial assumptions used in the December 31, 2019, valuation were based on the results of the most recent actuarial experience study, adopted by the Board on March 1, 2018.

Pre-retirement mortality rates were based on RP-2014 healthy employee dataset mortality with fully generational projected mortality improvements using MP-2017. RP-2014 healthy employee dataset mortality rates for males and females have been set forward 2 years. Post-retirement mortality rates for health lives were based on RP-2014 total dataset mortality with fully generational projected mortality improvements using MP-2017. RP-2014 total dataset mortality rates for males and females have been set forward 2 years. For disabled lives, RP-2014 disabled retiree mortality with fully generational projected mortality improvements using MP-2017.

Of the CSA employee members eligible for DROP benefits, 60% are assumed to decline participation and 40% are assumed to be elect participation. Those electing to participate are assumed to remain in DROP for 3 years.

Of the vested members who terminate, it is assumed that 60% will leave their contributions in the plan in order to be eligible for a benefit at their normal retirement date while remaining 40% elect to withdraw their contributions.

Long Term Expected Rate of Return. The long-term expected rate of return on pension plan investments was determined using expected return and volatility figures which were developed by Marquette Associates using their asset allocation software. The program simulates a variety of economic environments based on macroeconomic variables, and this simulation allows us to model the underlying probabilities of capital market returns. By running the monthly simulations over a 10-year basis and performing 1,000 trials, they develop results for expectations of capital market performance. Expected risk and return values for all asset classes are updated every six months, as the underlying data and assumptions reflect current market values and trends.

The target asset allocation and best estimates of arithmetic real rates of return for each major asset class are summarized as follows:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return*
Core Bonds	12.00 %	1.89 %
High Yield	2.00 %	4.18 %
Private Debt	3.00 %	9.54 %
All Cap U.S. Equity	18.50 %	7.48 %
Large-Cap Value Equity	3.50 %	7.18 %
Mid-Cap Value Equity	2.00 %	7.56 %
Small-Cap Value Equity	3.50 %	8.24 %
Non-U.S. All Cap	20.00 %	7.93 %
Emerging Markets-Small Cap	3.00 %	8.47 %
Real Estate Core Equity	7.50 %	6.07 %
Infrastructure	10.00 %	7.05 %
Risk Parity	5.00 %	4.94 %
Private Equity-FOF	10.00 %	11.34 %
Total	100.00 %	

* Geometric mean

Determination of Discount Rate (SEIR). The plan uses the Bond Buyer G.O. 20 Year Bond Municipal Bond Index to satisfy the requirements under paragraph 48 of GASB Statement No. 74. As this Index is issued weekly, the value closest to, but after the reporting date is used in determining the appropriate rate. Based on this practice, the municipal bond index rate at June 24, 2021 was 2.16% and 2.21% at June 25, 2020.

The discount rate used to measure the total OPEB liability as of June 30, 2021, was 7.50%. The projection of cash flows used to determine the discount rate was performed in accordance with GASB Statement No. 74. The projection's basis was an actuarial valuation performed as of December 31, 2020. In addition to the actuarial methods and assumptions of the December 31, 2020, actuarial valuation, the following actuarial methods and assumptions were used in the projection of cash flows:

- No future employee contributions were assumed to be made.
- No future employer contributions were assumed to be made.

Based on these assumptions, CRS' fiduciary net position was projected to never be depleted, as a result, the long-term expected rate of return was used in the determination of the single equivalent interest rate (SEIR). Here, the long-term expected rate of return of 7.50% on plan investments was applied to all periods, resulting in a SEIR at the measurement date of 7.50%

Sensitivity of the net OPEB (asset) to changes in the discount rate and healthcare cost trend rates. The following presents the net OPEB (asset) of the District, as well as what the District's net OPEB (asset) would be if it were calculated using a discount rate that is 1% lower or 1% higher than the current discount rate. Similarly, the following also presents what the District's net OPEB (asset) would be if it were calculated.

using a healthcare cost trend rate that is 1% lower or 1% higher than the current rate (amounts in thousands):

	Healthcare Cost Trend Rates		
Distict' Net OPEB (Asset)	1% Decrease	Current Rate	1% Increase
1% Increase (8.50%)		$ (38,147)	
Current Discount Rate (7.50%)	$ (38,914)	(31,407)	$ (22,545)
1% Decrease (6.50%)		$ (23,471)	

Change in Net OPEB Liability/(Asset). Changes in the District's financial reporting entity's net OPEB liability/(asset) for the measurement year ended June 30, 2021, were as follows (amounts in thousands):

	Total OPEB Liability	Plan Fiduciary Net Position	Net OPEB Liability/ (Asset)
Balances at June 30, 2020	$ 67,997	$ 82,697	$ (14,700)
Changes for the year:			
Service cost	584	-	584
Interest	5,096	-	5,096
Benefit changes	3,035	-	3,035
Difference between expected and actual experience	255	-	255
Net investment income (loss)	-	26,077	(26,077)
Benefit payments, including refunds of employee contributions	(4,814)	(4,814)	-
Administrative expense	-	(98)	98
Other changes	-	(302)	302
Net changes	4,156	20,863	(16,707)
Balances at June 30, 2021	$ 72,153	$ 103,560	$ (31,407)

The total OPEB liability as of June 30, 2021, is based on the actuarial valuation results as of December 31, 2020. The total OPEB liability as of June 30, 2021, was determined using standard projection (roll forward) techniques. The roll forward calculation adds the normal cost (also called the service cost) for the projection period—for experience and assumption changes, the first half of 2021, subtracts the expected net benefit payments for the period, and then applies the SEIR used to measure the total OPEB liability as of the valuation date. The roll forward calculation for the expected change is determined using a similar procedure, except that the total OPEB liability and service cost are based on GASB Statement No. 75 results as of the prior measurement date, one year projection period used, and actual net benefit payments are subtracted. The difference between this expected total OPEB liability and the projected

total OPEB liability as of June 30, 2021, before reflecting any changes of assumptions or other inputs is the experience (gain) or loss for the period.

NOTE 11 - RELATED PARTY TRANSACTIONS

Cincinnati Water Works provides billing and collection services on customers' accounts for District. Fees for these services for 2021 and 2020 were $6,135,855 and $6,693,664, respectively. Fees are also paid to other municipalities and villages within Hamilton County for collection of sewerage bills.

The City of Cincinnati provides "overhead" services to District, such as check disbursement, investment and legal services, etc. The fees for these services for 2021 and 2020 were $2,505,040 and $2,582,066, respectively. In addition, the City's Municipal Garage provides gasoline and repairs vehicles for District. Fees for these services were $1,556,704 and $1,591,354 for 2021 and 2020, respectively.

NOTE 12 - COMMITMENTS AND CONTINGENCIES

The City of Cincinnati and the Board of County Commissioners of Hamilton County, Ohio are parties to a Global Consent Decree, which was lodged in 2003 with the U.S. District Court for the Southern District of Ohio, Western Division. This decree focuses on combined sewer overflows, the implementation of the Sanitary Sewer Overflow Correction plan established in the Interim Partial Consent Decree, and other wet weather issues. The court approved the decrees on June 9, 2004. In August 2010, District's Revised Wet Weather Improvement Plan was approved by the federal government. The commitment was for District to complete a Phase 1 group of projects totaling $1.145 billion (in 2006 dollars). Work on Phase 1 is over 94% complete and $129 million under budget. Consent decree documents are posted on the District web site, msdgc.org, under consent decree.

As part of District's capital improvement program, District has entered into a number of contracts for construction, design, and other services. Commitments under these contracts aggregate approximately $85.5 million as of December 31, 2021, and 98.7 million as of December 31, 2020.

The State of Ohio Auditor's office released a Special Audit for the years 2009-2015. The Findings for Recovery amounted to $779,164, of which $22,619 and $212,635 was recovered in 2019 and 2018, respectively. In 2019, the balance owed to District was turned over to the Hamilton County Prosecutor's office for review and disposition.

NOTE 13 - RISK MANAGEMENT

District is part of the City of Cincinnati Risk Management Program. The City purchases commercial insurance to cover losses due to theft of, damage to, or destruction of assets and purchases general liability insurance for specific operations and professional liability insurance for certain operations. All other risks of loss are self-insured. Separately, District carries property insurance pursuant to an all-risk policy on District's buildings and equipment per the revenue bond trust agreement. There has been no reduction in insurance coverage from coverage in 2003. Insurance settlements for claims resulting from risks covered by commercial insurance have not exceeded the insurance coverage in any of the past four years.

NOTE 14 – PREPAID EXPENSES AND OTHER

The City of Cincinnati offered an Early Retirement Incentive Program (ERIP) in 2007. The City Retirement System was paid District's share of the remaining liability in the amount of $8,723,061. This amount represents in full the liability for 2015-2021 years. The payment was processed and paid in March 2016. The remaining prepaid expense balance was $0 for 2021 and $1,273,061 for 2020.

Prepaid Insurance was $229,783, and Accrued Interest Receivable was $1,313,460 at December 31, 2021, for a total Prepaid Expenses and Other of $1,543,243.

NOTE 15 - SUBSEQUENT EVENTS

The United States and the State of Ohio declared a state of emergency in March 2020 due to the COVID-19 pandemic. The financial impact of COVID-19 and the ensuing emergency measures will impact subsequent periods of the District. The District's investment portfolio and investments of the pension and other employee benefit plan in which the District participates have incurred a significant decline in fair value, consistent with the general decline in financial markets. However, because the values of individual investments fluctuate with market conditions, and due to market volatility, the amount of losses that will be recognized in subsequent periods, if any, cannot be determined. In addition, the impact of the District's future operating costs, revenues, and any recovery from emergency funding, either federal or state, cannot be estimated.

There is a separate Consent Decree for the City Retirement System Plan court case, which may require additional employer share of pension contribution payments, however the exact dollar amount is unknown at this time.

The Board of County Commissioners authorized in March 2022, to enter into a Loan and Refinancing Agreements and authorization to provide for the Issuance of Taxable Convertible Sewer System Refunding Bonds. The Bonds shall not exceed $150,000,000 in aggregate principal amount.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of the MSD's Proportionate Share of the Net Pension Liability
Ohio Public Employees Retirement System - Traditional Pension Plan
Last Eight Years (1) (2)
Table 1
(Amounts in thousands)

	MSD's Proportion of the Net Pension Liability	MSD's Proportionate Share of the Net Pension Liability	MSD's Covered Payroll	MSD's Proportionate Share of the Net Pension Liability as a Percentage of its Covered Payroll	Plan Fiduciary Net Position as a Percentage of the Total Pension Liability
2014	0.01499479%	$ 1,766	$ 2,443	72.29%	86.36%
2015	0.01517751%	1,825	2,479	73.62%	86.45%
2016	0.01475990%	2,541	2,336	108.78%	81.08%
2017	0.01727562%	3,923	2,200	178.32%	77.25%
2018	0.01708312%	2,680	2,377	112.75%	84.66%
2019	0.01599242%	4,380	2,257	194.06%	74.70%
2020	0.01564887%	3,093	2,136	144.80%	82.17%
2021	0.01439087%	2,131	2,136	99.77%	86.88%

(1) Amounts presented for each year were determined as of MSD's measurement date, which is the prior year-end.
(2) Information prior to 2014 is not available.

Notes to Schedule:

Change in assumptions . In 2017, changes in assumptions were made based upon an updated experience study that was completed for the five-year period ended December 31, 2015. Significant changes included a reduction of the discount rate from 8.0% to 7.5%, a reduction in the wage inflation rate from 3.75% to 3.25%, and transition from the RP-2000 mortality tables to the RP-2014 mortality tables.

In 2019, a reduction of the discount rate was made from 7.5% to 7.2%.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of MSD's Pension Contributions
Ohio Public Employees Retirement System - Traditional Pension Plan
Last Ten Calendar Years
Table 2
(Amounts in thousands)

	Contractually Required Contributions	Contributions in Relation to the Contractually Required Contributions	Contribution Deficiency (Excess)	MSD's Covered Payroll	Contributions as a Percentage of Covered Payroll
2012	$ 275	$ (275)	$ -	$ 2,750	10.00%
2013	318	(318)	-	2,443	13.00%
2014	297	(297)	-	2,479	12.00%
2015	280	(280)	-	2,336	12.00%
2016	264	(264)	-	2,200	12.00%
2017	309	(309)	-	2,377	13.00%
2018	316	(316)	-	2,257	14.00%
2019	299	(299)	-	2,136	14.00%
2020	299	(299)	-	2,136	14.00%
2021	273	(273)	-	1,950	14.00%

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of the MSD's Proportionate Share of the Net OPEB Liability/(Asset)
Ohio Public Employees Retirement System - Traditional Pension Plan
Last Five Years (1) (2)
Table 3
(Amounts in thousands)

	MSD's Proportion of the Net OPEB Liability/(Asset)	MSD's Proportionate Share of the Net OPEB Liability/(Asset)	MSD's Covered Payroll	MSD's Proportionate Share of the Net OPEB Liability/(Asset) as a Percentage of its Covered Payroll	Plan Fiduciary Net Position as a Percentage of the Total OPEB Liability
2017	0.01786139%	$ 1,804	$ 2,200	82.00%	54.05%
2018	0.01664978%	1,808	2,377	76.06%	54.14%
2019	0.01550127%	2,021	2,257	89.54%	46.33%
2020	0.01497864%	2,069	2,136	96.86%	47.80%
2021	0.01403706%	(250)	2,136	(11.70%)	115.57%

(1) Amounts presented for each year were determined as of MSD's measurement date, which is the prior year-end.
(2) Information prior to 2017 is not available.

Notes to Schedule:

Change in assumptions. In 2018, the single discount rate changed from 4.23% to 3.85%.

In 2019, the single discount rate changed from 3.85% to 3.96%, the investment rate of return changed from 6.50% to 6.00%, and the health care cost trend rate changed from 7.50% initial to 10.00% initial.

In 2020, the single discount rate changed from 3.96% to 3.16% and the health care cost trend rate changed from 10.0% initial, 3.25% ultimate in 2029 to 10.5% initial, 3.50% ultimate in 2030.

In 2021, the single discount rate changed from 3.16% to 6.00% and the health care cost trend rate changed from 10.5% initial, 3.50% ultimate in 2030 to 8.5% initial, 3.50% ultimate in 2035.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of MSD's OPEB Contributions
Ohio Public Employees Retirement System - Traditional Pension Plan
Last Ten Calendar Years
Table 4
(Amounts in thousands)

	Contractually Required Contributions	Contributions in Relation to the Contractually Required Contributions	Contribution Deficiency (Excess)	MSD's Covered Payroll	Contributions as a Percentage of Covered Payroll
2012	$ 110	$ (110)	$ -	$ 2,750	4.00%
2013	24	(24)	-	2,443	1.00%
2014	50	(50)	-	2,479	2.00%
2015	47	(47)	-	2,336	2.00%
2016	44	(44)	-	2,200	2.00%
2017	24	(24)	-	2,377	1.00%
2018	3	(3)	-	2,257	0.13%
2019	2	(2)	-	2,136	0.09%
2020	2	(2)	-	2,136	0.09%
2021	3	(3)	-	1,950	0.15%

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of MSD's Changes in Net Pension Liability and Related Ratios
Cincinnati Retirement System
Last Eight Years (1) (2)
Table 5
(Amounts in thousands)

	2021	2020	2019	2018	2017
Total pension liability					
Service cost	$ 11,344	$ 7,108	$ 4,489	$ 4,260	$ 3,764
Interest	24,870	30,825	32,602	30,470	29,256
Benefit changes	4,537	-	-	-	5,344
Difference between expected and actual experience	15,853	5,073	8,698	5,577	649
Changes of assumptions	(259,433)	151,500	101,687	9,403	-
Benefit payments and refunds	(34,438)	(33,311)	(32,110)	(31,436)	(30,612)
Other	-	-	-	-	-
Net change in total pension liability	(237,267)	161,195	115,366	18,274	8,401
Total pension liability - beginning	696,598	535,403	420,037	401,763	393,362
Total pension liability - ending (a)	459,331	696,598	535,403	420,037	401,763
Plan net position					
Contributions - employer	6,400	6,531	6,381	6,080	5,647
Contributions - member	3,723	3,775	3,677	3,521	3,246
Contributions - ERIP payoff	-	-	-	-	-
Net investment income (loss)	88,994	(3,973)	14,394	26,180	38,292
Benefit payments and refunds	(34,438)	(33,311)	(32,110)	(31,436)	(30,612)
Administrative expense	(334)	(355)	(278)	(277)	(288)
Other	8,730	(1,005)	(1,439)	(1,893)	(3,065)
Net change in plan net position	73,075	(28,338)	(9,375)	2,175	13,220
Plan net position - beginning	270,841	299,179	308,554	306,379	293,159
Plan net position - ending (b)	343,916	270,841	299,179	308,554	306,379
Net pension liability - ending (a) - (b)	$ 115,415	$ 425,757	$ 236,224	$ 111,483	$ 95,384
Ratio of plan net position to total pension liability	74.87%	38.88%	55.88%	73.46%	76.26%
Covered payroll	$ 40,549	$ 41,462	$ 40,764	$ 37,809	$ 34,942
Net pension liability as a percentage of covered payroll	284.63%	1026.86%	579.49%	294.86%	272.98%

(continued)

(1) Information prior to 2014 was not available. MSD will continue to present information for years available until a full ten-year trend is available.
(2) The measurement year is from July 1 through June 30.

See Notes to the Required Supplementary Pension Information.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of MSD's Changes in Net Pension Liability and Related Ratios
Cincinnati Retirement System
Last Eight Years (1) (2)
Table 5 (continued)
(Amounts in thousands)

	2016	2015	2014
Total pension liability			
Service cost	$ 5,639	$ 5,346	$ 4,919
Interest	25,454	28,680	28,146
Benefit changes	(13,545)	-	-
Difference between expected and actual experience	734	(2,698)	-
Changes of assumptions	(111,431)	30,007	(3,381)
Benefit payments and refunds	(29,102)	(31,057)	(29,953)
Other	(35,654)	-	-
Net change in total pension liability	(157,905)	30,278	(269)
Total pension liability - beginning	551,267	520,989	521,258
Total pension liability - ending (a)	393,362	551,267	520,989
Plan net position			
Contributions - employer	4,639	5,596	7,252
Contributions - member	1,599	3,115	2,761
Contributions - ERIP payoff	8,723	-	-
Net investment income	(2,065)	9,455	49,002
Benefit payments and refunds	(29,102)	(31,057)	(29,953)
Administrative expense	(962)	(302)	(261)
Other	24,110	-	-
Net change in plan net position	6,942	(13,193)	28,801
Plan net position - beginning	286,217	299,410	270,609
Plan net position - ending (b)	293,159	286,217	299,410
Net pension liability - ending (a) - (b)	$ 100,203	$ 265,050	$ 221,579
Ratio of plan net position to total pension liability	74.53%	51.92%	57.47%
Covered payroll	$ 31,809	$ 31,232	$ 30,550
Net pension liability as a percentage of covered payroll	315.01%	848.65%	725.30%

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of MSD's Pension Contributions
Cincinnati Retirement System
Last Ten Calendar Years
Table 6
(Amounts in thousands)

	Actuarially Determined Employer Contributions	Actual Employer Contributions	Contribution Deficiency (Excess)	MSD's Covered Payroll	Contributions as a Percentage of Covered Payroll
2012	$ 9,923	$ (6,676)	$ 3,247	$ 33,671	19.83%
2013	13,051	(6,179)	6,872	31,369	19.70%
2014	16,087	(5,303)	10,784	30,550	17.36%
2015	13,756	(4,328)	9,428	31,232	13.86%
2016	12,356	(5,169)	7,187	31,809	16.25%
2017	8,541	(5,941)	2,600	34,942	17.00%
2018	10,879	(6,226)	4,653	38,536	16.16%
2019	11,541	(6,455)	5,086	40,053	16.12%
2020	12,226	(6,521)	5,705	40,289	16.19%
2021	12,927	(6,498)	6,429	40,339	16.11%

See Notes to the Required Supplementary Pension Information.

Metropolitan Sewer District (MSD),Hamilton County, Ohio
Required Supplementary Information
Notes to the Required Pension Information
Cincinnati Retirement System
Table 7

Actuarial Assumptions:

Actuarially determined contribution rates are calculated as of June 30, one year prior to the end of the fiscal year in which contributions are reported.

Actuarial cost method	Entry age
Amortization method	Level dollar
Amortization period	Open 30 year period
Asset valuation method	Five-year smoothed market value
Inflation	2.75%
Salary increases, including wage inflation	3.75% to 7.50%
Investment rate of return	7.50%, net of pension plan investment expense, and including inflation
Single equivalent discount rate	7.50%

Changes of Benefit Terms:

In 2017, there were several changes in benefit provisions as a result of Ordinance 336-2016 adopted by the City Council on October 26, 2016. In addition to incorporating many of the changes mandated by the Collaborative Settlement Agreement (CSA), the Ordinance also:

- Established benefit and eligibility provisions for Group E and F members not covered under the CSA similar to employees who are covered under the CSA.
- Established a universal cost-of-living adjustment (COLA) suspension period for all members.
- Established a universal 3% simple COLA rate for all members

In 2016, there were several changes in benefit provisions as a result of the Collaborative Settlement Agreement (CSA) between the City and various plaintiff groups representing certain active and retired members of CRS as approved by the Court on October 5, 2015 and generally effective January 1, 2016.

Changes in Actuarial Assumptions and Methods:

In 2018, actuarial assumptions and methods were changed based on the results of the actuarial experience study dated February 28, 2018. These changes include reducing the price inflation assumption from 3.00% to 2.75%; updating the retirement, withdrawal and disability rates, updating the mortality rates for all members to a generational approach using the RP-2014 morality tables, updating the merit salary scale; increasing the assumed administrative expense as a percentage of payroll added to the normal cost from 0.75% to 0.80%; updating the assumed proportion of deferred vested members who elect to receive a deferred benefit and who will elect to withdraw their contributions; and updating the assumed percentage of members who are married for the purposes of valuing pre-retirement survivor benefits.

Metropolitan Sewer District (MSD),Hamilton County, Ohio
Required Supplementary Information
Notes to the Required Pension Information
Cincinnati Retirement System
Table 7 (continued)

Changes in Actuarial Assumptions and Methods (continued):

In 2019, the System's fiduciary net position was projected to be available to make projected future benefit payment for current members through 2046. Projected benefit payments beyond 2046 were discounted at the municipal bond rate of 3.50%, resulting in a single equivalent discount rate of 5.56%.

In 2020, the System's fiduciary net position was projected to be available to make projected future benefit payment for current members through 2041. Projected benefit payments beyond 2041 were discounted at the municipal bond rate of 2.21%, resulting in a single equivalent discount rate of 3.56%.

In 2021, the expected long-term rate of return of 7.50% was used for the discount rate with the projected future fiduciary net position not being depleted.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of MSD's Changes in Net OPEB Liability/(Asset) and Related Ratios
Cincinnati Retirement System
Last Four Years (1) (2)
Table 8
(Amounts in thousands)

	2021	2020	2019	2018
Total OPEB liability				
Service cost	$ 584	$ 1,381	$ 1,155	$ 945
Interest	5,096	6,168	6,480	5,841
Benefit changes	3,035	(32,814)	-	-
Difference between expected and actual experience	255	(10,869)	475	3,030
Changes of assumptions	-	(11,168)	12,822	7,173
Benefit payments	(4,814)	(5,104)	(5,881)	(4,962)
Net change in total OPEB liability	4,156	(52,406)	15,051	12,027
Total OPEB liability - beginning	67,997	120,403	105,352	93,325
Total OPEB liability - ending (a)	72,153	67,997	120,403	105,352
Plan net position				
Net investment income (loss)	26,077	(1,139)	4,080	7,354
Benefit payments	(4,814)	(5,104)	(5,881)	(4,962)
Administrative expense	(98)	(102)	(79)	(78)
Other	(302)	(132)	(206)	(78)
Net change in plan net position	20,863	(6,477)	(2,086)	2,236
Plan net position - beginning	82,697	89,174	91,260	89,024
Plan net position - ending (b)	103,560	82,697	89,174	91,260
Net OPEB liability/(asset) - ending (a) - (b)	$ (31,407)	$ (14,700)	$ 31,229	$ 14,092
Ratio of plan net position to total OPEB liability/(asset)	143.53%	121.62%	74.06%	86.62%
Covered employee payroll	$ 28,755	$ 31,926	$ 33,066	$ 33,158
Net OPEB liability/(asset) as a percentage of covered employee payroll	(109.22%)	(46.04%)	94.44%	42.50%

(1) Information prior to 2018 was not available. MSD will continue to present information for years available until a full ten-year trend is available.
(2) The measurement year is from July 1 through June 30.

See Notes to the Required Supplementary OPEB Information.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of MSD's OPEB Contributions
Cincinnati Retirement System
Last FSix Calendar Years (1)
Table 9
(Amounts in thousands)

	Actuarially Determined Employer Contributions	Actual Employer Contributions	Contribution Deficiency (Excess)	MSD's Covered Employee Payroll	Contributions as a Percentage of Covered Employee Payroll
2016	$ 248	$ -	$ 248	$ 31,384	0.00%
2017	714	-	714	32,369	0.00%
2018	534	-	534	32,440	0.00%
2019	974	-	974	32,794	0.00%
2020	537	-	537	31,951	0.00%
2021	-	-	-	29,652	0.00%

(1) Information prior to 2016 is not available.

See Notes to the Required Supplementary OPEB Information.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Notes to the Required OPEB Information
Cincinnati Retirement System
Table 10

Actuarial Assumptions:

Actuarially determined contribution rates are calculated as of June 30, one year prior to the end of the fiscal year in which contributions are reported.

Actuarial cost method	Entry age
Amortization method	Level dollar
Amortization period	Open 30 year period
Asset valuation method	Five-year smoothed market value
Inflation	CPI: 2.75%; Medical CPI: 3.25%
Salary increases, including wage inflation	3.75% to 7.50%
Investment rate of return	7.50%, net of pension plan investment expense, and including inflation
Initial health care cost trend rates	
Pre Medicare	7.73%
Medicare	8.73% (Non-Model Plan) / 48.80% (Model Plan)
Ultimate health care cost trend rates	
Pre Medicare	4.00%
Medicare	4.00%
Year ultimate health care cost trend rates reached	
Pre Medicare	2034
Medicare	2034

Change of Benefit Terms:

In 2021, the Plan offered an early retirement incentive program which provided two additional years of service that would count towards benefits and eligibility. Eligible members were those projected to be eligible for normal retirement as of July 1, 2020 or have earned at least 28 years of service as of July 1, 2020.

In 2020, the Plan moved all Medicare Part A and Part B eligible, and Medicare Part B only eligible Plan participants to the new fully insured Medicare Advantage plan offered by Anthem, effective January 1, 2020.

In 2017, the Plan changes included in Ordinance 336-2016 were adopted by the City Council on October 26, 2016. In addition to incorporating many of the changes mandated by the CSA, the Ordinance also:

- Excluded members hired after December 31, 2015 from eligibility to receive retiree health benefits;
- Established benefit and eligibility provisions for Group E and F members, not covered under the CSA, similar to employees who are covered under the CSA.
- Specified eligibility and postemployment contribution requirements for the retiree health benefits payable to members and beneficiaries entitled to deferred benefits.
- Modified eligibility and postemployment contribution requirements to retiree health benefits paid as the result of an in-service death.

In 2016, there were several changes in benefit provisions as a result of the Collaborative Settlement Agreement (CSA) between the City and various plaintiff groups representing certain active and retired members of CRS as approved by the Court on October 5, 2015 and generally effective January 1, 2016.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Notes to the Required OPEB Information
Cincinnati Retirement System
Table 10 (continued)

Changes in Actuarial Assumptions and Methods:

In 2020, the expected long-term rate of return of 7.50% was used for the discount rate with the projected future net position not being depleted. The claims assumptions and retiree contributions were updated to reflect actual 2020 premiums.

The medical trend assumptions were updated to include several factors. First, the initial trends for the Medicare Advantage plans were set at 0% for medical and 7% for drug, while the trends for the contribution rates for the plans were set at a -5.7% to account for the health insurance tax reduction. The ultimate health care trend was set at 4%, with each trend period set at 15 years.

The claim cost curves were updated based on the experience of the retirees in the Secure, Select and Model plans. The data provided claim experience for all covered members (retirees, covered spouses, and covered children) by age. Additional information was provided for the new Medicare Advantage Plans, which were applied to the 2020 claim curves above.

The percentage of members to not qualify for premium-free Medicare Part A coverage was lowered from 15% to 10%.

In 2019, the December 31, 2018 valuation included a change in the Municipal Bond Index Rate from 3.89% to 3.50%; a decrease in the discount rate (SEIR) from 6.13% to 5.07%, part-time employees were included in the Plan's population, and the health care cost trend rates were updated to reflect the current market place.

In 2018, actuarial assumptions and methods were changed based on recent plan experience done concurrently with the December 31, 2017 valuation, including a change in the Municipal Bond Index Rate from 3.65% to 3.89%; a decrease in the discount rate (SEIR) from 6.31% to 6.13%, a decrease in the price inflation assumption from 3.00% to 2.75%, an update of the retirement, withdrawal, and disability rates; an update of the mortality rates for all members to a generational approach using the RP-2014 mortality tables; an update of the merit salary scales; and updates to the following to better reflect the anticipated experience of the plan: assumed rates of health care inflation, assumed rats of health benefit plan participation, contribution rates for the Select Plan and the Model Plan, and DROP participation rates.

In 2017, future contribution rates for retiree health benefit recipients are now based upon the projected retiree health care costs associated with each projection year's closed group of participants.

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OHIO AUDITOR OF STATE
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INDEPENDENT AUDITOR'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING AND ON COMPLIANCE AND OTHER MATTERS REQUIRED BY *GOVERNMENT AUDITING STANDARDS*

Metropolitan Sewer District of Greater Cincinnati
Hamilton County
1605 Gest Street
Cincinnati, Ohio 45204

To the Hamilton County Board of Commissioners:

We have audited, 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, the financial statements of the Metropolitan Sewer of Greater Cincinnati, Hamilton County, (the District) as of and for the years ended December 31, 2021 and 2020, and the related notes to the financial statements, which collectively comprise the District's basic financial statements and have issued our report thereon dated May 19, 2022. We also noted the financial impact of COVID-19 and the continuing emergency measures which may impact subsequent periods of the District.

Report on Internal Control Over Financial Reporting

In planning and performing our audit of the financial statements, we considered the District's internal control over financial reporting (internal control) as a basis for designing audit procedures that are appropriate in the circumstances for the purposes of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the District's internal control. Accordingly, we do not express an opinion on the effectiveness of the District's internal control.

A *deficiency in internal control* exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct misstatements on a timely basis. A *material weakness* is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the District's financial statements will not be prevented, or detected and corrected, on a timely basis. A *significant deficiency* is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses or significant deficiencies may exist that were not identified.

Report on Compliance and Other Matters

As part of obtaining reasonable assurance about whether the District's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the financial statements. However, providing an opinion on compliance with those provisions was not an objective of our audit and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

Purpose of This Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the District's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the District's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.



Keith Faber
Auditor of State
Columbus, Ohio
May 19, 2022

OHIO AUDITOR OF STATE
KEITH FABER

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

HAMILTON COUNTY

AUDITOR OF STATE OF OHIO CERTIFICATION

This is a true and correct copy of the report, which is required to be filed pursuant to Section 117.26, Revised Code, and which is filed in the Office of the Ohio Auditor of State in Columbus, Ohio.

Certified for Release 6/7/2022

88 East Broad Street, Columbus, Ohio 43215
Phone: 614-466-4514 or 800-282-0370

This report is a matter of public record and is available online at
www.ohioauditor.gov

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI
HAMILTON COUNTY

SINGLE AUDIT

FOR THE YEAR ENDED DECEMBER 31, 2022

OHIO AUDITOR OF STATE
KEITH FABER

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI
HAMILTON COUNTY
DECEMBER 31, 2022

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METROPOLITAN SEWER OF GREATER CINCINNATI
HAMILTON COUNTY
DECEMBER 31, 2021

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OHIO AUDITOR OF STATE
KEITH FABER

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INDEPENDENT AUDITOR'S REPORT

Metropolitan Sewer District of Greater Cincinnati
Hamilton County
1605 Gest Street
Cincinnati, Ohio 45204

To the Hamilton County Board of Commissioners:

Report on the Audit of the Financial Statements

Opinions

We have audited the financial statements of the Metropolitan Sewer District of Greater Cincinnati, Hamilton County, Ohio (the District), as of and for the years ended December 31, 2022 and 2021, and the related notes to the financial statements, which collectively comprise the District's basic financial statements as listed in the table of contents.

In our opinion, the accompanying financial statements referred to above present fairly, in all material respects, the financial position of the Metropolitan Sewer District of Greater Cincinnati, Hamilton County, Ohio as of December 31, 2022 and 2021, and the changes in financial position and its cash flows for the year then ended in accordance with the accounting principles generally accepted in the United States of America.

Basis for Opinions

We conducted our audit in accordance with auditing standards generally accepted in the United States of America (GAAS) and the standards applicable to financial audits contained in *Government Auditing Standards,* issued by the Comptroller General of the United States. Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Financial Statements* section of our report. We are required to be independent of the District, and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Emphasis of Matter

As discussed in Note 15 to the financial statements, the financial impact of COVID-19 and the continuing emergency measures may impact subsequent periods of the District. Our opinion is not modified with respect to this matter.

Responsibilities of Management for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with accounting principles generally accepted in the United States of America, and for 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.

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the District's ability to continue as a going concern for twelve months beyond the financial statement date, including any currently known information that may raise substantial doubt shortly thereafter.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinions. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with GAAS and *Government Auditing Standards* will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the financial statements.

In performing an audit in accordance with GAAS and *Government Auditing Standards*, we

- exercise professional judgment and maintain professional skepticism throughout the audit.
- identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements.
- obtain an understanding of internal control relevant to the audit 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 District's internal control. Accordingly, no such opinion is expressed.
- evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements.
- conclude whether, in our judgment, there are conditions or events, considered in the aggregate, that raise substantial doubt about the District's ability to continue as a going concern for a reasonable period of time.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control-related matters that we identified during the audit.

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the *management's discussion and analysis*, and schedules of net pension and other post-employment benefit liabilities and pension and other post-employment benefit contributions be presented to supplement the basic financial statements. Such information is the responsibility of management and, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the basic 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 audit was conducted for the purpose of forming an opinion on the financial statements that collectively comprise the District's basic financial statements. The Schedule of Expenditures of Federal Awards as required by Title 2 U.S. Code of Federal Regulations (CFR) Part 200, Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards is presented for 2022 for purposes of additional analysis and is not a required part of the basic financial statements.

Such information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the basic financial statements. The information has been subjected to the auditing procedures applied in the audit of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the Schedule of Expenditures of Federal Awards is fairly stated, in all material respects, in relation to the basic financial statements as a whole.

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated May 12, 2023, on our consideration of the District's internal control over financial reporting and our tests of its compliance with certain provisions of laws, regulations, contracts and grant agreements and other matters. The purpose of that report is solely 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 effectiveness of the District's 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 District's internal control over financial reporting and compliance.



Keith Faber
Auditor of State
Columbus, Ohio
May 12, 2023

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MANAGEMENT DISCUSSION AND ANALYSIS
(UNAUDITED)

This section of the Metropolitan Sewer District's annual financial report presents our discussion and analysis of the District's financial performance during the fiscal years ended December 31, 2022, and December 31, 2021. Please read it in conjunction with the District's basic financial statements and footnotes, beginning on page 13.

FINANCIAL HIGHLIGHTS FOR THE YEAR

- Assets and deferred outflows exceeded liabilities and deferred inflows by $1,288 million at the close of the 2022 fiscal year.
- The District's net position increased by $97.6 million in 2022, or 8.2%.
- During fiscal year 2022, the District's total assets decreased $15.5 million to $2,375 million, a 0.6% decrease.
- Total long-term liabilities increased $107.7 million to $1,064 million in fiscal year 2022.
- The District's debt service coverage ratio remains strong at 1.8 for fiscal year 2022.
- A refinance of the 2013A Bonds, occurred in April 2022, to a 2022A Revenue Bond, resulting in a new present value of savings of $14.5 million.

FINANCIAL STATEMENTS OVERVIEW

Financial Reporting Entity– The Metropolitan Sewer District of Greater Cincinnati is a Hamilton County enterprise fund managed and operated by the City of Cincinnati. The District is operated pursuant to the authority of the Revised Code authorizing the formation of joint sewer districts, agreements between counties and municipal corporations. The District provides sewage treatment within a service area of approximately 400 square miles and encompasses portions of four counties in southwestern Ohio. The District provides wastewater removal and treatment to over 220,000 residential, commercial and industrial sewer connections and operates and maintains over 3,000 miles of sanitary and combined sewers, seven major wastewater treatment plants and 100 pump stations. As an enterprise fund, operations are reported on the full accrual basis of accounting: revenues are recognized when earned, and expenses are recognized when incurred. The County issues a separate Annual Comprehensive Financial Report which includes the District as a separate enterprise fund of the County. The financial statements of the District report information about the District using accounting methods similar to those used by private-sector companies. These statements provide both long-term and short-term information about the District's overall financial status.

Financial Statement Structure --

In addition to the Independent Auditor's Report, the annual financial report consists of three segments:

- The Management's Discussion and Analysis provides explanations for, and analysis of the District's financial activities based upon currently known facts, conditions, and decisions of the District's management. While primarily focused on current year results compared with prior years, this discussion also addresses certain long-term issues, which may, in management's opinion, impact the District's financial performance.

- Basic Financial Statements, which depict the District's financial position as of December 31, 2022 and 2021, along with earnings performance and cash flow information. These statements include the Statement of Net Position, the Statement of Revenues, Expenses, and Changes in Net Position and the Statement of Cash Flows.
- The accompanying notes explain some of the financial statement data and provide more detailed information.

Required Basic Financial Statements -- The Statement of Net Position is the first required statement; it includes the District's assets and liabilities and provides information about the nature and amounts of investments in resources (assets) and nature and extent of obligations (liabilities) with the difference being reported as net position. It also provides the basis for computing the rates of return, evaluating the capital structure of the District, and assessing the liquidity and financial flexibility of the District. Over time, increases or decreases in the District's net position is one indicator of whether its financial health is improving or deteriorating. Other non-financial factors such as changes in economic conditions, population growth, and new or changed legislation also need to be considered in assessing the District's financial condition. The Statement of Revenues, Expenses, and Change in Net Position is the second required financial statement which demonstrates the changes in net position from one fiscal period to the next by accounting for revenues and expenditures and measuring the financial results of operations. This statement measures the profitability (i.e. change in net position) of the District's operations over the past year and can be used to determine whether the District has successfully recovered all of its costs through its user fees and other charges. The final required financial statement is the Statement of Cash Flows. The primary purpose of this statement is to provide information about the District's cash receipts, cash payments, and net changes in cash and cash equivalents resulting from operations, investing, and capital and noncapital financing activities. It also provides information regarding sources of cash, uses of cash, and changes in cash balances during the reporting period.

Notes to the audited financial statements contain information essential to understanding them, such as the District's significant accounting policies and information about certain financial statement account balances.

FINANCIAL ANALYSIS

Table A below shows that in fiscal year 2022, 87.3% of the District's net position reflects its investment in capital assets (e.g., buildings, sewer laterals, and equipment), less related debt still outstanding used to acquire those assets. These capital assets are used primarily in the collection and treatment of wastewater throughout the District's service area.

- The related liabilities will be repaid with resources provided by system users through rates and fees. Long-term debt (net of the current portion) decreased by $63.4 million in 2022, or -7.6%, and decreased by $53.1 million in 2021, or -5.98%.
- Net position increased $97.6 million in 2022 and increased $114.9 million in 2021. Percentage increase/decreases over the two-year period of 8.2%, and 10.7%, respectively. Total expenses in both years were due to fluctuations attributable to accounting for pensions, and price increases.

Table A
Condensed Summary of Net Position
(In Thousands)

	2022	Percentage Increase (Decrease) over 2021	2021	Percentage Increase (Decrease) over 2020	2020	Percentage Increase (Decrease) over 2019
Current and other assets	$ 95,623	1.0%	$ 94,712	18.8%	$ 79,756	19.6%
Noncurrent (restricted) Assets	$ 377,329	-12.1%	$ 429,415	-6.5%	$ 459,288	-10.9%
Capital assets, net	$1,902,834	1.9%	$ 1,867,200	2.2%	$ 1,827,577	4.0%
Total assets	2,375,786	-0.6%	2,391,327	1.0%	2,366,621	1.2%
Deferred Outflows	$ 76,424	216.2%	$ 24,169	-81.4%	$ 129,753	44.6%
Current liabilities	$ 85,881	2.7%	$ 83,657	9.4%	$ 76,484	-9.7%
Noncurrent liabilities	$1,063,837	11.3%	$ 956,132	-27.8%	$ 1,324,567	10.3%
Total liabilities	$1,149,718	10.6%	$ 1,039,789	-25.8%	$ 1,401,051	9.0%
Deferred Inflows	$ 14,175	-92.3%	$ 184,994	849.6%	$ 19,481	152.1%
Net investment in capital assets	$1,124,409	9.2%	$ 1,029,342	8.9%	$ 944,971	11.6%
Restricted	$ 4,602	2.7%	$ 4,482	-2.0%	$ 4,573	-36.2%
Unrestricted	$ 159,306	1.5%	$ 156,889	24.2%	$ 126,298	-55.1%
Total Net Position	$1,288,317	8.2%	$ 1,190,713	10.7%	$ 1,075,842	-5.3%

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Table B below shows total operating revenues for fiscal year 2022 of $273.6 million, an increase of $7.6 million, or 2.9%. Operating revenues were $266.0 million, an increase of $8.5 million, or 3.3% in 2021. Meanwhile, total expenses increased $18.0 million, or 11.6%, in 2022 and decreased $180.5 million, or 53.8%, in 2021. Decreases/Increases in total expenses in both those years was due to fluctuations attributable to accounting for pensions and price increases.

Table B
Condensed Summary of Revenues
Expenses and Changes in Net Position
(In Thousands)

	2022	Percentage Increase (Decrease) over 2021	2021	Percentage Increase (Decrease) over 2020	2020	Percentage Increase (Decrease) over 2019
Operating revenues	$ 273,618	2.9%	$ 266,026	3.3%	$ 257,484	-5.4%
Nonoperating revenues	(9,235)	5059.2%	(179)	-101.3%	13,930	-23.1%
Total revenues	264,383	-0.6%	265,847	-2.1%	271,414	-6.5%
Depreciation and amortization expense	$ 67,319	-0.7%	$ 67,813	2.1%	$ 66,437	-0.3%
Other operating expenses	134,868	12.9%	119,506	-4.6%	125,252	-0.1%
Pension Expense	(51,387)	-13.3%	(59,287)	-152.0%	114,027	52.2%
Nonoperating expenses	22,332	-17.5%	27,078	-9.5%	29,934	-16.4%
Total expenses	$ 173,132	11.6%	$ 155,110	-53.8%	$ 335,650	10.9%
Income from operations	$ 91,251	-17.6%	$ 110,737	-272.4%	$ (64,236)	-120.4%
Capital contributions	$ 6,354	53.7%	$ 4,134	-5.6%	$ 4,381	-29.3%
Change in net position	$ 97,605	-15.0%	$ 114,871	-291.9%	$ (59,855)	875.8%
Total Net Position, beginning	1,190,713	10.7%	1,075,842	-5.3%	1,135,697	-0.5%
Total Net Position, ending	$1,288,318	8.2%	$ 1,190,713	10.7%	$ 1,075,842	-5.3%

- Operating expenses, excluding depreciation, amortization and net pension expense, increased by $15.4 million to $134.9 million in 2022 from $119.5 million in 2021. The increase was due to an increase in Purchased Services and Other Operating expenses. 2021 saw a decrease of $5.8 million, or -4.6%, over the prior year. The decrease was due to utilities, fuel, supplies, purchased services and other expenses.
- Salary and wages increased $5.9 million to $60.7 million in 2022 compared to $54.8 million in 2021. This was a combination of Salary and Wages and Benefits.
- Depreciation expense decreased $0.5 million, or -0.7%, in 2022. Depreciation expense increased $1.3 million, 2.1%, in 2021 compared to the prior year.

- Non-operating expenses for 2022 were $22.3 million, a decrease of $4.7 million or -17.5%. 2021 decreased $2.9 million, or -9.5%, due to changes in interest expense and the fair value of investments.
- The City of Cincinnati offered an Early Retirement Incentive Program (ERIP) in 2007. In 2016, the District paid the City $8,723,061, its share of the remaining liability to the City Retirement System. This amount represents in full the liability for the years 2015-2021 and is being amortized over 7 years. ERIP amortization expense was $1,273 million in 2021 final year, and $1,250 million in 2020.

Table C reflects year-end capital balances. As of December 31, the District's investment in capital assets (net of accumulated depreciation) amounted to $1,903 million in 2022, $1,867 million in 2021. Capital assets increased $98.7 million, or 3.3%, on system improvement projects, land acquired for those projects and equipment replacement in 2022. Capital contributions were $6.4 million and $4.1 million in 2022 and 2021, respectively.

Capital construction and sewer improvement projects were 30.2% in 2022 and 37.3% of the program in 2021. Additional information on the District's capital assets can be found in Note 5 to the financial statements.

Table C
Capital Assets
(In Thousands)

	2022	Percentage Increase (Decrease) over 2021	2021	Percentage Increase (Decrease) over 2020	2020	Percentage Increase (Decrease) over 2019
Land	$ 12,313	0.0%	$ 12,313	20.9%	$ 10,188	0.0%
Buildings	341,939	0.0%	341,939	0.1%	341,666	0.0%
Leased Asset Building	15,000	0.0%	15,000	0.0%	15,000	0.0%
Equipment	779,400	3.8%	751,084	3.4%	726,265	4.3%
Sewer Laterals	1,472,819	3.6%	1,420,974	5.4%	1,348,645	3.0%
Construction in progress	507,895	3.8%	489,374	0.2%	488,533	14.1%
Subtotal	$3,129,366	3.3%	$ 3,030,684	3.4%	$ 2,930,297	4.6%
Less accumulated depreciation	1,221,844	5.4%	1,159,172	5.5%	1,098,783	5.6%
Less accumulated depreciation Leased Asset	4,687	8.7%	4,312	9.5%	3,937	5.6%
Net capital assets	$1,902,835	1.9%	$ 1,867,200	1.9%	$ 1,831,514	4.0%

Bond Issuances

The District finances its construction program through a combination of revenue bonds, state revolving loans through the State of Ohio and cash, with the primary source being tax-exempt revenue bonds. The District's revenue bond rates are:

- Moody's Investors Services Aa2
- Standard & Poor's Corporation AA+

Revenue bond service Debt Coverage in 2022 was 282% and 289% in 2021, compared to an Agency policy of 150% (25% higher than indenture requirements). The total debt coverage for 2022 was 178% and 183% in 2021, compared to the indenture requirement of 125%.

Rate Increase - Hamilton County Commissioners approved a 3% rate increase of the District's sewer fee effective as of 1/1/2023.

GASB 68

During 2015, the Metropolitan Sewer District of Greater Cincinnati adopted GASB Statement 68, "Accounting and Financial Reporting for Pensions—an Amendment of GASB Statement 27," which significantly revised accounting for pension costs and liabilities. For reasons discussed below, many end users of this financial statement will gain a clearer understanding of the Metropolitan Sewer District of Greater Cincinnati's actual financial condition by adding deferred inflows related to pension and the net pension liability to the reported net position and subtracting deferred outflows related to pension.

Governmental Accounting Standards Board standards are national and apply to all government financial reports prepared in accordance with generally accepted accounting principles. When accounting for pension costs, GASB 27 focused on a funding approach. This approach limited pension costs to contributions annually required by law, which may or may not be sufficient to fully fund each plan's *net pension liability*. GASB 68 takes an earnings approach to pension accounting; however, the nature of Ohio's statewide pension systems and state law governing those systems requires additional explanation in order to properly understand the information presented in these statements.

Under the standards required by GASB 68, the net pension liability equals the Metropolitan Sewer District of Greater Cincinnati's proportionate share of each plan's collective:

1. Present value of estimated future pension benefits attributable to active and inactive employees' past service.
2 Minus plan assets available to pay these benefits.

GASB notes that pension obligations, whether funded or unfunded, are part of the "employment exchange" – that is, the employee is trading his or her labor in exchange for wages, benefits, and the promise of a future pension. GASB noted that the unfunded portion of this pension promise is a present

obligation of the government, part of a bargained-for benefit to the employee and should accordingly be reported by the government as a liability since they received the benefit of the exchange. However, the Metropolitan Sewer District of Greater Cincinnati is not responsible for certain key factors affecting the balance of this liability. The Metropolitan Sewer District of Greater Cincinnati employees are covered by two pension systems. They are the City of Cincinnati Retirement System (CRS), and the Ohio Public Employees Retirement System (OPERS). The City of Cincinnati Retirement System (CRS) is accounted for as a single employer defined benefit pension plan. For CRS, the employee shares the obligation of funding pension benefits with the employer. Both employer and employee contribution rates are set by the City of Cincinnati ordinance. The CRS system provides retirement and disability benefits, annual cost of living adjustments, and death benefits to plan members and beneficiaries. The City of Cincinnati makes employer contributions based on a percentage of covered payroll of all CRS members. For Ohio PERS, the employee shares the obligation of funding pension benefits with the employer. Both employer and employee contribution rates are capped by State statute. A change in these caps requires action of both Houses of the General Assembly and approval of the Governor. Benefit provisions are also determined by State statute. The employee enters the employment exchange with the knowledge that the employer's promise is limited not by contract but by law. The employer enters the exchange also knowing that there is a specific, legal limit to its contribution to the pension system. In Ohio, there is no legal means to enforce the unfunded liability of the pension system *as against the public employer.* State law operates to mitigate/lessen the moral obligation of the public employer to the employee, because all parties enter the employment exchange with notice as to the law. The pension system is responsible for the administration of the plan.

Most long-term liabilities have set repayment schedules or, in the case of compensated absences (i.e., sick and vacation leave), are satisfied through paid time-off or termination payments. There is no repayment schedule for the net pension liability. As explained above, changes in pension benefits, contribution rates, and return on investments affect the balance of the net pension liability but are outside the control of the local government. In the event that contributions, investment returns, and other changes are insufficient to keep up with required pension payments, State statute does not assign/identify the responsible party for the unfunded portion. Due to the unique nature of how the net pension liability is satisfied, this liability is separately identified within the long-term liability section of the statement of net position.

In accordance with GASB 68, the Metropolitan Sewer District of Greater Cincinnati's statements prepared on an accrual basis of accounting include an annual pension expense for their proportionate share of each plan's *change* in net pension liability not accounted for as deferred inflows/outflows.

The COVID-19 Crisis has the District reassessing the 2023 budget expenditures.

For additional information on the Management Discussion and Analysis please contact:

Metropolitan Sewer District of Greater Cincinnati
Office of the Director
1600 Gest Street, Cincinnati, OH 45204

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Metropolitan Sewer District
Statement of Net Position
For The Periods Ended December 31, 2022 And December 31, 2021
(All amounts expressed in thousands)

	2022	2021
ASSETS		
Current assets:		
Cash, cash equivalents and pooled investments held by the City of Cincinnati (Note 2)	$ 22,478	$ 19,918
Accounts receivable (Note 3)	42,007	41,438
Prepaid expenses and other (Note 14)	1,324	1,543
Total current assets	65,809	62,899
Noncurrent assets:		
Restricted assets:		
Cash, cash equivalents, and pooled investments held by the City of Cincinnati		
Construction account (Note 2)	19,590	57,193
Amount to be transferred to surplus account (Note 2)	62,675	66,352
Held by trustee: (Note 4)		
Cash and cash equivalents (Note 2)	4,652	4,537
Investments - Held to maturity (Note 2)	290,412	301,333
Total restricted assets	377,329	429,415
Other assets:		
Other	29,814	31,813
Total other assets	29,814	31,813
Capital assets: (Note 5)		
Land	12,313	12,313
Buildings	356,939	356,939
Sewer Laterals	1,472,819	1,420,974
Equipment	779,399	751,084
Construction in progress	507,895	489,374
Total capital assets	3,129,365	3,030,684
Less:		
Accumulated depreciation	(1,226,531)	(1,163,484)
Net capital assets	1,902,834	1,867,200
Total noncurrent assets	2,309,977	2,328,428
Total assets	2,375,786	2,391,327
Deferred outflow of resources		
Deferred charges on refunding	4,694	6,021
Deferred Pension and OPEB Outflows	71,730	18,148
Total Deferred Outflow of Resources	76,424	24,169

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

Metropolitan Sewer District
Statement of Net Position
For The Periods Ended December 31, 2022 And December 31, 2021
(All amounts expressed in thousands)

	2022	2021
LIABILITIES		
Current liabilities:		
Payable from current assets:		
Current portion of long-term debt (Note 6)	57,079	54,118
Current portion of compensated absences (Note 8)	5,677	4,692
Accounts payable	8,689	6,687
Accrued payroll expenses	3,267	2,638
Total current liabilities payable from current assets	74,712	68,135
Payable from restricted assets:		
Construction accounts payable	9,640	13,694
Accrued interest payable	1,529	1,828
Total current liabilities payable from restricted assets	11,169	15,522
Total current liabilities	85,881	83,657
Noncurrent liabilities:		
Accrued compensated absences (Note 8)	4,369	4,267
Long-term debt (Note 6)	770,907	834,319
Net Pension Liability CRS (Note 9)	287,387	115,415
Net Pension Liability OPERS	1,174	2,131
Net Other Post Employment Benefit Liability (Note 10)	0	0
Total noncurrent liabilities	1,063,837	956,132
Total liabilities	1,149,718	1,039,789
Deferred Inflow of resources		
Deferred Pension and OPEB Inflows	14,175	184,994
Net position:		
Net investment in capital assets	1,124,409	1,029,342
Restricted	4,602	4,482
Unrestricted (Note 15)	159,306	156,889
Total Net Position	$ 1,288,317	$ 1,190,713

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

Metropolitan Sewer District
Statement of Revenue, Expenses and Changes in Fund Net Position
For The Periods Ended December 31, 2022 And December 31, 2021
(All amounts expressed in thousands)

	2022	2021
REVENUES		
Operating revenues:		
Sewerage service charges	$ 250,894	$ 243,605
Sewer surcharges	18,747	17,856
All other revenues	3,977	4,565
Total operating revenues	273,618	266,026
EXPENSES		
Operating expenses:		
Personnel services:		
Salary and Wages	60,712	54,812
Pension Expense	(51,387)	(59,287)
Purchased services	36,941	33,882
Utilities, fuel and supplies	25,781	20,477
Depreciation and amortization	67,319	67,813
Other expenses	11,434	10,335
Total operating expenses	150,800	128,032
Operating income	122,818	137,994
NONOPERATING		
Nonoperating revenues (expenses):		
Interest income	4,057	4,463
Change in fair value of investments	(13,292)	(4,642)
Interest expense	(22,332)	(27,078)
	(31,567)	(27,257)
Total nonoperating revenues (expenses)		
Income (loss) before contributions	91,251	110,737
Capital contributions	6,354	4,134
Change in net position	97,605	114,871
Total net position, beginning	1,190,713	1,075,842
Total net position, ending	$ 1,288,318	$ 1,190,713

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

Metropolitan Sewer District
Statement of Cash Flows
For The Periods Ended December 31, 2022 And December 31, 2021
(All amounts expressed in thousands)

	2022	2021
Cash flows from Operating Activities:		
Cash received from customers	$ 268,107	$ 258,984
Cash payments for goods and services	(73,145)	(63,867)
Cash payments for personnel costs	(58,953)	(56,527)
Other operating revenues	3,437	3,348
Net Cash Provided by Operating Activities	139,446	141,938
Cash Flows from Capital and Related Financing Activities:		
Principal and interest payments on long-term debt	(82,082)	(81,043)
Acquisition and construction of capital assets	(105,756)	(97,719)
Loan and Grant proceeds	1,801	2,936
Transfer into construction account from trustee investment account	66,352	126,366
Transfer from operating cash account to trustee investment account	(66,352)	(61,485)
Tap-in fees	6,327	2,891
Proceeds from the sale of capital assets	181	120
Net Cash (Used) by Capital and Related Financing Activities	(179,529)	(107,934)
Cash Flows from Investing Activities:		
Purchase of government securities	13,407	(60,484)
Net increase (decrease) in fair value of cash and investments	(13,292)	(4,642)
Interest earned on investments	1,363	1,488
Net Cash Provided (Used) by Investing Activities	1,478	(63,638)
Net Increase (Decrease) in Cash and Cash Equivalents	(38,605)	(29,634)
Cash and Cash Equivalents at January 1	148,000	177,634
Cash and Cash Equivalents at December 31	$ 109,395	$ 148,000
Reconciliation of Operating Income to Net Cash Provided by Operating Activities:		
Income from operations	$ 122,818	$ 137,994
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation and amortization	67,319	67,813
Capital Expenses moved to Operating	90	40
Operating Expense Reimbursed by Interdepartment Billings	(597)	0
Changes in assets and liabilities:		
Net change in customer accounts receivable	(569)	(863)
Net change in prepaid assets	219	(633)
Net change in other assets	1,999	(16,957)
Net change in operating accounts payable	2,002	807
Net change in accrued payroll and related expenses	1,104	(2,062)
Net Pension Liability	171,015	(311,304)
Net Other Post Employment Benefit Liability (Note 10)	0	(2,069)
Net Change in cash received from customers	(78)	(8)
Net Change in Deferred Charges on Refunding Outflows	1,327	1,327
Net Change in Deferred Pension Outflows	(53,582)	104,257
Net Change in Deferred Pension Inflows (Note 10)	(170,819)	165,513
Net Change in Capital Expenses 7600 moved to Fixed Assets in Fund 701	(2,802)	(1,917)
Net Cash Provided by Operating Activities	$ 139,446	$ 141,938
Non-cash Transactions:		
Structures donated as contributed capital in aid of construction	$ 3,990	$ 2,546
Acquisition and construction of capital asset paid directly by WPCLF loan proceeds	0	3,314
Construction accounts payable related to acquisition of capital assets	9,640	13,694

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

NOTE 1 - ACCOUNTING POLICIES

A summary of the significant accounting policies applied in the accompanying financial statements follows:

Organization

The Metropolitan Sewer District of Greater Cincinnati (the District), an enterprise fund of the County of Hamilton, Ohio, collects and treats industrial and residential wastewater for municipalities and unincorporated areas of Hamilton County. The District was formed on April 10, 1968, pursuant to resolutions of the Board of County Commissioners of Hamilton County and Ordinances of the City of Cincinnati, providing for a consolidation of the City Sewer Department and the County Sewer District. The two entities executed an agreement with an initial 50-year term. Per the agreement, the City is responsible for operational management. The original agreement was set to expire in April 2018 but has since been extended indefinitely by the Federal District Court. The parties remain in mediation in Federal District Court to resolve their remaining disputes.

Under a contract with the City of Cincinnati, the Board designated the City as its agent for the maintenance and operation of the District. The annual budget, prepared on a non-GAAP budgetary basis of accounting, is approved by the Board and administered by the City. Budgetary control is exercised at the divisional level, and between personnel and all other costs. The County issues a separate Annual Comprehensive Financial Report which includes the District as a separate enterprise fund of the County.

Basis of Accounting

The accompanying financial statements were prepared on the accrual basis of accounting, whereby revenues and expenses are recognized in the period earned or incurred.

Use of Estimates

The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions 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.

Statement of Cash Flows

For purposes of the Statements of Cash Flows, all highly liquid investments with a maturity of three months or less when purchased are considered to be cash equivalents. Pooled cash and investments held by the City of Cincinnati are considered cash equivalents by the District.

Investments

The District is required by Ohio law to invest in only United States obligations; federal agency securities; Ohio bonds and other obligations or such obligations of political subdivisions of the state, provided that the subdivisions are located within Hamilton County; time certificates of deposit or deposit accounts in an eligible institution; and no-load money market mutual funds consisting only of investments mentioned above. Investments are required to mature within five years from the date of settlement, unless the investment is matched to a specific obligation or debt of the District.

GASB Statement No. 72, *Fair Value Measurement and Application*, addresses accounting and financial reporting issues related to fair value measurements. This Statement provides guidance for determining a fair value measurement for financial reporting purposes for applying fair value to certain investments and disclosures related to all fair value measurements.

Prepaids

Payments made for services that will benefit periods beyond fiscal year end December 31, 2022, are recorded as prepaids using the consumption method. A current asset for the prepaid amount is recorded at the time of the purchase and an expense is reported in the year in which services are consumed.

Inventory

Supplies and materials are stated at the lower of cost or market on a first-in, first-out (FIFO) basis.

Capital Assets

Capital assets include land, construction in progress, buildings, sewer laterals and mains, studies and equipment. Capital assets are defined as assets with an initial, individual cost of more than $5,000.

Capital assets are stated at historical cost for assets acquired after the District's inception in 1968. Assets which were acquired prior to 1968 and not identifiable with specific historical costs are not included in the capital assets balance. Assets acquired by the District through contributions, such as contributions from land developers and federal and state grants, are capitalized and recorded in the plant records at the contributors' reported cost. Construction costs include the cost of in-force labor. See Note 5 for more information on capital assets.

Land acquired for the District's use is titled to either the City of Cincinnati or Hamilton County. The cost of this land has been recorded on the books of the District since it has the full benefit of the land as an economic resource.

Depreciation expense is computed on the straight-line method over the estimated useful lives of the respective assets. The estimated lives are as follows:

Building	40 years
Sewer Laterals	40 years
Equipment	5-25 years

Any gain or loss arising from the disposal of capital assets has been credited or charged to income.

Unamortized Financing Costs

The unamortized financing costs include insurance, consulting and attorney fees incurred in connection with the revenue bond obligations. These amounts are being amortized on the straight-line method over the lives of the revenue bonds. Bond premiums and discounts are being amortized on the interest method over the lives of the revenue bonds.

Deferred Outflows/Inflows of Resources

In addition to assets, the statement of financial position will sometimes report a separate section for deferred outflows of resources. Deferred outflows of resources represent a consumption of net assets that applies to a future period and will not be recognized as an outflow of resources (expense) until then. For the District, deferred outflows of resources are reported on the statement of net position for deferred charges on refunding, pension and other postemployment benefits (OPEB). A deferred charge on refunding results from the difference in the carrying value of refunded debt and its reacquisition price. This amount is deferred and amortized over the shorter of the life of the refunded or refunding debt. The deferred outflows of resources related to pension and OPEB are explained in Notes 9 and 10.

In addition to liabilities, the statement of financial position reports a separate section for deferred inflows of resources. Deferred inflows of resources represent an acquisition of net assets that applies to a future period and will not be recognized until that time. For the District, deferred inflows of resources have been recorded in the statement of net position for pension and OPEB, as explained in Notes 9 and 10.

Pension/OPEB Plans

Employees participate in either the City of Cincinnati's Retirement System or the Ohio Public Employees Retirement System. For purposes of measuring net pension liabilities and net OPEB assets, deferred outflows of resources and deferred inflows of resources related to pension and OPEB, and pension and OPEB expense, information about the fiduciary net position of the pension and OPEB plans and additions to/deductions from their fiduciary net position have been determined on the same basis as they are reported by the retirement systems. For this purpose, benefit payments (including refunds of employee contributions) are recognized when due and payable in accordance with the benefit terms. The retirement systems report investments at fair values.

Compensated Absences

Compensated absences include accrued vacation time, sick leave, compensatory time, and other related payments. Compensatory time and vacation time are paid out in full upon termination and are expensed in the year earned. Sick leave is paid out at various levels. The liability for sick leave is computed with the Termination Payment Method using an historical average of total years worked and total amount paid. The current amounts are an average of the annual expenditures. The entire compensated absence liability is reported on the financial statements.

Net Position

Net positions are the difference between assets, deferred outflows, deferred inflows, and liabilities. Net investment in capital assets are capital assets less accumulated depreciation and any outstanding long-term debt related to the acquisition, construction or improvement of those assets. Net positions are reported as restricted when there are legal limitations that are imposed on their use by county legislation or external restrictions by other governments, creditors or grantors. Restricted net positions of the District relate to debt service.

The District applies restricted resources when an expense is incurred for purposes for which both restricted and unrestricted net positions are available. The District does not have net position restricted by enabling legislation.

Operating Revenues and Expenses

Operating revenues are those revenues that are generated directly from the primary activity of the proprietary fund. For the District, these revenues are charges for services for wastewater treatment. Operating expenses are necessary costs incurred to provide the service that is the primary activity of the fund.

Contributions of Capital

Contributions of capital arise from outside contributions of capital assets or outside contributions of resources restricted to capital acquisition and construction.

Customer Assistance Program (CAP)

A Customer Assistance Program (CAP) was approved by the Board of Commissioners in April 2019 to take effect on July 31, 2019. This program is a 25% discount on sewer bills offered to low-income seniors over the age of 65. Depending on the number of customers that apply, the District estimates this could affect revenue in the amount of $250,000 up to $2.2 million, with 100% participation.

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NOTE 2 - DEPOSITS AND INVESTMENTS

Deposits

State statutes classify monies held by the District into three categories.

Active deposits are public deposits necessary to meet current demands on the treasury. Such monies must be maintained either as cash in the District's Treasury, in commercial accounts payable or withdrawable on demand, including negotiable order of withdrawal (NOW) accounts, or in money market deposit accounts.

Inactive deposits are public deposits that the District has identified as not required for use within the current two-year period of designation of depositories. Inactive deposits must either be evidenced by certificates of deposit maturing not later than the end of the current period of designation of depositories, or by savings or deposit accounts including, but not limited to, passbook accounts.

Interim deposits are deposits of interim monies. Interim monies are those monies which are not needed for immediate use, but which will be needed before the end of the current period of designation of depositories. Interim deposits must be evidenced by time certificates of deposit maturing not more than one year from the date of deposit or by savings or deposit accounts including passbook accounts.

Protection of the District's deposits is provided by the Federal Deposit Insurance Corporation (FDIC), by eligible securities pledged by financial institution as security for repayment, by surety company bonds deposited with the finance director by the financial institution or by a single collateral pool established by the financial institution to secure the repayment of all public monies deposited with the institution.

Custodial credit risk is the risk that in the event of a bank failure, the government's deposits may not be returned to it. The District's policy for deposits is collateral is required for demand deposits and certificates of deposit at 105 percent, or 102 percent if the financial institution participates in the Treasurer of State's Ohio Pooled Collateral System, of all deposits not covered by federal deposit insurance. Obligations that may be pledged as collateral are obligations of the United States and its agencies and obligations of the State and its municipalities, school districts, and district corporations. Obligations pledged to secure deposits must be delivered to a bank other than the institution in which the deposit is made. Written custodial agreements are required. The District is required to categorize deposits and investments according to GASB Statement No. 3 *Deposits with Financial Institutions, Investments, and Reverse Purchase Agreements*. The carrying value of the District's cash and cash equivalent deposits was $104,744,000 and $143,463,000 at December 31, 2022 and 2021, respectively.

Amounts held by the City of Cincinnati are invested on the District's behalf in accordance with the Cincinnati Municipal Code. Amounts held by the City are collateralized as part of the City's cash and investment balances. For GASB 40 disclosure requirements, refer to the financial statements as of June 30, 2022, for the City of Cincinnati.

Although the pledging bank has an investment and securities pool used to collateralize all public deposits, which are held in the financial institution's name, noncompliance with federal requirements could

potentially subject the District to a successful claim by the FDIC. The deposits not covered by federal depository insurance are considered uninsured and uncollateralized and subject to custodial credit risk.

Investments

State Statute, board of county commissioners resolutions, and the 1985 Trust Indenture as amended authorize the District to invest in obligations of U. S. Treasury, agencies and instrumentalities, certificates of deposit, repurchase agreements, money market deposit accounts, municipal depository funds, super NOW accounts, sweep accounts, separate trading of registered interest and principal of securities, mutual funds, bonds and other obligations of this State, and the State Treasurer's investment pool. Repurchase agreements are limited to 30 days and the market value of the securities must exceed the principal value of the agreement by at least 2 percent and be marked to market daily. Investments in stripped principal or interest obligations reverse repurchase agreements and derivatives are prohibited. The issuance of taxable notes for the purpose of arbitrage, the use of leverage and short selling are also prohibited. An investment must mature within five years from the date of purchase unless matched to a specific obligation or debt of the District and must be purchased with the expectation that it will be held to maturity. Investments may only be made through specified dealers and institutions. Payment for investments may be made only upon delivery of the securities representing the investments to the finance director or, if the securities are not represented by a certificate, upon receipt of confirmation of transfer from the custodian. The District has no investment policy that addresses interest rate risk.

Custodial Credit Risk – For an investment, custodial credit risk is the risk that, in the event of the failure of the counterparty the District will not be able to recover the value of its investments or collateral securities that are in the possession of an outside party. The Federal National Mortgage Association Notes, Federal Home Loan Mortgage Corporation Notes, and the Federal Home Loan Bank Notes are exposed to custodial credit risk in that they are uninsured, unregistered, and held by the counterparty's trust department or agent but not in the District's name. The District has no investment policy dealing with investment custodial risk beyond the requirement in state statute that prohibits payment for investments prior to the delivery of the securities representing such investments to the Treasurer or qualified trustee.

Funds held by the trustee are eligible investments as defined by the Trust Agreement and are in the name of the trustee for the benefit of the District.

Investments made by the District are summarized below. Trustee account investments are categorized according to credit risk into the following categories: (1) insured or registered, or securities held by the District or its agent (bank trust department) in the District's name; or (2) uninsured and unregistered, with securities held by the counterparty's trust department or agent in the District's name; or (3) uninsured, unregistered securities held by the counterparty, or its trust department or agent but not in the District's name. Money market funds are unclassified investments since they are not evidenced by securities that exist in physical or book entry form. As stated in GASB Statement No. 40, obligations of the U. S. government or obligations explicitly guaranteed by the U. S. government are not considered to have credit risk and do not require disclosure of credit quality.

The money market funds are invested in a treasury obligation fund with a Moody's credit rating of Aaa.

Concentration of Credit Risk: The Metropolitan Sewer District uses the City of Cincinnati's Investment Policy which addresses concentration of credit risk by requiring investments to be diversified to reduce risk of loss resulting from over concentration of assets in a specific issue or class of security. The following table includes the percentage of each investment type held by the District at December 31, 2022.

Investment Type	Fair Value	% of Total
Investments held by the City of Cincinnati	$104,743,937	26.20
U.S. Agency Securities	$87,246,720	21.83
U.S. Treasury Securities	$203,109,577	50.81
Money Market Funds	$4,651,625	1.16
	$399,751,859	100.00

The classification of cash and cash equivalents and investments on the financial statements is based on criteria set forth in GASB Statement No. 9. A reconciliation between the classifications of cash and investments of the financial statements and the classification per GASB Statement No. 3 is as follows:

(all amounts in thousands)

December 31, 2022	**Cash and Cash Equivalents**	**Investments**
GASB Statement No. 9	$109,395	$290,412
Money Market Funds	(4,651)	4,651
Total	$104,744	$295,063

(all amounts in thousands)

December 31, 2021	**Cash and Cash Equivalents**	**Investments**
GASB Statement No. 9	$148,000	301,378
Money Market Funds	(4,537)	4,537
Total	$143,463	305,915

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Fair Value Measurements: District categorizes its fair value measurements within the fair value hierarchy establish by GASB Statement No. 72. The District has the following recurring fair value measurements as of December 31, 2022:

	Fair Value Measurements Using *(amounts in thousands)*		
Investments by Fair Value Level	Fair Value	Quoted Price In Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)
U.S. Treasury Securities	$203,110	203,110	
U.S. Agency Securities	$87,247		87,247
	$290,347	$ 203,110	$ 87,247

U.S. Treasury securities classified in Level 1 of the fair value hierarchy are valued using quoted market prices. U.S. Agency securities classified in Level 2 of the fair value hierarchy are valued using pricing sources as provided by investment managers.

NOTE 3 - ACCOUNTS RECEIVABLE

Accounts receivable consist of the following:

(all amounts in thousands)

	2022	2021
Sewer charges and surcharges:		
Unbilled amount	$22,644	$21,407
Billed amount	30,348	33,170
Less Allowance for doubtful accounts	(13,208)	(14,932)
Other	2,223	1,793
Total	$42,007	$41,438

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NOTE 4 - RESTRICTED ASSETS

The Trust Agreement for the Series A Revenue Bonds (see Long-Term Debt Note) requires the establishment of certain trust accounts including a Bond Account, Bond Reserve Account, and a Surplus Account to be held by the Trustee. The Bond Account will be used to accumulate periodic principal and interest payments. The Bond Reserve Account will be funded in an amount equal to the highest annual future debt service requirement. The Surplus Account is available to be used for any other Sewer System purpose. The Trust Agreement also requires the creation of a Construction Account to be held by the City to pay for project costs. At December 31, 2022 and 2021 the following balances (at fair value) were maintained in the trust accounts:

(all amounts in thousands)

	2022	2021
Held by trustee:		
Reserve	$43,121	$44,890
Bond retirement	4,605	4,537
Surplus	247,337	256,443
Total	$295,063	$305,870

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NOTE 5 - CAPITAL ASSETS

(all amounts in thousands)

December 31, 2022	Beginning Balance	Lease Breakout	Increase	Decrease	Ending Balance
Capital Assets, not being depreciated:					
Land	$ 12,313		$ -		$ 12,313
Construction in progress	489,374		99,899	(81,378)	507,895
	$ 501,687		$ 99,899	$ (81,378)	$ 520,208
Capital Assets, being depreciated:					
Buildings	356,939	(15,000)	-	-	341,939
Leased Asset Building		15,000			15,000
Equipment	751,084		28,690	(374)	779,400
Sewer Laterals	1,420,974		55,743	(3,898)	1,472,819
	2,528,997	0	84,433	(4,272)	2,609,158
Total Capital Assets	3,030,684	-	184,332	(85,650)	3,129,366
Less accumulated depreciation:					
Buildings	177,963	(4,312)	6,799		180,450
Leased Asset Building		4,312	375		4,687
Equipment	386,172		21,002	(374)	406,800
Sewer Laterals	599,349		35,245		634,594
Total Accumulated Depreciation	1,163,484	0	63,421	(374)	1,226,531
Net Capital Assets	$ 1,867,200	$ -	$ 120,911	$ (85,276)	$ 1,902,835

Capital Asset category Sewer Laterals is comprised of two asset types, one is Sewer Lateral which are depreciated and Study Assets which are amortized.

In 2022, Capital Assets depreciation expense was $63,421,000 and Study Assets amortization expense was $3,898,000 for a total depreciation and amortization expense of $67,319,000 for the year.

NOTES TO THE FINANCIAL STATEMENTS
FOR THE YEARS ENDED DECEMBER 31, 2022, AND 2021

(all amounts in thousands)

December 31, 2021	Beginning Balance	Increase	Decrease	Ending Balance
Capital Assets, not being depreciated:				
Land	$ 10,188	$ 2,125		$ 12,313
Construction in progress	488,533	104,032	(103,191)	489,374
	$ 498,721	$ 106,157	$ (103,191)	$ 501,687
Capital Assets, being depreciated:				
Buildings	356,666	273	-	356,939
Equipment	726,265	25,554	(735)	751,084
Sewer Laterals	1,348,645	78,642	(6,313)	1,420,974
	2,431,576	104,469	(7,048)	2,528,997
Total Capital Assets	2,930,297	210,626	(110,239)	3,030,684
Less accumulated depreciation:				
Buildings	170,678	7,285		177,963
Equipment	366,400	20,507	(735)	386,172
Sewer Laterals	565,642	33,707		599,349
Total Accumulated Depreciation	1,102,720	61,499	(735)	1,163,484
Net Capital Assets	$ 1,827,577	$ 149,127	$ (109,504)	$ 1,867,200

Capital Asset category Sewer Laterals is comprised of two asset types, one is Sewer Lateral which are depreciated and Study Assets which are amortized.

In 2021, Capital Assets depreciation expense was $61,499,000 and Study Assets amortization expense was $6,314,000 for a total depreciation and amortization expense of $67,813,000 for the year.

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NOTE 6 - LONG-TERM DEBT

Long-term debt consisted of the following:

(all amounts in thousands)

	Principal Issue	Interest Rate %	Year of Maturity	2022	2021
Revenue Bonds					
2022	134,605	5.00	2038	$ 132,040	
2020	74,525	5.00	2035	64,435	$ 70,505
2019 - Direct Placement	107,970	4.00-5.00	2034	96,455	102,320
2015	52,520	3.00-5.00	2025	5,980	7,790
2014	162,650	4.00-5.00	2032	106,140	115,470
2013 (a)	258,695	0.45-5.00	2023	8,560	142,700
				413,610	438,785
Ohio Water and Sewer Rotary Commission	-	-	-	50	50
Ohio Public Works Commission	-	0.00-3.00	2041	243	281
Water Pollution Control Loan Fund	-	2.50-3.50		344,972	366,666
Lease Liability	15,000	2.00-5.00	2029	6,625	7,405
Total obligations				765,500	813,187
Bond Premiums				62,496	75,250
Deferred loss on defeasance				(4,694)	(6,021)
Current maturities				(57,079)	(54,118)
Long-term portion				$ 766,223	$ 828,298

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Principal and interest payments on long-term debt for the next five years and thereafter are as follows:

(all amounts in thousands)

	Revenue Bonds		Direct Placement Bonds		WPCLF		OPWC		Lease Liability	
Year	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest
2023	27,585	13,520	6,150	4,823	22,479	6,978	40	1	825	240
2024	29,600	11,503	6,450	4,515	22,974	6,449	25	-	860	207
2025	30,840	10,266	6,760	4,192	22,894	5,898	10	-	895	173
2026	32,915	8,971	7,090	3,855	23,033	5,355	10	-	930	137
2027	30,540	7,643	7,380	3,500	23,602	4,805	11		965	100
2028-2032	110,405	21,445	42,505	11,613	111,289	15,929	52	-	2,150	111
2033-2037	47,940	5,256	20,120	1,521	54,205	6,572	52	-	-	-
2038-2042	7,330	200	-	-	24,219	3,643	42	-	-	-
2043-2047					23,780	2,076	-			
2048-2052					16,497	478				
	$317,155	$ 78,804	$ 96,455	$ 34,019	$ 344,972	$ 58,183	$ 242	$ 1	$ 6,625	$ 968

Bond discount, premium, and loss on defeasance activity for the year:

December 31, 2022	Beginning Balance	Amortized	Refunded	Issued	Ending Balance
Bond Premium	$ 75,250	$ (4,680)	$ (8,084)	$ -	$ 62,486
Loss on defeasance	(6,021)	1,327	-	-	(4,694)
Total	$ 69,229	$ (3,353)	$ (8,084)	$ -	$ 57,792

December 31, 2021	Beginning Balance	Amortized	Refunded	Issued	Ending Balance
Bond Premium	$ 81,131	$ (5,881)		$ -	$ 75,250
Loss on defeasance	(7,348)	1,327	-	-	(6,021)
Total	$ 73,783	$ (4,554)	$ -	$ -	$ 69,229

Long-term debt activity for 2022:

(all amounts in thousands)

December 31, 2022	Beginning Balance	Additions	Reductions	Ending Balance
Revenue Bonds	$ 336,465	$ 134,605	$ 153,915	$ 317,155
Revenue Bonds - Direct Placement	$ 102,320		$ 5,865	$ 96,455
Ohio Water and Sewer Rotary Commission	50			$ 50
Ohio Public Works Commission	281		39	$ 242
Water Pollution Control Loan Fund	366,666		21,694	$ 344,972
Lease Liability	7,405		780	6,625
Total	$ 813,187	$ 134,605	$ 182,293	$ 765,499

Long-term debt activity for 2021:

(all amounts in thousands)

December 31, 2021	Beginning Balance	Additions	Reductions	Ending Balance
Revenue Bonds	$ 360,815		$ 24,350	$ 336,465
Revenue Bonds - Direct Placement	$ 107,970		$ 5,650	$ 102,320
Ohio Water and Sewer Rotary Commission	50	-	-	$ 50
Ohio Public Works Commission	355	-	74	$ 281
Water Pollution Control Loan Fund	379,946	6,863	20,143	$ 366,666
Lease Liability	8,150	-	745	7,405
Total	$ 857,286	$ 6,863	$ 50,962	$ 813,187

Revenue Bonds – Direct Placement

Effective November 26, 2019, the District issued $107,970,000 Series A, the Direct Placement Bond dated November 26, 2019. The proceeds from the 2019 Series A Bonds were used to defease the 2009B Revenue Bonds and pay for cost of issuance. The 2019 Series A Bonds were issued at a premium of $23,045,166. The 2019A Bonds are special obligations of the District, payable solely from the new revenues of the District and were issued on parity with the 2009 and 2010, 2013, 2014, 2015 bonds, secured equally and ratably under the Trust Agreement.

Revenue Bonds

a) Effective April 20, 2022, the District issued $134,605,000 Series A, Sewer Refunding Revenue Bonds dated April 20, 2022. The proceeds from the 2022A Series Bonds were used to defease portions of the 2013A revenue bonds and pay for the cost of issuance. The 2022A Bonds are special obligations of the District, payable solely from the net revenues of the District and were issued on parity with the 2013, 2014, 2015, 2019, 2020 bonds secured equally and ratably under the Trust Agreement.

A portion of the proceeds was used to purchase U.S. Government Securities which were deposited in an irrevocable trust with an escrow agent to provide for all future debt service to refund $125,985,000 of outstanding 2013A Bonds. As a result, these bonds are considered defeased and the liability of those bonds removed from the Balance Sheet.

The 2022A Bonds were sold at par, the District has, in effect reduced its aggregate debt services payments by $18,109,320 and obtained a present value savings of $14,522,761.

b) Effective November 17, 2020, the District issued $74,525,000 Series A, Sewer System Refunding Revenue Bonds dated November 17, 2020. The proceeds from the 2020 Series A Bonds were used to defease portions of the 2010A and 2010B revenue bonds and pay for the cost of issuance. The 2020 A bonds are special obligations of the District, payable solely from the net revenues of the District and were issued on parity with the 2010, 2013, 2014, 2015, 2019 bonds secured equally and ratable under the Trust Agreement.

A portion of the proceeds was used to purchase U.S. Government Securities which were deposited in an irrevocable trust with an escrow agent to provide for all future debt service to refund $101,000,000 of outstanding 2010A and 2010B Bonds. As a result, these bonds are considered defeased and the liability of those bonds removed from the balance sheet.

Although the refunding resulted in the recognition of an account premium of $18,870,385, the District has, in effect, reduced its aggregate debt service payments by $18,190,000, and obtained a present value of savings of $13,091,284.

c) Effective March 3, 2015, the District issued $52,520,000 Series A, Sewer System Refunding Revenue Bonds dated March 3, 2015. The proceeds from the 2015 Series A Bonds were used to defease portions of the 2005A revenue bonds and pay for the cost of issuance. The 2015A bonds are special obligations of the District, payable solely from the net revenues of the District and were issued on parity with the 1997, 2000, 2001, 2003A, 2003B, 2004, 2005A, 2005B, 2006, 2007, 2009A, and 2009B bonds, secured equally and ratably under the Trust Agreement.

A portion of the proceeds was used to purchase U.S. Government Securities which were deposited in an irrevocable trust with an escrow agent to provide for all future debt service to refund $60,360,000 of outstanding 2005A Bonds. As a result, these bonds are considered defeased and the liability for those bonds removed from the balance sheet.

Although the refunding resulted in the recognition of an accounting loss of $1,464,000 in accordance with GASB 23, Accounting and Financial Reporting for Refunding of Debt Reported by Proprietary Activities, the District has, in effect, reduced its aggregate debt service payments by $16,845,000, and obtained a present value of savings of $6,363,000.

d) Effective November 19, 2014, the District issued $162,650,000 Series A, Sewer System Refunding Revenue Bonds dated November 19, 2014. The proceeds from the 2014 Series A Bonds were used to defease portions of the 2003, 2005, and 2006 revenue bonds and pay for the cost of issuance. The 2014A bonds are special obligations of the District, payable solely from the net revenues of the

District and were issued on parity with the 1997, 2000, 2001, 2003A, 2003B, 2004, 2005A, 2005B, 2006, 2007, 2009A, and 2009B bonds, secured equally and ratably under the Trust Agreement.

A portion of the proceeds was used to purchase U.S. Government Securities which were deposited in an irrevocable trust with an escrow agent to provide for all future debt service to refund $750,000 of outstanding 2003 Series A Bonds, $61,190,000, of outstanding 2005 Series B Bonds, $60,620,000 of outstanding 2006 Series A Bonds, $52,505,000 of outstanding 2007 Series A Bonds, and $6,790,000 of outstanding 2009 Series A Bonds. As a result, these bonds are considered defeased and the liability for those bonds removed from the balance sheet.

Although the refunding resulted in the recognition of an accounting loss of $14,949,000 in accordance with GASB 23, Accounting and Financial Reporting for Refunding of Debt Reported by Proprietary Activities, the District has, in effect, reduced its aggregate debt service payments by $70,966,000, and obtained a present value of savings of $24,543,000.

e) Effective July 31, 2013, the District issued $178,760,000 Series A, Sewer System Refunding Revenue Bonds and $79,935,000 Series B, Sewer System Refunding Revenue Bonds dated July 31, 2013. A portion of the proceeds from the 2013 Series A and 2013 Series B Bonds were used to defease portions of the 2003 and 2004 revenue bonds and pay for the cost of issuance. The 2013A bonds are special obligations of the District, payable solely from the net revenues of the District and were issued on parity with the 1997, 2000, 2001, 2003A, 2003B, 2004, 2005A, 2005B, 2006, 2007, 2009A, 2009B, 2010A, and 2010B bonds, secured equally and ratably under the Trust Agreement.

A portion of the proceeds was used to purchase U.S. Government Securities which were deposited in an irrevocable trust with an escrow agent to provide for all future debt service to refund $112,720,000 of outstanding 2003 Series A Bonds, and $28,470,000 of outstanding 2004 Series A Bonds. As a result, these bonds are considered defeased and the liability for those bonds removed from the balance sheet.

The remaining proceeds from the 2013 Series A and 2013 Series B bonds were used to permanently fund certain previous capital expenditures and fund the new bond reserve requirements.

At December 31, 2022, and December 31, 2021 the amount of defeased debt outstanding was $405,050,000 and $296,085,000, respectively.

Maturities for bonds over the next five years and thereafter are shown below:

(all amounts in thousands)

Year	2022 Bonds	2020 Bonds	2019 Bonds	2015 Bonds	2014 Bonds	2013 Bonds	Total
2023	970	6,360	6,150	1,900	9,795	8,560	$ 33,735
2024	10,650	6,675	6,450	1,990	10,285		$ 36,050
2025	10,940	7,000	6,760	2,090	10,810		$ 37,600
2026	13,985	7,335	7,090	-	11,595		$ 40,005
2027	14,985	3,400	7,380		12,155		$ 37,920
2028-2033	39,375	19,530	42,505	-	51,500		$152,910
2034-2037	33,805	14,135	20,120	-			$ 68,060
2038-2043	7,330						$ 7,330
	$132,040	$ 64,435	$96,455	$ 5,980	$ 106,140	$ 8,560	$413,610

Under the terms of the amended revenue bond trust indenture, the District has agreed to certain covenants, among other things, to restrict additional borrowing, maintain rates sufficient to meet debt service requirements and maintain specified fund balances under trust agreements.

The Revenue bond issues as discussed above contain covenants which require the District to maintain a level of debt service coverage. The following calculation reflects the District's debt service coverage.

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NOTES TO THE FINANCIAL STATEMENTS
FOR THE YEARS ENDED DECEMBER 31, 2022, AND 2021

(all amounts in thousands)

	2022	2021
Revenues:		
Total operating revenues	$ 273,618	$ 266,026
Interest income	4,057	4,463
Tap-in/connection fees	3,990	2,607
Total pledged revenue	281,665	273,096
Total operating and maintenance expenses less depreciation and amortization, pension expense	134,868	119,506
Net income available for debt service (a)	$ 146,797	$ 153,590
Principal and interest requirement on revenue bonds (b)	$ 52,078	$ 53,169
Principal and interest requirements on obligations (c)	$ 82,641	$ 83,868
Debt service coverage		
Revenue bonds (a) divided by (b)	282%	289%
All obligations (a) divided by (c)	178%	183%
Maximum debt service coverage required on revenue bonds	125%	125%

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Ohio Water Development Authority Contracts

All contracts between the Ohio Water Development Authority (OWDA) and the Metropolitan Sewer District require the District to prescribe and charge such rates for sewer usage which are sufficient (after expenses of operation and maintenance) to pay principal and interest on OWDA contracts. The principal is repayable in equal semi-annual installments to maturity.

Water Pollution Control Loan Fund

The District has received low interest loan commitments from the Ohio Water Pollution Control Loan fund for certain qualified projects. As the projects progress the commitments are drawn down. The principal is repayable in semi-annual installments to the date of maturity for each project.

Ohio Water and Sewer Rotary Commission

Advances from Ohio Water and Sewer Rotary Commission represent tap-in fees and acreage assessments to be forwarded to the Commission upon collection from customers. Such advances do not bear interest unless they are determined to be in default.

Ohio Public Works Commission

The District has entered into agreements with the Ohio Public Works Commission (OPWC) for financing of certain qualified capital projects. As the projects progress the commitments are drawn down as funds are paid by OPWC directly to the contractors. The principal is repayable in semi-annual installments to the date of maturity for each project.

Interest on Long-Term Obligations

The following interest costs were incurred and expensed or capitalized as part of the cost of the District's additions to capital assets.

(all amounts in thousands)

	2022	2021
Interest incurred	$ 22,332	$ 27,078
Less interest capitalization	-	-
Interest expense	$ 22,332	$ 27,078

The District has implemented the GASB 89 Accounting for Interest Cost incurred before the end of a construction period in 2018.

NOTE 7 – LEASE LIABILITY

The District entered into a capital lease liability for a new engineering building in 2010. The leased asset was capitalized at the amount of the present value of the minimum lease payments at inception of the lease. Capital assets acquired under capital lease are as follows:

Buildings	$15,000,000

The following is a schedule of the future minimum lease liability payments required under the capital lease and the present value of the minimum lease payments as of fiscal year end.

(all amounts in thousands)

Fiscal Year Ending December 31,	Long-Term Debt
2023	1,065
2024	1,067
2025	1,067
2026	1,068
2027	1,064
2028-2029	2,262
Total Minimum Lease Liability Payments	7,593
Less: Amount Representing Interest	(968)
Present value of Minimum Lease Liability Payments	$ 6,625

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NOTE 8 – COMPENSATED ABSENCES

Compensated Absences

Compensated absences consist of vacation time, sick pay, and compensatory time. The following is a summary of activity for 2022 and 2021. $5,677 is considered due within one year for compensated absences as of December 31, 2022.

(all amounts in thousands)

	Beginning Balance	Increase	Decrease	Ending Balance
2022	$ 8,959	$ 5,284	$ 4,197	$ 10,046
2021	$ 10,399	$ 5,158	$ 4,758	$ 8,959

NOTE 9 – DEFINED BENEFIT PENSION PLANS

The District employees are covered by one of two pension systems: the Ohio Public Employees Retirement System (OPERS) and the City of Cincinnati Retirement System (CRS). OPERS is a cost-sharing multi-employer defined benefit pension plan. CRS is accounted for as a single-employer defined benefit plan.

Net Pension Liability

For purposes of measuring the net pension liability, deferred outflows of resources and deferred inflows of resources related to pensions, and pension expense, information about the fiduciary net position of the pension plans and additions to/deductions from their fiduciary net position have been determined on the same basis as they are reported by the retirement systems. For this purpose, benefit payments (including refunds of employee contributions) are recognized when due and payable in accordance with the benefit terms. The retirement systems report investments at fair value.

The net pension liability reported on the statement of net position represents a liability to employees for pensions. Pensions are a component of exchange transactions, between an employer and its employees, of salaries and benefits for employee services. Pensions are provided to an employee, on a deferred-payment basis, as part of the total compensation package offered by an employer for employee services each financial period. The obligation to sacrifice resources for pensions is a present obligation because it was created as a result of employment exchanges that already have occurred.

The net pension liability represents the District's actuarial present value (or with the OPERS cost-sharing, multiple-employer plan, the District's proportionate share of the pension plan's collective actuarial present value) of projected benefit payments attributable to past periods of service, net of each pension plan's fiduciary net position. The net pension liability calculation is dependent on critical long-term variables, including estimated average life expectancies, earnings on investments, cost of living

adjustments and other variables. While these estimates use the best information available, unknowable future events require adjusting this estimate annually. The District's share of each plan's unfunded benefits is presented as a long-term *net pension liability* on the accrual basis of accounting.

A. Ohio Public Employees Retirement System (OPERS)

Ohio Revised Code limits the District's obligation for liabilities to OPERS to annually required payments. The District cannot control benefit terms or the manner in which pensions from the cost-sharing, multiple-employer plan is financed; however, the District does receive the benefit of employees' services in exchange for compensation including pension.

GASB Statement No. 68 assumes the liability is solely the obligation of the employer, because (1) they benefit from employee services; and (2) State statute requires all funding to come from these employers. All contributions to date have come solely from these employers (which also includes costs paid in the form of withholdings from employees). State statute requires the pension plan to amortize unfunded liabilities within 30 years. If the amortization period exceeds 30 years, the pension plan's board must propose corrective action to the State legislature. Any resulting legislative change to benefits or funding could significantly affect the net pension liability. Resulting adjustments to net pension liability would be effective when the changes are legally enforceable.

Plan Description – OPERS

A limited number of the District employees participate in the Ohio Public Employees Retirement System (OPERS). OPERS administers three separate pension plans. The Traditional Pension Plan is a cost-sharing, multiple-employer defined benefit pension plan. The Member-Directed Plan is a defined contribution plan, and the Combined Plan is a cost-sharing, multiple-employer defined benefit pension plan with defined contribution features. While members (e.g., District employees) may elect the Member-Directed Plan or the Combined Plan, most employee members are in OPERS' Traditional Pension Plan; therefore, the following disclosures focus on the Traditional Pension Plan.

OPERS provides retirement, disability, survivor and death benefits, and annual cost of living adjustments to members of the Traditional Pension Plan. Authority to establish and amend benefits is provided by Chapter 145 of the Ohio Revised Code (ORC). OPERS issues a stand-alone financial report that includes financial statements, required supplementary information and detailed information about OPERS' fiduciary net position that may be obtained by visiting https://www.opers.org/financial/reports.shtml, by writing to Ohio Public Employees Retirement System, 277 East Town Street, Columbus, OH 43215-4642, or by calling 800-222-7377.

Senate Bill (SB) 343 was enacted into law with an effective date of January 7, 2013. In the legislation, members were categorized into three groups with varying provisions of the law applicable to each group. The following table provides age and service requirements for retirement and the retirement formula applied to final average salary (FAS) for the three-member groups under the Traditional Pension Plan as per the reduced benefits adopted by SB 343 (see OPERS' ACFR referenced above for additional information):

Group A Eligible to retire prior to January 7, 2013, or five years after January 7, 2013	Group B 20 years of service credit prior to January 7, 2013 or eligible to retire ten years after January 7, 2013	Group C Members not in other Groups and members hired on or after January 7, 2013
State and Local	**State and Local**	**State and Local**
Age and Service Requirements: Age 60 with 60 months of service credit or Age 55 with 25 years of service credit	**Age and Service Requirements:** Age 60 with 60 months of service credit or Age 55 with 25 years of service credit	**Age and Service Requirements:** Age 57 with 25 years of service credit or Age 62 with 5 years of service credit
Formula: 2.2% of FAS multiplied by years of Service for the first 30 years and 2.5% for service years in excess of 30	**Formula:** 2.2% of FAS multiplied by year of service for the first 30 years and 2.5% for service years in excess of 30	**Formula:** 2.2% of FAS multiplied by years of service for the first 35 years and 2.5% for service years in excess of 35

Final average salary (FAS) represents the average of the three highest years of earnings over a member's career for Groups A and B. Group C is based on the average of the five highest years of earnings over a member's career.

Members who retire before meeting the age and years of service credit requirement for unreduced benefits receive a percentage reduction in the benefit amount.

When a benefit recipient has received benefits for 12 months, an annual cost of living adjustment (COLA) is provided. This COLA is calculated on the base retirement benefit at the date of retirement and is not compounded. For those retiring prior to January 7, 2013, the COLA will continue to be a 3% simple annual COLA. For those retiring subsequent to January 7, 2013, beginning in calendar year 2019, the COLA will be based on the average percentage increase in the Consumer Price Index, capped at 3%.

Funding Policy—The ORC provides statutory authority for member and employer contributions. For fiscal year 2022, member contribution rates were 10% of salary and employer contribution rates were 14%. Employer contribution rates are actuarially determined and are expressed as a percentage of covered payroll. The District's contractually required contribution was $256,000 for 2022.

Pension Liabilities, Pension Expense, and Deferred Outflows of Resources and Deferred Inflows of Resources Related – OPERS

The net pension liability for OPERS was measured as of December 31, 2021 and the total pension liability used to calculate the net pension liability was determined by an actuarial valuation as of that date. The District's proportion of the net pension liability was based on the District's share of contributions to the pension plan relative to the contributions of all participating entities. The District's proportion, change in proportion and proportionate share of the net pension liability was 0.01349425%, a decrease of 0.000897%, and $1,174,000, respectively. Pension expense for the District was a negative $745,000.

At December 31, 2022, the District reported deferred outflows of resources and deferred inflows of resources related to pension from the following sources (amounts in thousands):

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net
MSD contributions subsequent to the measurement date	$ 256	$ -	$ 256
Net difference between projected and actual investment earnings	-	(1,395)	(1,395)
Difference between expected and actual experience	60	(26)	34
Change in assumptions	147	-	147
Change in MSD's proportionate share	-	(116)	(116)
	$ 463	$ (1,537)	$ (1,074)

$256,000 reported as deferred outflows of resources related to pension resulting from District contributions subsequent to the measurement date will be recognized as a reduction of the net pension liability in the year ending December 31, 2023. Other amounts reported as deferred outflows of resources and deferred inflows of resources related to pension will be recognized in pension expense as follows (amounts in thousands):

	Net Deferred Outflows/ (Inflows) of Resources
Year Ended December 31:	
2023	$ (284)
2024	(496)
2025	(328)
2026	(222)
	$ (1,330)

Actuarial Assumptions – OPERS

Actuarial valuations of an ongoing plan involve estimates of the values of reported amounts and assumptions about the probability of occurrence of events far into the future. Examples include assumptions about future employment, mortality and cost trends. Actuarially determined amounts are subject to continual review or modification as actual results are compared with past expectations and new estimates are made about the future.

Projections of benefits for financial reporting purposes are based on the substantive plan (the plan as understood by the employers and plan members) and include the types of benefits provided at the time of each valuation. The total pension liability in the December 31, 2021 actuarial valuation was determined using the following actuarial assumptions:

Wage inflation:	
Current measurement period	2.75%
Prior measurement period	3.25%
Future salary increases (including inflation):	
Current measurement period	2.75% to 10.75%
Prior measurement period	3.25% to 10.75%
COLA or Ad Hoc COLA	Pre 1/7/2013 retirees: 3% simple. Post 1/7/2013 retirees: 3% simple through 2022, then 2.05% simple
Investment rate of return:	
Current measurement period	6.90%
Prior measurement period	7.20%
Actuarial cost method	Individual entry age

Pre-retirement mortality rates are based on 130% of the Pub-2010 General Employee Mortality tables (males and females) for State and Local Government divisions and 170% of the Pub-2010 Safety Employee Mortality tables (males and females) for the Public Safety and Law Enforcement divisions. Post-retirement mortality rates are based on 115% of the PubG-2010 Retiree Mortality Tables (males and females) for all divisions. Post-retirement mortality rates for disabled retirees are based on the PubNS-2010 Disabled Retiree Mortality Tables (males and females) for all divisions. For all of the previous described tables, the base year is 2010 and mortality rates for a particular calendar year are determined by applying the MP-2020 mortality improvement scales (males and females) to all of these tables.

The most recent experience study was completed for the five-year period ended December 31, 2020.

During 2021, OPERS managed investments in three investment portfolios: the Defined Benefit portfolio, the Health Care portfolio and the Defined Contribution portfolio. The Defined Benefit portfolio contains the investment assets of the Traditional Pension Plan, the defined benefit component of the Combined Plan and the annuitized accounts of the Member-Directed Plan. Within the Defined Benefit portfolio, contributions into the plans are all recorded at the same time, and benefit payments all occur on the first of the month. Accordingly, the money-weighted rate of return is considered to be the same for all plans within the portfolio. The annual money-weighted rate of return expressing investment performance, net of investment expenses and adjusted for the changing amounts actually invested, for the Defined Benefit portfolio was a gain of 15.3% for 2021.

The allocation of investment assets within the Defined Benefit portfolio is approved by the Board of Trustees in the annual investment plan. Plan assets are managed on a total return basis with a long-term objective of achieving and maintaining a fully funded status for the benefits provided through the defined benefit pension plans. The long-term expected rate of return on defined benefit investment assets was

determined using a building-block method in which best-estimate ranges of expected future rates of return are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future rates of return by the target asset allocation percentage, adjusted for inflation. Best estimates of arithmetic rates of return were provided by the Board's investment consultant. For each major asset class that is included in the Defined Benefit portfolio's target asset allocation as of December 31, 2021, these best estimates are summarized in the following table:

Asset Class	Target Allocation	Weighted Average Long-Term Expected Real Rate of Return
Fixed Income	24.00%	1.03%
Domestic Equities	21.00%	3.78%
Real Estate	11.00%	3.66%
Private Equity	12.00%	7.43%
International Equities	23.00%	4.88%
Risk Parity	5.00%	2.92%
Other Investments	4.00%	2.85%
Total	100.00%	4.21%

Discount Rate. The discount rate used to measure the total pension liability was 6.9%. The projection of cash flows used to determine the discount rate assumed that contributions from plan members and those of the contributing employers are made at the statutorily required rates. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Sensitivity of the District's Proportionate Share of the Net Pension Liability to Changes in the Discount Rate. The following table represents the District's proportionate share of the net pension liability calculated using the current period discount rate assumption of 6.9%, as well as what the District's proportionate share of the net pension liability would be if it were calculated using a discount rate that is one-percentage point lower (5.9%) and one-percentage point higher (7.9%) than the current rate (amounts in thousands):

	1% Decrease (5.9%)	Current Discount Rate (6.9%)	1% Increase (7.9%)
MSD's proportionate share of the net pension liability	$ 3,095	$ 1,174	$ (425)

B. City of Cincinnati Retirement System (CRS)

Plan Description – CRS

Employees who do not participate in OPERS participate in CRS. CRS is accounted for as a single employer defined benefit pension plan. CRS provides retirement and disability benefits, annual cost of living adjustments, and death benefits to plan members and beneficiaries. CRS is considered part of the City of Cincinnati's financial reporting entity and is included in the City's financial report as a pension trust fund.

The financial report that includes financial statements, required supplementary information and detailed information about CRS' fiduciary net position may be obtained by visiting http://cincinnati-oh.gov/finance/financial-reports/. Article XV of the Administrative Code of the City of Cincinnati provides the statutory authority vesting the general administration and responsibility for the proper operation of the System in the Board of Trustees of the City of Cincinnati Retirement System.

Information in the remainder of this footnote is provided for the District's portion, being reported as an agency fund of the City, which also participates in and contributes to CRS, with a measurement date of June 30, 2022.

A major plan revision was approved by the City Council on March 16, 2011 and adopted by the CRS's Board. The plan allows for a two- and half-year transition period from July 1, 2011 to January 1, 2014. Active members who are eligible or become eligible to retire and elect to retire during this transition period can retire with 30 years of creditable service or at age 60 with at least five years of creditable service and will receive benefits according to the current plan as described below.

A Collaborative Settlement Agreement (CSA) was executed on May 7, 2015 and approved by the United States District Court on October 5, 2015. The CSA impacts employees who were retired on or before July 1, 2011 and employees who were in service on July 1, 2011 and who were vested (had 5 years' service credit) on that date. Employees who are members of the CRS who did not meet those criteria remained subject to the plan provisions adopted in Ordinances No 84-2011 and 85-2011.

The CSA implemented a number of changes to the CRS, including, but not limited to:

- Normal retirement eligibility;
- Early retirement eligibility;
- Retiree healthcare eligibility;
- Cost of living adjustments payable to retirees;
- Establishment of a Deferred Retirement Option Program (DROP);
- Creation of a 115 Trust for retiree healthcare benefits;
- Changes to the composition of the Board of Trustees; and
- Payoff of the 2007 Early Retirement Incentive Program (ERIP) liability.

Groups C & D Eligible to retire on or before July 1, 2011; or December 31, 2013	Group E Eligible to retire on or before December 31, 2013	Group F Hired before January 1, 2010 and not eligible for other groups	Group G Hired on or after January 1, 2010
Normal Retirement: Age 60 with 5 years of service, or any age with 30 years of service	**Normal Retirement:** Age 60 with 5 years of service, or any age with 30 years of service	**Normal Retirement:** Age 60 with 5 years of service, or any age with 30 years of service	**Normal Retirement:** Age 67 with 5 years of service, or age 62 with 30 years of service
Early Retirement: Age 55 with 25 years of service	**Early Retirement:** Age 55 with 25 years of service	**Early Retirement:** Age 55 with 25 years of service	**Early Retirement:** Age 57 with 15 years of service
Benefit Formula: 2.5% of AHC times years of service	**Benefit Formula:** 2.5% of AHC times years of service up to greater of 20 years or years of service as of July 1, 2011, and 2.2% thereafter	**Benefit Formula:** 2.5% of AHC times years of service up to greater of 20 years or years of service as of July 1, 2011, and 2.2% thereafter	**Benefit Formula:** 2.2% of AHC times years of service up to 30 years; 2.0% over 30 years

Average Highest Compensation (AHC) represents the average of the highest three consecutive years of earnings for Groups C and D. Group E will have a benefit with up to a three-step formula. The first step is the AHC based upon three consecutive years of earnings for service through December 31, 2013. The second step is the AHC based upon five consecutive years of earnings for service on and after January 1, 2014. The third step is for service in excess of 20 years and is based on the AHC for three consecutive years of earnings. Similar, Group F will have a benefit with up to a three-step formula. The first step is the AHC based upon three consecutive years of earnings for service through June 30, 2011. The second step is the AHC based upon five consecutive years of earnings for service on and after July 1, 2011. The third step is for service in excess of 20 years and is based on the AHC for three consecutive years of earnings. The AHC for Group G is based on the average of the highest five consecutive years of earnings. Upon retirement, members will not receive a cost-of-living adjustment (COLA) for the first three retirement anniversary dates. Thereafter, a 3% simple COLA benefit will be provided. A COLA poverty exception is available for members who meet certain financial requirements.

In fiscal year 2021, an ERIP was offered to employees who met certain eligibility requirements. The ERIP provided two additional years of membership service credit to full-time employees who had 28 years or more of service credit (and were at least age 62 for Group G) or who had at least five years of service credit and were at least age 60 (or at least age 67 for Group G) by December 31, 2020. Only employees in CRS were eligible. The additional actuarial accrued liability associated with the fiscal year 2021 ERIP was approximately $24,671,000 and is to be funded by separate contributions made by the Plan over a 15-year period. The annual payments are received by July 30 each fiscal year.

Members of the Active Employee Class, under the Collaborative Settlement Agreement, who have a minimum of 30 years' service credit are eligible to participate in the deferred retirement option plan (DROP). Upon entry into DROP, the member's monthly pension benefit is calculated as if they retired on

that date. DROP participants continue to work as a District employee and if eligible, may continue to be enrolled in a District sponsored employee healthcare plan. Maximum participation in the DROP is five years. Members who participate in DROP continue to contribute 9% of their pensionable earnings to CRS. The participant's monthly pension benefit amount (calculated as described above), as well as 75% of the participant's required CRS employee contributions, and interest earnings on their DROP account balance, accumulate tax-deferred in an account held in trust by the CRS. Participants do not have access to the funds in their DROP account while employed and participating in the DROP.

Interest is paid on DROP account balances quarterly at the rate equal to the 10-year U.S. Treasury Note Business Day Series, as published by the United States Federal Reserve, with a cap of 5%. The variable interest rate is determined quarterly. The rate for the last business day of each calendar quarter is applied to the following quarter.

The balance of the participant's DROP account is paid out in a lump sum or to another tax-qualified account (such as an IRA or 457 Deferred Compensation Plan) selected by the participant within 120 days of their retirement effective date.

Membership in the CRS pension as of the June 30, 2022, measurement date was as follows:

Retirees and beneficiaries (optionees) receiving benefits	4,206
Terminated plan members and beneficiaries (optionees) entitled to future benefits	247
Deferred retirement option plan (DROP) participants	184
Active plan members:	
Full-time	2,580
Part-time	1,238
Total	8,455
Inactive participants**	9,820

** Participants who are former employees who have an employee account balance in the plan but are not otherwise vested in an employee provided benefit.

Funding Policy—Each member contributes at a rate of 9.0% of his pensionable wages for 2022. The percent contributed by employees is provided by Chapter 203 Section 73 of the Cincinnati Municipal Code. The District makes employer contributions based on a percentage of the covered payroll of all CRS members. For 2022, the contribution rate was 16.25%. The District's contributions to the City of Cincinnati Retirement System's Pension Fund for the year ending December 31, 2022, were $6,707,092.

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

The net pension liability was measured as of June 30, 2022, and the total pension liability used to calculate the net pension liability was determined by an actuarial valuation as of December 31, 2021. The District reported a net pension liability of $287,387,000 and negative pension expense of $44,613,000.

At December 31, 2022, the District reported deferred outflows of resources related to pension from the following sources (amounts in thousands):

	Deferred Outflows of Resources
MSD contributions subsequent to the measurement date	$ 3,568
Differences between expected and actual experience	858
Net difference between projected and actual investment earnings	4,890
Change in proportion	1,571
Change in assumptions	55,560
	$ 66,447

$3,568,000 reported as deferred outflows of resources related to pension resulting from District contributions subsequent to the measurement date will be recognized as a reduction of the net pension liability in the year ended December 31, 2023. Other amounts reported as deferred outflows of resources related to pension will be recognized in pension expense as follows (amounts in thousands):

	Deferred Outflows Resources
Year Ended December 31:	
2023	$ 59,969
2024	34
2025	(5,444)
2026	8,320
	$ 62,879

Actuarial Assumptions: Total pension liability was determined by the following actuarial valuations, using the following actuarial assumptions, applied to applicable periods included in the measurement:

Inflation	2.75%
Salary increases, including inflation	3.75% to 7.50%
Long-term investment rate of return, net of pension plan investment expense, including inflation	7.50%
Municipal bond index rate:	
Measurement date	3.54%
Prior measurement date	2.21%

Single equivalent interest rate, net of pension plan investment expense, including inflation	
Measurement date	5.25%
Prior measurement date	7.50%

Active member mortality rates were based on the RP-2014 Mortality Table, with generational mortality improvement projections using the MP-2017 scale. Health inactive member mortality rates were based on the RP-2014 Mortality Table, with generational mortality improvement projections using the MP-2017 scale and set forward two years for both males and females. Disabled inactive member mortality rates were based on the RP-2014 Disabled Retiree Mortality Table, with generational improvement projections using the MP-2017 scale.

The actuarial assumptions used in the December 31, 2021, valuation was based on the results of the last actuarial experience study performed for the period January 1, 2012, to December 31, 2016, adopted on February 28, 2018.

Long Term Expected Rate of Return. The long-term expected rate of return on pension plan investments was determined using expected return and volatility figures which were developed by Marquette Associates using their asset allocation software. The program simulates a variety of economic environments based on macroeconomic variables, and this simulation allows us to model the underlying probabilities of capital market returns. By running the monthly simulations over a 10-year basis and performing 1,000 trials, they develop results for expectations of capital market performance. Expected risk and return values for all asset classes are updated every six months, as the underlying data and assumptions reflect current market values and trends.

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

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return*
Core Bonds	12.0 %	4.1 %
High Yield	2.0 %	9.0 %
Private Debt	3.0 %	8.6 %
All Cap U.S. Equity	21.5 %	6.9 %
Large-Cap Value Equity	3.5 %	6.7 %
Mid-Cap Value Equity	2.0 %	7.1 %
Small-Cap Value Equity	3.5 %	7.8 %
Non-U.S. All Cap	18.0 %	7.2 %
Emerging Markets-Small Cap	2.0 %	7.5 %
Real Estate Core Equity	7.5 %	6.6 %
Infrastructure	10.0 %	6.8 %
Risk Parity	2.5 %	4.8 %
Volatility Risk Premium	2.5 %	10.0 %
Private Equity-FOF	10.0 %	11.2 %
Total	100.0 %	

Discount Rate. The discount rate used to measure the total pension liability was 5.25% as of June 30, 2022. The projection of cash flows used to determine the discount rate assumed that employee contributions will be made at the current contribution rate and that employer contributions will be made as set out in the CSA. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make projected future benefit payments of current members through 2047. Projected benefit payments are discounted at the long-term expected return on assets of 7.50% to the extent the fiduciary net position is available to make the payments through 2047 and at the municipal bond rate of 3.54% to the extent they are not available after 2047. Consequently, the single equivalent rate used to determine the total pension liability as of June 30, 2022, is 5.25%. By comparison, the single equivalent rate used to determine the total pension liability as of June 30, 2021, was 7.50%.

Sensitivity of the Employer's Proportionate Share of the Net Pension Liability to Changes in the Discount Rate: The following chart represents the District financial reporting entity's proportionate share of the net pension liability calculated using the current period discount rate assumption of 5.25%, as well as the sensitivity to a 1% increase and 1% decrease in the current discount rate (amounts in thousands):

	1% Decrease (4.25%)	Current Discount Rate (5.25%)	1% Increase (6.25%)
MSD's Net Pension Liability	$ 361,523	$ 287,387	$ 225,727

Change in the Net Pension Liability: Changes in the District financial reporting entity's net pension liability for the measurement year ended June 30, 2022, were as follows (amounts in thousands):

	Total Pension Liability	Plan Fiduciary Net Position	Net Pension Liability
Balances at June 30, 2021	$ 459,331	$ 343,916	$ 115,415
Changes for the year:			
Service cost	4,055	-	4,055
Interest	34,899	-	34,899
Difference between expected and actual experience	1,931	-	1,931
Change in assumptions	125,010	-	125,010
Contributions - employer	-	7,304	(7,304)
Contributions - employee	-	3,864	(3,864)
Net investment income (loss)	-	(15,379)	15,379
Benefit payments, including refunds of employee contributions	(36,245)	(36,245)	-
Administrative expense	-	(333)	333
Other changes	-	(1,533)	1,533
Net changes	129,650	(42,322)	171,972
Balances at June 30, 2022	$ 588,981	$ 301,594	$ 287,387

The total pension liability (TPL) at the end of the measurement year, June 30, 2022, is measured as of the valuation date of December 31, 2021, and projected to June 30, 2022. Valuations will be completed every year. Each valuation will be rolled forward six months to provide the GAAP basis liability. There were assumption changes during the period, which are reflected in the amounts. The TPL and service cost have been determined using the entry age actuarial cost method as required by GASB Statement No. 67.

NOTE 10 – DEFINED BENEFIT OTHER POSTEMPLOYMENT BENEFIT (OPEB) PLANS

The two retirement systems District employees participate in provide defined benefit postemployment benefits other than pension. The Ohio Public Employees Retirement System (OPERS) is a cost-sharing multiple-employer defined benefit OPEB plans. The City of Cincinnati Retirement System (CRS) is accounted for as a single-employer defined benefit OPEB plan.

Net OPEB Assets

For purposes of measuring the net OPEB assets, deferred outflows of resources and deferred inflows of resources related to OPEB, and OPEB expense, information about the fiduciary net position of the OPEB plans and additions to/deductions from their fiduciary net position have been determined on the same basis as they are reported by the retirement systems. For this purpose, benefit payments (including refunds of employee contributions) are recognized when due and payable in accordance with the benefit terms. The retirement systems report investments at fair value.

The net OPEB asset reported on the statement of net position represents an asset to fund employee OPEB. OPEB is a component of exchange transactions—between an employer and its employees—of salaries and benefits for employee services. OPEB is provided to an employee—on a deferred-payment basis—as part of the total compensation package offered by an employer for employee services each financial period. The obligation to sacrifice resources for OPEB is a present obligation because it was created as a result of employment exchanges that already have occurred.

The net OPEB asset represents the District's actuarial present value (or with the OPERS cost-sharing, multiple-employer plan, the District's proportionate share of the OPEB plan's collective actuarial present value) of projected benefit payments attributable to past periods of service, net of each OPEB plan's fiduciary net position. The net OPEB asset) calculation is dependent on critical long-term variables, including estimated average life expectancies, earnings on investments, cost of living adjustments, cost trends and other variables. While these estimates use the best information available, unknowable future events require adjusting this estimate annually.

The District's share of each fully-funded benefits as long-term *net OPEB assets* on the accrual basis of accounting.

A. Ohio Public Employees Retirement System (OPERS)

Ohio Revised Code limits the District's obligation for liabilities to OPERS to annual required payments. The District cannot control benefit terms or the manner in which OPEB from the cost-sharing, multiple-employer plan is financed; however, the District does receive the benefit of employees' services in exchange for compensation including OPEB.

GASB Statement No. 75 assumes the liability is solely the obligation of the employer, because they benefit from employee services. OPEB contributions come from these employers and health care plan enrollees which pay a portion of the health care costs in the form of a monthly premium. The Ohio Revised Code permits but does not require the cost-sharing, multiple-employer retirement system to provide health care to eligible benefit recipients. Any change to benefits or funding could significantly affect the net OPEB asset. Resulting adjustments to the net OPEB asset would be effective when the changes are legally enforceable. The retirement systems may allocate a portion of the employer contributions to provide for these OPEB benefits.

Plan Description— OPERS

The District contributes to the health care plans administered by OPERS. OPERS is a cost-sharing, multiple-employer public employee retirement system comprised of three separate pension plans; the Traditional Pension Plan, a defined benefit plan; the Combined Plan, a combination defined benefit/defined contribution plan; and the Member-Directed Plan, a defined contribution plan.

OPERS maintains a cost-sharing, multiple-employer defined benefit post-employment health care trust, which funds multiple health care plans including medical coverage, prescription drug coverage and deposits to a Health Reimbursement Arrangement to qualifying benefit recipients of both the traditional pension and combined plans. This trust is also used to fund health care for member-directed plan

participants, in the form of a Retiree Medical Account (RMA). At retirement or refund, member-directed plan participants may be eligible for reimbursement of qualified medical expenses for their vested RMA balance.

In order to quality for postemployment health care coverage, age and service retirees under the traditional pension and combined plans must have twenty or more years of qualifying Ohio service credit. Health care coverage for disability benefit recipients and qualified survivor benefit recipients is available. The health care coverage provided by OPERS meets the definition of another post-employment benefit (OPEB) as described in GASB Statement No. 75. See OPERS' ACFR referenced below for additional information.

The Ohio Revised Code permits but does not require OPERS to provide health care to its eligible benefit recipients. Authority to establish and amend health care coverage is provided to the Board in Chapter 145 of the Ohio Revised Code.

Disclosures for the health care plan are presented separately in the OPERS financial report. Interested parties may obtain a copy by visiting https://www.opers.org/financial/reports.shtm, by writing to OPERS, 277 East Town Street, Columbus, Ohio 43215-4642, or by calling (614) 222-5601 or 800-222-7377.

Funding Policy—The Ohio Revised Code provides the statutory authority requiring public employers to fund postemployment health care through their contributions to OPERS. When funding is approved by OPERS' Board of Trustees, a portion of each employer's contribution to OPERS is set aside to fund OPERS health care plans. Beginning in 2018, health care is not being funded.

Employer contribution rates are expressed as a percentage of the earnable salary of active members. In 2022, state and local employers contributed at a rate of 14% of earnable salary. These are the maximum employer contribution rates permitted by the Ohio Revised Code. Active member contributions do not fund health care.

Each year, the OPERS Board determines the portion of the employer contribution rate that will be set aside to fund health care. The portion of employer contributions allocated to health care for members in the Traditional Pension Plan was 0% during calendar year 2022. For the Combined Plan, the portion of the employer contributions allocated to health care was 0% from January 1, 2022 to June 30, 2022, and was 2% from July 1, 2022 to December 31, 2022.

As recommended by OPERS' actuary, the portion of employer contributions allocated to health care beginning January 1, 2023 remains at 0% for the Traditional Pension Plan and 2% for the Combined Plan. The OPERS Board is also authorized to establish rules for the retiree or their surviving beneficiaries to pay a portion of the health care provided. Payment amounts vary depending on the number of covered dependents and the coverage selected. The employer contribution as a percentage of covered payroll deposited into the RMA for participants in the Member-Directed Plan for 2022 was 4%.

OPEB Asset, OPEB Expense, and Deferred Outflows and Inflows of Resources Related to OPEB—OPERS

The net OPEB asset and total OPEB liability for OPERS were determined by an actuarial valuation as of December 31, 2020, rolled forward to the measurement date of December 31, 2021, by incorporating the expected value of health care cost accruals, the actual health care payment, and interest accruals during the year. The District's proportion of the net OPEB asset was based on the District's share of contributions to the respective retirement system relative to the contributions of all participating entities. The District's proportion change in proportion and proportionate share of the net OPEB asset was 0.01318646%, a decrease of 0.000851%, and $413,000, respectively. OPEB expense for the District was negative $453,000.

At December 31, 2022, the District reported deferred outflows of resources and deferred inflows of resources related to OPEB from the following sources (amounts in thousands):

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net
MSD contributions subsequent to the measurement date	$ 5	$ -	$ 5
Net difference between projected and actual investment earnings	-	(197)	(197)
Difference between expected and actual experience	-	(62)	(62)
Change in assumptions	-	(168)	(168)
Change in MSD's proportionate share	-	(41)	(41)
	$ 5	$ (468)	$ (463)

$5,000 reported as deferred outflows of resources related to OPEB resulting from District contributions subsequent to the measurement date will be recognized as an increase of the net OPEB asset in the year ended December 31, 2023. Other amounts reported as deferred inflows of resources related to OPEB will be recognized in OPEB expense as follows (amounts in thousands):

	Deferred Inflows of Resources
Year Ended December 31:	
2023	$ (303)
2024	(94)
2025	(43)
	$ (440)

Actuarial Assumptions—OPERS

Actuarial valuations of an ongoing plan involve estimates of the value of reported amounts and assumptions about the probability of occurrence of events far into the future. Examples include assumptions about future employment, mortality, and cost trends. Actuarially determined amounts are subject to continual review or modification as actual results are compared with past expectations and new estimates are made about the future.

Projections of health care costs for financial reporting purposes are based on the substantive plan and include the types of coverages provided at the time of each valuation and the historical pattern of sharing of costs between OPERS and plan members. The total OPEB liability was determined by an actuarial valuation as of December 31, 2010, rolled forward to the measurement date of December 31, 2021. The actuarial valuation used the following actuarial assumptions applied to all prior periods included in the measurement in accordance with the requirements of GASB Statement No. 74:

Wage inflation:	
Current measurement period	2.75%
Prior measurement period	3.25%
Projected salary increases:	
Current measurement period	2.75% to 10.75%, including wage inflation
Prior measurement period	3.25% to 10.75%, including wage inflation
Singe discount rate:	6.00%
Investment rate of return	6.00%
Municipal bond rate:	
Current measurement period	1.84%
Prior measurement period	2.00%
Health care cost trend rate:	
Current measurement period	5.5% initial, 3.50% ultimate in 2034
Prior measurement period	8.5% initial, 3.50% ultimate in 2035
Actuarial cost method	Individual entry age

Pre-retirement mortality rates are based on 130% of the Pub-2010 General Employee Mortality tables (males and females) for State and Local Government divisions and 170% of the Pub-2010 Safety Employee Mortality tables (males and females) for the Public Safety and Law Enforcement divisions. Post-retirement mortality rates are based on 115% of the PubG-2010 Retiree Mortality Tables (males and females) for all divisions. Post-retirement mortality rates for disabled retirees are based on the PubNS-2010 Disabled Retiree Mortality Tables (males and females) for all divisions. For all of the previous described tables, the base year is 2010 and mortality rates for a particular calendar year are determined by applying the MP-2020 mortality improvement scales (males and females) to all of these tables.

The most recent experience study was completed for the five-year period ended December 31, 2020.

During 2021, OPERS managed investments in three investment portfolios: the Defined Benefit portfolio, the Health Care portfolio and the Defined Contribution portfolio. The Defined Benefit portfolio contains the investment assets of the Traditional Pension Plan, the defined benefit component of the Combined Plan and the annuitized accounts of the Member-Directed Plan. Within the Health Care portfolio, contributions into the plans are assumed to be received continuously throughout the year based on the actual payroll payable at the time contributions are made, and health care-related payments are assumed to occur mid-year. Accordingly, the money-weighted rate of return is considered to be the same for all plans within the portfolio. The annual money-weighted rate of return expressing investment performance, net of investment expenses and adjusted for the changing amounts actually invested, for the Health Care portfolio was a gain of 14.3% for 2021.

The allocation of investment assets within the Defined Benefit portfolio is approved by the Board of Trustees in the annual investment plan. Plan assets are managed on a total return basis with a long-term objective of achieving and maintaining a fully funded status for the benefits provided through the defined benefit pension plans. The long-term expected rate of return on defined benefit investment assets was determined using a building-block method in which best-estimate ranges of expected future rates of return are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future rates of return by the target asset allocation percentage, adjusted for inflation. Best estimates of arithmetic rates of return were provided by the Board's investment consultant. For each major asset class that is included in the Defined Benefit portfolio's target asset allocation as of December 31, 2021, these best estimates are summarized in the following table:

Asset Class	Target Allocation	Weighted Average Long-Term Expected Real Rate of Return (Arithmetic)
Fixed Income	34.00%	0.91%
Domestic Equities	25.00%	3.78%
REITs	7.00%	3.71%
International Equities	25.00%	4.88%
Risk Parity	2.00%	2.92%
Other Investments	7.00%	1.93%
Total	100.00%	3.45%

Discount Rate. A single discount rate of 6.0% was used to measure the OPEB liability on the measurement date of December 31, 2021. Projected benefit payments are required to be discounted to their actuarial present value using a single discount rate that reflects (1) a long-term expected rate of return on OPEB plan investments (to the extent that the health care fiduciary net position is projected to be sufficient to pay benefits), and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions

for use with the long-term expected rate are not met). This single discount rate was based on the actuarial assumed rate of return on the health care investment portfolio of 6.0% and a municipal bond rate of 1.84%. The projection of cash flows used to determine this single discount rate assumed that employer contributions will be made at rates equal to the actuarially determined contribution rate. Based on these assumptions, the health care fiduciary net position and future contributions were sufficient to finance health care costs through 2121. As a result, the actuarial assumed long-term expected rate of return on health care investments was applied to projected costs through the year 2121, the duration of the projection period through which projected health care payments are fully funded.

Sensitivity of the District's Proportionate Share of the Net OPEB Asset to Changes in the Discount Rate and Changes in the Health Care Cost Trend Rates. The following table present the net OPEB asset calculated using the single discount rate of 6.0% and the expected net OPEB asset if it were calculated using a discount rate that is 1.0% lower or 1.0% higher than the current rate (amounts in thousands):

	1% Decrease (5.0%)	Current Discount Rate (6.0%)	1% Increase (7.0%)
MSD' proportionate share of the net OPEB asset	$ 243	$ 413	$ 554

Sensitivity of the District's Proportionate Share of the Net OPEB Asset to Changes in the Health Care Cost Trend Rate. Changes in the health care cost trend rate may also have a significant impact on the net OPEB asset. The following table presents the net OPEB asset calculated using the assumed trend rates, and the expected net OPEB asset if it were calculated using a health care cost trend rate that is 1.0% lower or 1.0% higher than the current rate.

Retiree health care valuations use a health care cost-trend assumption that changes over several years built into the assumption. The near-term rates reflect increases in the current cost of health care; the trend starting in 2022 is 5.50%. If this trend continues for future years, the projection indicates that years from now virtually all expenditures will be for health care. A more reasonable alternative is that in the not-too-distant future, the health plan cost trend will decrease to a level at, or near, wage inflation. On this basis, the actuaries' project premium rate increases will continue to exceed wage inflation for approximately the next decade, but by less each year, until leveling off at an ultimate rate, assumed to be 3.50% in the most recent valuation.

	1% Decrease	Current Health Care Cost Trend Rate	1% Increase
MSD' proportionate share of the net OPEB asset	$ 417	$ 413	$ 408

B. City of Cincinnati Retirement System (CRS)

Plan Description – CRS

CRS provides health care coverage to eligible retirees, their spouse and dependent children and is accounted for as a single employer defined benefit OPEB plan. Active members in Group C who have earned fifteen years of membership service at the time of termination are eligible upon retirement. Other active members are eligible for retiree health care upon their retirement after reaching age 60 with 20 years of membership service, or any age with 30 years of service of which 20 years must be earned with CRS. Active members whose most recent membership enrollment date is on or after January 1, 2016 are not eligible for retiree health care benefits upon retirement.

CRS offers medical and prescription benefits to retirees before and during Medicare eligibility. Prescription benefits for Medicare eligible participants are provided through a Medicare Part D Employer Group Waiver Plan. CRS administers three health care plans that differ by deductibles, co-pays and out-of-pocket maximums. Two plans are closed groups. The third plan for eligible members who retire on or after January 1, 2016, follows the most advantageous plan offered to active District employees.

Membership in CRS OPEB as of the June 30, 2022, measurement date was as follows:

Retirees and beneficiaries (optionees) receiving benefits*	4,909
Terminated plan members and beneficiaries (optionees)	
Entitled to future benefits	371
Deferred retirement option plan (DROP) participants	184
Active plan members:	
Full-time	1,673
Part-time	210
Total	7,347

* OPEB members include 1,398 spouses currently receiving retiree health benefits.

CRS is considered part of the City of Cincinnati's financial reporting entity and is included in the City's financial report as part of the pension trust fund. The financial report that includes the financial statements, required supplementary information and detailed information about CRS' fiduciary net position may be obtained by visiting http://cincinnati-oh.gov/finance/financial-reports/. Information in the remainder of this footnote is provided for the District's portion, being reported as an agency fund of the City, which also participates in and contributes to the CRS, with a measurement date of June 30, 2022.

Funding Policy — Most retirees are subject to premiums that range from 0% to 10%. Other retiree premiums range from 5% to 75% depending on their date of hire, years of service and age at retirement. All members electing to participant in the dental and/or vision plan are required to pay the full cost of coverage. As such, it was assumed that CRS has no liability under GASB Statement No. 74 for these benefits.

OPEB (Asset), OPEB Expense, and Deferred Outflows and Inflows of Resources Related to OPEB—CRS

The District's net OPEB (asset) was measured as of June 30, 2022, and the total OPEB liability used to calculate the net OPEB asset was determined by an actuarial valuation as of December 31, 2021. The District reported a net OPEB asset of $29,245,000 and negative OPEB expense of $5,574,000.

At December 31, 2022, the District reported deferred outflows of resources and deferred inflows of resources related to OPEB from the following sources (amounts in thousands):

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net
Differences between expected and actual experience	$ 526	$ (2,697)	$ (2,171)
Net difference between projected and actual investment earnings	1,582	-	1,582
Change in proportion	151	(276)	(125)
Change in assumptions	2,556	(9,197)	(6,641)
	$ 4,815	$ (12,170)	$ (7,355)

Amounts reported as deferred outflows of resources and deferred inflows of resources will be recognized in OPEB expense as follows (amounts in thousands):

	Net Deferred Outflows/ (Inflows) of Resources
Year Ended December 31:	
2023	$ (4,302)
2024	(1,920)
2025	(3,630)
2026	2,497
	$ (7,355)

Actuarial Assumptions. The total OPEB liability in the following actuarial valuations were determined using the following actuarial assumptions, applied to the applicable periods included in the measurement:

Inflation:	
CPI	2.75%
Medical CPI	3.25%
Salary increases, including wage inflation	3.75% - 7.50%, decreasing as years of service increase

Long-term investment rate of return	7.50%
Municipal bond index rate:	
Measurement date	3.54%
Prior measurement date	2.16%
Single equivalent interest rate, net of OPEB plan investment expense, including price inflation	
Measurement date	7.50%
Prior measurement date	7.50%
Health care cost trends:	
Medicare supplement claims	
Pre-Medicare	8.00% for 2021, decreasing to an ultimate rate of 4.00% by 2036.
Post-Medicare	4.97% / 4.84% for Non-Model and Model Plans, respectively, for 2021, decreasing to an ultimate rate of 4.00% by 2036.

The demographic actuarial assumptions used in the December 31, 2019, valuation was based on the results of the most recent actuarial experience study, adopted by the Board on March 1, 2018.

Pre-retirement mortality rates were based on RP-2014 healthy employee dataset mortality with fully generational projected mortality improvements using MP-2017. RP-2014 healthy employee dataset mortality rates for males and females have been set forward 2 years. Post-retirement mortality rates for health lives were based on RP-2014 total dataset mortality with fully generational projected mortality improvements using MP-2017. RP-2014 total dataset mortality rates for males and females have been set forward 2 years. For disabled lives, RP-2014 disabled retiree mortality with fully generational projected mortality improvements using MP-2017.

Of the CSA employee members eligible for DROP benefits, 60% are assumed to decline participation and 40% are assumed to be elect participation. Those electing to participate are assumed to remain in DROP for 3 years.

Of the vested members who terminate, it is assumed that 60% will leave their contributions in the plan to be eligible for a benefit at their normal retirement date while remaining 40% elect to withdraw their contributions.

Long Term Expected Rate of Return. The long-term expected rate of return on pension plan investments was determined using expected return and volatility figures which were developed by Marquette Associates using their asset allocation software. The program simulates a variety of economic environments based on macroeconomic variables, and this simulation allows us to model the underlying probabilities of capital market returns. By running the monthly simulations over a 10-year basis and performing 1,000 trials, they develop results for expectations of capital market performance. Expected risk and return values for all asset classes are updated every six months, as the underlying data and assumptions reflect current market values and trends.

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

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return*
Core Bonds	12.0 %	4.1 %
High Yield	2.0 %	9.0 %
Private Debt	3.0 %	8.6 %
All Cap U.S. Equity	21.5 %	6.9 %
Large-Cap Value Equity	3.5 %	6.7 %
Mid-Cap Value Equity	2.0 %	7.1 %
Small-Cap Value Equity	3.5 %	7.8 %
Non-U.S. All Cap	18.0 %	7.2 %
Emerging Markets-Small Cap	2.0 %	7.5 %
Real Estate Core Equity	7.5 %	6.6 %
Infrastructure	10.0 %	6.8 %
Risk Parity	2.5 %	4.8 %
Volatility Risk Premium	2.5 %	10.0 %
Private Equity-FOF	10.0 %	11.2 %
Total	100.0 %	

Determination of Discount Rate (SEIR). The plan uses the Bond Buyer G.O. 20 Year Bond Municipal Bond Index to satisfy the requirements under paragraph 48 of GASB Statement No. 74. As this Index is issued weekly, the value closest to, but after the reporting date is used in determining the appropriate rate. Based on this practice, the municipal bond index rate at June 30, 2022, was 3.54% and 2.16% at June 24, 2021.

The discount rate used to measure the total OPEB liability as of June 30, 2022, was 7.50%. The projection of cash flows used to determine the discount rate was performed in accordance with GASB Statement No. 74. The projection's basis was an actuarial valuation performed as of December 31, 2021. In addition to the actuarial methods and assumptions of the December 31, 2021, actuarial valuation, the following actuarial methods, and assumptions were used in the projection of cash flows:

- No future employee contributions were assumed to be made.
- No future employer contributions were assumed to be made.

Based on these assumptions, CRS' fiduciary net position was projected to never be depleted, as a result, the long-term expected rate of return was used in the determination of the single equivalent interest rate (SEIR). Here, the long-term expected rate of return of 7.50% on plan investments was applied to all periods, resulting in a SEIR at the measurement date of 7.50%

Sensitivity of the net OPEB (asset) to changes in the discount rate and healthcare cost trend rates. The following presents the net OPEB (asset) of the District, as well as what the District's net OPEB (asset) would be if it were calculated using a discount rate that is 1% lower or 1% higher than the current discount rate. Similarly, the following also presents what the District's net OPEB (asset) would be if it were calculated

using a healthcare cost trend rate that is 1% lower or 1% higher than the current rate (amounts in thousands):

	Healthcare Cost Trend Rates		
MSD' Net OPEB (Asset)	1% Decrease	Current Rate	1% Increase
1% Increase (8.50%)		$ (35,516)	
Current Discount Rate (7.50%)	$ (36,292)	(29,245)	$ (21,076)
1% Decrease (6.50%)		$ (2,201)	

Change in Net OPEB Liability/(Asset). Changes in the District's financial reporting entity's net OPEB liability/(asset) for the measurement year ended June 30, 2022, were as follows (amounts in thousands):

	Total OPEB Liability	Plan Fiduciary Net Position	Net OPEB Liability/ (Asset)
Balances at June 30, 2021	$ 72,153	$ 103,560	$ (31,407)
Changes for the year:			
Service cost	538	-	538
Interest	5,488	-	5,488
Difference between expected and actual experience	401	-	401
Change in assumptions	(8,566)	-	(8,566)
Net investment income (loss)	-	(4,618)	4,618
Benefit payments, including refunds of employee contributions	(4,654)	(4,654)	-
Administrative expense	-	(100)	100
Other changes	-	417	(417)
Net changes	(6,793)	(8,955)	2,162
Balances at June 30, 2022	$ 65,360	$ 94,605	$ (29,245)

The total OPEB liability as of June 30, 2022, is based on the actuarial valuation results as of December 31, 2021. The total OPEB liability as of June 30, 2022, was determined using standard projection (roll forward) techniques. The roll forward calculation adds the normal cost (also called the service cost) for the projection period—for experience and assumption changes, the first half of 2022, subtracts the expected net benefit payments for the period, and then applies the SEIR used to measure the total OPEB liability as of the valuation date. The roll forward calculation for the expected change is determined using a similar procedure, except that the total OPEB liability and service cost are based on GASB Statement No. 75 results as of the prior measurement date, one year projection period used, and actual net benefit payments are subtracted. The difference between this expected total OPEB liability and the projected total OPEB liability as of June 30, 2022, before reflecting any changes of assumptions or other inputs is the experience (gain) or loss for the period.

NOTE 11 - RELATED PARTY TRANSACTIONS

Cincinnati Water Works provides billing and collection services on customers' accounts for the District. Fees for these services for 2022 and 2021 were and $7,039,175 and $6,135,855, respectively. Fees are also paid to other municipalities and villages within Hamilton County for collection of sewerage bills.

The City of Cincinnati provides "overhead" services to the District, such as check disbursement, investment and legal services, etc. The fees for these services for 2022 and 2021 were $1,254,813 and $2,505,040, respectively. In addition, the City's Municipal Garage provides gasoline and repairs vehicles for the District. Fees for these services were $1,579,818 and $1,556,704 for 2022 and 2021, respectively.

NOTE 12 - COMMITMENTS AND CONTINGENCIES

The City of Cincinnati and the Board of County Commissioners of Hamilton County, Ohio are parties to a Global Consent Decree, which was lodged in 2003 with the U.S. District Court for the Southern District of Ohio, Western Division. This decree focuses on combined sewer overflows, the implementation of the Sanitary Sewer Overflow Correction plan established in the Interim Partial Consent Decree, and other wet weather issues. The court approved the decrees on June 9, 2004. In August 2010, the District's Revised Wet Weather Improvement Plan was approved by the federal government. The commitment was for the District to complete a Phase 1 group of projects totaling $1.145 billion (in 2006 dollars). Work on Phase 1 is now complete and consent decree documents are posted on the District web site, msdgc.org, under consent decree.

As part of District's capital improvement program, the District has entered into a number of contracts for construction, design, and other services. Commitments under these contracts aggregate approximately $111.6 million as of December 31, 2022, and $85.5 million as of December 31, 2021.

NOTE 13 - RISK MANAGEMENT

The District is part of the City of Cincinnati Risk Management Program. The City purchases commercial insurance to cover losses due to theft of, damage to, or destruction of assets and purchases general liability insurance for specific operations and professional liability insurance for certain operations. All other risks of loss are self-insured. Separately, the District carries property insurance pursuant to an all-risk policy on the District's buildings and equipment per the revenue bond trust agreement. There has been no reduction in insurance coverage from coverage in 2003. Insurance settlements for claims resulting from risks covered by commercial insurance have not exceeded the insurance coverage in any of the past four years.

NOTE 14 – PREPAID EXPENSES AND OTHER

Prepaid Insurance was $245,342 and Accrued Interest Receivable was $1,078,176 at December 31, 2022, for a total Prepaid Expenses and Other of $1,323,518.

NOTE 15 - SUBSEQUENT EVENTS

The United States and the State of Ohio declared a state of emergency in March 2020 due to the COVID-19 pandemic. The financial impact of COVID-19 and the ensuing emergency measures will impact subsequent periods of the District. The District's investment portfolio and investments of the pension and other employee benefit plan in which the District participates have incurred a significant decline in fair value, consistent with the general decline in financial markets. However, because the values of individual investments fluctuate with market conditions, and due to market volatility, the amount of losses that will be recognized in subsequent periods, if any, cannot be determined. In addition, the impact of the District's future operating costs, revenues, and any recovery from emergency funding, either federal or state, cannot be estimated.

There is a separate Consent Decree for the City Retirement System Plan court case, which may require additional employer share of pension contribution payments, however the exact dollar amount is unknown at this time.

The District experienced a catastrophic electrical failure of a high voltage substation transformer on March 5, 2023. The Ohio EPA and the U.S. EPA National Response Center were immediately notified. There were no impacts to local drinking water. The investigation into the cause of the substation transformer failure is ongoing.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of the MSD's Proportionate Share of the Net Pension Liability
Ohio Public Employees Retirement System - Traditional Pension Plan
Last Nine Years (1) (2)
Table 1
(Amounts in thousands)

	MSD's Proportion of the Net Pension Liability	MSD's Proportionate Share of the Net Pension Liability	MSD's Covered Payroll	MSD's Proportionate Share of the Net Pension Liability as a Percentage of its Covered Payroll	Plan Fiduciary Net Position as a Percentage of the Total Pension Liability
2014	0.01499479%	$ 1,766	$ 2,443	72.29%	86.36%
2015	0.01517751%	1,825	2,479	73.62%	86.45%
2016	0.01475990%	2,541	2,336	108.78%	81.08%
2017	0.01727562%	3,923	2,200	178.32%	77.25%
2018	0.01708312%	2,680	2,377	112.75%	84.66%
2019	0.01599242%	4,380	2,257	194.06%	74.70%
2020	0.01564887%	3,093	2,136	144.80%	82.17%
2021	0.01439087%	2,131	2,136	99.77%	86.88%
2022	0.01349425%	1,174	1,950	60.21%	92.62%

(1) Amounts presented for each year were determined as of MSD's measurement date, which is the prior year-end.
(2) Information prior to 2014 is not available.

Notes to Schedule:

Change in assumptions . In 2017, changes in assumptions were made based upon an updated experience study that was completed for the five-year period ended December 31, 2015. Significant changes included a reduction of the discount rate from 8.0% to 7.5%, a reduction in the wage inflation rate from 3.75% to 3.25%, and transition from the RP-2000 mortality tables to the RP-2014 mortality tables.

In 2019, a reduction of the discount rate was made from 7.5% to 7.2%.

In 2022, changes in assumptions were made based upon an updated experience study that was completed for the five-year period ended December 31, 2020. Significant changes included a reduction of the discount rate from 7.2% to 6.9% , a reduction in wage inflation from 3.25% to 2.75%, and transition from RP-2014 mortality tables to to Pub-2010 mortality tables.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of MSD's Pension Contributions
Ohio Public Employees Retirement System - Traditional Pension Plan
Last Ten Calendar Years
Table 2
(Amounts in thousands)

	Contractually Required Contributions	Contributions in Relation to the Contractually Required Contributions	Contribution Deficiency (Excess)	MSD's Covered Payroll	Contributions as a Percentage of Covered Payroll
2013	$ 318	$ (318)	$ -	$ 2,443	13.00%
2014	297	(297)	-	2,479	12.00%
2015	280	(280)	-	2,336	12.00%
2016	264	(264)	-	2,200	12.00%
2017	309	(309)	-	2,377	13.00%
2018	316	(316)	-	2,257	14.00%
2019	299	(299)	-	2,136	14.00%
2020	299	(299)	-	2,136	14.00%
2021	273	(273)	-	1,950	14.00%
2022	256	(256)	-	1,829	14.00%

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of the MSD's Proportionate Share of the Net OPEB Liability/(Asset)
Ohio Public Employees Retirement System - Traditional Pension Plan
Last Six Years (1) (2)
Table 3
(Amounts in thousands)

	MSD's Proportion of the Net OPEB Liability/(Asset)	MSD's Proportionate Share of the Net OPEB Liability/(Asset)	MSD's Covered Payroll	MSD's Proportionate Share of the Net OPEB Liability/(Asset) as a Percentage of its Covered Payroll	Plan Fiduciary Net Position as a Percentage of the Total OPEB Liability
2017	0.01786139%	$ 1,804	$ 2,200	82.00%	54.05%
2018	0.01664978%	1,808	2,377	76.06%	54.14%
2019	0.01550127%	2,021	2,257	89.54%	46.33%
2020	0.01497864%	2,069	2,136	96.86%	47.80%
2021	0.01403706%	(250)	2,136	(11.70%)	115.57%
2022	0.01318646%	(413)	1,950	(21.18%)	128.23%

(1) Amounts presented for each year were determined as of MSD's measurement date, which is the prior year-end.
(2) Information prior to 2017 is not available.

Notes to Schedule:

Change in assumptions. In 2018, the single discount rate changed from 4.23% to 3.85%.

In 2019, the single discount rate changed from 3.85% to 3.96%, the investment rate of return changed from 6.50% to 6.00%, and the health care cost trend rate changed from 7.50% initial to 10.00% initial.

In 2020, the single discount rate changed from 3.96% to 3.16% and the health care cost trend rate changed from 10.0% initial, 3.25% ultimate in 2029 to 10.5% initial, 3.50% ultimate in 2030.

In 2021, the single discount rate changed from 3.16% to 6.00% and the health care cost trend rate changed from 10.5% initial, 3.50% ultimate in 2030 to 8.5% initial, 3.50% ultimate in 2035.

In 2022, changes in assumptions were made based upon an updated experience study that was completed for the five-year period ended December 31, 2020. Significant changes included a reduction in wage inflation from 3.25% to 2.75%, and transition from RP-2014 mortality tables to Pub-2010 mortality tables.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of MSD's OPEB Contributions
Ohio Public Employees Retirement System - Traditional Pension Plan
Last Ten Calendar Years
Table 4
(Amounts in thousands)

	Contractually Required Contributions	Contributions in Relation to the Contractually Required Contributions	Contribution Deficiency (Excess)	MSD's Covered Payroll	Contributions as a Percentage of Covered Payroll
2013	$ 24	$ (24)	$ -	$ 2,443	1.00%
2014	50	(50)	-	2,479	2.00%
2015	47	(47)	-	2,336	2.00%
2016	44	(44)	-	2,200	2.00%
2017	24	(24)	-	2,377	1.00%
2018	3	(3)	-	2,257	0.13%
2019	2	(2)	-	2,136	0.09%
2020	2	(2)	-	2,136	0.09%
2021	3	(3)	-	1,950	0.15%
2022	5	(5)	-	1,829	0.27%

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of MSD's Changes in Net Pension Liability and Related Ratios
Cincinnati Retirement System
Last Nine Years (1) (2)
Table 5
(Amounts in thousands)

	2022	2021	2020	2019	2018
Total pension liability					
Service cost	$ 4,055	$ 11,344	$ 7,108	$ 4,489	$ 4,260
Interest	34,899	24,870	30,825	32,602	30,470
Benefit changes	-	4,537	-	-	-
Difference between expected and actual experience	1,931	15,853	5,073	8,698	5,577
Changes of assumptions	125,010	(259,433)	151,500	101,687	9,403
Benefit payments and refunds	(36,245)	(34,438)	(33,311)	(32,110)	(31,436)
Other	-	-	-	-	-
Net change in total pension liability	129,650	(237,267)	161,195	115,366	18,274
Total pension liability - beginning	459,331	696,598	535,403	420,037	401,763
Total pension liability - ending (a)	588,981	459,331	696,598	535,403	420,037
Plan net position					
Contributions - employer	7,304	6,400	6,531	6,381	6,080
Contributions - member	3,864	3,723	3,775	3,677	3,521
Contributions - ERIP payoff	-	-	-	-	-
Net investment income (loss)	(15,379)	88,994	(3,973)	14,394	26,180
Benefit payments and refunds	(36,245)	(34,438)	(33,311)	(32,110)	(31,436)
Administrative expense	(333)	(334)	(355)	(278)	(277)
Other	(1,533)	8,730	(1,005)	(1,439)	(1,893)
Net change in plan net position	(42,322)	73,075	(28,338)	(9,375)	2,175
Plan net position - beginning	343,916	270,841	299,179	308,554	306,379
Plan net position - ending (b)	301,594	343,916	270,841	299,179	308,554
Net pension liability - ending (a) - (b)	$ 287,387	$ 115,415	$ 425,757	$ 236,224	$ 111,483
Ratio of plan net position to total pension liability	51.21%	74.87%	38.88%	55.88%	73.46%
Covered payroll	$ 42,611	$ 40,549	$ 41,462	$ 40,764	$ 37,809
Net pension liability as a percentage of covered payroll	672.78%	284.63%	1026.86%	579.49%	294.86%

(continued)

(1) Information prior to 2014 was not available. MSD will continue to present information for years available until a full ten-year trend is available.
(2) The measurement year is from July 1 through June 30.

See Notes to the Required Supplementary Pension Information.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of MSD's Changes in Net Pension Liability and Related Ratios
Cincinnati Retirement System
Last Nine Years (1) (2)
Table 5 (continued)
(Amounts in thousands)

	2017	2016	2015	2014
Total pension liability				
Service cost	$ 3,764	$ 5,639	$ 5,346	$ 4,919
Interest	29,256	25,454	28,680	28,146
Benefit changes	5,344	(13,545)	-	-
Difference between expected and actual experience	649	734	(2,698)	-
Changes of assumptions	-	(111,431)	30,007	(3,381)
Benefit payments and refunds	(30,612)	(29,102)	(31,057)	(29,953)
Other	-	(35,654)	-	-
Net change in total pension liability	8,401	(157,905)	30,278	(269)
Total pension liability - beginning	393,362	551,267	520,989	521,258
Total pension liability - ending (a)	401,763	393,362	551,267	520,989
Plan net position				
Contributions - employer	5,647	4,639	5,596	7,252
Contributions - member	3,246	1,599	3,115	2,761
Contributions - ERIP payoff	-	8,723	-	-
Net investment income	38,292	(2,065)	9,455	49,002
Benefit payments and refunds	(30,612)	(29,102)	(31,057)	(29,953)
Administrative expense	(288)	(962)	(302)	(261)
Other	(3,065)	24,110	-	-
Net change in plan net position	13,220	6,942	(13,193)	28,801
Plan net position - beginning	293,159	286,217	299,410	270,609
Plan net position - ending (b)	306,379	293,159	286,217	299,410
Net pension liability - ending (a) - (b)	$95,384	$ 100,203	$265,050	$ 221,579
Ratio of plan net position to total pension liability	76.26%	74.53%	51.92%	57.47%
Covered payroll	$34,942	$ 31,809	$ 31,232	$ 30,550
Net pension liability as a percentage of covered payroll	272.98%	315.01%	848.65%	725.30%

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of MSD's Pension Contributions
Cincinnati Retirement System
Last Ten Calendar Years
Table 6
(Amounts in thousands)

	Actuarially Determined Employer Contributions	Actual Employer Contributions	Contribution Deficiency (Excess)	MSD's Covered Payroll	Contributions as a Percentage of Covered Payroll
2013	$ 13,051	$ (6,179)	$ 6,872	$ 31,369	19.70%
2014	16,087	(5,303)	10,784	30,550	17.36%
2015	13,756	(4,328)	9,428	31,232	13.86%
2016	12,356	(5,169)	7,187	31,809	16.25%
2017	8,541	(5,941)	2,600	34,942	17.00%
2018	10,879	(6,226)	4,653	38,536	16.16%
2019	11,541	(6,455)	5,086	40,053	16.12%
2020	12,226	(6,521)	5,705	40,289	16.19%
2021	12,927	(6,498)	6,429	40,339	16.11%
2022	13,805	(6,940)	6,865	42,946	16.16%

See Notes to the Required Supplementary Pension Information.

Metropolitan Sewer District (MSD),Hamilton County, Ohio
Required Supplementary Information
Notes to the Required Pension Information
Cincinnati Retirement System
Table 7

Actuarial Assumptions:

Actuarially determined contribution rates are calculated as of June 30, one year prior to the end of the fiscal year in which contributions are reported.

Actuarial cost method	Entry age
Amortization method	Level dollar
Amortization period	Open 30 year period
Asset valuation method	Five-year smoothed market value
Inflation	2.75%
Salary increases, including wage inflation	3.75% to 7.50%
Investment rate of return	7.50%, net of pension plan investment expense, and including inflation
Municipal bond index rate	3.54%
Single equivalent discount rate	5.25%

Changes of Benefit Terms:

In 2017, there were several changes in benefit provisions as a result of Ordinance 336-2016 adopted by the City Council on October 26, 2016. In addition to incorporating many of the changes mandated by the Collaborative Settlement Agreement (CSA), the Ordinance also:

- Established benefit and eligibility provisions for Group E and F members not covered under the CSA similar to employees who are covered under the CSA.
- Established a universal cost-of-living adjustment (COLA) suspension period for all members.
- Established a universal 3% simple COLA rate for all members

In 2016, there were several changes in benefit provisions as a result of the Collaborative Settlement Agreement (CSA) between the City and various plaintiff groups representing certain active and retired members of CRS as approved by the Court on October 5, 2015 and generally effective January 1, 2016.

Changes in Actuarial Assumptions and Methods:

In 2018, actuarial assumptions and methods were changed based on the results of the actuarial experience study dated February 28, 2018. These changes include reducing the price inflation assumption from 3.00% to 2.75%; updating the retirement, withdrawal and disability rates, updating the mortality rates for all members to a generational approach using the RP-2014 morality tables, updating the merit salary scale; increasing the assumed administrative expense as a percentage of payroll added to the normal cost from 0.75% to 0.80%; updating the assumed proportion of deferred vested members who elect to receive a deferred benefit and who will elect to withdraw their contributions; and updating the assumed percentage of members who are married for the purposes of valuing pre-retirement survivor benefits.

Metropolitan Sewer District (MSD),Hamilton County, Ohio
Required Supplementary Information
Notes to the Required Pension Information
Cincinnati Retirement System
Table 7 (continued)

Changes in Actuarial Assumptions and Methods (continued):

In 2019, the System's fiduciary net position was projected to be available to make projected future benefit payment for current members through 2046. Projected benefit payments beyond 2046 were discounted at the municipal bond rate of 3.50%, resulting in a single equivalent discount rate of 5.56%.

In 2020, the System's fiduciary net position was projected to be available to make projected future benefit payment for current members through 2041. Projected benefit payments beyond 2041 were discounted at the municipal bond rate of 2.21%, resulting in a single equivalent discount rate of 3.56%.

In 2021, the expected long-term rate of return of 7.50% was used for the discount rate with the projected future fiduciary net position not being depleted.

In 2022, the System's fiduciary net position was projected to be available to make projected future benefit payment for current members through 2047. Projected benefit payments beyond 2047 were discounted at the municipal bond rate of 3.54%, resulting in a single equivalent discount rate of 5.25%.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of MSD's Changes in Net OPEB Liability/(Asset) and Related Ratios
Cincinnati Retirement System
Last Four Years (1) (2)
Table 8
(Amounts in thousands)

	2022	2021	2020	2019	2018
Total OPEB liability					
Service cost	$ 538	$ 584	$ 1,381	$ 1,155	$ 945
Interest	5,488	5,096	6,168	6,480	5,841
Benefit changes	-	3,035	(32,814)	-	-
Difference between expected and actual experience	401	255	(10,869)	475	3,030
Changes of assumptions	(8,566)	-	(11,168)	12,822	7,173
Benefit payments	(4,654)	(4,814)	(5,104)	(5,881)	(4,962)
Net change in total OPEB liability	(6,793)	4,156	(52,406)	15,051	12,027
Total OPEB liability - beginning	72,153	67,997	120,403	105,352	93,325
Total OPEB liability - ending (a)	65,360	72,153	67,997	120,403	105,352
Plan net position					
Net investment income (loss)	(4,618)	26,077	(1,139)	4,080	7,354
Benefit payments	(4,654)	(4,814)	(5,104)	(5,881)	(4,962)
Administrative expense	(100)	(98)	(102)	(79)	(78)
Other	417	(302)	(132)	(206)	(78)
Net change in plan net position	(8,955)	20,863	(6,477)	(2,086)	2,236
Plan net position - beginning	103,560	82,697	89,174	91,260	89,024
Plan net position - ending (b)	94,605	103,560	82,697	89,174	91,260
Net OPEB liability/(asset) - ending (a) - (b)	$ (29,245)	$ (31,407)	$ (14,700)	$ 31,229	$ 14,092
Ratio of plan net position to total OPEB liability/(asset)	144.74%	143.53%	121.62%	74.06%	86.62%
Covered employee payroll	$ 26,992	$ 28,755	$ 31,926	$ 33,066	$ 33,158
Net OPEB liability/(asset) as a percentage of covered employee payroll	(108.35%)	(109.22%)	(46.04%)	94.44%	42.50%

(1) Information prior to 2018 was not available. MSD will continue to present information for years available until a full ten-year trend is available.
(2) The measurement year is from July 1 through June 30.

See Notes to the Required Supplementary OPEB Information.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Schedule of MSD's OPEB Contributions
Cincinnati Retirement System
Last Seven Calendar Years (1)
Table 9
(Amounts in thousands)

	Actuarially Determined Employer Contributions	Actual Employer Contributions	Contribution Deficiency (Excess)	MSD's Covered Employee Payroll	Contributions as a Percentage of Covered Employee Payroll
2016	$ 248	$ -	$ 248	$ 31,384	0.00%
2017	714	-	714	32,369	0.00%
2018	534	-	534	32,440	0.00%
2019	974	-	974	32,794	0.00%
2020	537	-	537	31,951	0.00%
2021	-	-	-	29,652	0.00%
2022	-	-	-	29,962	0.00%

(1) Information prior to 2016 is not available.

See Notes to the Required Supplementary OPEB Information.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Notes to the Required OPEB Information
Cincinnati Retirement System
Table 10

Actuarial Assumptions:

Actuarially determined contribution rates are calculated as of June 30, one year prior to the end of the fiscal year in which contributions are reported.

Actuarial cost method	Entry age
Amortization method	Level dollar
Amortization period	Open 30 year period
Asset valuation method	Five-year smoothed market value
Inflation	CPI: 2.75%; Medical CPI: 3.25%
Salary increases, including wage inflation	3.75% to 7.50%
Investment rate of return	7.50%, net of pension plan investment expense, and including inflation
Initial health care cost trend rates	
Pre Medicare	8.00%
Medicare	4.97% (Non-Model Plan) / 4.84% (Model Plan)
Ultimate health care cost trend rates	
Pre Medicare	4.00%
Medicare	4.00%
Year ultimate health care cost trend rates reached	
Pre Medicare	2036
Medicare	2036

Change of Benefit Terms:

In 2021, the Plan offered an early retirement incentive program which provided two additional years of service that would count towards benefits and eligibility. Eligible members were those projected to be eligible for normal retirement as of July 1, 2020 or have earned at least 28 years of service as of July 1, 2020.

In 2020, the Plan moved all Medicare Part A and Part B eligible, and Medicare Part B only eligible Plan participants to the new fully insured Medicare Advantage plan offered by Anthem, effective January 1, 2020.

In 2017, the Plan changes included in Ordinance 336-2016 were adopted by the City Council on October 26, 2016. In addition to incorporating many of the changes mandated by the CSA, the Ordinance also:

- Excluded members hired after December 31, 2015 from eligibility to receive retiree health benefits;
- Established benefit and eligibility provisions for Group E and F members, not covered under the CSA, similar to employees who are covered under the CSA.
- Specified eligibility and postemployment contribution requirements for the retiree health benefits payable to members and beneficiaries entitled to deferred benefits.
- Modified eligibility and postemployment contribution requirements to retiree health benefits paid as the result of an in-service death.

In 2016, there were several changes in benefit provisions as a result of the Collaborative Settlement Agreement (CSA) between the City and various plaintiff groups representing certain active and retired members of CRS as approved by the Court on October 5, 2015 and generally effective January 1, 2016.

Metropolitan Sewer District (MSD), Hamilton County, Ohio
Required Supplementary Information
Notes to the Required OPEB Information
Cincinnati Retirement System
Table 10 (continued)

Changes in Actuarial Assumptions and Methods:

In 2020, the expected long-term rate of return of 7.50% was used for the discount rate with the projected future net position not being depleted. The claims assumptions and retiree contributions were updated to reflect actual 2020 premiums.

The medical trend assumptions were updated to include several factors. First, the initial trends for the Medicare Advantage plans were set at 0% for medical and 7% for drug, while the trends for the contribution rates for the plans were set at a -5.7% to account for the health insurance tax reduction. The ultimate health care trend was set at 4%, with each trend period set at 15 years.

The claim cost curves were updated based on the experience of the retirees in the Secure, Select and Model plans. The data provided claim experience for all covered members (retirees, covered spouses, and covered children) by age. Additional information was provided for the new Medicare Advantage Plans, which were applied to the 2020 claim curves above.

The percentage of members to not qualify for premium-free Medicare Part A coverage was lowered from 15% to 10%.

In 2019, the December 31, 2018 valuation included a change in the Municipal Bond Index Rate from 3.89% to 3.50%; a decrease in the discount rate (SEIR) from 6.13% to 5.07%, part-time employees were included in the Plan's population, and the health care cost trend rates were updated to reflect the current market place.

In 2018, actuarial assumptions and methods were changed based on recent plan experience done concurrently with the December 31, 2017 valuation, including a change in the Municipal Bond Index Rate from 3.65% to 3.89%; a decrease in the discount rate (SEIR) from 6.31% to 6.13%, a decrease in the price inflation assumption from 3.00% to 2.75%, an update of the retirement, withdrawal, and disability rates; an update of the mortality rates for all members to a generational approach using the RP-2014 mortality tables; an update of the merit salary scales; and updates to the following to better reflect the anticipated experience of the plan: assumed rates of health care inflation, assumed rats of health benefit plan participation, contribution rates for the Select Plan and the Model Plan, and DROP participation rates.

In 2017, future contribution rates for retiree health benefit recipients are now based upon the projected retiree health care costs associated with each projection year's closed group of participants.

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METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI
HAMILTON COUNTY

SCHEDULE OF EXPENDITURES OF FEDERAL AWARDS FOR THE YEAR ENDED DECEMBER 31, 2022

FEDERAL GRANTOR *Pass Through Grantor* Program / Cluster Title	Pass Through Entity Number	Federal AL# (CFDA) Number	Expenditures
U.S. DEPARTMENT OF HOMELAND SECURITY			
Passed through Ohio Emergency Management Agency:			
Hazard Mitigation Grant Program	OEMA-FEMA-DR-4424-OH	97.039	**$2,442,957**
Total Federal Awards Expenditures			**$2,442,957**

The accompanying notes are an integral part of this schedule.

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI
HAMILTON COUNTY

NOTES TO THE SCHEDULE OF EXPENDITURES OF FEDERAL AWARDS
2 CFR 200.510(b)(6)
FOR THE YEAR ENDED DECEMBER 31, 2022

NOTE A – BASIS OF PRESENTATION

The accompanying Schedule of Expenditures of Federal Awards (the Schedule) includes the federal award activity of Metropolitan Sewer District of Greater Cincinnati (the District) under programs of the federal government for the year ended December 31, 2022. The information on this Schedule is prepared in accordance with the requirements of Title 2 U.S. *Code of Federal Regulations* Part 200, *Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards* (Uniform Guidance). Because the Schedule presents only a selected portion of the operations of the District, it is not intended to and does not present the financial position, changes in net position, or cash flows of the District.

NOTE B – SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Expenditures reported on the Schedule are reported on the cash basis of accounting. Such expenditures are recognized following the cost principles contained in Uniform Guidance wherein certain types of expenditures may or may not be allowable or may be limited as to reimbursement.

NOTE C – INDIRECT COST RATE

The District has elected not to use the 10-percent de minimis indirect cost rate as allowed under the Uniform Guidance.

OHIO AUDITOR OF STATE
KEITH FABER

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INDEPENDENT AUDITOR'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING AND ON COMPLIANCE AND OTHER MATTERS REQUIRED BY *GOVERNMENT AUDITING STANDARDS*

Metropolitan Sewer District of Greater Cincinnati
Hamilton County
1605 Gest Street
Cincinnati, Ohio 45204

To the Hamilton County Board of Commissioners:

We have audited, 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 (*Government Auditing Standards*), the financial statements of the Metropolitan Sewer District of Greater Cincinnati, Hamilton County, (the District) as of and for the years ended December 31, 2022 and 2021, and the related notes to the financial statements, which collectively comprise the District's basic financial statements and have issued our report thereon dated May 12, 2023. We also noted the financial impact of COVID-19 and the continuing emergency measures which may impact subsequent periods of the District.

Report on Internal Control Over Financial Reporting

In planning and performing our audit of the financial statements, we considered the District's internal control over financial reporting (internal control) as a basis for designing audit procedures that are appropriate in the circumstances for the purposes of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the District's internal control. Accordingly, we do not express an opinion on the effectiveness of the District's internal control.

A *deficiency in internal control* exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct misstatements on a timely basis. A *material weakness* is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the District's financial statements will not be prevented, or detected and corrected, on a timely basis. A *significant deficiency* is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses or significant deficiencies may exist that were not identified.

Report on Compliance and Other Matters

As part of obtaining reasonable assurance about whether the District's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the financial statements. However, providing an opinion on compliance with those provisions was not an objective of our audit and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

Purpose of This Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the District's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the District's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.



Keith Faber
Auditor of State
Columbus, Ohio
May 12, 2023

OHIO AUDITOR OF STATE
KEITH FABER

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INDEPENDENT AUDITOR'S REPORT ON COMPLIANCE WITH REQUIREMENTS APPLICABLE TO THE MAJOR FEDERAL PROGRAM AND ON INTERNAL CONTROL OVER COMPLIANCE REQUIRED BY THE UNIFORM GUIDANCE

Metropolitan Sewer District of Greater Cincinnati
Hamilton County
1605 Gest Street
Cincinnati, Ohio 45204

To the Hamilton County Board of Commissioners:

Report on Compliance for the Major Federal Program

Opinion on the Major Federal Program

We have audited Metropolitan Sewer District of Greater Cincinnati's, Hamilton County, Ohio (the District), compliance with the types of compliance requirements identified as subject to audit in the U.S. Office of Management and Budget (OMB) *Compliance Supplement* that could have a direct and material effect on Metropolitan Sewer District of Greater Cincinnati's major federal program for the year ended December 31, 2022. Metropolitan Sewer District of Greater Cincinnati's major federal program is identified in the *Summary of Auditor's Results* section of the accompanying schedule of findings.

In our opinion, Metropolitan Sewer District of Greater Cincinnati complied, in all material respects, with the compliance requirements referred to above that could have a direct and material effect on its major federal program for the year ended December 31, 2022.

Basis for Opinion on the Major Federal Program

We conducted our audit of compliance in accordance with auditing standards generally accepted in the United States of America (GAAS); the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States (*Government Auditing Standards*); and the audit requirements of Title 2 U.S. *Code of Federal Regulations* Part 200, *Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards* (Uniform Guidance). Our responsibilities under those standards and the Uniform Guidance are further described in the *Auditor's Responsibilities for the Audit of Compliance* section of our report.

We are required to be independent of the District and to meet our other ethical responsibilities, in accordance with relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion on compliance for the major federal program. Our audit does not provide a legal determination of the District's compliance with the compliance requirements referred to above.

Responsibilities of Management for Compliance

The District's Management is responsible for compliance with the requirements referred to above and for the design, implementation, and maintenance of effective internal control over compliance with the requirements of laws, statutes, regulations, rules, and provisions of contracts or grant agreements applicable to the District's federal programs.

Auditor's Responsibilities for the Audit of Compliance

Our objectives are to obtain reasonable assurance about whether material noncompliance with the compliance requirements referred to above occurred, whether due to fraud or error, and express an opinion on the District's compliance based on our audit. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with GAAS, *Government Auditing Standards*, and the Uniform Guidance will always detect material noncompliance when it exists. The risk of not detecting material noncompliance resulting from fraud is higher than for that resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Noncompliance with the compliance requirements referred to above is considered material, if there is a substantial likelihood that, individually or in the aggregate, it would influence the judgment made by a reasonable user of the report on compliance about the District's compliance with the requirements of the major federal program as a whole.

In performing an audit in accordance with GAAS, *Government Auditing Standards*, and the Uniform Guidance, we:

- exercise professional judgment and maintain professional skepticism throughout the audit.
- identify and assess the risks of material noncompliance, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the District's compliance with the compliance requirements referred to above and performing such other procedures as we considered necessary in the circumstances.
- obtain an understanding of the District's internal control over compliance relevant to the audit in order to design audit procedures that are appropriate in the circumstances and to test and report on internal control over compliance in accordance with the Uniform Guidance, but not for the purpose of expressing an opinion on the effectiveness of the District's internal control over compliance. Accordingly, no such opinion is expressed.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and any significant deficiencies and material weaknesses in internal control over compliance that we identified during the audit.

Report on Internal Control Over Compliance

A *deficiency in internal control over compliance* exists when the design or operation of a control over compliance does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, noncompliance with a type of compliance requirement of a federal program on a timely basis. A *material weakness in internal control over compliance* is a deficiency, or combination of deficiencies, in internal control over compliance, such that there is a reasonable possibility that material noncompliance with a type of compliance requirement of a federal program will not be prevented, or detected and corrected, on a timely basis. A *significant deficiency in internal control over compliance* is a deficiency, or a combination of deficiencies, in internal control over compliance with a type of compliance requirement of a federal program that is less severe than a material weakness in internal control over compliance, yet important enough to merit attention by those charged with governance.

Our consideration of internal control over compliance was for the limited purpose described in the *Auditor's Responsibilities for the Audit of Compliance* section above and was not designed to identify all deficiencies in internal control over compliance that might be material weaknesses or significant deficiencies in internal control over compliance. Given these limitations, during our audit we did not identify any deficiencies in internal control over compliance that we consider to be material weaknesses, as defined above. However, material weaknesses or significant deficiencies in internal control over compliance may exist that were not identified.

Our audit was not designed for the purpose of expressing an opinion on the effectiveness of internal control over compliance. Accordingly, no such opinion is expressed.

The purpose of this report on internal control over compliance is solely to describe the scope of our testing of internal control over compliance and the results of this testing based on the requirements of the Uniform Guidance. Accordingly, this report is not suitable for any other purpose.



Keith Faber
Auditor of State
Columbus, Ohio
May 12, 2023

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METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI
HAMILTON COUNTY

SCHEDULE OF FINDINGS
2 CFR § 200.515
DECEMEMBER 31, 2022

1. SUMMARY OF AUDITOR'S RESULTS

(d)(1)(i)	**Type of Financial Statement Opinion**	Unmodified
(d)(1)(ii)	**Were there any material weaknesses in internal control reported at the financial statement level (GAGAS)?**	No
(d)(1)(ii)	**Were there any significant deficiencies in internal control reported at the financial statement level (GAGAS)?**	No
(d)(1)(iii)	**Was there any reported material noncompliance at the financial statement level (GAGAS)?**	No
(d)(1)(iv)	**Were there any material weaknesses in internal control reported for major federal programs?**	No
(d)(1)(iv)	**Were there any significant deficiencies in internal control reported for major federal programs?**	No
(d)(1)(v)	**Type of Major Programs' Compliance Opinion**	Unmodified
(d)(1)(vi)	**Are there any reportable findings under 2 CFR § 200.516(a)?**	No
(d)(1)(vii)	**Major Programs (list):**	AL #97.039 - FEMA Hazard Mitigation Grant Program
(d)(1)(viii)	**Dollar Threshold: Type A\B Programs**	Type A: > $ 750,000 Type B: all others
(d)(1)(ix)	**Low Risk Auditee under 2 CFR § 200.520?**	No

2. FINDINGS RELATED TO THE FINANCIAL STATEMENTS REQUIRED TO BE REPORTED IN ACCORDANCE WITH GAGAS

None

3. FINDINGS AND QUESTIONED COSTS FOR FEDERAL AWARDS

None

OHIO AUDITOR OF STATE
KEITH FABER

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

HAMILTON COUNTY

AUDITOR OF STATE OF OHIO CERTIFICATION

This is a true and correct copy of the report, which is required to be filed pursuant to Section 117.26, Revised Code, and which is filed in the Office of the Ohio Auditor of State in Columbus, Ohio.

Certified for Release 5/30/2023

88 East Broad Street, Columbus, Ohio 43215
Phone: 614-466-4514 or 800-282-0370

This report is a matter of public record and is available online at
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