Audit Committee Meeting
Friday, May 27, 2022 at 8:00 a.m.
www.glwater.org

Join Zoom Meeting

Meeting ID: **892 4975 7345** Passcode: **829151**

US Toll-free: **888 788 0099 or 877 853 5247**

Note: Text highlighted in yellow in this binder was updated on May 27, 2022.

AGENDA

9. COMMUNICATIONS
    A. *The Procurement Pipeline* for May 2022 (Page 397)
10. LOOK AHEAD
    A. Next Audit Committee Meeting: June 24, 2022 at 8:00 a.m.
11. OTHER MATTERS
12. ADJOURNMENT

Great Lakes Water Authority

735 Randolph Street
Detroit, Michigan 48226
glwater.legistar.com

Meeting Minutes - Draft

Audit Committee

Friday, April 22, 2022	8:00 AM	Zoom Telephonic Meeting

Zoom Telephonic Meeting

Join Zoom Meeting Here:
https://glwater.zoom.us/j/84428642613?pwd=TjRVR280c2UzdVMzVFFYMjB4TXk2QT09

Join By Telephone:
888 788 0099 US Toll-free
877 853 5247 US Toll-free
Meeting ID: 844 2864 2613
Passcode: 709128

1. Call To Order

Chairperson Baker called the meeting to order at 8:00 a.m.

2. Quorum Call

Present: 3 - Chairperson Brian Baker, Director Gary Brown, and Director Jaye Quadrozzi

3. Approval of Agenda

Chairperson Baker requested a Motion to Approve the Agenda.

Motion By: Jaye Quadrozzi
Support By: Gary Brown
Action: Approved
The motion carried by a unanimous vote.

4. Approval of Minutes

A. 2022-148 Minutes of March 25, 2022

Sponsors: Nicolette Bateson

Indexes: Finance

Attachments: 4A March 25, 2022 Audit Committee Meeting Minutes

Chairperson Baker requested a Motion to Approve the March 25, 2022 Audit Committee Meeting Minutes.

Motion By: Jaye Quadrozzi
Support By: Gary Brown
Action: Approved
The motion carried by a unanimous vote.

5. Public Comment

There were no public comments.

6. Old Business

None

7. New Business

A. 2022-147 **Contract No. 2104125 External Auditor Services**

Sponsors: Nicolette Bateson

Indexes: Finance

Attachments: 7A1 2022 Auditor RFP Board Letter Cover
7A3 2104125 Procurement Board Report-RFP

Motion By: Jaye Quadrozzi
Support By: Gary Brown
Action: Recommended for Approval to the Board of Directors
Agenda of April 27, 2022
The motion carried by a unanimous vote.

B. 2022-149 Underwriting Team Recommendation

Sponsors: Nicolette Bateson

Indexes: Finance

Attachments: 7B1 Underwriter Team Selection

7B2 Appendix A Underwriter Selection Procurement Report

7B3 GLWA Board Letter Underwriter Team Selection

7B4 Senior Underwriter Proposal Binder

Motion By: Jaye Quadrozzi
Support By: Gary Brown
Action: Received and Filed
The motion carried by a unanimous vote.

Note: A Special Audit Committee meeting has been scheduled for Friday, May 6, 2022 at 9:00 a.m. to review Underwriting Team recommendations made by staff to the Audit Committee.

C. 2022-150 **Resolution to Adopt the Project Plans for FY 2023 Clean Water State Revolving Fund (CWSRF) Consideration**

Sponsors: Nicolette Bateson

Indexes: Finance

Attachments: 7C1 AC Memo - Request to Approve CWRF Resolution for FY 2023

7C3 Resolution for the FY 2023 CWSRF Project Plans - GLWA

7C4 GLWA 2023 WRRF SRF Project Plan Summary

7C5 Oakwood District Relief Sewer - Project Plan Summary

7C6 Freud Pump Station Improvements - Project Plan Summary

Motion By: Jaye Quadrozzi
Support By: Gary Brown
Action: Recommended for Approval to the Board of Directors Agenda of May 25, 2022
The motion carried by a unanimous vote.

8. Reports

A. 2022-151 CFO Report

Sponsors: Nicolette Bateson

Indexes: Finance

Attachments: 8A1 CFO Report April 2022
8A2 FY 2032 Ten Year Forecast 3.29.2022
8A3 Post Meeting Appendix - April 2022

Motion By: Gary Brown
Support By: Jaye Quadrozzi
Action: Received and Filed
The motion carried by a unanimous vote.

B. 2022-152 Monthly Financial Report for January 2022

Sponsors: Nicolette Bateson

Indexes: Finance

Attachments: 8B January 2022 Financial Report_Tagetik

Motion By: Gary Brown
Support By: Jaye Quadrozzi
Action: Received and Filed
The motion carried by a unanimous vote.

C. 2022-153 Business Inclusion and Diversity Program Update

Sponsors: Nicolette Bateson

Indexes: Finance

Attachments: 8C Business Inclusion and Diversity Program Update

Motion By: Jaye Quadrozzi
Support By: Gary Brown
Action: Received and Filed
The motion carried by a unanimous vote.

D. 2022-154 Quarterly CWIP Report

Sponsors: Nicolette Bateson

Indexes: Finance

Attachments: 8D Quarterly CWIP Report FY 2022 Q2

Motion By: Gary Brown
Support By: Jaye Quadrozzi
Action: Received and Filed
The motion carried by a unanimous vote.

9. Communications

A. 2022-155 The Procurement Pipeline for April 2022

Sponsors: Nicolette Bateson

Indexes: Finance

Attachments: 9A The Procurement Pipeline for April 2022

No Action Taken

10. Look Ahead

A Special Audit Committee Meeting is scheduled for Friday, May 6, 2022 at 9:00 a.m.

The next regular Audit Committee Meeting is scheduled for Friday, May 27, 2022 at 8:00 a.m.

11. Other Matters

There were no other matters.

12. Adjournment

There being no further business, the meeting was adjourned at 10:00 a.m.

Motion By: Jaye Quadrozzi
Support By: Gary Brown
Action: Approved
The motion carried by a unanimous vote.

Great Lakes Water Authority

735 Randolph Street
Detroit, Michigan 48226
glwater.legistar.com

Meeting Minutes - Draft

Audit Committee

Friday, May 6, 2022 **9:00 AM**

Join Zoom Meeting
https://glwater.zoom.us/j/83510810013?pwd=dzZ4NmxnRWd2UEJwWmNldU9HVDlCUT09

Meeting ID: 835 1081 0013
Passcode: 419107

One tap mobile
+13017158592,,83510810013# US (Washington DC)
+13126266799,,83510810013# US (Chicago)

Zoom Telephonic

1. Call To Order

Chairperson Baker called the meeting to order at 9:00 a.m.

2. Quorum Call

Present: 3 - Chairperson Brian Baker, Director Gary Brown, and Director Jaye Quadrozzi

3. Approval of Agenda

Chairperson Baker requested a Motion to Approve the Agenda.

Motion By: Jaye Quadrozzi
Support By: Gary Brown
Action: Approved
The motion carried by a unanimous vote.

4. Approval of Minutes

None

5. Public Comment

There were no public comments.

6. Old Business

A. 2022-179 Approval of the 2022 Bond Program Underwriting Team

Sponsors: Nicolette Bateson

Indexes: Finance

Attachments: 6A0 Underwriter Team Selection
2022-179 Attachment 1
2022-179 Attachment 2
6A3 GLWA Underwriter Cost Proposals Summary (4-27-22)
6A4 2200290 Procurement Board Report

Motion By: Gary Brown
Support By: Jaye Quadrozzi
Action: Recommended for Approval to the Board of Directors Workshop Meeting Agenda of May 11, 2022
The motion carried by a unanimous vote.

7. New Business

None

8. Reports

None

9. Communications

None

10. Look Ahead

A. The next Audit Committee Meeting is scheduled for Friday, May 27, 2022, at 8:00 a.m.

11. Other Matters

There were no other matters.

12. Adjournment

Chairperson Baker requested a Motion to Adjourn.

Motion By: Gary Brown
Support By: Jaye Quadrozzi
Action: Approved
The motion carried by a unanimous vote.

There being no further business, the meeting was adjourned at 9:17 a.m.

GLWA
Great Lakes Water Authority

Financial Services
Audit Committee Communication

Date: May 27, 2022

To: Great Lakes Water Authority Audit Committee

From: Madison Merzlyakov, Affordability & Assistance Manager

Re: WRAP Funding Reallocation

Background: Periodically, the Board of Directors considers the reallocation of uncommitted Water Residential Assistance Program (WRAP) funds by fiscal year. The purpose of a reallocation is to provide additional funding to those service areas where the funding was fully committed. At the Audit Committee meeting on February 25, 2022, the Committee requested that additional WRAP funding information be provided prior to making a recommendation for reallocation. The purpose of this memo is to share the additional information requested and to recommend reallocation for the uncommitted and unspent funds that were identified.

Analysis: GLWA staff have compiled information across the WRAP program years in service to capture funds that were budgeted, reallocated, spent by the community action agencies, and commitments that remain as of June 30, 2021. This information is captured in Table 1 below.

Table 1 – Community Action Agency WRAP Balance Roll Forward as of June 30, 2021

Great Lakes Water Authority
Community Action Agency WRAP Balance Rollforward
as of June 30, 2021

	Wayne Metro			OLHSA	MCA	
	Detroit	Flint/Genesee County	Out-Wayne, Washtenaw, Monroe	Oakland	Macomb, St. Clair, Lapeer	Total
INFLOWS/BUDGET						
FY 2016	$ 1,728,596	$ 89,081	$ 1,101,208	$ 1,032,849	$ 548,266	$ 4,500,000
FY 2017	1,787,572	92,340	1,189,370	1,083,681	578,037	4,731,000
FY 2018	1,834,728	40,375	1,260,779	1,165,210	622,208	4,923,300
FY 2019	1,941,442	22,915	1,192,801	1,154,065	620,776	4,931,999
FY 2020	1,968,243	23,663	1,022,068	1,114,023	740,103	4,868,100
FY 2021*	3,090,509	24,488	1,057,797	1,149,643	766,064	6,088,501
Total Annual Inflows	$ 12,351,090	$ 292,862	$ 6,824,023	$ 6,699,471	$ 3,875,454	$ 30,042,900
REALLOCATIONS						
FY 2016	$ 1,664,832	$ 53,643	$ (758,864)	$ (591,164)	$ (368,447)	$ -
FY 2017	786,981	425,635	(599,000)	(330,198)	(283,418)	-
FY 2018	794,400	392,392	(441,153)	(429,264)	(316,375)	-
FY 2019	1,182,593	493,311	(494,672)	(807,449)	(373,783)	-
Annual Reallocations	$ 4,428,806	$ 1,364,981	$ (2,293,689)	$ (2,158,075)	$ (1,342,023)	$ -
USES						
Services Provided (including Admin Costs)						
Thru FY 2019	$ 6,082,728	$ 244,506	$ 1,367,305	$ 1,548,136	$ 699,218	$ 9,941,893
FY 2020	3,013,646	352,790	646,836	320,264	132,474	4,466,009
FY 2021	3,771,245	259,307	756,121	349,446	252,992	5,389,110
Total Annual Uses	$ 12,867,619	$ 856,602	$ 2,770,263	$ 2,217,845	$ 1,084,683	$ 19,797,012
Net Balance Available Before Allowance for Commitments to Participants, June 30, 2021						$ 10,245,888
REMAINING COMMITMENTS						
As of June 30, 2021	4,112,774	217,050	982,463	116,949	101,890	5,531,126
Net Balance Available (Unspent & Uncommitted)	**$ (200,497)**	**$ 584,191**	**$ 777,608**	**$2,206,602**	**$1,346,858**	**$ 4,714,762**

**The local system began contributing 1% of budgeted revenues to the WRAP program as of July 1, 2020.*

Based on the items *highlighted in yellow* in the Net Balance Available line of Table 1 above, a total of $4,331,068 has been uncommitted and unspent since 2016 in the counties of Washtenaw, Monroe, Lapeer, Macomb, Oakland, St. Clair, Out-Wayne.

Wayne Metropolitan Community Action Agency (Wayne Metro) has recommended that the uncommitted and unspent funds from those counties be reallocated to the City of Detroit and the City of Flint. Details of their recommendation can be found in the accompanying letter.

Reallocation Recommendations: GLWA staff recommends reallocation of uncommitted and unspent funds as detailed in ***Table 2 – Proposed WRAP Reallocation***, ***Table 3 – Proposed WRAP Reallocation Distribution*** and ***Table 4 - Adjusted June 30, 2021, Roll Forward with Proposed Reallocations*** below.

- The City of Detroit to receive a total of $2,815,194 (65 percent) of the uncommitted and unspent funds available. After accounting for administrative costs of 12 percent ($337,823), the remaining funds will be $1,981,897 (80 percent) allocated towards direct assistance and $495,474 (20 percent) allocated towards conservation assistance.

- The City of Flint to receive a total of $1,515,874 (35 percent) of the uncommitted and unspent funds available. After accounting for administrative costs of 12 percent ($181,905), the remaining funds will be $1,981,897 (80 percent) allocated towards direct assistance and $266,794 (20 percent) allocated towards conservation assistance.

As of December 31, 2021, WRAP inflows have been timely and within budget. Data by agency can be found in the most recent WRAP Quarterly Report. A reallocation request of funds uncommitted and/or unspent for Fiscal Year 2022 can be expected in the coming months.

Table 2 – Proposed WRAP Reallocation – In Total

	Detroit	Flint	Out-Wayne, Washtenaw & Monroe Counties	Oakland County	Macomb, Lapeer & St. Clair Counties	Total
Net Balance Available as of 6/30/2021 *(from Table 1 above)*	($200,497)	$584,191	$777,608	$2,206,602	$1,346,858	$4,714,762
Proposed Reallocation	$2,815,194	$1,515,874	($777,608)	($2,206,602)	($1,346,858)	$0

Table 3 – Proposed WRAP Reallocation Distribution – By Use

Distribution of Reallocation	Direct Assistance	Conservation Assistance	Admin	Total
Detroit	$1,981,897	$495,474	$337,823	$2,815,194
Flint	$1,067,175	$266,794	$181,905	$1,515,874

Table 4 – Adjusted June 30, 2021, Roll Forward with Proposed Reallocations

Great Lakes Water Authority

Community Action Agency WRAP Balance Adjusted Rollforward
as of June 30, 2021

	Wayne Metro			OLHSA	MCA	
	Detroit	Flint/Genesee County	Out-Wayne, Washtenaw, Monroe	Oakland	Macomb, St. Clair, Lapeer	Total
INFLOWS/BUDGET						
FY 2016	$ 1,728,596	$ 89,081	$ 1,101,208	$ 1,032,849	$ 548,266	$ 4,500,000
FY 2017	1,787,572	92,340	1,189,370	1,083,681	578,037	4,731,000
FY 2018	1,834,728	40,375	1,260,779	1,165,210	622,208	4,923,300
FY 2019	1,941,442	22,915	1,192,801	1,154,065	620,776	4,931,999
FY 2020	1,968,243	23,663	1,022,068	1,114,023	740,103	4,868,100
FY 2021*	3,090,509	24,488	1,057,797	1,149,643	766,064	6,088,501
Total Annual Inflows	$ 12,351,090	$ 292,862	$ 6,824,023	$ 6,699,471	$ 3,875,454	$ 30,042,900
REALLOCATIONS						
FY 2016	$ 1,664,832	$ 53,643	$ (758,864)	$ (591,164)	$ (368,447)	$ -
FY 2017	786,981	425,635	(599,000)	(330,198)	(283,418)	-
FY 2018	794,400	392,392	(441,153)	(429,264)	(316,375)	-
FY 2019	1,182,593	493,311	(494,672)	(807,449)	(373,783)	-
FY 2020 & FY 2021	2,815,194	1,515,874	(777,608)	(2,206,602)	(1,346,858)	
Annual Reallocations	$ 7,244,000	$ 2,880,855	$ (3,071,297)	$ (4,364,677)	$ (2,688,881)	$ -
USES						
Services Provided (including Admin Costs)						
Thru FY 2019	$ 6,082,728	$ 244,506	$ 1,367,305	$ 1,548,136	$ 699,218	$ 9,941,893
FY 2020	3,013,646	352,790	646,836	320,264	132,474	4,466,009
FY 2021	3,771,245	259,307	756,121	349,446	252,992	5,389,110
Total Annual Uses	$ 12,867,619	$ 856,602	$ 2,770,263	$ 2,217,845	$ 1,084,683	$ 19,797,012
Net Balance Available Before Allowance for Commitments to Participants, June 30, 2021						$ 10,245,888
REMAINING COMMITMENTS						
As of June 30, 2021	4,112,774	217,050	982,463	116,949	101,890	5,531,126
Net Balance Available	**$ 2,614,697**	**$2,100,065**	**$ -**	**$ -**	**$ -**	**$ 4,714,762**
(Unspent & Uncommitted)						

**The local system began contributing 1% of budgeted revenues to the WRAP program as of July 1, 2020.*

Proposed Action: The GLWA Audit Committee recommends that the Great Lakes Water Authority Board approve the recommendation to approve the reallocation of the uncommitted and unspent assistance funds of $2,815,194 to the City of Detroit and $1,515,874 to the City of Flint.

Wayne Metropolitan
Community Action Agency
Established 1971

7310 Woodward Ave. Suite 800
Detroit, MI 48202
Main: (313) 873-6000
Fax: (313) 873-6066

May 5th, 2022

Great Lakes Water Authority
735 Randolph
Detroit, MI 48226

To Whom it May Concern,

The Water Residential Assistance Program in Wayne County is crucial to clients who need access to water and seek a pathway toward self-sufficiency.

With the unspent funding for Out Wayne, Washtenaw, Monroe, Macomb, Lapeer, St. Clair and Oakland Counties, Wayne Metro would like to recommend that those uncommitted funds be reallocated to Detroit at 65% and Flint at 35%. Also, Wayne Metro is proposing to assign the funds at the ratio of 80% toward direct assistance and 20% toward conservation assistance. This reallocation would greatly support new enrollees of year 2023 based on the new changes GLWA makes to the Water Residential Assistance Program, which would allow Wayne Metro to increase the monthly direct assistance amount for clients.

Wayne Metro is proud to administer the WRAP program to residents in Wayne County with the greatest need and we appreciate the continued support that GLWA provides.

Best,

Louis D. Piszker

Louis Piszker
Chief Executive Officer

Financial Services
Audit Committee Communication

Date: May 27, 2022

To: Great Lakes Water Authority Audit Committee

From: Madison Merzlyakov, Affordability & Assistance Manager

Re: Proposed Water Residential Assistance Program Changes

Background: On March 25, 2022, the Audit Committee received a report related to "Water Residential Assistance Program (WRAP) Update". The purpose of that report was to advise the Audit Committee of the efforts to identify improvements for a more effective WRAP. The Audit Committee indicated directional alignment with the proposal. Staff noted that there were several tasks to achieve a July 1, 2022 effective date. That report is attached. Also, informative to this item is the Item #8D - WRAP Quarterly Report on the Audit Committee's May 27, 2022 meeting agenda.

Analysis: Since the time that the above report was presented, staff has communicated with stakeholders and has engaged a firm to conduct a study to determine the average level of the residential bill by community. While it will be a few weeks before that analysis is complete to provide the details by community, it is recommended that the structural changes be put into place to meet a launch for July 1, 2022. The proposed Board Action and related administrative tasks to carry out the changes are in the table below.

Proposed Board Action	Administrative Task
Authorize a WRAP "Sliding Scale Assistance <u>Approach</u>" that is based on relative average residential bill by community and household income to determine the level of payment assistance. The scale is established administratively with reporting to the Audit Committee to adapt to changing bill amounts by community.	Utilizing data from a number of sources, including individual communities, establish and publish the WRAP "Sliding Scale Assistance <u>Schedule</u>".
Authorize the elimination of the opt-in/opt-out and service level options for GLWA Member Communities, thereby allowing all eligible households in the GLWA service region to take advantage of the program.	Communicate this change to Member Partner Communities and service delivery partners.

A foundation to these changes is regular reporting of WRAP performance and changes to the "Sliding Scale Assistance Schedule" to the Audit Committee on no less than a quarterly basis.

Proposed Action: The GLWA Audit Committee recommends that the Great Lakes Water Authority Board approve the following Water Residential Assistance Program changes effective July 1, 2022.

1. Authorize a WRAP "Sliding Scale Assistance Approach" that is based on relative average residential bill by community and household income to determine the level of payment assistance.

2. Authorize the elimination of the opt-in/opt-out and service level options for GLWA Member Communities, thereby allowing all eligible households in the GLWA service region to take advantage of the program.

3. Regular reporting to the Audit Committee of WRAP performance and changes to the "Sliding Scale Assistance Schedule" to the Audit Committee on no less than a quarterly basis.

GLWA
Great Lakes Water Authority

Financial Services
Audit Committee Communication

Date: March 25, 2022

To: Great Lakes Water Authority Audit Committee

From: Nicolette N. Bateson, CPA, Chief Financial Officer & Treasurer

Re: Water Residential Assistance Program Update

Background: In June 2020, the Great Lakes Water Authority contracted with Public Sector Consultants (PSC) to engage stakeholders and perform an evaluation of WRAP program effectiveness and opportunities for improvement. In November 2020, PSC presented the Board of Directors with a list of recommendations which have largely been put into place. The effectiveness of these changes, along with the performance of service delivery partners was difficult to evaluate as the COVID-19 pandemic restrained WRAP client service opportunities. The evaluation of these changes was also occurring at a time when an unprecedented level of one-time water assistance funding was distributed to the action agencies by the state of Michigan. Best use of public resources was to apply the state and federally supported funding first and WRAP second. The pandemic further limited in-home services to protect the residents and workers in alignment with public health requirements and guidelines.

Analysis: Beginning July 1, 2021, the service partner delivery model moved from a decentralization from Wayne Metro as the lead for the entire service area to Oakland Livingston Human Service Agency (OLHSA) and Macomb Community Action Agency (MCAA) being the lead agency for their respective county. With nearly nine months experience with the new WRAP delivery model, there has been improvement in Oakland and Macomb utilization, but the pace and trajectory are still below meeting the needs that we know exist. Additionally, as we now emerge from the pandemic era with one-time funding for arrearages and assistance and a return to in-person interactions, *the timing and implementation for broader amendments to the WRAP program design and delivery model is warranted*.

It is important to note that we are very appreciative and have the highest level of respect for each of our service delivery partners, Wayne Metro, OLHSA, and MCAA. They have risen to an immense challenge over the past two years. Each agency, and each county, is unique. I want to underscore this point, because the barriers to success may sound critical of the individual agencies. That is not the case. What we have discovered, is that 1) there are a number of competing priority programs to manage in the human services area, 2) fundamental changes that need to be made to the WRAP design and delivery methods for greater success, and 3) a "one source" action agency, particularly for Oakland and Macomb, is leaving out a number of viable pipelines to reach out to constituents in need. It is important that the program moving forward retains what is working well and focus on the barriers to success. One of the areas working well is the relationship with the City of Detroit Water & Sewerage Department (DWSD) and Wayne Metro – particularly as it relates to program administration. The size of the city's customer base makes it unique compared to the other member partner communities. For those reasons, proposals to amend some administrative processes may not be applicable to DWSD.

The table below is an executive summary of the barriers and **strategies** that we would like to begin to rollout with a target date of full implementation by July 1, 2022. There are many details to work through internally and with external stakeholders as well as the Board of Directors via the leadership of GLWA's Affordability & Assistance Manager, Madison Merzlyakov. There is an attached memo from her related to details and next steps. The table below is presented to frame the discussion with the Audit Committee before we launch into an aggressive timeline to effectuate program changes.

Barriers to Success	Strategy
Program Benefits	
A payment amount of $25/month is meaningful in some communities but not others	Utilize EPA's model for determining water affordability where annual cost of water service is compared to household income and other relevant factors
Given the monthly bill compared to the $25 payment, clients decline participation because they know they will not be successful based on their payment amount based on the relative size of their water bill	Scalability of payment, client education related to budget payments, reward participation of *some* payment to stay in program
Misnomer that someone needs to "have documented income" to receive benefits	Caseworker training that "proof of income" is helpful in determining eligibility but recognize that a person is in need because they have no income - allow for instances where there is temporarily no income and/or acknowledge that household support may come from other sources.
Lack of contractor resources and/or in-house action agency expertise to manage the water use efficiency audits and/or repairs	Expand client service delivery partners who have the staff resources and compatible programs to reach out and service more constituents; evaluate GLWA procuring master agreements for agencies to access for contractors

Barriers to Success	Strategy
Unique to the City of Flint – stop and start of WRAP based on funding available	Smoothing of existing resource commitments and perhaps more often reviews of overall program utilization/reallocation
Program Administration	
Three levels at which each community opts-in level 1, opt-in level 2, or complete opt-out; this is very confusing and burdensome for case workers. As a result, case workers do not promote WRAP at point of intake and/or the program becomes siloed from other agency offerings.	Eliminate the opt-in/opt out model and move to direct client service that eliminates workload on Member Partner communities. Train case workers with a simple list of eligible communities.
Tracking success of the monthly, bi-monthly, or quarterly payment is based on an unreasonably burdensome Excel file exchanged between Member Community and Action Agency.	Eliminate the burden on the Member Partner community. Empower caseworker to work with client to review the client's progress in making payments as a pathway to long-term success rather than compliance validation by the Member Partner community.
Placing burden on a handful of action agencies are the best approach to reach constituents in need *throughout* the GLWA service area.	Expand "client service delivery partners" who have the staff resources and compatible programs to reach out to more people as well as provide services.
Action agency staffing is limited, program is burdensome, and other programs are higher priorities.	Expand client service delivery partners who have the staff resources and compatible programs to expand access to the program.
Data tracking monthly is not timely or effective for decision making and monitoring program effectiveness.	Client data sheet submitted to GLWA in some electronic method that provides statistical data (e.g., excludes client's personal information).
Outreach	
Ensure the level of outreach matches the resources available for delivery on services promoted. If outreach increases client awareness, but there are not sufficient caseworkers, the program will falter.	Expand client service delivery partners who have the staff resources and compatible programs to reach out to more people and serve as secondary source to manage client needs.

Barriers to Success	Strategy
Expand grass roots partner engagement of WRAP to evaluate outreach effectiveness and networking.	Advisory panel including service delivery partners and others to support program success.

The next steps include the following.

1. Receive Audit Committee feedback
2. GLWA to build out the details of the WRAP strategy moving forward
3. Strengthen program delivery where it is most successful (Wayne Metro and DWSD)
4. Continue discussions with, and recruitment of additional service delivery partners with an emphasis on the GLWA service area outside of Wayne County

Proposed Action: Receive and file this report.

GLWA
Great Lakes Water Authority

Financial Services
Audit Committee Communication

Date: March 25, 2022

To: Great Lakes Water Authority Audit Committee

From: Madison Merzlyakov, Affordability & Assistance Manager

Re: Water Residential Assistance Program – Next Steps in Program Improvements

The Great Lakes Water Authority (GLWA) is continuously evaluating ways to improve the Water Residential Assistance Program (WRAP) to best utilize the funding available. The following program design changes are recommended to remove unnecessary barriers to households enrolling in the program, as well as providing the right level assistance to adequately meet a household's need.

1. Evaluate Water Affordability

A household enrolled in WRAP is currently eligible for $25 per month in direct bill assistance. This amount is meaningful in some communities but not in others. Household income, size and the amount of the water bill is not considered. In some cases, households decline participation because they know they will not be successful based on their payment amount given the relative size of their water bill.

When evaluating water affordability at a community level the EPA has determined combined sewer and water bills over 4.5% of the median household income for the community to be unaffordable. GLWA is proposing to utilize this approach and create a sliding scale for direct bill payment assistance that is based upon their average bill amount and household income.

As discussed above, upon intake a household would need to provide data on a year's worth of water consumption and costs to calculate the average bill amount. It would then be determined how much of their household income is being spent on their bill. Once this percentage is obtained, the caseworker could determine the level of assistance based on a scale. Below is an example of what this scale might look like.

Water Bill as a Percentage of Household Income	Under 4%	4.5%	5%	5.5%	6%	6.5% and above
Monthly Support	$25	$30	$35	$40	$45	$50

Using this sliding scale of assistance, GLWA has run the following scenarios to demonstrate how the program would work for different households.

Scenario 1: Household of one at 135% of the federal poverty level (FPL)

Household Income: $20,000 or $1,666 a month

- Average water bill: $95/month or 5.7% of their household income ($95 is the average bill in City of Detroit)
- Monthly direct assistance: $40
- New average water bill: $55/month or 3.3% of their monthly household income

Scenario 2: Household of four at 200% of FPL

Household income $55,500 or $4,583 a month

- Average water bill: $140/month or 3% median household income
- Monthly direct assistance: $25
- New water bill $115 or 2.5% of their monthly household income

Scenario 3: Median household income in Detroit and average monthly water bills

Household income: $32,498 or $2,708 a month

- Average water bill: $95 or 3.5% of household income
- Monthly direct assistance: $25
- New water bill $70 or 2.6% of household income

2. Move toward direct client assistance

Reducing the workload burden required of our Member Communities. This will be accomplished by removing the requirement of communities to verify on time payments for the household. This will also empower the Community Action Agencies (CAAs) to work with the client to review their progress in making payments as a pathway to long-term personal financial sustainability.

Direct Client Assistance Process:

1) Household provides documented income (if available)/ability to pay and data on water consumption and cost for the past year (i.e. past water bill information)
2) CAA verifies eligibility and calculates monthly support based on annual water bill amount and household income
3) CAA alerts Member Community that the household is enrolled in WRAP

4) Member Community flag accounts that are enrolled in WRAP to avoid water shutoff or penalty fees *(note: this part of the proposal may not be universally accepted by Member Communities and will require further dialog)*
5) CAA makes payments directly to the Member Community on behalf of the household
6) Member Community receive and apply payments from the CAA to the corresponding household in same manner as any other account payment
7) Household makes payments on the remainder of their bill to the Member Community
8) CAA works directly with household to review progress in making payments as a pathway to long-term success

It is important to note that the current relationship between Wayne Metro and the Detroit Water & Sewerage Department (DWSD) is working well and the current established process is successful. What works well for a large community like Detroit, will not always work well for smaller communities. GLWA is not recommending changes to that specific relationship.

3. Provide WRAP as core service for eligible Member Communities (thereby eliminating opt-in/out and service levels)

Due to Member Community resources being required to administer the program, communities must choose to opt into WRAP. When opting in, a community then has multiple options to choose from. The opt in requirement and options have caused confusion for residents and is a burden on the CAAs. It also means that while all Member Communities are paying into the program, not all residents are able to take advantage of the program.

By removing the workload burden Member Communities experienced with their involvement in the monthly/quarterly bill review as mentioned in item 2 above, we believe there is no reason to continue with the opt in model and different program options. This would mean that if a low-income household in an eligible GLWA Member Community meets the other requirements of WRAP, they will be eligible for all elements of the program. This will allow the program to be more accessible, removes the burden at the Member Community level and allows for more simple, direct assistance to the household.

4. Allow for instances where there is no income

There is the impression that a household must have income to be eligible for WRAP. While CAAs have been flexible in what they accept as formal income, this has been a barrier to categorial eligibility and engaging the wraparound services that CAAs can provide.

GLWA is proposing that upon intake if a household indicates they do not have documented income, they are still able to enroll in the program and a plan to maintain payments is documented. An example of this could be where a family member provides financial support to the household.

5. Form a Member Community WRAP Advisory Panel

GLWA recognizes that engagement at the member community level is still important to the success of WRAP. A Member Community WRAP Advisory Panel will be formed that has representatives from various Member Communities to help establish what that relationship might look like and to help continuously evaluate the program and its success.

6. Expand Partnerships

The CAAs have been key partners in administering WRAP, however they are often faced with resource constraints, as they are responsible for administering many other programs. There are other resources in the region that may be able to support different elements of the WRAP program.

GLWA proposes to begin engaging other potential service delivery partners in addition to our CAAs to help with program aspects like outreach and conservation elements (minor plumbing repairs, home water audit, contractor resources).

7. Track progress

Currently, the CAAs own the data and report out to GLWA in various formats. Data tracking on a monthly basis is not timely or effective for decision making and monitoring program effectiveness. GLWA proposes that data is more closely tracked and provided directly to GLWA via a client data sheet submitted upon intake that provides statistical data (but not personal information).

8. Provide more frequent reviews of overall program utilization

The City of Flint is in a unique position that often results in the stopping and starting of the program based on current funding available. GLWA is proposing that by reviewing the program utilization more frequently and considering reallocation on a more regular basis, the program will be able to run smoother for Flint residents.

Financial Services
Audit Committee Communication

Date: May 27, 2022

To: Great Lakes Water Authority Audit Committee

From: Kim Garland, CPA, Director – Financial Services Area Chief of Staff

Re: Resolution to Adopt the City of Detroit Water and Sewerage Department Water Main Replacement – FY 2023 Drinking Water State Revolving Fund (DWSRF) Project Plan

Background & Analysis: See attached draft Great Lakes Water Authority ("GLWA") Board letter.

Proposed Action: The GLWA Audit Committee recommends the approval of the Resolution to Adopt the city of Detroit Water and Sewerage Department Water Main Replacement – FY 2023 Drinking Water State Revolving Fund Project Plan, as presented.

..Title

Resolution to Adopt the City of Detroit Water and Sewerage Department Water Main Replacement – FY 2023 Drinking Water State Revolving Fund (DWSRF) Project Plan

..Body

Agenda of: June 22, 2022
Item No.: **2022-**

TO: The Honorable
Board of Directors
Great Lakes Water Authority

FROM: Suzanne R. Coffey, P.E.
Interim Chief Executive Officer
Great Lakes Water Authority

DATE: June 22, 2022

RE: **Resolution to Adopt the City of Detroit Water and Sewerage Department Water Main Replacement – FY 2023 Drinking Water State Revolving Fund (DWSRF) Project Plan**

MOTION

Upon recommendation of Nicolette Bateson, Chief Financial Officer/Treasurer, the Board of Directors (Board) of the Great Lakes Water Authority (GLWA) **approves the attached Resolution for the City of Detroit Water and Sewerage Department (DWSD) Water Main Replacement – FY 2023 Drinking Water State Revolving Fund (DWSRF) Project Plan;** and authorizes the CEO to take such other action as may be necessary to accomplish the intent of this vote.

BACKGROUND

The Great Lakes Water Authority (GLWA) secures capital improvement financing for the of Detroit Water and Sewerage Department (DWSD) in accordance with foundational documents related to the establishment of GLWA.DWSD has identified a water main replacement project in its FY 2023 to 2026 Capital Improvement Plan (CIP) for submittal to the Michigan Department of Environment, Great Lakes and Energy (EGLE) for the DWSRF financing program for funding in the state's 2023 fiscal year. The deadline for submitting all DWSRF project plans to EGLE is July 1, 2022, but prior to submitting the project plans, a public hearing must be held for the affected area.

These projects seek to replace aging water mains at select locations in the neighborhoods of Warrendale, McDowell, Brightmoor, Claytown, Springwells, Crary/St. Marys, Grandmont, Martin Park, Pilgrim Village, University District, Grixdale Farms, Greenfield Park, Mapleridge, East English Village, Yorkshire Woods, Denby, and Outer Drive-Hayes in the City of Detroit. The projects are titled WS-732 (Project A) and WS-733 (Project B). Construction will include excavation of existing water mains, installation of new pipes, rehabilitation of pipes, replacement of Lead (Pb) water service lines of two inches diameter or less to connect the water main and the customer water meter, pressure testing, backfill of the excavation required for piping work, and restoration of each work site. The estimated cost of these projects overall is $22,000,000; $11,000,000 for Project A and $11,000,000 for Project B.

The FY 2023 DWSRF Project Plan and public hearing for DWSD Water Main Project was posted on the DWSD website and can be found at: www.detroitmi.gov/dwsd. This project plan was presented at the DWSD public hearing on April 20, 2022.

JUSTIFICATION

Pursuant to Section 7.2(b) of the Regional Water Supply System Lease between the City of Detroit and GLWA, the Authority shall cooperate fully with the City in the implementation of the Detroit Capital Improvement, including financing through the Authority. Therefore, GLWA will submit the local project plan as it will be the DWSRF loan applicant. Per notification, from EGLE, GLWA does not need to hold a separate public hearing on the local project, however, the GLWA Board of Directors will need to act on the included resolution at its regularly scheduled meeting on June 22, 2022. The resolution must be approved and signed to ensure that the finalized Project Plan is assembled, printed, and submitted to EGLE by the deadline of July 1, 2022.

GLWA concurs with the DWSD Water Main Project adoption, and as the DWSRF applicant, is seeking low interest loan assistance from the DWSRF Program. There are several significant benefits to DWSD in utilizing funding through this program. First, although the EGLE interest rate for FY 2023 will not be determined until October 2022, the current year's interest rate of 1.875% for 20-year loans, 2.125% for 30-year loans, and 1.875% for 40-year loans (disadvantaged communities only). Savings are typically significant when comparing the interest rates under the DWSRF program with a similar open market revenue bond issue.

In addition, funding secured through the DWSRF program does not require GLWA and DWSD to undertake the rigorous effort of preparing an official statement as is necessary with a standard open market bond transaction. And finally, use of SRF funding as junior lien debt does not impact GLWA debt reserve requirements.

DWSD does qualify as a disadvantaged community and would be eligible for the 40-year terms, if desired, at the time of loan closing should this project be approved for funding. It is also anticipated that if these loans are approved they would qualify for a certain level of loan forgiveness due to grant funding available through the State to support projects associated with lead and copper service line replacement.

BUDGET IMPACT

GLWA will be the loan applicant on DWSRF loans issued on behalf of the DWSD, and DWSD will be the DWSRF loan recipient as determined by EGLE. All project costs financed by GLWA, on behalf of DWSD, through the DWSRF program bonds and resulting principal and interest payments on the bonds will be directly allocable to the DWSD local system. Debt service is anticipated to begin in FY 2026 for this project and will be included as part of the FY 2025 – FY 2026 biennial budget.

COMMITTEE REVIEW

This matter was presented to the GLWA Audit Committee at its May 27, 2022 meeting. The Audit Committee [insert action] that the Great Lakes Water Authority Board of Director approve the attached Resolution to Adopt the City of Detroit Water and Sewerage Department Water Main Replacement – FY 2023 Drinking Water State Revolving Fund (DWSRF) Project Plan as presented.

SHARED SERVICES IMPACT

This item does not impact the shared services agreement between GLWA and DWSD.

Great Lakes Water Authority
Resolution 2022-

RE: Resolution to Adopt the Detroit Water and Sewerage Department (DWSD) Water Main Replacement Project Plan
FY 2023 Drinking Water State Revolving Fund (DWSRF) Project Plan

By Board Member: ____

Whereas: The City of Detroit through its Detroit Water and Sewerage Department (DWSD), and the Great Lakes Water Authority (GLWA), both jointly recognize the need to make improvements to portions of the existing water distribution system that are owned and operated by the City of Detroit and that are physically located within the city limits; and

Whereas: Pursuant to Section 7.2(b) of the Regional Water Supply System Lease between the City of Detroit and GLWA, the Authority shall cooperate fully with the City in the implementation of the Detroit Capital Improvement, including financing through the Authority; and

Whereas: The DWSD prepared a Drinking Water State Revolving Fund (DWSRF) Project Plan, which recommends water main replacement and associated appurtenances, including removal of certain lead service lines, in the Warrendale, McDowell, Claytown, Brightmoor, Springwells, Crary/St. Marys, and Grandmont Neighborhoods in the City of Detroit, further referenced as WS-732; and

Whereas: The DWSD prepared a Drinking Water State Revolving Fund (DWSRF) Project Plan, which recommends water main replacement and associated appurtenances, including removal of certain lead service lines, in the Martin Park, Pilgrim Village, University District, Grixdale Farms, Greenfield Park, Mapleridge, East English Village, Yorkshire Woods, Denby, and Outer Drive-Hayes Neighborhoods in the City of Detroit, further referenced as WS-733; and

Whereas: The Project Plan was presented by DWSD at a virtual Public Hearing held on April 20, 2022 at 2:00 pm. in the DWSD Board of Water Commissioners (BOWC) board room, and all public comments were considered and addressed; and

Whereas: The DWSD formally adopted said Project Plan and agreed to implement the identified selected alternative of water main and lead service line replacements as described in said document;

Whereas: It is the desire of the GLWA Board of Directors to secure low interest loan assistance through the DWSRF program.

Now Therefore Be It:

Resolved The GLWA Board hereby accepts and approves the DWSD Water Main Replacement DWSRF Project Plan as approved by the DWSD BOWC at its April 20, 2022 meeting; and Be It Further

Resolved The GLWA concurs with the DWSRF Project Plan adoption and agrees to serve as the DWSRF loan applicant on behalf of the City of Detroit, the loan recipient, for all activities required by DWSRF financing, and in accordance with local and state intergovernmental agreement; and Be It Further

Resolved The GLWA Resolution identifying Designated Representatives adopted on April 26, 2017 established the GLWA authorized representatives for all DWSRF program activities, and no updates to these designations are necessary at this time and Be It Further

Resolved That the Chief Executive Officer (CEO) is authorized to transmit the final FY 2022 DWSRF Project Plan for the Water Main Replacement project to the Michigan Department of Environment, Great Lakes and Energy on behalf of the GLWA Board of Directors and take all appropriate steps to secure approval of a low interest loan in accordance with the State of Michigan's DWSRF procedures so that the project can proceed expeditiously to construction.

Adopted by the Great Lakes Water Authority Board on:

CITY OF DETROIT
Water and Sewerage Department

Water Main Replacement and Rehabilitation inclusive of Lead (Pb) Service Line Replacements in Neighborhoods at Various Locations West and East of Livernois:

Project A, WS -732: Warrendale, McDowell, Claytown, Brightmoor, Springwells, Crary/St. Marys, and Grandmont

Project B, WS -733: Martin Park, Pilgrim Village, University District, Grixdale Farms, Greenfield Park, Mapleridge, East English Village, Yorkshire Woods, Denby, and Outer Drive-Hayes

Project Plan
April 20, 2022

Mike Duggan
Mayor

Gary Brown
Director

Michael Einheuser
Chairperson
Board of Water Commissioners

City of Detroit

Mike Duggan, Mayor

Detroit City Council

Mary Sheffield, President
James Tate, President Pro-Tem
Angela Whitfield-Calloway
Scott Benson
Latisha Johnson
Gabriela Santiago-Romero
Fred Durhal III
Mary Waters
Coleman A. Young II

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APPENDICES

1. EXECUTIVE SUMMARY

The City of Detroit is a retail customer of the Great Lakes Water Authority (GLWA), for which GLWA provides potable water to the City of Detroit and neighboring southeastern Michigan communities throughout Wayne, Oakland, Macomb, St. Clair, Lapeer, Genesee, Washtenaw and Monroe Counties. The 1,079 square mile water service area, which includes Detroit and 127 suburban communities, makes up approximately 40% of the state's population.

The water distribution system servicing the City of Detroit is comprised of approximately 2,700 miles of various size pipes ranging mainly from 6 to 16 inches. Most of these pipes were installed in the late 19th century and first half of the 20th century. Due to the age of these pipes and the multiseasonal stresses upon the network, water main breaks are a constant occurrence and they constitute a drain on the Detroit Water and Sewerage Department's (DWSD) resources necessary to address these breaks, often times during inclement weather conditions. Water main breaks can also increase the potential public health risk from cross-connection contamination (bacteriological and/or chemical) resulting from reduced pressure or depressurized water mains during the repair. DWSD has developed a process for the identification of water system improvements needed in neighborhoods across the City of Detroit.

Project A, WS-732: Water Main Replacement and Rehabilitation at Select Locations West of Livernois; Warrendale, McDowell, Brightmoor, Claytown, Springwells, Crary/St. Marys, and Grandmont

DWSD has identified several project areas for pipe replacement and rehabilitation, in Warrendale, McDowell, Brightmoor, Claytown, Springwells, and Crary/St. Marys, and Grandmont Neighborhoods that are in urgent need of addressing the repeated water main breaks and also based on Risk Analysis and results of hydraulic modeling. DWSD proposed to develop contract number WS-732 with a Project scope that includes replacing and rehabilitating approximately 29,716 linear feet of vintage cast iron water main of pipe size 6 through 12 inches in diameter for an estimated total project cost of $11.485 M.

This Project Plan identifies the current condition of the existing pipes and presents alternatives for addressing the deteriorated conditions of these pipes. Evaluation of these alternatives was performed based on the Michigan Department of Environment, Great Lakes and Energy (MI-EGLE) guidelines for preparing a Drinking Water State Revolving Fund (DWSRF) Project Plan. The recommendation presented in this Project Plan consists primarily of replacing the aged water mains with new ones based on the findings of hydraulic modelling results and water main break history. Several of the replaced water mains based upon poor condition will be upsized where hydraulic capacity does not support a minimum of 20 psi under all flow conditions. In a limited number of streets, rehabilitating the existing main with a structural liner will be performed as opposed to replacement. Full Lead service line replacements (approximately 430 Lead services) are also included in the water main replacement project. It is a benefit to the public health and safety to replace the Lead service lines. DWSD policy is that all Lead water services, as encountered, shall be replaced with copper from the proposed water main to the individual customer meters as part of its capital project work. Additionally, DWSD contractors are required to perform an excavation at every service connection to visually verify if the service is Lead or copper.

Water main replacement (WS-732) through the DWSRF loan program is expected to increase by no more than 0.82% the cost of water to a typical City of Detroit customer due to the impact of construction cost. However, the impact may be less since it would be influenced by other factors such as the reduction in operating costs (chemicals, energy, etc.), less water loss through breaks, and reduced maintenance/repairs. Therefore, the actual rate determination would be based on factors that encompass the delivery of comprehensive services by DWSD to its customers. It should be recognized that the debt for distribution water main replacement work within the City of Detroit will be paid by Detroit customers only, not the entire service area.

The increase in rate as calculated above is based on repayment of the DWSRF loan over a 20-year period. As a disadvantaged community, the City of Detroit can request a 30-year or 40-year financing period. DWSD has indicated they will select a 30-year financing period.

Project B, WS-733: Water Main Replacement and Rehabilitation at Select Locations East of Livernois; Martin Park, Pilgrim Village, University District, Grixdale Farms, Greenfield Park, Mapleridge, East English Village, Yorkshire Woods, Denby, and Outer Drive-Hayes

DWSD has identified several project areas for pipe replacement and rehabilitation, in Martin Park, Pilgrim Village, University District, Grixdale Farms, Greenfield Park, Mapleridge, East English Village, Yorkshire Woods, Denby, and Outer Drive-Hayes Neighborhoods that are in urgent need of addressing the repeated water main breaks and also based on Risk Analysis and results of hydraulic modeling. DWSD proposed to develop a contract number WS-733 with a Project scope that includes replacing and rehabilitating approximately 27,176 linear feet of vintage cast iron water main of pipe size 6 through 12 inches in diameter for an estimated total project cost of $10.86 M.

This Project Plan identifies the current condition of the existing pipes and presents alternatives for addressing the deteriorated conditions of these pipes. Evaluation of these alternatives was performed based on the Michigan Department of Environment, Great Lakes and Energy (MI-EGLE) guidelines for preparing a Drinking Water State Revolving Fund (DWSRF) Project Plan. The recommendation presented in this Project Plan consists primarily of replacing the aged water mains with new ones based on the findings of hydraulic modelling results and water main break history. Several of the replaced water mains based upon poor condition will be upsized where hydraulic capacity does not support a minimum of 20 psi under all flow conditions. In a limited number of streets, rehabilitating the existing main with a structural liner will be performed as opposed to replacement. Full Lead service line replacements (approximately 430 Lead services) are also included in the water main replacement project. It is a benefit to the public health and safety to replace the Lead service lines. DWSD's policy is that all Lead water services, as encountered, shall be replaced with copper from the proposed water main to the individual customer meters as part of its capital project work. Additionally, DWSD contractors are required to perform an excavation at every service connection to visually verify if the service is Lead or copper.

Water main replacement (WS-733) through the DWSRF loan program is expected to increase by no more than 0.78% the cost of water to a typical City of Detroit customer due to the impact of construction cost. However, the impact may be less since it would be influenced by other factors such as the reduction in operating costs (chemicals, energy, etc.), less water loss through breaks, and reduced maintenance/repairs. Therefore, the actual rate determination would be based on factors that encompass the delivery of comprehensive services by DWSD to its customers. It should be recognized that the debt for distribution water main replacement work within the City of Detroit will be paid by Detroit customers only, not the entire service area.

The increase in rate as calculated above is based on repayment of the DWSRF loan over a 20-year period. As a disadvantaged community, the City of Detroit can request a 30-year or 40-year financing period. DWSD has indicated they will select a 30-year financing period.

2. PROJECT OVERVIEW

2.1. INTRODUCTION

2.1.1. **Project A, WS-732: Water Main Replacement and Rehabilitation at Select Locations West of Livernois: Warrendale, McDowell, Brightmoor, Claytown, Springwells, Crary/St.Marys, and Grandmont**

2.1.2 **Project B, WS-733: Water Main Replacement and Rehabilitation at Select Locations East of Livernois: Martin Park, Pilgrim Village, University District, Grixdale Farms, Greenfield Park, Mapleridge, East English Village, Yorkshire Woods, Denby, and Outer Drive-Hayes**

DWSD has identified several project areas for pipe replacement and rehabilitation, WS-732, West of Livernois, in Warrendale, McDowell, Brightmoor, Claytown, Springwells, Crary/St.Marys, and Grandmont and WS-733, East of Livernois, in Martin Park, Pilgrim Village, University District, Grixdale Farms, Greenfield Park, Mapleridge, East English Village, Yorkshire Woods, Denby, and Outer Drive-Hayes Neighborhoods in Detroit, that are in urgent need of addressing the repeated water main breaks and based on Risk Analysis and results of hydraulic models.

Under the CIP, planning work to renew and rehabilitate the water infrastructure for WS-732 and WS-733 were conducted and the following approach was typically used: 1) assessing the condition of the infrastructure by direct field assessment/inspection; 2) assessing the performance of the infrastructure, using hydraulic modeling and other analytical tools; 3) comparing condition and performance to level of service benchmarks/goals; 4) identifying capital improvement requirements and prioritizing them based on agreed-upon parameters and 5) developing a value-based CIP to identify prioritized needs. Work includes either rehabilitation or replacement of buried water infrastructure.

The City of Detroit has an estimated 80,000 + Lead water services active within the municipal water system. Given the potential negative health impacts to water system customers, DWSD has been undertaking efforts in the replacement of these services. Per EPA and MI-EGLE requirements, Lead services are replaced from the water main all the way to the customer meter within their property (residence, commercial space, other). While the Lead services are expected to be within the older portions of Detroit, realistically, they can be located in any neighborhood. Replacing about 860 Lead services will be replaced across WS-732 and WS-733 which is included in the estimated total project cost of nearly twenty two and a half million dollars ($11.485 M and $10.86 M respectively).

2.2 PURPOSE

This document has been prepared in accordance with the planning guidelines adopted by MI-EGLE for the Drinking Water State Revolving Fund (DWSRF) low interest loan program. It is the intent of the DWSD to seek low interest loan assistance under the DWSRF program for the recommended work.

The purpose of this document is to describe the capital improvement project for water main replacement/rehabilitation, which DWSD is proposing to undertake with DWSRF assistance to provide reliable water supply to its customers. This Project Plan provides information on the status of the current water main system, a description of why the project is needed, an evaluation of alternatives, and a description of the recommended alternative and an assessment of environmental impacts. The Project Plan also serves as the basis for public review and comment on the proposed work in accordance with the public participation requirements of the DWSRF program.

3. PROJECT BACKGROUND

3.1. SUMMARY OF PROJECT NEED

Project A, WS-732: Water Main Replacement and Rehabilitation at Select Locations West of Livernois: Warrendale, McDowell, Brightmoor, Claytown, Springwells, Crary/St.Marys, and Grandmont

Most of the water distribution system serving the City of Detroit was installed in the late 19^{th} century or early 20^{th} century. These water mains are unlined pit cast iron or spun cast iron pipe and have outlived their useful life of 50 years based on recorded number of water main breaks and field experience with the system. As the pipes start to exceed this life expectancy, problems arise such as: frequent breakage, loss of pipe wall thickness, exfiltration of treated water through leaks, cracks and corroded joints, hydraulic obstructions due to tuberculation on the interior pipe surfaces, increased pumping costs due to reduced hydraulic capacity, and in severe leaking cases, ponding of water on roadways.

Reduced or complete loss of pressure during these main breaks and subsequent repair can pose an increased risk to public health from potential chemical or bacteriological contamination by cross-connection. Loss of pressure in a public water supply is to be avoided whenever possible and maintaining minimum system pressure is imposed upon public water systems through the requirements of the Michigan Safe Drinking Water Act (PA 399, as amended).

The project will replace Lead service lines of two inches in diameter and smaller from the public water main to the meter, as part of these projects, Full Lead Service Line Replacement (FLSLR). Lead service lines 1.5-inches and 2-inches are replaced with in-kind diameters in copper; 1-inch and less are replaced with 1-inch copper. Service lines that are larger than two inches in diameter are rigid metal pipe of copper or iron per building code.

DWSD has established an asset management program with a goal to replace the aged water distribution system, which is approximately 2,700 miles of water main of various sizes (six to sixteen inches) over a 70 year period. This asset management replacement program started more than ten years ago. This goal would enable the distribution system to be replaced on a cycle consistent with the life expectancy of the pipe. Currently, DWSD prioritizes its water main replacement program based on a consideration of the following factors:

1. Frequency of breaks/leaks in the system.
2. Occupancy of the area under consideration with a dense resident occupancy considered as a high priority. Also, a pipe is considered a priority if it supplies a school, hospitals, government buildings, public safety offices, or another prioritized structure.
3. Reduced hydraulic capacity due to low coefficients of friction (C factors) as a

result of tuberculation on the interior pipe surface.

4. Inadequate fire protection availability due to reduced hydraulic capacity.
5. Increased pumping cost as a result of frictional increases.
6. Age and structural condition of the water main.

Historically, DWSD has tracked water maintenance activity and carefully logged the frequency of breakage in various sectors of the system. Breakage/leaks of 5 or more per 1,000 feet of water main as measured from valve to valve are considered to be threshold for evaluating possible pipe replacement, in conjunction with the above criteria. The project identified in this project plan has been recently identified as an area in critical need based upon break history and hydraulic modelling analysis which identified one or more criteria listed above. The entire length of water mains identified for replacement and rehabilitation as part of WS-732 project plan had, on average 14.85 breaks per 1,000 linear feet of main over the mains' lifetime. For WS-733, that value is 11.15 breaks per 1000 linear feet. For water main replacements, pipes of eight and twelve inch diamaters will remain those sizes. Ten-inch pipe (not being a commercially produced pipe size) will be replaced with twelve-inch. Also, six-inch pipe is no longer a recommended minimum size for water main supply, thus 6-inch pipe will be replaced with eight-inch (except in those cases of a fire hydrant supply connection).

Several overview maps are included to identify project locations for WS-732 and WS-733 **Figures 3-1-A** and **3-1-B .**

Lead service lines are a public health threat. The replacement of the Lead service lines on private and public property are DWSRF eligible. DWSD policy is that all Lead water services, as encountered, shall be replaced with copper from the water main to the individual customer meters as part of its capital project work. Additionally, DWSD contractors are required to perform an excavation at the curb box of every service connection to visually verify if the service is Lead or copper. The project will replace Lead service lines of two inches in diameter and smaller from the public water main to the meter, defined here as Full Lead Service Line Replacement (FLSLR). Lead service lines of 1.5-inches and 2-inches are replaced with in-kind diameters in copper; 1-inch and less are replaced with 1-inch copper. Service lines that are larger than two inches in diameter are rigid metal pipe of copper or iron per building.

Figure 3-1-A PROJECT LOCATION MAPS for Project A, WS-732

Project Location Map - Watermain Replacement WS-732

Detroit West Side - Council District 1 - Watermains on Burt, Southfield Freeway Northbound Service Drive, Puritan, Harlow, and Oakfield

Watermain Replacement Locations, City of Detroit Water and Sewerage Department

FY: 2023 DWSRF Project Plan for WS-732

Replacing approximately 29,716 LFT of water main, fire hydrants, gate valves, and all other appurtenance with full lead service replacement in neighborhood of Crary/St. Marys, Brightmoor, Grandmont, Pembroke, Warrendale, Claytown, and Springwells of City of Detroit

Project Location Map - Watermain Replacement WS-732

Detroit Northwest Side - Council District 2 - Watermains on Meyers Rd

Watermain Replacement Locations, City of Detroit Water and Sewerage Department
FY: 2023 DWSRF Project Plan for WS-732

Replacing approximately 29,716 LFT of water main, fire hydrants, gate valves, and all other appurtenance with full lead service replacement in neighborhood of Crary/St. Marys, Brightmoor, Grandmont, Pembroke, Warrendale, Claytown, and Springwells of City of Detroit

Project Location Map - Watermain Replacement WS-732

Detroit West Side - Council District 7 - Watermains on Paul, Piedmont, Artesian, Greenview, and Faust

Watermain Replacement Locations, City of Detroit Water and Sewerage Department
FY: 2023 DWSRF Project Plan for WS-732

Replacing approximately 29,716 LFT of water main, fire hydrants, gate valves, and all other appurtenance with full lead service replacement in neighborhood of Crary/St. Marys, Brightmoor, Grandmont, Pembroke, Warrendale, Claytown, and Springwells of City of Detroit

Project Location Map - Watermain Replacement WS-732

Detroit Southwest Side - Council District 6 - Watermains on John Kronk

Watermain Replacement Locations, City of Detroit Water and Sewerage Department
FY: 2023 DWSRF Project Plan for WS-732

Replacing approximately 29,716 LFT of water main, fire hydrants, gate valves, and all other appurtenance with full lead service replacement in neighborhood of Crary/St. Marys, Brightmoor, Grandmont, Pembroke, Warrendale, Claytown, and Springwells of City of Detroit

Table 3-1-A DETAILED LIST OF WATER MAIN REPLACEMENT IN NEIGHBORHOOD WEST of LIVERNOIS UNDER WS-732

Neighborhood	Street Name	From	To	Length of Existing Pipe (Ft.) per Pipe Diameter (inch)					Pipe Material	Intervention Suggested
				6"	8"	10"	12"	16"		
McDowell	Meyers	Seven mile	Chippewa	815	440		1,918		CI	
Brightmoor	Burt	Lyndon	I-96		2,592				CI	
Claytown	Lonyo	John Kronk	Baubee				2,821		CI	
Springwells	Lonyo	John Kronk	Dix				1,084		CI	
Warrendale	Paul	Southfield Fwy	Minock		4,135				CI	
Warrendale	Piedmont	W Warren Ave	Paul	2,582					CI	
Warrendale	Artesian	Paul	Kirkwood		1,316				CI	
Warrendale	Greenview	Paul	Ford St	2,514					CI	
Warrendale	Faust	Dayton	Kirkwood		777				CI	
Grandmont	Southfield Fwy	Grand River	Schoolcraft	2,440	170		2,400		CI	
Crary/ St.Marys	Harlow	Verne	Puritan		1,310				CI	
Crary/ St.Marys	Oakfield	Verne	Puritan	1,292					CI	
Crary/ St.Marys	Puritan	Southfield Fwy	Oakfield		1,110				CI	
		Total Linear Feet: 29,716							CI= CAST IRON	

Project B, WS-733: Water Main Replacement and Rehabilitation at Select Locations East of Livernois; Martin Park, Pilgrim Village, University District, Grixdale Farms, Greenfield Park, Mapleridge, East English Village, Yorkshire Woods, Denby, and Outer Drive-Hayes

Most of the water distribution system serving the City of Detroit was installed in the late 19th century or early 20th century. These water mains are unlined pit cast iron or spun cast iron pipe and have outlived their useful life of 50 years based on recorded number of water main breaks and field experience with the system. As the pipes start to exceed this life expectancy, problems arise such as: frequent breakage, loss of pipe wall thickness, exfiltration of treated water through leaks, cracks and corroded joints, hydraulic obstructions due to tuberculation on the interior pipe surfaces, increased pumping costs due to reduced hydraulic capacity, and in severe leaking cases, ponding of water on roadways.

Reduced or complete loss of pressure during these main breaks and subsequent repair can pose an increased risk to public health from potential chemical or bacteriological contamination by cross-connection. Loss of pressure in a public water supply is to be avoided whenever possible and maintaining minimum system pressure is imposed upon public water systems through the requirements of the Michigan Safe Drinking Water Act (PA 399, as amended).

The project will replace Lead service lines of two inches in diameter and smaller from the public water main to the meter, as part of these projects, Full Lead Service Line Replacement (FLSLR). Lead service lines 1.5-inches and 2-inches are replaced with in-kind diameters in copper; 1-inch and less are replaced with 1-inch copper. Service lines that are larger than two inches in diameter are rigid metal pipe of copper or iron per building code.

DWSD has established an asset management program with a goal to replace the aged water distribution system, which is approximately 2,700 miles of water main of various sizes (six to sixteen inches) over a 70 year period. This asset management replacement program started more than ten years ago. This goal would enable the distribution system to be replaced on a cycle consistent with the life expectancy of the pipe. Currently, DWSD prioritizes its water main replacement program based on a consideration of the following factors:

1. Frequency of breaks/leaks in the system.
2. Occupancy of the area under consideration with a dense resident occupancy considered as a high priority. Also, a pipe is considered a priority if it supplies a school, hospitals, government buildings, public safety offices, or another prioritized structure.
3. Reduced hydraulic capacity due to low coefficients of friction (C factors) as a result of tuberculation on the interior pipe surface.
4. Inadequate fire protection availability due to reduced hydraulic capacity.
5. Increased pumping cost as a result of frictional increases.

6. Age and structural condition of the water main.

Historically, DWSD has tracked water maintenance activity and carefully logged the frequency of breakage in various sectors of the system. Breakage/leaks of 5 or more per 1,000 feet of water main as measured from valve to valve are considered to be threshold for evaluating possible pipe replacement, in conjunction with the above criteria. The project identified in this project plan has been recently identified as an area in critical need based upon break history and hydraulic modelling analysis which identified one or more criteria listed above. The entire length of water mains identified for replacement and rehabilitation as part of WS-732 project plan had, on average 14.85 breaks per 1,000 linear feet of main over the mains' lifetime. For WS-733, that value is 11.15 breaks per 1000 linear feet. For water main replacements, pipes of eight and twelve inch diamaters will remain those sizes. Ten-inch pipe (not being a commercially produced pipe size) will be replaced with twelve-inch. Also, six-inch pipe is no longer a recommended minimum size for water main supply, thus 6-inch pipe will be replaced with eight-inch (except in those cases of a fire hydrant supply connection).

Several overview maps are included to identify project locations for WS-732 and WS-733 **Figure 3-1-B .**

Lead service lines are a public health threat. The replacement of the Lead service lines on private and public property are DWSRF eligible. DWSD policy is that all Lead water services, as encountered, shall be replaced with copper from the water main to the individual customer meters as part of its capital project work. Additionally, DWSD contractors are required to perform an excavation at the curb box of every service connection to visually verify if the service is Lead or copper. The project will replace Lead service lines of two inches in diameter and smaller from the public water main to the meter, defined here as Full Lead Service Line Replacement (FLSLR). Lead service lines of 1.5-inches and 2-inches are replaced with in-kind diameters in copper; 1-inch and less are replaced with 1-inch copper. Service lines that are larger than two inches in diameter are rigid metal pipe of copper or iron per building.

Figure 3-1-B PROJECT LOCATION MAPS for Project A, WS-733

Project Location Map - Watermain Replacement WS-733

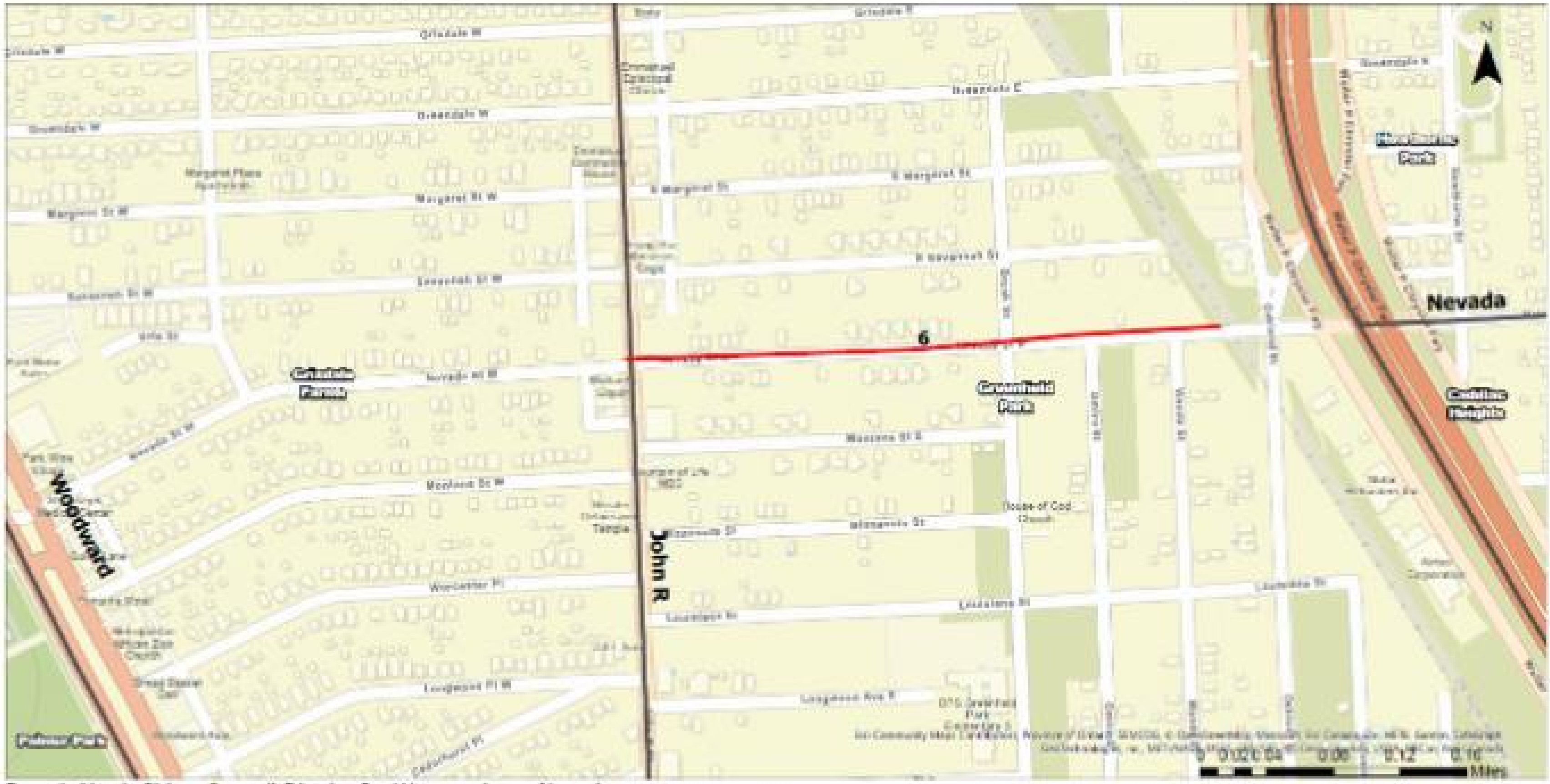
Detroit North Side - Council District 2 - Watermains on Livernois

Watermain Replacement Locations, City of Detroit Water and Sewerage Department

FY: 2023 DWSRF Project Plan for WS-733

Replacing approximately 27,176 LFT of water main, fire hydrants, gate valves, and all other appurtenance with full lead service replacement in neighborhood of Bagley, University District, Fitzgerald, Martin Park, Pilgrim Village, Grixdale Farms, Greenfield Park, Mapleridge, Denby, Yorkshire Woods, and East English Village of City of Detroit

Project Location Map - Watermain Replacement WS-733



Detroit North Side - Council District 3 - Watermain on Nevada

Watermain Replacement Locations, City of Detroit Water and Sewerage Department
FY: 2023 DWSRF Project Plan for WS-733

Replacing approximately 27,176 LFT of water main, fire hydrants, gate valves, and all other appurtenance with full lead service replacement in neighborhood of Bagley, University District, Fitzgerald, Martin Park, Pilgrim Village, Grixdale Farms, Greenfield Park, Mapleridge, Denby, Yorkshire Woods, and East English Village of City of Detroit

Project Location Map - Watermain Replacement WS-733

Detroit Northeast Side - Council District 4 - Watermains on Linnhurst, Troester, Cedargrove, and Hazelridge

Watermain Replacement Locations, City of Detroit Water and Sewerage Department

FY: 2023 DWSRF Project Plan for WS-733

Replacing approximately 27,176 LFT of water main, fire hydrants, gate valves, and all other appurtenance with full lead service replacement in neighborhood of Bagley, University District, Fitzgerald, Martin Park, Pilgrim Village, Grixdale Farms, Greenfield Park, Mapleridge, Denby, Yorkshire Woods, and East English Village of City of Detroit

Project Location Map - Watermain Replacement WS-733

Detroit Northeast Side - Council District 4 - Watermains on Whittier

Watermain Replacement Locations, City of Detroit Water and Sewerage Department

FY: 2023 DWSRF Project Plan for WS-733

Replacing approximately 27,176 LFT of water main, fire hydrants, gate valves, and all other appurtenance with full lead service replacement in neighborhood of Bagley, University District, Fitzgerald, Martin Park, Pilgrim Village, Grixdale Farms, Greenfield Park, Maplendge, Denby, Yorkshire Woods, and East English Village of City of Detroit

Table 3-1-B DETAILED LIST OF WATER MAIN REPLACEMENT IN NEIGHBORHOOD EAST of LIVERNOIS UNDER WS-733

Neighborhood	Street Name	From	To	Length of Existing Pipe (Ft.) per Pipe Diameter (inch)					Pipe Material	Intervention Suggested
				6"	8"	10"	12"	16"		
University District/ Martin Park/ Pilgrim Village	Livernois	Margareta	M-10	385	870		7,080		CI	
Grixdale Farms/ Greenfield Park	Nevada	I-75	John R.	1,900					CI	
East English Village/ Yorkshire Woods/ Denby/Outer Drive-Hayes	Whittier	Whitehill	Chandler Park Dr	589	4,500		1,470		CI	
Mapleridge	Linnhurst	Hayes	Morang	1,528					CI	
Mapleridge	Troester	Maccrary	Kelly	2,855					CI	
Mapleridge	Cedargrove	Maccrary	Kelly	1,516	1,355				CI	
Mapleridge	Hazelridge	Celestine	Kelly	3,128					CI	
		Total Linear Feet: 27,176							CI= CAST IRON	

3.2 STUDY AREA CHARACTERISTICS

3.2.1 DELINEATION OF STUDY AREA

The general study area for this Project Plan is the portion of DWSD service area within the corporate limits of the City of Detroit. The study area encompasses approximately 88,876 acres with a population of approximately 642,508 people according to the 2020 Census, plus considerable commercial and industrial activity.

3.2.2 LAND USE IN STUDY AREA

As shown in **Table 3.2**, the existing land use within the City of Detroit is comprised predominantly of residential, commercial and industrial uses. Most of the land in the area is developed already and there is, therefore, little opportunity for land use changes to occur except through redevelopment.

Table 3-2. LAND USE IN DETROIT

Land Use	Acreage	Percentage (%)
Residential	54,392	61%
Commercial	13,492	15%
Industrial	7,020	8%
Recreation/Open	9,497	11%
Other	4,475	5%

3.2.3 ECONOMIC CHARACTERISTICS

Detroit has had an unemployment rate considerably above regional and national averages. High unemployment rates have been a chronic problem in a ring surrounding the central business district. Compared to regional averages, Detroit has a relatively low percentage of its population employed in professional occupations and has a higher than average incidence of unskilled workers. Prime employment categories include civil service, banking, real estate and insurance. The median household income was listed as $[30,894 update] on the U.S. Census website along with an estimated persons in poverty at 35.0%[1]. Income levels in Detroit tend to be significantly below those levels reported in neighboring areas in Wayne, Oakland, and Macomb Counties.

[1] https://www.census.gov/quickfacts/fact/table/detroitcitymichigan/IPE120216#viewtop Census Data 2019

3.3 POPULATION DATA

The population projections presented in the 2015 Water Master Plan Update report prepared by CDM/Smith for DWSD indicate a forecasted decline in population for the City of Detroit. The City of Detroit population is expected to decrease from 713,777 (2010 Census) to 613,709 by the year 2035. The 2019 estimated population on the U.S. Census website is 670,031[1]. The SEMCOG July 2020 Projected Population is 642,508.

3.4. EXISTING FACILITIES

The Detroit Water Distribution System is defined as pipes that are 16 inches and smaller in diameter with the majority of piping in diameters of six-inch and eight-inch. Most of the system is quite old. Many pipes are over 100 years old, and the average age of pipes in the entire city is approximately 85 years.

Most of the pipe in the Detroit Water Distribution System is comprised of older unlined pit cast and centrifugally spun cast iron pipe. Newer ductile iron pipe has been installed in the City ever since it became commonly available (generally after 1970), but ductile iron piping represents a very small percentage of the total length of pipe in the system. Additionally, there is some asbestos cement pipe in the system. DWSD use of asbestos cement pipe ended in the mid-1980s.

Table 3.3 summarizes the distribution of various pipe sizes in the system. It is noted that much of the six-inch and eight-inch pipes have low coefficients of friction (C factors) citywide, thereby increasing the energy required to maintain adequate pressure and transport capacity.

Table 3-3. CITY-WIDE DISTRIBUTION SYSTEM PIPING SUMMARY

Pipe Diameter	Linear Footage	% of System
6”	5,481,018	39%
8”	6,047,000	42%
10”	257,222	2%
12”	1,665,873	12%
16”	748,742	5%

Table 3-4 shows the existing water main data by type and installation year, and shows the distribution of various pipe types within the system.

Table 3-4. SUMMARY OF DETROIT WATER MAIN DISTRIBUTION PIPES

Type	Installation Period	% of System
Unlined cast iron pipes – Pit cast	Until 1923	40%
Unlined cast iron pipes – Class 150	1923-1940	38%
Unlined cast iron pipes – Class 250	After 1940	10%
Lined ductile iron	After 1970	7%
Asbestos cement	After 1980	5%

According to a 1977 report prepared by DWSD, cast iron pipes purchased and installed prior to 1923 were manufactured by the pit-cast process, which gave long trouble-free service. From 1923 to 1940, cast iron pipes (Class 150) made by a centrifugal process (spun cast) were purchased and installed in the Detroit system. The Department experienced serious trouble with spun cast pipes, and a lifespan of 35 to 40 years was suggested to this class of pipes based on the same report. Starting from 1940, DWSD began using Class 250 spun cast pipe for additional wall thickness for combating corrosion. DWSD officially adopted the standard use of Class 250 pipe in 1945. The CIPMO team has evaluated the current pipe class standard for the application and pressure duty required of the pipe replacements. Trench construction is generally proposing the use of Class 52 and 54 ductile iron pipe encased with a polyethylene wrap. For trenchless installation, such as pipe-bursting of existing cast iron pipe and horizontal directional drilling, pipe replacement will be with High Density Polyethylene (HDPE), -DR11 C900 pipe. These trenchless construction techniques are used around the country in urban areas and is a means to save time and construction cost, and minimize disruption to the right-of-way, other existing utilities, and the rate payers in Detroit.

The City of Detroit has an estimated 80,000 + Lead (Pb) water services active within the municipal water system. Given the potential negative health impacts to water system customers, DWSD has been undertaking efforts in the replacement of these services. Per EPA and MI-EGLE requirements, Lead services are replaced from the water main all the way to the customer meter within their property (residence, commercial space, other). Lead replacements are integrated into water main replacement capital work.

4 ANALYSIS OF ALTERNATIVES

In accordance with the MI-EGLE guidelines for preparing a DWSRF Project Plan, the potential alternatives to be analyzed include a No Action Alternative, Optimum Performance of Existing Facilities Alternative, and a Regional Alternative.

4.1 IDENTIFICATION OF POTENTIAL ALTERNATIVES

Project A, WS-732: Water Main Replacement and Rehabilitation at Select Locations West of Livernois: Warrendale, McDowell, Brightmoor, Claytown, Springwells, Crary/St.Marys, and Grandmont

Project B, WS-733: Water Main Replacement and Rehabilitation at Select Locations East of Livernois: Martin Park, Pilgrim Village, University District, Grixdale Farms, Greenfield Park, Mapleridge, East English Village, Yorkshire Woods, Denby, and Outer Drive-Hayes

4.1.1. "NO ACTION" – Alternative 1

As indicated in Section 3.1, the project is needed due to the aging water mains. The water mains included in this project have exceeded their useful life as evidenced by the frequent breaks that occur leading to disruption of water supply, potential increased risk to public health, and potential flooding issues for the residents, commercial, and industrial customers. A "No Action" alternative would simply worsen the conditions by leading to an increase in water main breaks, more frequent disruption to customer service and potential increased public health risk, and potential for loss of other utilities including sewers, gas, and roads; all the while, putting additional stress on an already resource-challenged DWSD. Furthermore, the "No Action" alternative leaves unaddressed the higher energy loss associated with the pipe interior roughness. Therefore, a "No Action" alternative is not considered viable and is not pursued further.

4.1.2 OPTIMUM PERFORMANCE OF EXISTING FACILITIES – Alternative 2

DWSD is currently operating the water distribution system within the constraints of an aging system. The aging system contains Lead service lines. It is a benefit to the public health and safety to remove and replace the Lead service lines. Water main breaks are handled through the assigned DWSD staff, and supplemented with contracted services as conditions may require. In 2014, DWSD embarked on a 20-Year Infrastructure Plan to address upgrading, maintaining or replacing the water mains depending on the severity of the problem. A water main leakage detection program is ongoing. The program used to be outsourced, but currently DWSD is self-performing leak detection efforts. The leak survey completed in 2014 was based on several studies conducted to qualitatively and quantitatively evaluate the water leaks in the City water distribution system. As mentioned in Section 1 of this plan, DWSD has engaged a Capital Improvement Plan Management Organization (CIPMO) for the purpose of targeting assets for condition assessment and accelerating the replacement of DWSD's buried infrastructure. Through collaboration with DWSD and other City departments, the CIPMO team has developed a specific five year CIP, targeting specific areas of Detroit for condition assessment of buried water and sewer infrastructure and development of rehabilitation or replacement strategies.

4.1.3 REGIONAL ALTERNATIVE – Alternative 3

Under the Bifurcation Agreement, GLWA operates the water treatment plants, pump stations, transmission mains, and distribution mains that provide potable water to the City of Detroit and 127 additional municipal water supplies as a regional water system. The service area identified for water main replacement resides entirely within the City of Detroit.

The City of Detroit and all of the surrounding communities, adjacent to the subject area, are serviced by GLWA. Therefore, a Regional Alterative in the context of this Project Plan is not applicable.

4.2 ANALYSIS OF PRINCIPAL ALTERNATIVES

Project A, WS-732: Water Main Replacement and Rehabilitation at Select Locations West of Livernois: Warrendale, McDowell, Brightmoor, Claytown, Springwells, Crary/St.Marys, and Grandmont

Project B, WS-733: Water Main Replacement and Rehabilitation at Select Locations East of Livernois: Martin Park, Pilgrim Village, University District, Grixdale Farms, Greenfield Park, Mapleridge, East English Village, Yorkshire Woods, Denby, and Outer Drive-Hayes

4.2.1 DESCRIPTION OF PRINCIPAL ALTERNATIVES

There are only two options for addressing the problems associated with aged water mains. DWSD can either do nothing and continue to repair the old pipes (Alternative 1), or replace or rehabilitate the old pipes with new ones (Alternative 2). As a part of Alternative 2, rehabilitation of a limited number of feet of water main will be incorporated.

A. Alternative 1 – Repair of Existing Water Mains

Water main repair is conducted throughout the system, particularly in those areas where problems have not escalated to the point which would warrant replacement as described in Section 3.1. Nevertheless, water main repairs are time consuming, costly, constitute a drain on DWSD resources needed to carry out the repairs, and pose a potential increase in public health risk. In addition, repairs often trigger additional breakage and/or leaks in the vicinity as a result of disturbances to the section of pipe being repaired. Water main repairs require shutting off potable water service to multiple customers while the source of the leak is confirmed, repaired and returned to service. Repair activities cannot be pre-scheduled, and field crews must respond on an “as needed” basis, often during the winter months when cold weather and freeze-thaw conditions trigger pipe breaks.

B. Alternative 2 – Water Main Replacement

Replacement of aged water main pipes is based on the replacement criteria discussed in Section 3.1. The replacement pipe is sized to meet the service area needs, including commercial, business and residential demographics. In all cases, 6-inch diameter water mains are being replaced with an 8-inch minimum diameter water main to facilitate maintaining pressures under all flow conditions. Full Lead Service Line Replacement (FLSLR) will be included in the scheduled replacement of aged water mains. It is a benefit to the public health and safety to replace the Lead service lines. DWSD policy is that all Lead water services, as encountered, shall be replaced with copper from the water main to the individual customer meter as part of its capital project work. Additionally, DWSD contractors are required to perform an excavation at every service connection to visually verify if the service is Lead or copper. The project will replace Lead service lines of two (2) inches in diameter and smaller from the public water main to the meter, herein defined as FLSLR. Lead service lines of 1.5-inches and 2-inches are replaced with in-kind diameters in copper; Lead services of 1-inch and less are replaced with 1-inch copper. Replacement of aged water mains also provides for the use of ductile iron or HDPE piping. Finally, some pipes are rehabilitated in place using a specialty lining process.

The cast iron pipes included in this project have surpassed their anticipated service life. The piping replacements call for a minimum eight-inch diameter water main, the minimum recommended size in a distribution system for communities who intend to provide fire flow protection, which is also supported by Recommended Standards for Water Works

COST EFFECTIVENESS ANALYSIS

A monetary evaluation of the feasible alternatives was prepared using MI-EGLE guidelines for DWSRF Project Plans, including the present worth formulas and discount interest rate of (-0.500%). Under this analysis, the useful life is assumed to be 50 years for pipelines. The salvage value of pipes at the end of the 20-year planning period was computed on the basis of a straight-line depreciation over the useful life of the item. Therefore, the salvage value of the pipes at the end of the 20-year planning period is estimated to be 60% of the initial cost. (20/50)=0.6

The present worth of salvage value was then computed by multiplying the salvage at the end of the 20 years by the conversion factor 0.9418 based on the following formula:
1/(1+(0.3)/100)^20=0.9418

$PW = F * 1/(1 + i)^n$ Where:
PW = Present Worth (Salvage)

F = Future Value (Salvage)
i = Discount Interest Rate (0.3%)
n = Number of Years (20)
$1/(1 + i)^n$ = Conversion Factor

Interest during the construction period was computed using the formula:
(0.3)/100*0.5*2*15,159,150=(45,477) Project A, WS-732
and,
(0.3)/100*0.5*2*14,882,512=(44,648) Project B, WS-733

I = i * 0.5 * P * C
Where:
I = Interest Value
i = Discount Interest Rate (0.3%)
P = Period of Construction in Years (assumed to be two years)
C = Capital Cost of the Project

The annual Operation and Maintenance (O&M) expenses associated with each alternative were estimated, and then converted into a Present Worth value by multiplying the annual cost by a conversion factor of 19.3836 using the following formula:
[(1+(0.3)/100)^20-1] / 0.3)/100(1+(0.3)/100)^20]= 19.3836

$PW = A * [((1 + i)^n – 1)/i(1 + i)^n]$
Where:
PW = Present Worth (O&M)
A = Annual O&M Cost
i = Discount Interest Rate (0.3%)
n = Number of Years (20)
$[((1 + i)^n – 1)/i(1 + i)^n]$ = Conversion Factor

For each alternative, the total Present Worth was computed from the estimated cost (including construction, engineering, and administrative costs), salvage value, interest during construction, and/or O&M costs. This equates to the amount which would be needed at the start of the project to cover construction costs and operating expenses over the 20-year planning period if interest were to accrue at the discount rate (0.3%) annually.

The Present Worth of each alternative was then converted to an Equivalent Annual Cost, which is the amount which would be paid uniformly over a 20-year period based on the Present Worth value. This amount was obtained by the using the following formula and capital recovery factor

of 0.0516:
$=[(0.3)/100(1 +(0.3)/100)^{20)}/((1 +(0.3)/100)^{20} – 1)]= 0.0516$

$A = PW * [(i(1 + i)^n)/((1 + i)^n – 1)]$
Where:
A = Equivalent Annual Cost
PW = Present Worth
i = Discount Interest Rate (0.3%) n =
Number of Years (20)
$[(i(1 + i)^n)/((1 + i)^n – 1)]$ = Capital Recovery Factor

The cost analysis for Alternatives 1 and 2 is presented in **Table 4-1-1 and 4-1-2**. Capital costs are based on a unit cost basis for the purpose of this analysis to show the estimated expenses for a typical 1,000 foot pipe length. The annual O&M cost is based on DWSD historical data in past reports.

Table 4-1-1 COST COMPARISON OF WS-732, WATER MAIN REPLACEMENT - Warrendale, McDowell, Brightmoor. Claytown, Springwells, Crary/St.Marys, and Grandmont

AVERAGE EQUIVALENT ANNUAL COST DETERMINATION
PROJECT-A, WS-732

Cost Effective Analysis and Present Worth Determination							
Project: **DWSD Project A**							
System: **Water Main Replacement, Various Locations in Detroit West of Livernois Avenue**							
Planning Period: 2023-2043	20 Years	Alternative 1			Alternative 2		
Construction Duration:	2 Year	NO ACTION			29,716	LINEAR FEET OF	
Inflation Rate (CPI):	2.000%				WATER MAIN REPLACEMENT		
Discount Rate:	0.300%						
Capital Costs (One Time Expenditures):	Salvage Value Factor			Present Worth Factor			Present Worth Factor
50 Yr. Structures	0.6000	$ -			$ 11,484,204		
20 Yr. Process Equipment	0.0000	$ -			$ -		
10 Yr. Process Equipment	0.0000	$ -		0.9997	$ -		0.9997
15 Yr. Auxiliary Equipment	0.6667	$ -		0.9996	$ -		0.9996
10 Yr. Auxiliary Equipment	0.0000	$ -		0.9997	$ -		0.9997
Subtotal		$ -			$ 11,484,204		
Contingency	10%	$ -			$ 1,148,420		
Engineering, Legal, Admin., "Green" Provisions	20%	$ -			$ 2,526,525		
Total		$ -			$ 15,159,150		
	CPI Factor						
10 Replacement Cost at Yr.	1.2190	$ -			$ -		
15 Replacement Cost at Yr.	1.3459	$ -			$ -		
20 Salvage Value at Yr.		$ -		0.9418	$ 6,890,523		0.9418
OM&R Costs (Recurring Equal Expenditures)		2023	2043		2023	2043	
Repair & Maintenance		$ 1,188,640	$ 1,262,028		$ -	$ -	
Total O&M Costs		$ 1,188,640	$ 1,262,028		$ -	$ -	
Fixed O&M Costs		$ 1,188,640	$ 1,188,640		$ -	$ -	
Total Variable O&M Costs		$ -	$ 73,388		$ -	$ -	
Yearly Increase		$ 3,669			$ -		
Present worth (PW) of constant annual O&M cost:				19.3836			19.3836
PW of variable annual O&M cost (annual increase):				182.2139			182.2139
Capital Recovery Factor				0.0516			0.0516
Assumptions		CALCULATIONS - PRESENT WORTH			CALCULATIONS - PRESENT WORTH		
1) Based on an average of five breaks per year		1. Initial Cost		$ -	1. Initial Cost		$ 15,159,150
2) Annual O&M cost does not include cost of restoration and cost		2a. Constant O&M		$ 23,040,151	2a. Constant O&M		$ -
of contracted services if needed		2b. Variable O&M		$ 668,616	2b. Variable O&M		$ -
		3. Replacement Cost		$ -	3. Replacement Cost		$ -
		4. Salvage Value	(minus)	$ -	4. Salvage Value	(minus)	$ 6,489,833
		5. Interest During Construction		$ -	5. Interest During Construction		$ 45,477
		6. Total Present Worth		$ 23,708,767	6. Total Present Worth		$ 8,714,794
EQUIVALENT ANNUAL COST				**$ 1,223,134**			**$ 449,596**

3/14/2022

Table 4-1-2 COST COMPARISON OF WS-733, WATER MAIN REPLACEMENT - Martin Park, Pilgrim Village, University District, Grixdale Farms, Greenfield Park, Mapleridge, East English Village, Yorkshire Woods, Denby, and Outer Drive-Hayes

AVERAGE EQUIVALENT ANNUAL COST DETERMINATION
PROJECT-B, WS-733

Cost Effective Analysis and Present Worth Determination								
Project: DWSD Project B								
System: Water Main Replacement, Various Locations in Detroit East of Livernois Avenue								
Planning Period: 2023-2043	20 Years	Alternative 1			Alternative 2			
Construction Duration:	2 Year	NO ACTION				27,176	LINEAR FEET OF	
Inflation Rate (CPI): 2.000%						WATER MAIN REPLACEMENT		
Discount Rate: 0.300%								
Capital Costs (One Time Expenditures):	Salvage Value Factor			Present Worth Factor				Present Worth Factor
50 Yr. Structures	0.6000	$ -				$ 10,866,792		
20 Yr. Process Equipment	0.0000	$ -				$ -		
10 Yr. Process Equipment	0.0000	$ -		0.9997		$ -		0.9997
15 Yr. Auxiliary Equipment	0.6667	$ -		0.9996		$ -		0.9996
10 Yr. Auxiliary Equipment	0.0000	$ -		0.9997		$ -		0.9997
Subtotal		$ -				$ 10,866,792		
Contingency	10%	$ -				$ 1,086,679		
Engineering, Legal, Admin., "Green" Provisions	20%	$ -				$ 2,390,694		
Total		$ -				$ 14,344,165		
	CPI Factor							
10 Replacement Cost at Yr.	1.2190	$ -				$ -		
15 Replacement Cost at Yr.	1.3459	$ -				$ -		
20 Salvage Value at Yr.		$ -		0.9418		$ 6,520,075		0.9418
OM&R Costs (Recurring Equal Expenditures)		2023	2043			2023	2043	
Repair & Maintenance		$ 1,087,040	$ 1,154,155			$ -	$ -	
Total O&M Costs		$ 1,087,040	$ 1,154,155			$ -	$ -	
Fixed O&M Costs		$ 1,087,040	$ 1,087,040			$ -	$ -	
Total Variable O&M Costs		$ -	$ 67,115			$ -	$ -	
Yearly Increase		$ 3,356				$ -		
Present worth (PW) of constant annual O&M cost:				19.3836				19.3836
PW of variable annual O&M cost (annual increase):				182.2139				182.2139
Capital Recovery Factor				0.0516				0.0516
Assumptions		CALCULATIONS - PRESENT WORTH			CALCULATIONS - PRESENT WORTH			
1) Based on an average of five breaks per year		1. Initial Cost		$ -	1. Initial Cost			$ 14,344,165
2) Annual O&M cost does not include cost of restoration and cost of contracted services if needed		2a. Constant O&M		$ 21,070,775	2a. Constant O&M			$ -
		2b. Variable O&M		$ 611,466	2b. Variable O&M			$ -
		3. Replacement Cost		$ -	3. Replacement Cost			$ -
		4. Salvage Value	(minus)	$ -	4. Salvage Value		(minus)	$ 6,140,927
		5. Interest During Construction		$ -	5. Interest During Construction			$ 43,032
		6. Total Present Worth		**$ 21,682,241**	**6. Total Present Worth**			**$ 8,246,271**
EQUIVALENT ANNUAL COST				**$ 1,118,585**				**$ 425,425**

3/17/2022

As shown in Tables 4-1-1 and 4-1-2 for WS-732 and WS-733, the equivalent annual cost of option 2 (water main replacement) is significantly less than the Equivalent Annual Cost of ongoing repairs. Therefore, Alternative 2, Replacement of the water mains is the most cost efficient.

4.1.1 ENVIRONMENTAL EVALUATION

The environmental impact of the pipe repair alternative is more severe when compared to the water main replacement alternative. Under the repair alternative, the environmental impact and disruption of service is experienced multiple times annually, and will increase over the 20-year analysis period. The environmental impact of the water main replacement is related mostly to the one-time construction phase and is discussed in more detail in Section 6.0. Leakage from aged pipes results in wasted treated water and increased energy use by equipment required to treat the raw water and pump the finished water into the distribution system. Water leaking from aged pipes is referred to as non-revenue water since it is wasted and lost to the environment after having gone through the expense of treatment and pumping processes. The wasted water has an impact on the GLWA cost of treating and pumping potable water. That cost is borne by all of GLWA customers including DWSD customers. Leakage (including water lost through leaking joints, as well as breaks and main flushing) based on past DWSD studies has been found to be significant, and above average when compared to other major cities nationwide. This lost water from leaks and broken water mains also has an impact on the regional wastewater treatment facilities because the waste ater collection system serving the City of Detroit is a combined sewer. Therefore, additional energy used at interceptor lift stations and the raw and intermediate sewerage lift pumps at the Water Resource Recovery Facility to pump this additional flow from water main leakage has a negative environmental impact. This leakage would also contribute to combined sewer overflows during severe weather events in the City.

4.1.2 IMPLEMENTABILITY AND PUBLIC PARTICIPATION

Both alternatives described in Section 4.2.1 can be implemented. The pipe repair alternative would be implemented primarily by the DWSD maintenance staff with occasional support from contracted services under emergency conditions when break occurrence is extensive, whereas the pipe replacement alternative would require DWSD to procure a contractor to implement the work through a contract agreement. As previously discussed, there is a benefit to the public health to replace the Lead service lines during a water main replacement project. The public participation would be ensured through a public notice to allow local residents ample time to review the Project Plan and become familiar with the proposed project. A 30-day minimum advanced public notice of a hearing, and a public hearing would be held to provide time for the local residents to provide input and express their concerns regarding the Project Plan and the selected alternative.

4.1.3 TECHNICAL AND OTHER CONSIDERATIONS

Pipe replacement (Alternative 2) is substantially less burdensome from a staffing and resource management perspective, since new pipes constructed of modern materials require minimal maintenance over long periods of time. By contrast, repairing old pipe (Alternative 1) is very resource intensive and very difficult to plan. Furthermore, the work must be conducted on an emergency basis, often during extremely inclement weather. Pipe breaks adversely impact residents as they experience an interruption in their service, and they are exposed to a potential increase in public health risk due to the potential for contamination through backflow or back-pressure from a cross-connection. Many breaks occur during winter due to shifting soils from freeze/thaw cycles and result in roadways, sidewalks, and other areas encumbered with ice that can be very destructive to roads and vehicles and constitute a safety hazard. In addition, new pipes provide greater fire protection due to improved hydraulic capacity, since the old pipes often exhibit tuberculation on their interior surfaces. This tuberculation increases friction between the flowing water and the interior pipe wall, causing increased pressure loss and decreased flow.

5 SELECTED ALTERNATIVE

Alternative 2 is the alternative recommended for implementation based on both monetary and non-monetary evaluation. This alternative encompasses the installation of new water mains to replace aged pipes subject to excessive breaks. The work will include excavation of the existing mains and installation of new pipes. All pipes whether replaced by open excavation, Horizontal Directional Drilling and Pipe Bursting or lined will be subjected to pressure testing and disinfection, and then right-of-way restoration will be performed. The replacement or rehabilitation of the existing mains will include the replacement of Lead service lines as encountered during the water main replacement work. It is a benefit to the public health and safety to remove the Lead service lines. As previously mentioned, DWSD policy is that all Lead water services shall be replaced with copper from the water main to the individual customer meter as part of capital project work. Additionally, DWSD contractors are required to perform an excavation at every service connection to visually verify if the service is Lead or copper. The project will replace Lead service lines of two inches in diameter and smaller from the public water main to the meter (FLSLR). Lead service lines 1.5-inches and 2-inches are replaced with in-kind diameters in copper and 1-inch and less are replaced with 1-inch copper. Any disturbed areas adjacent to the pipes will be re-vegetated and restored to pre-project conditions.

5.1 DESCRIPTION

Project A, WS-732 and Project B, WS-733
The specific streets where the new water mains for WS-732 will be installed are listed in **Table 3-1-A**, along with the pipe diameters, lengths and general location within the project. For WS-733, the streets and pipe breakdowns is shown in **Table 3-1-B**. Figures 3-1-A and 3-1-B are the mapsets showing the piping work.

5.2 COSTS

Project A, WS-732 and Project B, WS-733
The estimated cost for the proposed water main project consists of: construction costs plus costs to cover engineering (design and construction) and administrative tasks. The estimated total cost for the Water Main Replacement all the listed Neighborhoods in Detroit is provided in **Appendix A-2.**

Cost are summarized below in **Tables 5-1-A and 5-1-B**.

Table 5-1-A **Project A, WS-732: Water Main Replacement and Rehabilitation at Select Locations West of Livernois: Warrendale, McDowell, Brightmoor, Claytown, Springwells, and Crary/St.Marys and Grandmont**

Planning Period:	2023-2043	20	Years	**PROJECT A: WS-732**
Construction Duration:		2	Years	**29,716 LINEAR FEET OF WATER MAIN REPLACEMENT AND REHABILITATION**
Inflation Rate (CPI):		2	%	
Discount Rate:		(0.3)	%	
Capital Costs (One Time Expenditures):				
50 Yr. Structures				$11,484,204
Contingency			10%	$1,148.420
Engineering, Administrative, Legal, "Green" Provisions			20%	$2,526,525
Total				**$15,159,150**

Table 5-1-B **Project B, WS-733: Water Main Replacement and Rehabilitation at Select Locations East of Livernois**: **Martin Park, Pilgrim Village, University District, Grixdale Farms, Greenfield Park, Mapleridge, East English Village, Yorkshire Woods, Denby, and Outer Drive-Hayes**

Planning Period:	2023-2043	20	Years	**PROJECT B: WS-733**
Construction Duration:		2	Years	**27,176 LINEAR FEET OF WATER MAIN REPLACEMENT AND REHABILITATION**
Inflation Rate (CPI):		2	%	
Discount Rate:		(0.3)	%	
Capital Costs (One Time Expenditures):				
50 Yr. Structures				$10,866,792
Contingency			10%	$1,086,679
Engineering, Legal, Admin."Green " 'Provisions			20%	$2,390,694
Total				**$14,344,165**

The Estimated cost for Full service line replacement is included in **Appendix A-1**

5.2.1 IMPLEMENTATION SCHEDULE

The recommended Water Main Replacement project is scheduled to be completed in accordance with the following schedule.

Table 5-2 PROJECT MILESTONE SCHEDULES

Project Activity	Project WS-732	Project WS-733
Advertise for Public Hearing	March 18, 2022	May 18, 2022
Public Hearing on Draft Project Plan	April 20, 2022	June 20, 2022
Complete and Submit Final Project Plan	June 28, 2022	August 28, 2022
Complete Plans and Specifications	February, 2023	April, 2023
Advertise for Bids	March, 2023	May, 2023
Receive Bids	April, 2023	June, 2023
Award Construction Contract	July, 2023	September, 2023
Start of Construction	August, 2023	October, 2023
Complete Construction	August, 2025	October, 2025

5.2.2 USER COST

The water main replacement recommended in this Project Plan is targeted for low interest loan assistance through the DWSRF program. The availability of loan funds is dependent on annual appropriations and the placement of the project on the Priority List prepared annually by MI-EGLE.

Repayment of the DWSRF loan through annual debt retirement payments will impact the residential customer rates resulting in increased user costs. This impact to customer rates is generally determined by dividing the additional expenses among the users in the service area as summarized in **Table 5-3-1 and 5-3-2**. The annualized cost of the project was calculated using the capital recovery factor 0.0516 and the following formula:

$$A = PW * [(i(1 + i)^n)/((1 + i)^n – 1)]$$

Where:

A = Equivalent Annual Cost

PW = Present Worth

i = Interest Rate through DWSRF Loan (0.3%)

n = Number of Years (20)

$[(i(1 + i)^n)/((1 + i)^n – 1)]$ = Capital Recovery Factor

Table 5-3-1 USER COST IMPACT FOR PROJECT A, WS-732

Item	Project A WS-732
Total Cost of Project	$15,159,150
Annualized Cost of Project (assuming DWRF interest rate of 2.0% over 20 years)	$449,596
Number of User Accounts (households) in City of Detroit	175,000
Average Water Consumption per Household (industry average)	7,333 gallons/month (approximately 980 ft^3/month)
Current DWSD Water Supply Rate	$26.60 per 1,000 ft^3
Current Monthly DWSD Water Supply Rate per Household	$26.07
Current Annual DWSD Water Supply Rate per Household	$312.82
Increase in Cost per Household (Year 1)	$2.57
Proposed Annual DWSD Water Supply Rate per Household (Year 1)	$315.39
Proposed Percent Increase in Cost per Household per Year	0.82%

Table 5-3-2 USER COST IMPACT FOR PROJECT B, WS-733

Item	Project B WS-733
Total Cost of Project	$14,344,165
Annualized Cost of Project (assuming DWRF interest rate of 2.0% over 20 years)	$425,425
Number of User Accounts (households) in City of Detroit	175,000
Average Water Consumption per Household (industry average)	7,333 gallons/month (approximately 980 ft^3/month)
Current DWSD Water Supply Rate	$26.60 per 1,000 ft^3
Current Monthly DWSD Water Supply Rate per Household	$26.07
Current Annual DWSD Water Supply Rate per Household	$312.82
Increase in Cost per Household (Year 1)	$2.43
Proposed Annual DWSD Water Supply Rate per Household (Year 1)	$315.25
Proposed Percent Increase in Cost per Household per Year	0.78%

The theoretical impact of financing the WS-732 and WS-733 water main replacement through the DWSRF loan program is expected to increase by no more than 0.82% due to WS-732 and 0.78% due to WS-733 the cost of water to a typical user. This anticipated increase is due to the impact of construction cost. However, the impact would be less since it would be influenced by other factors such as the reduction in operating costs (chemicals, energy, etc.), less water loss through breaks, and reduced maintenance/repairs. Therefore, the actual rate determination would be based on factors that encompass the delivery of comprehensive services by DWSD to its customers. It should be recognized that the debt for distribution water main replacement work within the City of Detroit will be paid by Detroit customers only, not the entire service area.

If DWSRF loans are not available, DWSD will need to finance the cost of the water main replacement as part of its Capital Improvement Program (CIP) through revenue bonds.

5.2.3 ABILITY TO IMPLEMENT THE SELECTED ALTERNATIVE

DWSD is a City-owned utility with broad statutory authority. Prior to GLWA assuming responsibility for operating and maintaining the regional water supply through the Bifurcation Agreement, DWSD had entered into contracts with its suburban customers, which establish the terms and conditions for providing water, and overseeing the operation and maintenance of the regional system. The Department has substantial experience in the financing of capital improvements under a variety of programs. It has a proven track record for using system revenues to retire its debt on new facilities.

The Great Lakes Water Authority (GLWA) will be the loan applicant on behalf of the City of Detroit Water and Sewerage Department (DWSD), the loan recipient.

5.2.4 DISADVANTAGED COMMUNITY STATUS

The DWSRF program includes provisions for qualifying the applicant community as a disadvantaged community. The benefits for communities with a population of 10,000 or more that quality for the disadvantaged community status consist of:

- Award of 30 additional priority points.
- Possible extension of the loan term to 30 years or the useful life of the components funded, whichever is earlier. The estimated useful life of the new water mains is 50 years. DWSD is aware that the DWSRF program offers 20, 30 and 40 year loan terms and will evaluate which term is the most appropriate for DWSD and its customers. DWSD has initially indicated they will select a 30 year loan term.

MI-EGLE requires submittal of a Disadvantaged Community Status Determination Worksheet to determine if the community qualifies for this status. A completed worksheet is included in **Appendix C.**

Reference; *[1] https://www.census.gov/quickfacts/fact/table/detroitcitymichigan/IPE120216#viewtop*
Under Criterion 1, Detroit qualifies for Disadvantaged Community Status based on approximately 37.9% of families in Detroit below the poverty level.

5.2.5 SURFACE WATER INTAKE PROTECTION PROGRAM

Protection of surface water intakes for the system is the responsibility of GLWA as a part of the bifurcation agreement. Prior to that agreement, three (3) grants were received to develop plans for a Surface Water Intake Protection program. These grants are for the three raw water intakes now maintained by GLWA. Two intakes are located in the Detroit River at Fighting Island and Belle Isle; the third intake is located in Lake Huron adjacent to Burtchville Township, located north of the City of Port Huron. The plans were prepared as part of the 2015 Water Master Plan Update. The applicable box in the Project Plan Submittal Form will be checked for State approval of the Surface Water Intake Protection Program.

6 EVALUATION OF ENVIRONMENTAL IMPACTS

6.1 GENERAL

The anticipated environmental impacts resulting from implementing the recommendations of this Project Plan include beneficial and adverse; short and long-term; and irreversible and irretrievable. The following is a brief discussion of the anticipated environmental impacts of the selected alternative.

6.1.1 BENEFICIAL AND ADVERSE

The proposed project will significantly improve DWSD capability to provide reliable, high quality potable water (at the required service volume and pressure) to its residents in the City of Detroit. The project will also generate construction-related jobs, and local contractors would have an opportunity to bid the contracts.

Noise and dust will be generated during construction of the proposed Projects. The contractors will be required to implement efforts to minimize noise, dust and related temporary construction byproducts. Some street congestion and disruption of vehicular movement may occur for short periods of time, and areas targeted for water main replacement will require a short (2-4 hour) service interruption for the switchover from the old pipes to the new ones. Residents will need to flush their lines after the switchover is made. Spoils from open trenches will be subject to erosion; the contractors will thereby be required to implement a Soil Erosion and Sedimentation Control (SESC) Program as described and regulated under Michigan's Part 91, Soil Erosion and Sedimentation Control, of the Natural Resources and Environmental Protection Act (NREPA). Wayne County considers DWSD an Authorized Public Agency with regard to SESC. Underground utility services (water, electric, gas, etc.) may be interrupted occasionally for short periods of time. The aesthetics of the area will be temporarily affected until restoration is complete. Resources will be lost in the production of materials used in construction, and fossil fuels will also be utilized during construction activities. All construction will be in the road right-of-way (ROW). The work will be done in the City of Detroit ROW. Replacement of Lead water service lines will occur on private property as permitted by a written agreement with the resident.

SHORT AND LONG-TERM

The short-term adverse impacts associated with construction activities will be minimal, and will be mitigated in comparison to the resulting long-term beneficial impacts. Short-term adverse impacts include traffic disruption, dust, noise, and site aesthetics. No adverse long-term impacts are anticipated. Additionally, there will be no change to the visible landscape at the completion of this project.

6.1.2 IRREVERSIBLE OR IRRETRIEVABLE

The impact of the proposed project on irreversible and irretrievable commitment of resources includes materials utilized during construction and fossil fuels utilized to implement project construction.

6.2 ANALYSIS OF IMPACTS

6.2.1 DIRECT IMPACTS

Construction of the proposed project is not expected to have an adverse effect on historical, archaeological, geographic or cultural areas, as the construction activities will occur within extensively urbanized areas which have previously been disturbed by prior development and existing road rights-of-way. Additionally, there will be no change to the visible landscape at the completion of this project.

The proposed project will not detrimentally affect the water quality of the area, air quality, wetlands, endangered species, wild and scenic rivers, or unique agricultural lands.

6.2.2 INDIRECT IMPACTS

It is not anticipated that DWSD's proposed projects will alter the ongoing pattern of growth and development in the study area. Growth patterns in the service area are subject to local use and zoning plans, thus providing further opportunity to minimize indirect impacts.

6.2.3 CUMULATIVE IMPACTS

Improved customer satisfaction and reliable service delivery of potable water to customers are the primary cumulative beneficial impacts anticipated from the construction of the proposed water mains.

7 MITIGATION

7.1 GENERAL

Where adverse impacts cannot be avoided, mitigation methods will be implemented. Mitigation measures for the project such as soil erosion control will be utilized as necessary and in accordance with applicable laws. Details will be further specified in the construction contract documents used for the projects.

7.2 MITIGATION OF SHORT-TERM IMPACTS

Short-term impacts due to construction activities such as noise, dust and street congestion cannot be avoided. However, efforts will be made to minimize the adverse impacts by use of thorough design and well planned construction sequencing. To the extent possible, water mains will be located in rights-of-way to minimize adverse impacts on private property and routings will be selected to avoid major street and ornamental vegetation whenever possible. Established tree removals in the public righ-of-way will also be avoided where possible. Where tree removals cannot be avoided, replacement saplings will be planted as a part of the restoration after construction. Access to properties will be maintained throughout the construction period for the water main replacement work. Site restoration will minimize the adverse impacts of construction, and adherence to the Soil Erosion and Sedimentation Act will minimize the impacts due to disturbance of the soil structure. Specific techniques will be specified in the construction contract documents.

Open trenches will be protected to minimize the hazards to citizens and construction will not normally take place in residential areas at night or on weekends in order to minimize disruption of normal living patterns.

7.3 MITIGATION OF LONG-TERM IMPACTS

Careful restoration of street pavement, sidewalks and driveways will be required to ensure that they perform satisfactorily in the future. The aesthetic impacts of construction will be mitigated by site restoration.

7.4 MITIGATION OF INDIRECT IMPACTS

In general, it is not anticipated that mitigation measures to address indirect impacts will be necessary for the recommended improvements addressed in this Project Plan. The proposed project is not located in undeveloped areas, nor is it to promote growth in areas not currently served by DWSD. In addition, the local land use plan and zoning ordinance further regulate and control development. For these reasons, indirect impacts are not likely to be a concern for this project.

8 PUBLIC PARTICIPATION

8.1 PUBLIC HEARING

8.1.1 PUBLIC HEARING ADVERTISEMENT AND NOTICE

A Public Hearing Notice will be published 30 days in advance of the hearing date to alert parties interested in this Project Plan and request input prior to its adoption (see **Appendix D**). This direct mail notice will be included an invitation to comment. While the public hearing is scheduled to be held at a regular DWSD Board of Water Commissioners meeting at a location out in the community, due to COVID-19 protocols, the meeting will be held virtually on April 20, 2022.

PUBLIC HEARING TRANSCRIPT

A formal public hearing on the draft Project Plan will be held before the DWSD Board of Water Commissioners on April 20, 2022. The hearing included a presentation on the project, as well as an opportunity for public comment and questions. The official hearing transcript and a copy of the visual aids (handout) used during the presentation is included in **Appendix D** along with the attendance list.

8.1.2 PUBLIC HEARING COMMENTS RECEIVED AND ANSWERED

There were no comments or responses from the public resulting from the public hearing.

8.1.3 ADOPTION OF THE PROJECT PLAN

The Project Plan is expected to get approved by the DWSD Board of Water Commissioners at the public hearing on April 20, 2022, and the GLWA Board of Directors at their regular meeting conducted on April 27, 2022 and resolutions will be adopted, ultimately authorizing GLWA to proceed with official filing of the Project Plan for purposes of securing low interest loan assistance under the DWSRF Program. Executed copies of the DWSD Board of Water Commissioners and the GLWA Board of Directors Resolutions approving the Project Plan are included in **Appendix C** of this document. Miscellaneous correspondence applicable to the Project Plan will also be included in **Appendix C** of the final document.

APPENDIX A-1 and A-2

Table A- 1and A-2 Cost Estimate for
Full Lead service Line Replacement
Water Main Replacement in Midtown, Cultural Center, and Medical Center Neighborhoods in Detroit

APPENDIX B

SUBMITTAL FORM, SELF-CERTIFICATION FORM, DISADVANTAGED COMMUNITY STATUS DETERMINATION WORKSHEET, BOARD RESOLUTIONS

APPENDIX C

PUBLIC HEARING NOTICE, MAILING LIST FOR PUBLIC HEARING, PUBLIC HEARING TRANSCRIPT, VISUAL AIDS

APPENDIX D

PROJECT PLAN CORRESPONDENCE; USACE PERMIT; SHPO SUBMITTAL; MNFI REVIEW; USFWS REVIEW

Financial Services
Audit Committee Communication

Date: May 27, 2022

To: Great Lakes Water Authority Audit Committee

From: Kim Garland, CPA, Financial Services Area Chief of Staff

Re: Resolution Regarding Approval of Series Ordinance Authorizing Issuance and Sale of Water Supply System Revenue Bonds in an Amount Not to Exceed $40,000,000 (Ordinance 2022-03)

Background & Analysis: See attached draft Great Lakes Water Authority ("GLWA") Board letter.

Proposed Action: The GLWA Audit Committee recommends that the Great Lakes Water Authority Board approve the resolution for the Approval of Series Ordinance Authorizing Issuance and Sale of Water Supply System Revenue Bonds in an Amount Not to Exceed $40,000,000 for 7532-01 GLWA – 96-inch Water Main Relocation – Phase 1.

..Title

Resolution Regarding Approval of Series Ordinance Authorizing Issuance and Sale of Water Supply System Revenue Bonds in an Amount Not to Exceed $40,000,000 (Ordinance 2022-03)

..Body

Agenda of: June 22, 2022
Item No.: **2022-___**
Amount: Not to Exceed $40,000,000

TO: The Honorable
Board of Directors
Great Lakes Water Authority

FROM: Suzanne R. Coffey, P.E.
Interim Chief Executive Officer
Great Lakes Water Authority

DATE: June 22, 2022

RE: **Resolution Regarding Approval of Series Ordinance Authorizing Issuance and Sale of Water Supply System Revenue Bonds in an Amount Not to Exceed $40,000,000 (Ordinance 2022-03)**

MOTION

Upon recommendation of Nicolette N. Bateson, Chief Financial Officer//Treasurer, the Board of Directors (Board) of the Great Lakes Water Authority (GLWA), **approve the resolution Approval of Series Ordinance Authorizing Issuance and Sale of Water Supply System Revenue Bonds in an Amount Not to Exceed $40,000,000 as presented,** and authorizes the CEO to take such other action as may be necessary to accomplish the intent of this vote.

BACKGROUND

There are two elements to the background related to this resolution: financing considerations and the project being funded.

Financing Considerations

The amount being financed with revenue bonds via the Drinking Water Revolving Fund (DWRF) Bonds is within authorized GLWA limits. On February 26, 2020, the Great Lakes Water Authority ("GLWA") Board of Directors approved Resolution 2020-068, "Resolution of the Great Lakes Water Authority Authorizing Publication of Notice of Intent to Issue Water Supply System Revenue Bonds in a principal amount not to exceed $200,000,000" (the "Notice of Intent"). This is the fourth series of water bonds from that Notice of Intent in the amount not to exceed $40,000,000.

The proposed action authorizes the bonds to be issued. The approval of the Series Ordinance presented today is the next formal step required by the GLWA Board of Directors in the bond issuance process. The Series Ordinance authorizes the issuance of the Bonds by GLWA, sets forth the guidelines for the DWRF Bonds, designates the Bonds as 2022 SRF-2 Junior Lien Bonds, and authorizes the Chief Executive Officer or the Chief Financial Officer to execute the final terms of the Bonds, paying issuance costs and signing of the Purchase Contract and Sale Order, within the parameters set forth in the Series Ordinance.

Project Considerations

Project Plan Approval - On June 23, 2021, the GLWA Board of Directors conducted a public hearing related to the 96-inch Water Transmission Main (WTM) Relocation Project - FY 2022 Drinking Water Revolving Fund (DWSRF) Project Plan. Subsequent to that public hearing, the Board adopted the project plan.

Project Plan – It should be noted that the estimated costs for the project plan were estimated at approximately $171 million for "Alternative 10" in the above referenced documents presented in June 2021.

JUSTIFICATION

This series of bonds authorized by this ordinance will be sold through the state of Michigan's DWRF program (Project #7532-01) is a Regional Water System project involving the 96-inch water main relocation. Redundant supply features for the 96-inch water main are considered prudent for preserving its long-term viability.

The 2022 SRF-2 Junior Lien Bonds will be sold to the Michigan Finance Authority. The current program interest rate for the DWRF is 1.875% for 20-year and 2.125% for 30-year loans. Based on the not to exceed amount for this series of $40.0 million.

BUDGET IMPACT

The debt service payments on the GLWA Regional project are anticipated to start on October 1, 2023 with minimal amounts of interest due, because of the projected draw down schedules. An estimate for debt service on the loan is included in the biennial FY 2024 Water Budget as well as GLWA's current ten year forecast.

COMMITTEE REVIEW

This matter was reviewed by the GLWA Audit Committee at its meeting on May 27, 2022. The Audit Committee [insert action] approval of the resolution Approval of Series Ordinance Authorizing Issuance and Sale of Water Supply System Revenue Bonds in an Amount Not to Exceed $40,000,000 as presented.

GREAT LAKES WATER AUTHORITY
ORDINANCE NO. 2022-03

SERIES ORDINANCE AUTHORIZING ISSUANCE AND SALE OF WATER SUPPLY SYSTEM REVENUE BONDS IN AN AMOUNT NOT TO EXCEED $40,000,000

WHEREAS, pursuant to Resolution No. 2015-10-02 adopted by the Board of Directors of the Great Lakes Water Authority (the "Authority") on October 7, 2015, the Authority Board approved and adopted Master Bond Ordinance No. 2015-01 (as subsequently amended through the date hereof, the "Ordinance"), which authorizes the issuance by the Authority of Water Supply System Revenue Bonds; and

WHEREAS, the Ordinance authorizes the issuance of such Water Supply System Revenue Bonds in one or more Series pursuant to a Series Ordinance authorizing the issuance and sale of such Series; and

WHEREAS, the Authority Board has determined that it is necessary to authorize at this time three or more Series of SRF Junior Lien Bonds (the "2022 SRF-2 Junior Lien Bonds") to provide moneys to pay the costs of the hereinafter described repairs, extensions, enlargements and improvements to the Regional Water System identified in the Capital Improvement Program (the "2022 SRF-2 Project").

NOW, THEREFORE, BE IT ORDAINED BY THE BOARD OF DIRECTORS OF THE GREAT LAKES WATER AUTHORITY AS FOLLOWS:

Section 1. Authority for this Series Ordinance. This Series Ordinance (the "2022 SRF-2 Series Ordinance") is adopted pursuant to Section 1102(1) of the Ordinance.

Section 2. Definitions. Except as otherwise provided in this 2022 SRF-2 Series Ordinance, all terms which are defined in Section 101 of the Ordinance shall have the same meanings, respectively, in this 2022 SRF-2 Series Ordinance as such terms are given in the Ordinance. In addition, the following terms shall have the following meanings unless the context shall clearly indicate some other meaning:

(a) "2022 SRF-2 Junior Lien Bonds" means the Bonds authorized by Section 5 of this 2022 SRF-2 Series Ordinance for the purpose of paying and/or reimbursing costs of the 2022 SRF-2 Project.

(b) "2022 SRF-2 Project" means improvements to the Regional Water System, related to all or part of the 96-inch Water Transmission Main Relocation Project and is planned to include the segment of the 96-inch transmission main located between GLWA's North Service Center and Imlay Booster Stations.

(c) "Authorized Denomination" means any denomination as determined by an Authorized Officer in the Sale Order.

(d) "Authorized Officer" means either the Chief Executive Officer or the Chief Financial Officer. In accordance with Resolution 2021-330 adopted by the Authority Board on August 11, 2021, references herein to Chief Executive Officer shall be deemed to include any duly appointed Interim Chief Executive Officer.

(e) "Construction Fund, Series SRF 2022-2" means a subaccount or subaccounts of the Construction Fund established in accordance with Section 10 of this 2022 SRF-2 Series Ordinance relating to the construction of the 2022 SRF-2 Project to be paid with the proceeds of the 2022 SRF-2 Junior Lien Bonds.

(f) "Interest Payment Date" means except as otherwise set forth in the Sale Order each April 1 and October 1.

(g) "Maturity Date" means such dates of maturity of the 2022 SRF-2 Junior Lien Bonds as determined in the Sale Order.

(h) "MFA" means the Michigan Finance Authority.

(i) "Person" means any natural person, association, corporation, trust, partnership, joint venture, joint-stock company, municipal corporation, public body or other entity, however organized.

(j) "Project Costs" means the costs of acquiring, constructing, equipping, installing and financing the 2022 SRF-2 Project, including Issuance Costs relating to the 2022 SRF-2 Junior Lien Bond.

(k) "Purchase Contract" means the Purchase Contract between the MFA and the Authority with respect to the purchase by the MFA and the sale by the Authority of the 2022 SRF-2 Junior Lien Bonds.

(l) "Regular Record Date" means except as otherwise set forth in the Sale Order the fifteenth day of the calendar month immediately preceding an Interest Payment Date.

(m) "Sale Order" means any one or more Sale Orders of an Authorized Officer authorizing acts consistent with the Ordinance and this 2022 SRF-2 Series Ordinance necessary and appropriate to complete the sale, execution and delivery of the 2022 SRF-2 Junior Lien Bonds and to complete the other transactions contemplated herein.

(n) "Supplemental Agreement" means the Supplemental Agreement among the Authority, the MFA and the State of Michigan acting through the Department of Environment, Great Lakes, and Energy, with respect to the 2022 SRF-2 Junior Lien Bonds.

(o) "Taxable 2022 SRF-2 Junior Lien Bonds" means any 2022 SRF-2 Junior Lien Bonds other than Tax-Exempt 2022 SRF-2 Junior Lien Bonds.

(p) "Tax-Exempt 2022 SRF-2 Junior Lien Bonds" means any 2022 SRF-2 Junior Lien Bonds that are Tax-Exempt Bonds.

Section 3. Approval of 2022 SRF-2 Project.

(a) Approval of 2022 SRF-2 Project. It is hereby determined to be necessary for the public health, benefit and welfare of the area served by the Regional Water System to acquire, construct and undertake the 2022 SRF-2 Project, and the 2022 SRF-2 Project is hereby approved and accepted.

(b) Estimated Cost and Period of Usefulness of 2022 SRF-2 Project1. The Project Costs are estimated by the Authority Board to not exceed $40,000,000 and the Project Costs are hereby approved and confirmed. The period of usefulness of the 2022 SRF-2 Project is estimated to be not less than 40 years.

Section 4. Authorization of 2022 SRF-2 Junior Lien Bonds.

(a) Authorization of Borrowing.

(i) The Authority may borrow an aggregate amount not in excess of $40,000,000, as is finally determined in the Sale Order, and issue the 2022 SRF-2 Junior Lien Bonds in one Series, all to evidence such borrowing pursuant to Act 233, Act 94 and the Ordinance, as 2022 SRF-2 Junior Lien Bonds, all as finally determined in the Sale Order. The amount of the 2022 SRF-2 Junior Lien Bonds authorized in this Section 5(a)(i) shall include the amount of the net original issue premium, if any.

(b) Purpose of 2022 SRF-2 Junior Lien Bonds. The 2022 SRF-2 Junior Lien Bonds shall be issued as Additional Bonds for the purpose of paying and/or reimbursing Project Costs.

(c) Priority of Lien. The 2022 SRF-2 Junior Lien Bonds shall be issued as SRF Junior Lien Bonds.

(d) Insufficient Proceeds. To the extent that proceeds of SRF Junior Lien Bonds are insufficient to pay Project Costs, the insufficiency shall be paid from the proceeds of future Additional Bonds, if any, and/or moneys of the Regional Water System on hand and legally available therefor, as determined by the Authority Board.

(e) Separate Series and Subseries. The 2022 SRF-2 Junior Lien Bonds are issuable at one or more times and as one or more separate subseries of Bonds in such amounts as determined in the Sale Order.

(f) Taxable and Tax-Exempt 2022 SRF-2 Junior Lien Bonds. The 2022 SRF-2 Junior Lien Bonds may be issued as Taxable 2022 SRF-2 Junior Lien Bonds or Tax-Exempt 2022 SRF-2 Junior Lien Bonds, or as separate subseries of both, as set forth in the Sale Order.

(g) Source of Payment and Security. The 2022 SRF-2 Junior Lien Bonds shall be payable and secured as provided in Section 8.

(h) Applicability of Ordinance. Except as otherwise provided in this 2022 SRF-2 Series Ordinance or in the Sale Order, all of the provisions of the Ordinance shall apply to the 2022 SRF-2 Junior Lien Bonds as if set forth in full in this 2022 SRF-2 Series Ordinance, the purpose of this 2022 SRF-2 Series Ordinance being to supplement the Ordinance to authorize the issuance of 2022 SRF-2 Junior Lien Bonds for the purposes set forth herein.

Section 5. 2022 SRF-2 Junior Lien Bond Details.

(a) Designation.

(1) The 2022 SRF-2 Junior Lien Bonds shall bear the designations Water Supply System Revenue Bonds, Series 2022-SRF-2 and shall include such other designations, including, without limitation, designations for multiple subseries, as determined by an Authorized Officer as shall be set forth in the Sale Order and not inconsistent with the Ordinance or this 2022 SRF-2 Series Ordinance.

(2) If the 2022 SRF-2 Junior Lien Bonds is not issued in 2022, an Authorized Officer is authorized in her discretion to re-designate the year and Series designation of such Series of 2022 SRF-2 Junior Lien Bonds and the various funds and accounts established hereunder to correspond with the year of issuance of such Series of 2022 SRF-2 Junior Lien Bonds. Furthermore, an Authorized Officer is authorized to establish designations within the various funds and accounts established hereunder if necessary in order to differentiate such funds and accounts from other similarly named funds and accounts related to other Bonds.

(b) Numbering. The 2022 SRF-2 Junior Lien Bonds shall be numbered in such manner as shall be determined in the Sale Order.

(c) Principal. The 2022 SRF-2 Junior Lien Bonds shall be issued in the form of Serial Bonds or Term Bonds, or any combination of Serial Bonds and Term Bonds, in any Authorized Denomination, and the principal thereof shall mature on October 1, or such other date as set forth in the Sale Order, in such years and amounts, and shall be or not be subject to redemption prior to maturity, all as shall be determined in the Sale Order subject to the following limitations:

(1) No 2022 SRF-2 Junior Lien Bonds shall mature later than 40 years after the date of issuance thereof.

(2) The 2022 SRF-2 Junior Lien Bonds shall only be issued with annual principal and interest installments permitted by the Ordinance, including Section 207 thereof.

(d) Interest. 2022 SRF-2 Junior Lien Bonds or portions thereof shall bear interest at a rate or rates as set forth in the Sale Order not in excess of 2.50% per annum. Interest on 2022 SRF-2 Junior Lien Bonds shall be payable on each Interest Payment Date.

(e) Payment of Principal and Interest. The principal of, premium, if any, and interest on the 2022 SRF-2 Junior Lien Bonds shall be payable in lawful money of the United States. Except as otherwise provided in the Sale Order, so long as the 2022 SRF-2 Junior Lien Bonds are owned by the MFA, the 2022 SRF-2 Junior Lien Bonds are payable as to principal, redemption premium, if any, and interest at The Bank of New York Mellon Trust Company, N.A., or at such other place as shall be designated in writing to the Authority by the MFA (the MFA's Depository"), and the Authority agrees that it will deposit with the MFA's Depository payments of the principal of, premium, if any, and interest on the 2022 SRF-2 Junior Lien Bonds in immediately available funds by 12:00 noon at least five Business Days prior to the date on which any such payment is due, whether by maturity, redemption or otherwise. If the 2022 SRF-2 Junior Lien Bonds are not registered in the name of the MFA, the principal of and premium, if any, on the 2022 SRF-2 Junior Lien Bonds are payable upon the surrender thereof at the corporate trust office of the Trustee and the interest is payable by check or draft drawn on the Trustee and mailed to the registered owners as of the immediately preceding Regular Record Date at their address shown on the registration books of the Authority maintained by the Trustee.

(f) Dating. The 2022 SRF-2 Junior Lien Bonds shall be dated such date as determined in the Sale Order.

(g) Reserve Requirement. There shall be no Reserve Requirement with respect to the 2022 SRF-2 Junior Lien Bonds.

(h) Exchange. The registered owner of any 2022 SRF-2 Junior Lien Bond may exchange such 2022 SRF-2 Junior Lien Bond for a new 2022 SRF-2 Junior Lien Bond or Bonds of the same interest rate, maturity and Priority of Lien in an equal aggregate principal amount in one or more of the Authorized Denominations by surrendering such 2022 SRF-2 Junior Lien Bond to be exchanged at the designated office of the Trustee together with an assignment duly executed by the registered owner thereof or his attorney or legal representative in such form as shall be satisfactory to the Trustee. As provided in Section 206 of the Ordinance, the Trustee shall be responsible for the registration, transfer and exchange of 2022 SRF-2 Junior Lien Bonds and shall indicate its acceptance of such duties by a document filed with an Authorized Officer concurrently with the delivery of the 2022 SRF-2 Junior Lien Bonds.

(i) Execution and Delivery of 2022 SRF-2 Junior Lien Bonds. The 2022 SRF-2 Junior Lien Bonds shall be executed in the name of the Authority by manual or facsimile signature of the Chief Executive Officer of the Authority and countersigned by the manual or facsimile signature of the Secretary of the Authority Board, and shall have the Authority's seal or facsimile thereof affixed or printed thereon. The Chief Financial Officer is authorized to deliver the 2022 SRF-2 Junior Lien Bonds to the MFA upon receiving the purchase price therefor in lawful money of the United States.

(j) Form of 2022 SRF-2 Junior Lien Bonds. The 2022 SRF-2 Junior Lien Bonds shall be in substantially the following form, subject to such changes, additions or deletions as determined by the Chief Executive Officer within the parameters of this 2022 SRF-2 Series Ordinance:

R-__

UNITED STATES OF AMERICA
STATE OF MICHIGAN
COUNTIES OF MACOMB, OAKLAND AND WAYNE
GREAT LAKES WATER AUTHORITY
WATER SUPPLY SYSTEM REVENUE BOND,
SERIES 2022-SRF-2

REGISTERED OWNER: Michigan Finance Authority

PRINCIPAL AMOUNT: $_______________

INTEREST RATE: ____%

ORIGINAL ISSUE DATE:

The Great Lakes Water Authority, Counties of Macomb, Oakland and Wayne, State of Michigan (the "Issuer"), upon authorization from the Board of Directors of the Issuer (the "Board"), has issued this Bond. The Issuer, for value received, promises to pay, in lawful money of the United States of America, but only from the Pledged Assets (as defined below), to the Registered Owner named above, or registered assigns, the Principal Amount stated above, or so much thereof as shall have been advanced to the Issuer and not prepaid or reduced pursuant to a Purchase Contract between the Issuer and the Michigan Finance Authority (the "MFA"), a Supplemental Agreement by and among the Issuer, the MFA and State of Michigan acting through the Department of Environment, Great Lakes, and Energy [and approved and agreed to by the Issuer], and the Order of Approval issued by the Department of Environment, Great Lakes, and Energy. The Principal Amount shall be payable on the dates and in the principal installments set forth in Schedule A attached hereto.

In the event less than the Principal Amount of this Bond is disbursed by the MFA, any portion of the Principal Amount is prepaid as provided herein, or any serial principal payment becomes due before the Issuer has received proceeds from corresponding purchased principal installments of at least a like amount, then the MFA may prepare a new serial principal installment repayment schedule which shall be presented to the Issuer and be effective upon receipt as provided in the Purchase Contract.

Interest on this Bond shall accrue from the Original Issue Date set forth above at the Interest Rate set forth above, only on that portion of installments of the Principal Amount which have been disbursed by the MFA, shall be payable on ________, 201_ and semiannually on each April 1 and October 1 thereafter (each an "Interest Payment Date").

If the MFA is not the registered owner of this Bond, principal of this Bond is payable upon presentation and surrender at the designated office of U.S. Bank Trust Company, National Association, as Trustee under the Ordinance (as defined below) or such other trustee as the Issuer may hereafter designate by notice mailed to the registered owner not less than 60 days prior to any Interest Payment Date (the "Trustee").

Interest on this Bond is payable to the registered owner of record as of the close of business on the 15th day of the month immediately preceding any Interest Payment Date as shown on the registration books kept by the Trustee by check or draft mailed by the Trustee to the registered owner at the registered address. Interest on this Bond shall be computed on the basis of a 360-day year comprised of twelve 30-day months. During the time funds are being drawn down by the Issuer under this Bond, the MFA will periodically provide the Issuer with a statement showing the amount of principal that has been advanced and the date of each advance, which statement shall constitute prima facie evidence of the reported information; provided, that no failure on the part of the MFA to provide such a statement or to reflect a disbursement or the correct amount of a disbursement shall relieve the Issuer of its obligation to repay the outstanding principal amount actually advanced [(subject to any principal forgiveness as provided for herein)], all accrued interest thereon, and any other amount payable with respect thereto in accordance with the terms of this Bond.

In the event of a default in the payment of principal or interest hereon when due, whether at maturity, by redemption or otherwise, the amount of such default shall bear interest (the "additional interest") at a rate equal to the rate of interest that is two percent above the MFA’s cost of providing funds (as determined by the MFA) to make payment on the bonds of the MFA issued to provide funds to purchase this Bond but in no event in excess of the maximum rate of interest permitted by law. The additional interest shall continue to accrue until the MFA has been fully reimbursed for all costs incurred by the MFA (as determined by the MFA) as a consequence of the Issuer's default. Such additional interest shall be payable on the interest payment date following demand of the MFA. In the event that (for reasons other than the default in the payment of any municipal obligation purchased by the MFA) the investment of amounts in the reserve account established by the MFA for the bonds of the MFA issued to provide funds to purchase this bond fails to provide sufficient available funds (together with any other funds that may be made available for such purpose) to pay the interest on outstanding bonds of the MFA issued to fund such account, the Issuer shall and hereby agrees to pay on demand only the Issuer’s pro rata share (as determined by the MFA) of such deficiency as additional interest on this bond.

Notwithstanding any other provision of this Bond, so long as the MFA is the owner of this Bond, (a) this Bond is payable as to principal, premium, if any, and interest at The Bank of New York Mellon Trust Company, N.A., or at such other place as shall be designated in writing to the Issuer by the MFA (the “MFA’s Depository”); (b) the Issuer agrees that it will deposit with the MFA’s Depository payments of the principal of, premium, if any, and interest on this Bond in immediately available funds by 12:00 noon at least five business days prior to the date on which any such payment is due whether by maturity, redemption or otherwise; in the event that the MFA’s Depository has not received the Issuer’s deposit by 12:00 noon on the scheduled day, the Issuer shall immediately pay to the MFA as invoiced by the MFA an amount to recover the MFA’s administrative costs and lost investment earnings attributable to that late payment; and (c) written notice of any redemption of this Bond shall be given by the Issuer and received by the MFA’s Depository at least 40 days prior to the date on which redemption is to be made.

This Bond is one of a series of bonds designated “Water Supply System Revenue Bonds, Series 2022-SRF-2” and is issued pursuant to the provisions of (i) Act 233, Public Acts of Michigan, 1955, as amended (“Act 233”), and Act 94, Public Acts of Michigan, 1933, as amended (“Act 94”), (ii) Master Bond Ordinance No. 2015-01 adopted by the Board on October 7, 2015, as amended (the "Bond Ordinance"), (iii) the Series Ordinance Authorizing Issuance and Sale of Water Supply System Revenue Bonds in an Amount not to Exceed $40,000,000, adopted by the Board on ____________, 2022 (the "Series Ordinance"), and (iv) a Sale Order of the Chief Executive Officer of the Issuer dated ____________, 2022 (the "Sale Order," and, collectively with the Bond Ordinance and the Series Ordinance, the "Ordinance"). This Bond is issued for the purposes set forth in the Series Ordinance and the Sale Order.

For the prompt payment of the principal of and interest on this Bond, and other bonds issued by the Issuer pursuant to the Bond Ordinance, the Issuer has irrevocably pledged the Pledged Assets (as defined in the Bond Ordinance), which includes the revenues of the Water System (as defined in the Bond Ordinance), after provision is made for reasonable and necessary expenses of operation, maintenance and administration of the Water System (the "Net Revenues"), and a statutory lien on the Net Revenues and Pledged Assets is hereby recognized and acknowledged. Such lien is a third lien, subject to obligations heretofore and hereafter issued or incurred under the Bond Ordinance secured by a first or second lien on the Pledged Assets. This Bond is of equal standing on a parity with all other obligations heretofore and hereafter issued or incurred under the Bond Ordinance and secured by a third lien on the Pledged Assets.

For a complete statement of the revenues from which and the conditions under which this Bond is payable, a statement of the conditions under which Additional Bonds (as defined in the Bond Ordinance) of senior or equal standing and Additional Bonds of junior standing may hereafter be issued and the general covenants and provisions pursuant to which this Bond is issued, reference is made to the Bond Ordinance.

This Bond is subject to redemption prior to maturity at the option of the Issuer and with the prior written consent of and upon such terms as may be required by the MFA. That portion of this Bond called for redemption shall not bear interest after the date fixed for redemption, provided funds are on hand with the Trustee to redeem the same.

THIS BOND IS ISSUED UNDER ACT 233 AND ACT 94. IT IS A SELF-LIQUIDATING BOND AND IS NOT A GENERAL OBLIGATION OF THE ISSUER AND DOES NOT CONSTITUTE AN INDEBTEDNESS OF THE ISSUER WITHIN ANY CONSTITUTIONAL OR STATUTORY LIMITATION, BUT IS PAYABLE, BOTH AS TO PRINCIPAL AND INTEREST SOLELY FROM THE PLEDGED ASSETS OF THE WATER SYSTEM. THE PAYMENT OF THE PRINCIPAL OF AND INTEREST ON THIS BOND ARE SECURED BY A STATUTORY LIEN ON THE PLEDGED ASSETS AS DESCRIBED HEREIN.

The Issuer has covenanted and agreed, and hereby covenants and agrees, to fix and maintain, or cause to be fixed and maintained, at all times while any bonds payable from the Pledged Assets of the Water System shall be outstanding, such rates for service furnished by the Water System as shall be sufficient to provide for payment of the interest upon and the principal of this Bond and all other Bonds (as defined in the Bond Ordinance) assumed or issued and to be issued under the Bond Ordinance as and when the same shall become due and payable, to create and maintain a bond redemption fund therefor, including a bond reserve for Bonds other than this Bond, to provide for the payment of expenses of administration and operation and such expenses for maintenance of the Water System as are necessary to preserve the same in good repair and working order, and to provide for such other expenditures and funds for the Water System, all as are required by the Bond Ordinance.

This Bond is transferable only upon the books of the Issuer kept for that purpose at the office of the Trustee by the registered owner hereof in person, or by his attorney duly authorized in writing, upon the surrender of this Bond together with a written instrument of transfer satisfactory to the Trustee duly executed by the registered owner or his attorney duly authorized in writing, and thereupon a new registered bond or bonds of the same type, in the same aggregate principal amount and of the same maturity shall be issued to the transferee in exchange therefor as provided in the Ordinance and upon the payment of the charges, if any, therein prescribed.

It is hereby certified and recited that all acts, conditions and things required by law precedent to and in the issuance of this Bond have been done and performed by regular and due time and form as required by law.

This Bond is not valid or obligatory for any purpose until the Trustee's Certificate of Authentication hereon has been executed by the Trustee.

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IN WITNESS WHEREOF, the Great Lakes Water Authority, Counties of Macomb, Oakland and Wayne, State of Michigan, has caused this Bond to be signed in its name by the facsimile signatures of its Chief Executive Officer and its Secretary of the Board, and a facsimile of its corporate seal to be printed, impressed or otherwise reproduced hereon, all as of the Original Issue Date.

GREAT LAKES WATER AUTHORITY

By:____
Chief Executive Officer

Countersigned:

By:____
Secretary, Board of Directors

[Seal]

CERTIFICATE OF AUTHENTICATION

This Bond is authenticated as the bond designated by the Issuer as "Water Supply System Revenue Bond, Series 2022-SRF-2".

U.S. Bank Trust Company, National Association,
Trustee

By:____

Date of Authentication: __________, 2022

ASSIGNMENT

For value received, the undersigned sells, assigns and transfers unto _________________________ this Bond and all rights hereunder and hereby irrevocably appoints _________________________ attorney to transfer this Bond on the books kept for registration thereof with full power of substitution in the premises.

Dated:_________________________ ____

Signature

NOTICE: The signature to this assignment must correspond with the name as it appears on the face of this Bond in every particular.

Schedule A

The principal amounts and maturity dates applicable to the Bond to which this Schedule A is attached are as follows:

Date	Amount

Based on the schedule provided above unless revised as provided in this paragraph, repayment of the Principal Amount shall be made according to such schedule until the full Principal Amount disbursed to the Issuer is repaid; provided, however, that the Issuer shall have no obligation to repay any serial principal installment for which the Issuer did not receive a disbursement of Principal Amount by the date such serial principal installment is due. In the event the Order of Approval issued by the Department of Environment, Great Lakes, and Energy (the "Order") approves a principal amount of assistance less than the amount of this Bond, the MFA shall only disburse principal up to the amount stated in the Order. In the event (1) that the payment schedule described above provides for payment of a total principal amount greater than the amount of assistance approved by the Order, (2) that less than the principal amount of assistance approved by the Order is disbursed to the Issuer by the MFA or (3) of prepayment [or principal forgiveness] of the Bond, the MFA shall prepare a new payment schedule that shall be effective upon receipt by the Issuer.

END OF BOND FORM

Section 6. Concerning the Securities Depository.

(a) As used herein:

"Beneficial Owner" means any Person who indirectly owns 2022 SRF-2 Junior Lien Bonds pursuant to the indirect ownership system maintained by a securities depository (the "Securities Depository") and its Participants, commonly known as the "Book-Entry Only System."

"Participant" means any Person whose ownership of 2022 SRF-2 Junior Lien Bonds is shown on books of the Securities Depository.

(b) The 2022 SRF-2 Junior Lien Bonds will initially be registered in the name of the MFA, or such other purchasers as designated in the Sale Order. In the event 2022 SRF-2 Junior Lien Bonds are later to be registered in the name of a Securities Depository or its nominee, neither the Authority nor the Trustee shall have any responsibility or obligation to any Participant or to any Beneficial Owner with respect to any matter, including the following:

(1) the accuracy of the records of the Securities Depository, its nominee or any Participant with respect to any ownership interest in 2022 SRF-2 Junior Lien Bonds,

(2) the delivery to any Participant, Beneficial Owner or any other Person other than the Securities Depository of any notice with respect to: any 2022 SRF-2 Junior Lien Bonds, including any notice of redemption, or

(3) the payment to any Participant, Beneficial Owner or any other Person, other than the Securities Depository of any amount with respect to the principal (and premium, if any) of or interest on any 2022 SRF-2 Junior Lien Bonds.

(c) The Trustee shall pay all principal (and premium, if any) of and interest on the 2022 SRF-2 Junior Lien Bonds only to or upon the order of the MFA, or the Securities Depository, as applicable, and all such payments shall be valid and effective fully to satisfy and discharge the Authority's obligations with respect to the principal (and premium, if any) of, and interest on such 2022 SRF-2 Junior Lien Bonds to the extent of the sum or sums so paid.

(d) If 2022 SRF-2 Junior Lien Bonds become registered in the name of the Securities Depository and (1) the Authority receives a written notice from the Securities Depository to the effect the Securities Depository is unable or unwilling to discharge its responsibilities or (2) the Authority determines that it is in the best interests of the Beneficial Owners of 2022 SRF-2 Junior Lien Bonds that they be able to obtain 2022 SRF-2 Junior Lien Bonds in certificated form, then, in either event, the Authority shall notify the Trustee and, in the case of clause, (2), the Securities Depository.

(e) Upon discontinuance of the use of the Book-Entry Only System maintained by the Securities Depository, if any, pursuant to subsection (d), above and upon receipt of notice from the Securities Depository containing sufficient information, the Authority shall execute and the Trustee shall authenticate and deliver 2022 SRF-2 Junior Lien Bonds in certificated form to

Beneficial Owners in exchange for the beneficial interests of such Beneficial Owners in corresponding principal amounts and in any Authorized Denominations.

(f) Notwithstanding any other provision of this 2022 SRF-2 Series Ordinance to the contrary, so long as any 2022 SRF-2 Junior Lien Bond is registered in the name of the Securities Depository or its nominee:

(1) all payments with respect to the principal, premium, if any, and interest on such 2022 SRF-2 Junior Lien Bond and all notices of redemption, tender and otherwise with respect to such 2022 SRF-2 Junior Lien Bond shall be made and given, respectively, to the Securities Depository as provided in the letter of representations from the Authority to the Securities Depository with respect to such 2022 SRF-2 Junior Lien Bonds or any master letter of representations from the Authority to the Securities Depository;

(2) if less than all of the 2022 SRF-2 Junior Lien Bonds of the same type of any maturity are to be redeemed, then the particular 2022 SRF-2 Junior Lien Bonds or portions of 2022 SRF-2 Junior Lien Bonds of such type and maturity to be redeemed shall be selected by the Securities Depository in any such manner as the Securities Depository may determine;

(3) all payments with respect to principal of the 2022 SRF-2 Junior Lien Bonds and premium, if any and interest on the 2022 SRF-2 Junior Lien Bonds shall be made in such manner as shall be prescribed by the Securities Depository; and

(4) if a 2022 SRF-2 Junior Lien Bond is redeemed or tendered in part, then all amounts payable in respect of such redemption or tender shall be paid without presentation and surrender of such 2022 SRF-2 Junior Lien Bond pursuant to the procedures of the Securities Depository.

Section 7. Payment of 2022 SRF-2 Junior Lien Bonds; Confirmation of Statutory Lien.

(a) The 2022 SRF-2 Junior Lien Bonds and the interest thereon shall be payable solely from the Pledged Assets.

(b) To secure payment of the 2022 SRF-2 Junior Lien Bonds, the statutory lien upon the whole of the Pledged Assets established by Act 94 and the pledge created in Section 501 of the Ordinance is hereby confirmed in favor of the 2022 SRF-2 Junior Lien Bonds as follows: Such lien in favor of the 2022 SRF-2 Junior Lien Bonds shall be a statutory third lien on the Pledged Assets of equal standing and Priority of Lien with all issued, to be issued and outstanding SRF Junior Lien Bonds.

Section 8. Funds and Accounts; Flow of Funds. Except as otherwise provided in this 2022 SRF-2 Series Ordinance, all of the provisions relative to funds and accounts, their maintenance, the flow of funds and other details relative thereto, shall remain as specifically set forth in the Ordinance.

Section 9. Disposition of Proceeds.

(a) Disposition of Accrued Interest and Capitalized Interest. (1)From the proceeds of the sale of the 2022 SRF-2 Junior Lien Bonds there shall be immediately deposited in the SRF Junior Lien Debt Service Account, an amount equal to any accrued interest received on the delivery of the 2022 SRF-2 Junior Lien Bonds and any capitalized interest on the 2022 SRF-2 Junior Lien Bonds, and the Authority may take credit for the amount so deposited against the amount required to be deposited in the SRF Junior Lien Debt Service Account for payment of the next maturing interest payment on the 2022 SRF-2 Junior Lien Bonds.

(b) Construction Fund. The balance of the proceeds of the 2022 SRF-2 Junior Lien Bonds shall be deposited in the Construction Fund and used to pay Project Costs as provided in Section 10.

Section 10. Construction Fund.

(a) A subaccount of the Authority Regional Construction Account of the Construction Fund established by the Ordinance shall be established for the 2022 SRF-2 Junior Lien Bonds and designated the "Construction Fund, Series SRF 2022-2," and shall be established and maintained as a separate depository account with a Custodian as designated by the Chief Financial Officer.

(b) Moneys in the Construction Fund, Series SRF 2022-2 shall be applied solely to payment of Project Costs (or to the reimbursement of Project Costs paid by the Authority from other funds prior to the issuance of the 2022 SRF-2 Junior Lien Bonds).

(1) Payments or reimbursement for Project Costs for construction, either on account or otherwise, shall not be made unless the registered engineer in charge of such work shall file with an Authorized Officer a signed statement to the effect that the work has been completed in accordance with the plans and specifications therefor, that it was done pursuant to and in accordance with the contract therefor, that such work is satisfactory and that such work has not been previously paid for.

(2) Payment or reimbursement for Project Costs consisting of Issuance Costs and engineering, legal and financial costs shall be made upon submission of appropriate documentation to an Authorized Officer.

Section 11. Tax Covenant.

(a) The Authority hereby covenants and represents with the registered owners of the Tax-Exempt 2022 SRF-2 Junior Lien Bonds, that so long as any of the Tax-Exempt 2022 SRF-2 Junior Lien Bonds remain outstanding and unpaid as to either principal or interest, the Authority shall, to the extent permitted by law, take all actions within its control to maintain, and will refrain from taking any action which would impair, the exclusion of the interest on the Tax-Exempt 2022 SRF-2 Junior Lien Bonds from gross income for federal income tax purposes under the Code.

(b) The actions referred to in subsection (a), above include, but are not limited to actions relating to any required rebate of arbitrage earnings and the expenditure and investment of proceeds of Tax-Exempt 2022 SRF-2 Junior Lien Bonds and moneys deemed to be proceeds of

Tax-Exempt 2022 SRF-2 Junior Lien Bonds, and to prevent Tax-Exempt 2022 SRF-2 Junior Lien Bonds from being or becoming "private activity bonds" as that term is used in the Code.

Section 12. Sale of 2022 SRF-2 Junior Lien Bonds; Purchase Contract; Expiration of Referendum Period.

(a) The 2022 SRF-2 Junior Lien Bonds shall be sold by negotiated sale to the MFA pursuant to a Purchase Contract in customary form with such changes thereto as an Authorized Officer shall determine are in the best interests of the Authority, within the parameters established by this 2022 SRF-2 Series Ordinance. Such determination shall be conclusively established by the Authorized Officer's execution of the Purchase Contract to the MFA.

(b) The Authority Board hereby determines that the sale of the 2022 SRF-2 Junior Lien Bonds by negotiated sale as described in subsection (a) is in the best interests of the Authority and will allow the 2022 SRF-2 Junior Lien Bonds to receive a subsidized interest rate through participation in the MFA's Drinking Water Revolving Fund Program.

(c) An Authorized Officer is authorized to accept, on behalf of the Authority, an offer from the MFA to purchase the 2022 SRF-2 Junior Lien Bonds subject to the following limitations:

(1) The interest rate with respect to the 2022 SRF-2 Junior Lien Bonds shall not exceed 2.50%.

(2) The aggregate purchaser's discount at which the 2022 SRF-2 Junior Lien Bonds shall be sold to the MFA shall not exceed 2.00%.

(d) An Authorized Officer shall confirm in the Sale Order that there was no petition meeting the requirements of Section 33 of Act 94 that was filed with the Secretary of the Authority Board within 45 days of the date of publication of the notice of intent to issue bonds with respect to the 2022 SRF-2 Junior Lien Bonds as required by Section 33 of Act 94.

Section 13. Delegation of Authority to and Authorization of Actions of Authorized Officers.

(a) An Authorized Officer shall make all determinations herein provided to be made in the Sale Order and shall make all such determinations in accordance with the best interests of the Authority within the parameters of this 2022 SRF-2 Series Ordinance.

(b) In addition to determinations authorized elsewhere in this 2022 SRF-2 Series Ordinance, an Authorized Officer shall determine the aggregate principal amount of 2022 SRF-2 Junior Lien Bonds to be issued, but not in excess of the aggregate principal amount authorized by this 2022 SRF-2 Series Ordinance, on the basis of her evaluation of the maximum amount of 2022 SRF-2 Junior Lien Bonds which can be sold, given anticipated interest rates and the revenue coverage requirements with respect to the 2022 SRF-2 Junior Lien Bonds and for any other reasons the Authorized Officer deems appropriate.

(1) Such determination shall also include the redemption provisions for the 2022 SRF-2 Junior Lien Bonds.

(2) An Authorized Officer shall also determine and establish, in accordance with this 2022 SRF-2 Series Ordinance, the maturities of the 2022 SRF-2 Junior Lien Bonds, whether such maturities shall be serial or term maturities and the Mandatory Redemption Requirements for any term maturities.

(c) An Authorized Officer is authorized, if necessary, to file applications and to pay the related fees, if any, to the Michigan Department of Treasury at her discretion under Act 34 for one or more orders of approval to issue all or a portion of the 2022 SRF-2 Junior Lien Bonds, and such waivers or other Treasury approvals as necessary to implement the sale, delivery and security for the 2022 SRF-2 Junior Lien Bonds as authorized herein, and as required by the Michigan Department of Treasury or Act 34.

(d) An Authorized Officer shall determine in the Sale Order that the requirements set forth in Section 207 of the Ordinance with respect to the issuance of the 2022 SRF-2 Junior Lien Bonds as Additional Bonds have been satisfied.

(e) An Authorized Officer is hereby authorized and directed to do and perform any and all other acts and things with respect to the 2022 SRF-2 Junior Lien Bonds which are necessary or appropriate to carry into effect, consistent with the Ordinance and this 2022 SRF-2 Series Ordinance, the authorizations therein and herein contained including without limitation the securing of ratings by bond rating agencies, and the incurring of reasonable fees costs and expenses incidental to the foregoing, for and on behalf of the Authority.

Section 14. Advancement of Project Costs. At the direction of an Authorized Officer, the Authority may advance certain Project Costs from the Authority's funds prior to the issuance of the 2022 SRF-2 Junior Lien Bonds to the extent that such costs are expenditures appropriate for reimbursement under applicable law, including the Code in the case of Tax-Exempt 2022 SRF-2 Junior Lien Bonds.

Section 15. Ratification. All determinations and decisions of an Authorized Officer heretofore taken with respect to the issuance and sale of the 2022 SRF-2 Junior Lien Bonds as permitted or required by the Ordinance or law are hereby ratified, confirmed and approved.

Section 16. Additional Authorization. The Chief Executive Officer, the Chief Financial Officer, the Chief Administrative and Compliance Officer and the General Counsel of the Authority, any such officials acting in an interim or acting capacity to such officers, their deputies and staff, or any of them, are hereby authorized to execute and deliver such certificates, Supplemental Agreements, other agreements, documents, instruments, opinions and other papers as may be deemed necessary or appropriate to complete the sale, execution and delivery of the 2022 SRF-2 Junior Lien Bonds and otherwise give effect to the transactions contemplated by this 2022 SRF-2 Series Ordinance, as determined by such officials executing and delivering the foregoing items.

Section 17. 2022 SRF-2 Series Ordinance a Contract. The provisions of this 2022 SRF-2 Series Ordinance shall constitute a contract between the Authority and each registered owner of an outstanding 2022 SRF-2 Junior Lien Bond.

Section 18. Professional Services.

(a) Dickinson Wright PLLC is hereby appointed as Bond Counsel for the 2022 SRF-2 Junior Lien Bonds, notwithstanding the periodic representation by Dickinson Wright PLLC in unrelated matters of other parties and potential parties to the issuance of the 2022 SRF-2 Junior Lien Bonds.

(b) PFM Financial Advisors LLC is hereby appointed as Financial Advisor for the 2022 SRF-2 Junior Lien Bonds, notwithstanding the periodic representation by PFM Financial Advisors LLC in unrelated matters of other parties and potential parties to the issuance of the 2022 SRF-2 Junior Lien Bonds.

(c) The fees and expenses of Dickinson Wright PLLC and PFM Financial Advisors LLC shall be payable as an Issuance Cost from the proceeds of the 2022 SRF-2 Junior Lien Bonds or other available funds.

(d) An Authorized Officer is authorized to engage financial and other consultants as she deems necessary or appropriate in connection with the sale, issuance and delivery of the 2022 SRF-2 Junior Lien Bonds and to pay the fees and expenses thereof from the proceeds of the 2022 SRF-2 Junior Lien Bonds or other available funds.

Section 19. Severability; Headings; and Conflict. If any section, paragraph, clause or provision of this 2022 SRF-2 Series Ordinance shall be held invalid, the invalidity of such section, paragraph, clause or provision shall not affect any of the other provisions of this 2022 SRF-2 Series Ordinance. The section and paragraph headings in this 2022 SRF-2 Series Ordinance are furnished for convenience of reference only and shall not be considered to be part of this 2022 SRF-2 Series Ordinance.

Section 20. Publication and Recordation. This 2022 SRF-2 Series Ordinance shall be published in full in the Detroit Legal News, a newspaper of general circulation within the geographic boundaries of the Authority qualified under State law to publish legal notices, promptly after its adoption, and shall be maintained in the official records of the Authority and such recording authenticated by the signatures of the Chairperson and Secretary of the Authority Board.

Section 21. Repeal. All ordinances, resolutions, indentures or orders, or parts thereof, in conflict with the provisions of this 2022 SRF-2 Series Ordinance are, to the extent of such conflict, repealed.

Section 22. Effective Date. This 2022 SRF-2 Series Ordinance shall be effective upon adoption.

Adopted and signed on the ____ day of May, 2022.

GREAT LAKES WATER AUTHORITY

Signed ______________________________
Chairperson

Signed ______________________________
Secretary

4859-6481-8459 v1 [63818-41]

Great Lakes Water Authority
Resolution 2022-___
RE: Approval of Series Ordinance Authorizing Issuance and Sale of Water Supply System Revenue Bonds in an Aggregate Amount not to Exceed $40,000,000
Ordinance 2022-03

By Board Member: ____

Whereas There has been presented to the Board of Directors of the Great Lakes Water Authority (the "Authority") an ordinance entitled "Series Ordinance Authorizing the Issuance and Sale of Water Supply System Revenue Bonds in an Aggregate Amount not to Exceed $40,000,000" (the "2022 SRF-2 Series Ordinance"), which ordinance is a Series Ordinance as defined and described in Master Bond Ordinance No. 2015-01 adopted by the Board of Directors on October 7, 2015, as amended on December 9, 2015, January 27, 2016, August 10, 2016 and February 12, 2020.

Whereas The Articles of Incorporation of the Authority provide that at least 5 of the 6 members of the Authority Board must vote to approve the 2022 SRF-2 Series Ordinance.

Now, Therefore Be It:

Resolved That the 2022 SRF-2 Series Ordinance, in the form presented to this meeting, is approved and adopted, and the Chairperson and the Secretary are authorized to authenticate the 2022 SRF-2 Series Ordinance in the form approved; **And Be it Further**

Resolved That an affirmative vote of at least 5 members of the Authority Board is necessary for the passage of this Resolution.

Adopted by the Great Lakes Water Authority Board on: ______, 2022

4882-6401-7691 v1 [63818-41]

GLWA
Great Lakes Water Authority

Financial Services
Audit Committee Communication

Date: May 27, 2022

To: Great Lakes Water Authority Audit Committee

From: Kim Garland, CPA, Financial Services Area Chief of Staff

Re: Resolution Regarding Approval of Series Ordinance Authorizing Issuance and Sale of Sewer Disposal System Revenue Bonds in an Amount Not to Exceed $66,000,000 (Ordinance 2022-04)

Background & Analysis: See attached draft Great Lakes Water Authority ("GLWA") Board letter.

Proposed Action: The GLWA Audit Committee recommends that the Great Lakes Water Authority Board approve the resolution for the Approval of Series Ordinance Authorizing Issuance and Sale of Sewer Disposal System Revenue Bonds in an Amount Not to Exceed $66,000,000 for 5742-01 Connors Creek Sanitary Sewer System Rehabilitation.

..Title

Resolution Regarding Approval of Series Ordinance Authorizing Issuance and Sale of Sewer Disposal System Revenue Bonds in an Amount Not to Exceed $66,000,000 (Ordinance 2022-04)

..Body

Agenda of: June 22, 2022
Item No.: **2022-___**
Amount: Not to Exceed $66,000,000

TO: The Honorable
Board of Directors
Great Lakes Water Authority

FROM: Suzanne R. Coffey, P.E.
Interim Chief Executive Officer
Great Lakes Water Authority

DATE: June 22, 2022

RE: **Resolution Regarding Approval of Series Ordinance Authorizing Issuance and Sale of Sewer Disposal System Revenue Bonds in an Amount Not to Exceed $66,000,000 (Ordinance 2022-04)**

MOTION

Upon recommendation of Nicolette N. Bateson, Chief Financial Officer & Treasurer, the Board of Directors (Board) of the Great Lakes Water Authority (GLWA), **approves the resolution related to the Approval of Series Ordinance Authorizing Issuance and Sale of Sewer Disposal System Revenue Bonds in an Amount Not to Exceed $66,000,000 as presented,** and authorizes the CEO to take such other action as may be necessary to accomplish the intent of this vote.

BACKGROUND

There are two elements to the background related to this resolution: financing considerations and the project being funded.

Financing Considerations

The amount being financed with revenue bonds via the Clean Water State Revolving Fund (CWSRF) Bonds is within authorized GLWA limits. On March 8, 2017 the Great Lakes Water Authority ("GLWA") Board of Directors approved Resolution 2017-03, "Resolution of the Great Lakes Water Authority Authorizing Publication of Notice of Intent to Issue Sewerage Disposal System Revenue Bonds" in a principal amount not to exceed $275,000,000 (the "Notice of Intent"). This is the ninth series of sewer bonds from that Notice of Intent and is in the amount not to exceed $66,000,000.

The proposed action authorizes the bonds to be issued. The approval of the Series Ordinance presented today is the next formal step required by the GLWA Board of Directors in the bond issuance process. The Series Ordinance authorizes the issuance of the Bonds by GLWA, sets forth the guidelines for the CWSRF Bonds, designates the Bonds as 2022 SRF-2 Junior Lien Bonds, and authorizes the Chief Executive Officer or the Chief Financial Officer to execute the final terms of the Bonds, paying issuance costs and signing of the Purchase Contract and Sale Order, within the parameters set forth in the Series Ordinance.

Project Considerations

Project Plan Approval - On May 26, 2021, the GLWA Board of Directors conducted a public hearing related Connors Creek Sewer System Rehabilitation FY 2022 State Revolving Fund (SRF) Project. Subsequent to that public hearing, the Board adopted the project plan. Project Plan – It should be noted that the costs for the project plan were estimated at approximately $37 million in the documents presented in May 2021. The increase from that project plan ($37 million) to the requested financing level ($66 million) in May 2022 is due to the following.

A Brown & Caldwell study conducted after the development of the original project plan found increased sediment in the pipes resulting from the June/July 2021 rain events that have added approximately $22 million in debris removal costs. This debris removal, in addition to known market conditions driving overall supply and demand fluctuations in the construction industry, are the underlying reasons for this project cost increase.

JUSTIFICATION

This series of bonds authorized by this ordinance will be sold through the state of Michigan's CWSRF program (Project #5742-01) for a Regional Sewer System project involving the rehabilitation of the Connors Creek Sewer System (CCSS). The CCSS was originally constructed about 100 years ago; and defects of varying severity have been identified in recent inspections.

The 2022 SRF-2 Junior Lien Bonds will be sold to the Michigan Finance Authority. The current program interest rate for the CWSRF is 1.875% for 20-year and 2.125% for 30-year loans. Based on the not to exceed amount for this series of $66.0 million.

BUDGET IMPACT

The debt service payments on the GLWA Regional project are anticipated to start on October 1, 2023 with minimal amounts of interest due, because of the projected draw down schedules. An estimate for debt service on the loan will be included in the biennial FY 2024 Water Budget as well as GLWA's current ten-year forecast.

COMMITTEE REVIEW

This matter was reviewed by the GLWA Audit Committee at its meeting on May 27, 2022. The Audit Committee *[insert action]* of the resolution for the Approval of Series Ordinance Authorizing Issuance and Sale of Sewer Disposal System Revenue Bonds in an Amount Not to Exceed $66,000,000 as presented.

GREAT LAKES WATER AUTHORITY
ORDINANCE NO. 2022-04

SERIES ORDINANCE AUTHORIZING ISSUANCE AND SALE OF SEWAGE DISPOSAL SYSTEM REVENUE BONDS IN AN AGGREGATE AMOUNT NOT TO EXCEED $66,000,000

WHEREAS, pursuant to Resolution No. 2015-10-03 adopted by the Board of Directors of the Great Lakes Water Authority (the "Authority") on October 7, 2015, the Authority Board approved and adopted Master Bond Ordinance No. 2015-02 (as subsequently amended through the date hereof, the "Ordinance"), which authorizes the issuance by the Authority of Sewage Disposal System Revenue Bonds; and

WHEREAS, the Ordinance authorizes the issuance of such Sewage Disposal System Revenue Bonds in one or more Series pursuant to a Series Ordinance authorizing the issuance and sale of such Series; and

WHEREAS, the Authority Board has determined that it is necessary to authorize at this time one or more Series of SRF Junior Lien Bonds (the "2022 SRF-2 Junior Lien Bonds") to provide moneys to pay the costs of the hereinafter described repairs, extensions, enlargements and improvements to the Regional Sewer System identified in the Capital Improvement Program (the "2022 SRF-2 Project").

NOW, THEREFORE, BE IT ORDAINED BY THE BOARD OF DIRECTORS OF THE GREAT LAKES WATER AUTHORITY AS FOLLOWS:

Section 1. Authority for this Series Ordinance. This Series Ordinance (the "2022 SRF-2 Series Ordinance") is adopted pursuant to Section 1102(1) of the Ordinance.

Section 2. Definitions. Except as otherwise provided in this 2022 SRF-2 Series Ordinance, all terms which are defined in Section 101 of the Ordinance shall have the same meanings, respectively, in this 2022 SRF-2 Series Ordinance as such terms are given in the Ordinance. In addition, the following terms shall have the following meanings unless the context shall clearly indicate some other meaning:

(a) "2022 SRF-2 Junior Lien Bonds" means the Bonds authorized by Section 5 of this 2022 SRF-2 Series Ordinance for the purpose of paying and/or reimbursing costs of the 2022 SRF-2 Project.

(b) "2022 SRF-2 Project" means improvements to the Regional Sewer System, including but not limited to the rehabilitation and replacement of aging sewers and manhole structures in the Connors Creek Sewer System in the City of Detroit, the restoration of streets, rights-of-way and easements affected by the improvements and related facilities, as well as all work, equipment and appurtenances necessary or incidental to such improvements.

(c) "Authorized Denomination" means any denomination as determined by an Authorized Officer in the Sale Order.

(d) "Authorized Officer" means either the Chief Executive Officer or the Chief Financial Officer. In accordance with Resolution 2021-330 adopted by the Authority Board on August 11, 2021, references herein to Chief Executive Officer shall be deemed to include any duly appointed Interim Chief Executive Officer.

(e) "Interest Payment Date" means except as otherwise set forth in the Sale Order each April 1 and October 1.

(f) "Maturity Date" means such dates of maturity of the 2022 SRF-2 Junior Lien Bonds as determined in the Sale Order.

(g) "MFA" means the Michigan Finance Authority.

(h) "Person" means any natural person, association, corporation, trust, partnership, joint venture, joint-stock company, municipal corporation, public body or other entity, however organized.

(i) "Project Costs" means the costs of acquiring, constructing, equipping, installing and financing the 2022 SRF-2 Project, including Issuance Costs relating to the 2022 SRF-2 Junior Lien Bonds.

(j) "Purchase Contract" means the Purchase Contract between the MFA and the Authority with respect to the purchase by the MFA and the sale by the Authority of a Series of the 2022 SRF-2 Junior Lien Bonds.

(k) "Regional Construction Fund, Series 2022 SRF-2" means a subaccount of the Construction Fund established in accordance with Section 11 of this 2022 SRF-2 Series Ordinance relating to the construction of the 2022 SRF-2 Project to be paid with the proceeds of the 2022 SRF-2 Junior Lien Bonds.

(l) "Regular Record Date" means except as otherwise set forth in the Sale Order the fifteenth day of the calendar month immediately preceding an Interest Payment Date.

(m) "Sale Order" means any one or more Sale Orders of an Authorized Officer authorizing acts consistent with the Ordinance and this 2022 SRF-2 Series Ordinance necessary and appropriate to complete the sale, execution and delivery of the 2022 SRF-2 Junior Lien Bonds and to complete the other transactions contemplated herein.

(n) "Supplemental Agreement" means the Supplemental Agreement among the Authority, the MFA and the State of Michigan acting through the Department of Environment, Great Lakes, and Energy, with respect to the 2022 SRF-2 Junior Lien Bonds.

(o) "Taxable 2022 SRF-2 Junior Lien Bonds" means any 2022 SRF-2 Junior Lien Bonds other than Tax-Exempt 2022 SRF-2 Junior Lien Bonds.

(p) "Tax-Exempt 2022 SRF-2 Junior Lien Bonds" means any 2022 SRF-2 Junior Lien Bonds that are Tax-Exempt Bonds.

Section 3. Approval of 2022 SRF-2 Project. It is hereby determined to be necessary for the public health, benefit and welfare of the area served by the Regional Sewer System to acquire, construct and undertake the 2022 SRF-2 Project, and the 2022 SRF-2 Project is hereby approved and accepted.

Section 4. Estimated Cost and Period of Usefulness of 2022 SRF-2 Project. The Project Costs are estimated by the Authority Board to not exceed $66,000,000 and the Project Costs are hereby approved and confirmed. The period of usefulness of the 2022 SRF-2 Project is estimated to be not less than 40 years.

Section 5. Authorization of 2022 SRF-2 Junior Lien Bonds.

(a) Authorization of Borrowing. The Authority may borrow an amount not in excess of $66,000,000, as is finally determined in the Sale Order, and issue the 2022 SRF-2 Junior Lien Bonds in one or more Series, all to evidence such borrowing pursuant to Act 233, Act 94 and the Ordinance, as 2022 SRF-2 Junior Lien Bonds, all as finally determined in the Sale Order. The amount of the 2022 SRF-2 Junior Lien Bonds authorized in this Section 5(a) shall include the amount of the net original issue premium, if any.

(b) Purpose of 2022 SRF-2 Junior Lien Bonds. The 2022 SRF-2 Junior Lien Bonds shall be issued as Additional Bonds for the purpose of paying and/or reimbursing Project Costs.

(c) Priority of Lien. The 2022 SRF-2 Junior Lien Bonds shall be issued as SRF Junior Lien Bonds.

(d) Insufficient Proceeds. To the extent that proceeds of SRF-2 Junior Lien Bonds are insufficient to pay Project Costs, the insufficiency shall be paid from the proceeds of future Additional Bonds, if any, and/or moneys of the Regional Sewer System on hand and legally available therefor, as determined by the Authority Board.

(e) Taxable and Tax-Exempt 2022 SRF-2 Junior Lien Bonds. The 2022 SRF-2 Junior Lien Bonds may be issued as Taxable 2022 SRF-2 Junior Lien Bonds or Tax-Exempt 2022 SRF-2 Junior Lien Bonds, or as separate subseries of both, as set forth in the Sale Order.

(f) Source of Payment and Security. The 2022 SRF-2 Junior Lien Bonds shall be payable and secured as provided in Section 8.

(g) Applicability of Ordinance. Except as otherwise provided in this 2022 SRF-2 Series Ordinance or in the Sale Order, all of the provisions of the Ordinance shall apply to the 2022 SRF-2 Junior Lien Bonds as if set forth in full in this 2022 SRF-2 Series Ordinance, the purpose of this 2022 SRF-2 Series Ordinance being to supplement the Ordinance to authorize the issuance of 2022 SRF-2 Junior Lien Bonds for the purposes set forth herein.

Section 6. 2022 SRF-2 Junior Lien Bond Details.

(a) Designation.

(1) The 2022 SRF-2 Junior Lien Bonds shall bear the designations Sewage Disposal System Revenue Bonds, Series 2022-SRF-2 and shall include such other designations, including, without limitation, designations for multiple subseries, as determined by an Authorized Officer as shall be set forth in the Sale Order and not inconsistent with the Ordinance or this 2022 SRF-2 Series Ordinance.

(2) If the 2022 SRF-2 Junior Lien Bonds are not issued in 2022, an Authorized Officer is authorized in her discretion to re-designate the year and Series designation of such Series of 2022 SRF-2 Junior Lien Bonds and the various funds and accounts established hereunder to correspond with the year of issuance of such Series of 2022 SRF-2 Junior Lien Bonds. Furthermore, an Authorized Officer is authorized to establish designations within the various funds and accounts established hereunder if necessary in order to differentiate such funds and accounts from other similarly named funds and accounts related to other Bonds.

(b) Numbering. The 2022 SRF-2 Junior Lien Bonds shall be numbered in such manner as shall be determined in the Sale Order.

(c) Principal. The 2022 SRF-2 Junior Lien Bonds shall be issued in the form of Serial Bonds or Term Bonds, or any combination of Serial Bonds and Term Bonds, in any Authorized Denomination, and the principal thereof shall mature on October 1, or such other date as set forth in the Sale Order, in such years and amounts, and shall be or not be subject to redemption prior to maturity, all as shall be determined in the Sale Order subject to the following limitations:

(1) No 2022 SRF-2 Junior Lien Bonds shall mature later than 40 years after the date of issuance thereof.

(2) The 2022 SRF-2 Junior Lien Bonds shall only be issued with annual principal and interest installments permitted by the Ordinance, including Section 207 thereof.

(d) Interest. 2022 SRF-2 Junior Lien Bonds or portions thereof shall bear interest at a rate or rates as set forth in the Sale Order not in excess of 2.50% per annum. Interest on 2022 SRF-2 Junior Lien Bonds shall be payable on each Interest Payment Date.

(e) Payment of Principal and Interest. The principal of, premium, if any, and interest on the 2022 SRF-2 Junior Lien Bonds shall be payable in lawful money of the United States. Except as otherwise provided in the Sale Order, so long as the 2022 SRF-2 Junior Lien Bonds are owned by the MFA, the 2022 SRF-2 Junior Lien Bonds are payable as to principal, redemption premium, if any, and interest at U.S. Bank Trust Company, National Association, or at such other place as shall be designated in writing to the Authority by the MFA (the MFA's Depository"), and the Authority agrees that it will deposit with the MFA's Depository payments of the principal of, premium, if any, and interest on the 2022 SRF-2 Junior Lien Bonds in immediately available funds by 12:00 noon at least five Business Days prior to the date on which any such payment is due, whether by maturity, redemption or otherwise. If the 2022 SRF-2 Junior Lien Bonds are not registered in the name of the MFA, the principal of and premium, if any, on the 2022 SRF-2 Junior Lien Bonds are payable upon the surrender thereof at the corporate trust office of the Trustee and the interest is payable by check or draft drawn on the Trustee and mailed to the registered owners as of the immediately preceding Regular Record Date at their address shown on the registration books of the Authority maintained by the Trustee.

(f) Dating. The 2022 SRF-2 Junior Lien Bonds shall be dated such date as determined in the Sale Order.

(g) Reserve Requirement. There shall be no Reserve Requirement with respect to the 2022 SRF-2 Junior Lien Bonds.

(h) Exchange. The registered owner of any 2022 SRF-2 Junior Lien Bond may exchange such 2022 SRF-2 Junior Lien Bond for a new 2022 SRF-2 Junior Lien Bond or Bonds of the same interest rate, maturity and Priority of Lien in an equal aggregate principal amount in one or more of the Authorized Denominations by surrendering such 2022 SRF-2 Junior Lien Bond to be exchanged at the designated office of the Trustee together with an assignment duly executed by the registered owner thereof or his attorney or legal representative in such form as shall be satisfactory to the Trustee. As provided in Section 206 of the Ordinance, the Trustee shall be responsible for the registration, transfer and exchange of 2022 SRF-2 Junior Lien Bonds and shall indicate its acceptance of such duties by a document filed with an Authorized Officer concurrently with the delivery of the 2022 SRF-2 Junior Lien Bonds.

(i) Execution and Delivery of 2022 SRF-2 Junior Lien Bonds. The 2022 SRF-2 Junior Lien Bonds shall be executed in the name of the Authority by manual or facsimile signature of the Chief Executive Officer of the Authority and countersigned by the manual or facsimile signature of the Secretary of the Authority Board, and shall have the Authority's seal or facsimile thereof affixed or printed thereon. The Chief Financial Officer is authorized to deliver the 2022 SRF-2 Junior Lien Bonds to the MFA upon receiving the purchase price therefor in lawful money of the United States.

(j) Form of 2022 SRF-2 Junior Lien Bonds. The 2022 SRF-2 Junior Lien Bonds shall be in substantially the following form, subject to such changes, additions or deletions as determined by the Chief Executive Officer within the parameters of this 2022 SRF-2 Series Ordinance:

R-__

UNITED STATES OF AMERICA
STATE OF MICHIGAN
COUNTIES OF MACOMB, OAKLAND AND WAYNE
GREAT LAKES WATER AUTHORITY
SEWAGE DISPOSAL SYSTEM REVENUE BOND,
SERIES 2022-SRF-2

REGISTERED OWNER: Michigan Finance Authority

PRINCIPAL AMOUNT: $_______________

INTEREST RATE: ____%

ORIGINAL ISSUE DATE:

The Great Lakes Water Authority, Counties of Macomb, Oakland and Wayne, State of Michigan (the "Issuer"), upon authorization from the Board of Directors of the Issuer (the "Board"), has issued this Bond. The Issuer, for value received, promises to pay, in lawful money of the United States of America, but only from the Pledged Assets (as defined below), to the Registered Owner named above, or registered assigns, the Principal Amount stated above, or so much thereof as shall have been advanced to the Issuer and not prepaid or reduced pursuant to a Purchase Contract between the Issuer and the Michigan Finance Authority (the "MFA"), a Supplemental Agreement by and among the Issuer, the MFA and State of Michigan acting through the Department of Environment, Great Lakes, and Energy and the Order of Approval issued by the Department of Environment, Great Lakes, and Energy. The Principal Amount shall be payable on the dates and in the principal installments set forth in Schedule A attached hereto.

In the event less than the Principal Amount of this Bond is disbursed by the MFA, any portion of the Principal Amount is prepaid as provided herein, or any serial principal payment becomes due before the Issuer has received proceeds from corresponding purchased principal installments of at least a like amount, then the MFA may prepare a new serial principal installment repayment schedule which shall be presented to the Issuer and be effective upon receipt as provided in the Purchase Contract.

Interest on this Bond shall accrue from the Original Issue Date set forth above at the Interest Rate set forth above, only on that portion of installments of the Principal Amount which have been disbursed by the MFA, shall be payable on ________, 20__ and semiannually on each April 1 and October 1 thereafter (each an "Interest Payment Date").

If the MFA is not the registered owner of this Bond, principal of this Bond is payable upon presentation and surrender at the designated office of U.S. Bank Trust Company, National Association, as Trustee under the Ordinance (as defined below) or such other trustee as the Issuer may hereafter designate by notice mailed to the registered owner not less than 60 days prior to any Interest Payment Date (the "Trustee").

Interest on this Bond is payable to the registered owner of record as of the close of business on the 15th day of the month immediately preceding any Interest Payment Date as shown on the registration books kept by the Trustee by check or draft mailed by the Trustee to the registered owner at the registered address. Interest on this Bond shall be computed on the basis of a 360-day year comprised of twelve 30-day months. During the time funds are being drawn down by the Issuer under this Bond, the MFA will periodically provide the Issuer with a statement showing the amount of principal that has been advanced and the date of each advance, which statement shall constitute prima facie evidence of the reported information; provided, that no failure on the part of the MFA to provide such a statement or to reflect a disbursement or the correct amount of a disbursement shall relieve the Issuer of its obligation to repay the outstanding principal amount actually advanced [(subject to any principal forgiveness as provided for herein)], all accrued interest thereon, and any other amount payable with respect thereto in accordance with the terms of this Bond.

In the event of a default in the payment of principal or interest hereon when due, whether at maturity, by redemption or otherwise, the amount of such default shall bear interest (the "additional interest") at a rate equal to the rate of interest that is two percent above the MFA's cost of providing funds (as determined by the MFA) to make payment on the bonds of the MFA issued to provide funds to purchase this Bond but in no event in excess of the maximum rate of interest permitted by law. The additional interest shall continue to accrue until the MFA has been fully reimbursed for all costs incurred by the MFA (as determined by the MFA) as a consequence of the Issuer's default. Such additional interest shall be payable on the interest payment date following demand of the MFA. In the event that (for reasons other than the default in the payment of any municipal obligation purchased by the MFA) the investment of amounts in the reserve account established by the MFA for the bonds of the MFA issued to provide funds to purchase this bond fails to provide sufficient available funds (together with any other funds that may be made available for such purpose) to pay the interest on outstanding bonds of the MFA issued to fund such account, the Issuer shall and hereby agrees to pay on demand only the Issuer's pro rata share (as determined by the MFA) of such deficiency as additional interest on this Bond.

Notwithstanding any other provision of this Bond, so long as the MFA is the owner of this Bond, (a) this Bond is payable as to principal, premium, if any, and interest at U.S. Bank Trust Company, National Association, or at such other place as shall be designated in writing to the Issuer by the MFA (the "MFA's Depository"); (b) the Issuer agrees that it will deposit with the MFA's Depository payments of the principal of, premium, if any, and interest on this Bond in immediately available funds by 12:00 noon at least five business days prior to the date on which any such payment is due whether by maturity, redemption or otherwise; in the event that the MFA's Depository has not received the Issuer's deposit by 12:00 noon on the scheduled day, the Issuer shall immediately pay to the MFA as invoiced by the MFA an amount to recover the MFA's administrative costs and lost investment earnings attributable to that late payment; and (c) written notice of any redemption of this Bond shall be given by the Issuer and received by the MFA's Depository at least 40 days prior to the date on which redemption is to be made.

This Bond is one of a series of bonds designated "Sewage Disposal System Revenue Bonds, Series 2022-SRF-2" and is issued pursuant to the provisions of (i) Act 233, Public Acts of Michigan, 1955, as amended ("Act 233"), and Act 94, Public Acts of Michigan, 1933, as amended ("Act 94"), (ii) Master Bond Ordinance No. 2015-02 adopted by the Board on October 7, 2015, as amended (the "Bond Ordinance"), (iii) the Series Ordinance Authorizing Issuance and Sale of Sewage Disposal System Revenue Bonds in an Aggregate Amount not to Exceed $___________, adopted by the Board on ____________, 2022 (the "Series Ordinance"), and (iv) a Sale Order of the Chief Executive Officer of the Issuer dated ____________, 2022 (the "Sale Order," and, collectively with the Bond Ordinance and the Series Ordinance, the "Ordinance"). This Bond is issued for the purposes set forth in the Series Ordinance and the Sale Order.

For the prompt payment of the principal of and interest on this Bond, and other bonds issued by the Issuer pursuant to the Bond Ordinance, the Issuer has irrevocably pledged the Pledged Assets (as defined in the Bond Ordinance), which includes the revenues of the Sewer System (as defined in the Bond Ordinance), after provision is made for reasonable and necessary expenses of operation, maintenance and administration of the Sewer System (the "Net Revenues"), and a statutory lien on the Net Revenues and Pledged Assets is hereby recognized and acknowledged. Such lien is a third lien, subject to obligations heretofore and hereafter issued or incurred under the Bond Ordinance secured by a first or second lien on the Pledged Assets. This Bond is of equal standing on a parity with all other obligations heretofore and hereafter issued or incurred under the Bond Ordinance and secured by a third lien on the Pledged Assets.

For a complete statement of the revenues from which and the conditions under which this Bond is payable, a statement of the conditions under which Additional Bonds (as defined in the Bond Ordinance) of senior or equal standing and Additional Bonds of junior standing may hereafter be issued and the general covenants and provisions pursuant to which this Bond is issued, reference is made to the Bond Ordinance.

This Bond is subject to redemption prior to maturity at the option of the Issuer and with the prior written consent of and upon such terms as may be required by the MFA. That portion of this Bond called for redemption shall not bear interest after the date fixed for redemption, provided funds are on hand with the Trustee to redeem the same.

THIS BOND IS ISSUED UNDER ACT 233 AND ACT 94. IT IS A SELF-LIQUIDATING BOND AND IS NOT A GENERAL OBLIGATION OF THE ISSUER AND DOES NOT CONSTITUTE AN INDEBTEDNESS OF THE ISSUER WITHIN ANY CONSTITUTIONAL OR STATUTORY LIMITATION, BUT IS PAYABLE, BOTH AS TO PRINCIPAL AND INTEREST SOLELY FROM THE PLEDGED ASSETS OF THE SEWER SYSTEM. THE PAYMENT OF THE PRINCIPAL OF AND INTEREST ON THIS BOND ARE SECURED BY A STATUTORY LIEN ON THE PLEDGED ASSETS AS DESCRIBED HEREIN.

The Issuer has covenanted and agreed, and hereby covenants and agrees, to fix and maintain, or cause to be fixed and maintained, at all times while any bonds payable from the Pledged Assets of the Sewer System shall be outstanding, such rates for service furnished by the Sewer System as shall be sufficient to provide for payment of the interest upon and the principal of this Bond and all other Bonds (as defined in the Bond Ordinance) assumed or issued and to be issued under the Bond Ordinance as and when the same shall become due and payable, to create and maintain a bond redemption fund therefor, including a bond reserve for Bonds other than this Bond, to provide for the payment of expenses of administration and operation and such expenses for maintenance of the Sewer System as are necessary to preserve the same in good repair and working order, and to provide for such other expenditures and funds for the Sewer System, all as are required by the Bond Ordinance.

This Bond is transferable only upon the books of the Issuer kept for that purpose at the office of the Trustee by the registered owner hereof in person, or by his attorney duly authorized in writing, upon the surrender of this Bond together with a written instrument of transfer satisfactory to the Trustee duly executed by the registered owner or his attorney duly authorized in writing, and thereupon a new registered bond or bonds of the same type, in the same aggregate principal amount and of the same maturity shall be issued to the transferee in exchange therefor as provided in the Ordinance and upon the payment of the charges, if any, therein prescribed.

It is hereby certified and recited that all acts, conditions and things required by law precedent to and in the issuance of this Bond have been done and performed by regular and due time and form as required by law.

This Bond is not valid or obligatory for any purpose until the Trustee's Certificate of Authentication hereon has been executed by the Trustee.

[Remainder of Page Intentionally Left Blank]

IN WITNESS WHEREOF, the Great Lakes Water Authority, Counties of Macomb, Oakland and Wayne, State of Michigan, has caused this Bond to be signed in its name by the facsimile signatures of its Chief Executive Officer and its Secretary of the Board and its corporate seal or a facsimile thereof to be printed, impressed or otherwise reproduced hereon, all as of the Original Issue Date.

GREAT LAKES WATER AUTHORITY

By:______________________________________
Chief Executive Officer

Countersigned:

By:______________________________________
Secretary, Board of Directors

[Seal]

CERTIFICATE OF AUTHENTICATION

This Bond is authenticated as the bond designated by the Issuer as “Sewage Disposal System Revenue Bond, Series 2022-SRF-2”.

U.S. Bank Trust Company, National Association,
Trustee

By:____

Date of Authentication: __________, 2022

ASSIGNMENT

For value received, the undersigned sells, assigns and transfers unto __________________________ this Bond and all rights hereunder and hereby irrevocably appoints __________________________ attorney to transfer this Bond on the books kept for registration thereof with full power of substitution in the premises.

Dated:__________________________ ____
Signature

NOTICE: The signature to this assignment must correspond with the name as it appears on the face of this Bond in every particular.

Schedule A

The principal amounts and maturity dates applicable to the Bond to which this Schedule A is attached are as follows:

Date	Amount

Based on the schedule provided above unless revised as provided in this paragraph, repayment of the Principal Amount shall be made according to such schedule until the full Principal Amount disbursed to the Issuer is repaid; provided, however, that the Issuer shall have no obligation to repay any serial principal installment for which the Issuer did not receive a disbursement of Principal Amount by the date such serial principal installment is due. In the event the Order of Approval issued by the Department of Environment, Great Lakes, and Energy (the "Order") approves a principal amount of assistance less than the amount of the Bond, the MFA shall only disburse principal up to the amount stated in the Order. In the event (1) that the payment schedule described above provides for payment of a total principal amount greater than the amount of assistance approved by the Order, (2) that less than the principal amount of assistance approved by the Order is disbursed to the Issuer by the MFA or (3) of prepayment [or principal forgiveness] of the Bond, the MFA shall prepare a new payment schedule that shall be effective upon receipt by the Issuer.

END OF BOND FORM

Section 7. Concerning the Securities Depository.

(a) As used herein:

"Beneficial Owner" means any Person who indirectly owns 2022 SRF-2 Junior Lien Bonds pursuant to the indirect ownership system maintained by a securities depository (the "Securities Depository") and its Participants, commonly known as the "Book-Entry Only System."

"Participant" means any Person whose ownership of 2022 SRF-2 Junior Lien Bonds is shown on books of the Securities Depository.

(b) The 2022 SRF-2 Junior Lien Bonds will initially be registered in the name of the MFA, or such other purchasers as designated in the Sale Order. In the event 2022 SRF-2 Junior Lien Bonds are later to be registered in the name of a Securities Depository or its nominee, neither the Authority nor the Trustee shall have any responsibility or obligation to any Participant or to any Beneficial Owner with respect to any matter, including the following:

(1) the accuracy of the records of the Securities Depository, its nominee or any Participant with respect to any ownership interest in 2022 SRF-2 Junior Lien Bonds,

(2) the delivery to any Participant, Beneficial Owner or any other Person other than the Securities Depository of any notice with respect to: any 2022 SRF-2 Junior Lien Bonds, including any notice of redemption, or

(3) the payment to any Participant, Beneficial Owner or any other Person, other than the Securities Depository of any amount with respect to the principal (and premium, if any) of or interest on any 2022 SRF-2 Junior Lien Bonds.

(c) The Trustee shall pay all principal (and premium, if any) of and interest on the 2022 SRF-2 Junior Lien Bonds only to or upon the order of the MFA, or the Securities Depository, as applicable, and all such payments shall be valid and effective fully to satisfy and discharge the Authority's obligations with respect to the principal (and premium, if any) of, and interest on such 2022 SRF-2 Junior Lien Bonds to the extent of the sum or sums so paid.

(d) If 2022 SRF-2 Junior Lien Bonds become registered in the name of the Securities Depository and (1) the Authority receives a written notice from the Securities Depository to the effect the Securities Depository is unable or unwilling to discharge its responsibilities or (2) the Authority determines that it is in the best interests of the Beneficial Owners of 2022 SRF-2 Junior Lien Bonds that they be able to obtain 2022 SRF-2 Junior Lien Bonds in certificated form, then, in either event, the Authority shall notify the Trustee and, in the case of clause, (2), the Securities Depository.

(e) Upon discontinuance of the use of the Book-Entry Only System maintained by the Securities Depository, if any, pursuant to subsection (d), above and upon receipt of notice from the Securities Depository containing sufficient information, the Authority shall execute and the Trustee shall authenticate and deliver 2022 SRF-2 Junior Lien Bonds in certificated form to

Beneficial Owners in exchange for the beneficial interests of such Beneficial Owners in corresponding principal amounts and in any Authorized Denominations.

(f) Notwithstanding any other provision of this 2022 SRF-2 Series Ordinance to the contrary, so long as any 2022 SRF-2 Junior Lien Bond is registered in the name of the Securities Depository or its nominee:

(1) all payments with respect to the principal, premium, if any, and interest on such 2022 SRF-2 Junior Lien Bond and all notices of redemption, tender and otherwise with respect to such 2022 SRF-2 Junior Lien Bond shall be made and given, respectively, to the Securities Depository as provided in the letter of representations from the Authority to the Securities Depository with respect to such 2022 SRF-2 Junior Lien Bonds or any master letter of representations from the Authority to the Securities Depository;

(2) if less than all of the 2022 SRF-2 Junior Lien Bonds of the same type of any maturity are to be redeemed, then the particular 2022 SRF-2 Junior Lien Bonds or portions of 2022 SRF-2 Junior Lien Bonds of such type and maturity to be redeemed shall be selected by the Securities Depository in any such manner as the Securities Depository may determine;

(3) all payments with respect to principal of the 2022 SRF-2 Junior Lien Bonds and premium, if any and interest on the 2022 SRF-2 Junior Lien Bonds shall be made in such manner as shall be prescribed by the Securities Depository; and

(4) if a 2022 SRF-2 Junior Lien Bond is redeemed or tendered in part, then all amounts payable in respect of such redemption or tender shall be paid without presentation and surrender of such 2022 SRF-2 Junior Lien Bond pursuant to the procedures of the Securities Depository.

Section 8. Payment of 2022 SRF-2 Junior Lien Bonds; Confirmation of Statutory Lien.

(a) The 2022 SRF-2 Junior Lien Bonds and the interest thereon shall be payable solely from the Pledged Assets.

(b) To secure payment of the 2022 SRF-2 Junior Lien Bonds, the statutory lien upon the whole of the Pledged Assets established by Act 94 and the pledge created in Section 501 of the Ordinance is hereby confirmed in favor of the 2022 SRF-2 Junior Lien Bonds as follows: Such lien in favor of the 2022 SRF-2 Junior Lien Bonds shall be a statutory third lien on the Pledged Assets of equal standing and Priority of Lien with all issued, to be issued and outstanding SRF Junior Lien Bonds.

Section 9. Funds and Accounts; Flow of Funds. Except as otherwise provided in this 2022 SRF-2 Series Ordinance, all of the provisions relative to funds and accounts, their maintenance, the flow of funds and other details relative thereto, shall remain as specifically set forth in the Ordinance.

Section 10. Disposition of Proceeds.

(a) Disposition of Accrued Interest and Capitalized Interest. From the proceeds of the sale of the 2022 SRF-2 Junior Lien Bonds there shall be immediately deposited in the SRF Junior Lien Debt Service Account, an amount equal to any accrued interest received on the delivery of the 2022 SRF-2 Junior Lien Bonds and any capitalized interest on the 2022 SRF-2 Junior Lien Bonds, and the Authority may take credit for the amount so deposited against the amount required to be deposited in the SRF Junior Lien Debt Service Account for payment of the next maturing interest payment on the 2022 SRF-2 Junior Lien Bonds.

(b) Construction Fund. The balance of the proceeds of the 2022 SRF-2 Junior Lien Bonds shall be deposited in the Construction Fund and used to pay Project Costs as provided in Section 11.

Section 11. Construction Fund.

(a) A subaccount of the Authority Regional Construction Account of the Construction Fund established by the Ordinance shall be established for the 2022 SRF-2 Junior Lien Bonds and designated the "Construction Fund, Series 2022 SRF-2," and shall be established and maintained as a separate depository account with a Custodian as designated by the Chief Financial Officer.

(b) Moneys in the Construction Fund, Series 2022 SRF-2 shall be applied solely to payment of Project Costs (or to the reimbursement of Project Costs paid by the Authority from other funds prior to the issuance of the 2022 SRF-2 Junior Lien Bonds).

(1) Payments or reimbursements for Project Costs for construction, either on account or otherwise, shall not be made unless the registered engineer in charge of such work shall file with an Authorized Officer a signed statement to the effect that the work has been completed in accordance with the plans and specifications therefor, that it was done in accordance with the contract therefor, that such work is satisfactory and that such work has not been previously paid for.

(2) Payment or reimbursement for Project Costs consisting of Issuance Costs and engineering, legal and financial costs shall be made upon submission of appropriate documentation to an Authorized Officer.

Section 12. Tax Covenant.

(a) The Authority hereby covenants and represents with the registered owners of the Tax-Exempt 2022 SRF-2 Junior Lien Bonds, that so long as any of the Tax-Exempt 2022 SRF-2 Junior Lien Bonds remain outstanding and unpaid as to either principal or interest, the Authority shall, to the extent permitted by law, take all actions within its control to maintain, and will refrain from taking any action which would impair, the exclusion of the interest on the Tax-Exempt 2022 SRF-2 Junior Lien Bonds from gross income for federal income tax purposes under the Code.

(b) The actions referred to in subsection (a), above include, but are not limited to actions relating to any required rebate of arbitrage earnings and the expenditure and investment of proceeds of Tax-Exempt 2022 SRF-2 Junior Lien Bonds and moneys deemed to be proceeds of Tax-Exempt 2022 SRF-2 Junior Lien Bonds, and to prevent Tax-Exempt 2022 SRF-2 Junior Lien Bonds from being or becoming "private activity bonds" as that term is used in the Code.

Section 13. Sale of 2022 SRF-2 Junior Lien Bonds; Purchase Contract; Expiration of Referendum Period.

(a) The 2022 SRF-2 Junior Lien Bonds shall be sold by negotiated sale to the MFA pursuant to a Purchase Contract in customary form with such changes thereto as an Authorized Officer shall determine are in the best interests of the Authority, within the parameters established by this 2022 SRF-2 Series Ordinance. Such determination shall be conclusively established by the Authorized Officer's execution of the Purchase Contract to the MFA.

(b) The Authority Board hereby determines that the sale of the 2022 SRF-2 Junior Lien Bonds by negotiated sale as described in subsection (a) is in the best interests of the Authority and will allow the 2022 SRF-2 Junior Lien Bonds to receive a subsidized interest rate through participation in the MFA's State Revolving Fund Program.

(c) An Authorized Officer is authorized to accept, on behalf of the Authority, an offer from the MFA to purchase the 2022 SRF-2 Junior Lien Bonds subject to the following limitations:

(1) The interest rate with respect to any Series of the 2022 SRF-2 Junior Lien Bonds shall not exceed 2.50%.

(2) The aggregate purchaser's discount at which any Series of the 2022 SRF-2 Junior Lien Bonds shall be sold to the MFA shall not exceed 2.00%.

(d) An Authorized Officer shall confirm in the Sale Order that there was no petition meeting the requirements of Section 33 of Act 94 that was filed with the Secretary of the Authority Board within 45 days of the date of publication of the notice of intent to issue bonds with respect to the 2022 SRF-2 Junior Lien Bonds as required by Section 33 of Act 94.

Section 14. Delegation of Authority to and Authorization of Actions of Authorized Officers.

(a) An Authorized Officer shall make all determinations herein provided to be made in the Sale Order and shall make all such determinations in accordance with the best interests of the Authority within the parameters of this 2022 SRF-2 Series Ordinance.

(b) In addition to determinations authorized elsewhere in this 2022 SRF-2 Series Ordinance, an Authorized Officer shall determine the aggregate principal amount of 2022 SRF-2 Junior Lien Bonds to be issued, but not in excess of the aggregate principal amount authorized by this 2022 SRF-2 Series Ordinance, on the basis of her evaluation of the maximum amount of 2022 SRF-2 Junior Lien Bonds which can be sold, given anticipated interest rates and the revenue coverage requirements with respect to the 2022 SRF-2 Junior Lien Bonds and for any other reasons the Authorized Officer deems appropriate.

(1) Such determination shall also include the redemption provisions for the 2022 SRF-2 Junior Lien Bonds.

(2) An Authorized Officer shall also determine and establish, in accordance with this 2022 SRF-2 Series Ordinance, the maturities of each Series of the 2022 SRF-2 Junior Lien Bonds, whether such maturities shall be serial or term maturities and the Mandatory Redemption Requirements for any term maturities.

(c) An Authorized Officer is authorized, if necessary, to file applications and to pay the related fees, if any, to the Michigan Department of Treasury at her discretion under Act 34 for one or more orders of approval to issue all or a portion of the 2022 SRF-2 Junior Lien Bonds, and such waivers or other Treasury approvals as necessary to implement the sale, delivery and security for the 2022 SRF-2 Junior Lien Bonds as authorized herein, and as required by the Michigan Department of Treasury or Act 34.

(d) An Authorized Officer shall determine in the Sale Order that the requirements set forth in Section 207 of the Ordinance with respect to the issuance of the 2022 SRF-2 Junior Lien Bonds as Additional Bonds have been satisfied.

(e) An Authorized Officer is hereby authorized and directed to do and perform any and all other acts and things with respect to the 2022 SRF-2 Junior Lien Bonds which are necessary or appropriate to carry into effect, consistent with the Ordinance and this 2022 SRF-2 Series Ordinance, the authorizations therein and herein contained including without limitation the securing of ratings by bond rating agencies, and the incurring of reasonable fees costs and expenses incidental to the foregoing, for and on behalf of the Authority.

Section 15. Advancement of Project Costs. At the direction of an Authorized Officer, the Authority may advance certain Project Costs from the Authority's funds prior to the issuance of the 2022 SRF-2 Junior Lien Bonds to the extent that such costs are expenditures appropriate for reimbursement under applicable law, including the Code in the case of Tax-Exempt 2022 SRF-2 Junior Lien Bonds.

Section 16. Ratification. All determinations and decisions of an Authorized Officer heretofore taken with respect to the issuance and sale of the 2022 SRF-2 Junior Lien Bonds as permitted or required by the Ordinance or law are hereby ratified, confirmed and approved.

Section 17. Additional Authorization. The Chief Executive Officer, the Chief Financial Officer, the Chief Administrative and Compliance Officer and the General Counsel of the Authority, any such officials acting in an interim or acting capacity to such officers, their deputies and staff, or any of them, are hereby authorized to execute and deliver such certificates, Supplemental Agreements, other agreements, documents, instruments, opinions and other papers as may be deemed necessary or appropriate to complete the sale, execution and delivery of the 2022 SRF-2 Junior Lien Bonds and otherwise give effect to the transactions contemplated by this 2022 SRF-2 Series Ordinance, as determined by such officials executing and delivering the foregoing items.

Section 18. 2022 SRF-2 Series Ordinance a Contract. The provisions of this 2022 SRF-2 Series Ordinance shall constitute a contract between the Authority and each registered owner of an outstanding 2022 SRF-2 Junior Lien Bond.

Section 19. Professional Services.

(a) Dickinson Wright PLLC is hereby appointed as Bond Counsel for the 2022 SRF-2 Junior Lien Bonds, notwithstanding the periodic representation by Dickinson Wright PLLC in unrelated matters of other parties and potential parties to the issuance of the 2022 SRF-2 Junior Lien Bonds.

(b) PFM Financial Advisors LLC is hereby appointed as Financial Advisor for the 2022 SRF-2 Junior Lien Bonds, notwithstanding the periodic representation by PFM Financial Advisors LLC in unrelated matters of other parties and potential parties to the issuance of the 2022 SRF-2 Junior Lien Bonds.

(c) The fees and expenses of Dickinson Wright PLLC and PFM Financial Advisors LLC shall be payable as an Issuance Cost from the proceeds of the 2022 SRF-2 Junior Lien Bonds or other available funds.

(d) An Authorized Officer is authorized to engage financial and other consultants as she deems necessary or appropriate in connection with the sale, issuance and delivery of the 2022 SRF-2 Junior Lien Bonds and to pay the fees and expenses thereof from the proceeds of the 2022 SRF-2 Junior Lien Bonds or other available funds.

Section 20. Severability; Headings; and Conflict. If any section, paragraph, clause or provision of this 2022 SRF-2 Series Ordinance shall be held invalid, the invalidity of such section, paragraph, clause or provision shall not affect any of the other provisions of this 2022 SRF-2 Series Ordinance. The section and paragraph headings in this 2022 SRF-2 Series Ordinance are furnished for convenience of reference only and shall not be considered to be part of this 2022 SRF-2 Series Ordinance.

Section 21. Publication and Recordation. This 2022 SRF-2 Series Ordinance shall be published in full in the Detroit Legal News, a newspaper of general circulation within the geographic boundaries of the Authority qualified under State law to publish legal notices, promptly after its adoption, and shall be maintained in the official records of the Authority and such recording authenticated by the signatures of the Chairperson and Secretary of the Authority Board.

Section 22. Repeal. All ordinances, resolutions, indentures or orders, or parts thereof, in conflict with the provisions of this 2022 SRF-2 Series Ordinance are, to the extent of such conflict, repealed.

Section 23. Effective Date. This 2022 SRF-2 Series Ordinance shall be effective upon adoption.

Adopted and signed on the _____ day of _________, 2022.

GREAT LAKES WATER AUTHORITY

Signed ____
Chairperson

Signed ____
Secretary

4887-6798-1066 v2 [63818-39]

Great Lakes Water Authority
Resolution 2022-___
RE: Approval of Series Ordinance Authorizing Issuance and Sale of Sewage Disposal System Revenue Bonds in an Amount not to Exceed $66,000,000
Ordinance 2022-04

By Board Member: _______________

Whereas There has been presented to the Board of Directors of the Great Lakes Water Authority (the "Authority") an ordinance entitled "Series Ordinance Authorizing the Issuance and Sale of Sewage Disposal System Revenue Bonds in an Amount not to Exceed $66,000,000" (the "2022 SRF-2 Series Ordinance"), which ordinance is a Series Ordinance as defined and described in Master Bond Ordinance No. 2015-02 adopted by the Board of Directors on October 7, 2015, as amended on December 9, 2015, January 27, 2016, August 10, 2016 and February 12, 2020.

Whereas The Articles of Incorporation of the Authority provide that at least 5 of the 6 members of the Authority Board must vote to approve the 2022 SRF-2 Series Ordinance.

Now, Therefore Be It:

Resolved That the 2022 SRF-2 Series Ordinance, in the form presented to this meeting, is approved and adopted, and the Chairperson and the Secretary are authorized to authenticate the 2022 SRF-2 Series Ordinance in the form approved; **And Be it Further**

Resolved That an affirmative vote of at least 5 members of the Authority Board is necessary for the passage of this Resolution.

Adopted by the Great Lakes Water Authority Board on: _______, 2022

4868-0267-6235 v1 [63818-39]

AGENDA ITEM #8A

GLWA Great Lakes Water Authority

Financial Services
Audit Committee Communication

Date: May 27, 2022

To: Great Lakes Water Authority Audit Committee

From: Nicolette N. Bateson, CPA, Chief Financial Officer & Treasurer

Re: CFO Update

ERP Implementation

Initial training for team members who are key to configuration decisions have begun. We are very excited about this new system and what it means for the future of financial reporting and management as well as the expanded capabilities for the Organizational Development team. Official project kick-off is in June 2022 and is being facilitated by GLWA's Information Technology team.

Budget Submitted to GFOA

The final FY 2023 & FY 2024 Biennial Budget & Five Year Forecast (444 pages!) has been posted to the GLWA website and submitted to the Government Finance Officers Association for the budget awards program. A big thank you to the Financial Services Area team for preparing a high quality document that provides both high level and detailed information.

Budget Amendments

In the third quarter of FY 2022, GLWA received sufficient information to quantify the economic impacts of the changing economy, increased costs in chemical and utilities, resolution of some outstanding matters related to water usage at the water resource recovery facility, and increased construction costs. For this reason, we request a special meeting of the Audit Committee on or after June 6, 2022 to review the FY 2022 third quarter budget amendments.

Bond Transaction Kickoff

This week, the bond transaction working group is launching the internal project to prepare for an FY 2022 bond program for the capital improvement program. Updates will be provided at the June 2022 Audit Committee meeting.

Water Charges Methodology

Through the Member Partner Outreach program, the water system charges methodology project kicked off this month. Updates will be provided at the June 2022 Audit Committee meeting.

Monthly Financial Report Binder

February 2022

Presented to the
Great Lakes Water Authority
Audit Committee on May 27, 2022

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Financial Report
Executive Summary Dashboard
for the Month Ended February 28, 2022

Key Financial Metrics

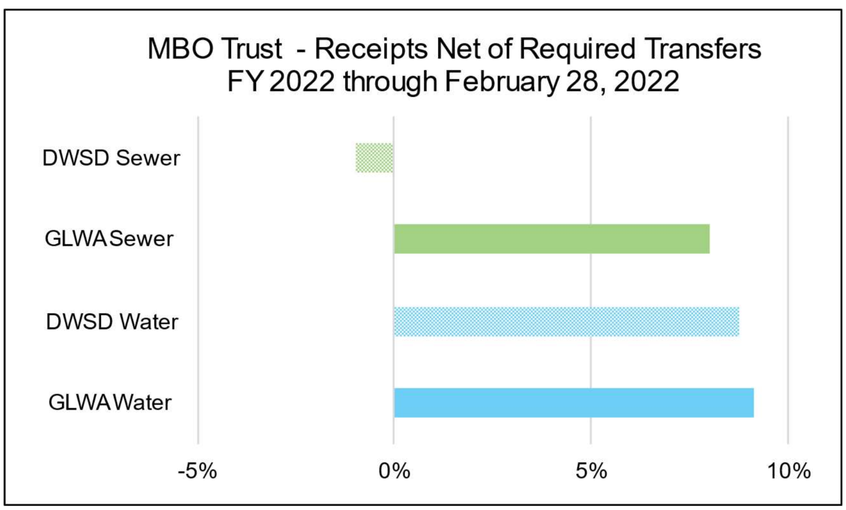
The table below provides key report highlights and flags the financial risk of a budget shortfall by year-end as follows: No Risk (green) - Potential (yellow) - Likely (red)

Each variance is monitored by the Great Lakes Water Authority (GLWA) management and, where appropriate, operating and/or budget priorities are re-evaluated. Budget amendments are prepared and presented quarterly based on most current information. To address the wholesale water revenue shortfall, a first quarter budget amendment was approved for $2.4 million. Capital spend is less than the total Capital Improvement Plan (CIP); an amendment is under consideration.

As of February 28, 2022					
Metric	FY 2022 Budget	FY 2022 Amended Budget	FY 2022 Actual	Variance from Financial Plan	Report Page Reference
Wholesale Water Billed Revenue ($M)	$221.4	$219.0	$217.2	-1%	48
Wholesale Water Billed Usage (mcf)	9,262,000	9,042,000	8,850,000	-2%	
Wholesale Sewer Billed Revenue ($M)	$180.9	$180.9	$180.9	0%	50
Wholesale Water Operations & Maintenance ($M)	$96.0	$96.0	$86.2	-10%	5
Wholesale Sewer Operations & Maintenance ($M)	$120.9	$120.9	$123.2	2%	
Investment Income ($M)	$2.0	$2.0	$2.4	20%	37
Water Prorated Capital Spend w/SRA* ($M)	$90.0	$90.0	$105.0	17%	28
Sewer Prorated Capital Spend w/SRA* ($M)	$54.0	$54.0	$43.0	-20%	29

*SRA refers to the capital spending ratio assumption which allows capital program delivery realities to align with the financial plan.

Master Bond Ordinance (MBO) Trust Net Receipts (page 53)



Net cash flow receipts remain positive for GLWA Water and Sewer. This means that all legal commitments of the MBO Trust and the lease payment are fully funded – and that positive cash flow is available for additional capital program funding in subsequent year(s). DWSD Water reports a surplus of $5.8 million and DWSD Sewer reports a $1.9 million shortfall of net receipts over disbursements through February 2022. On August 26, 2021, the DWSD Board of Water Commissioners proactively adopted budget amendments to address potential shortfalls for FY 2022. These budget amendments are reflected in this February 2022 report. Looking ahead, strong DWSD net receipts for March resolve the current Sewer shortfall although DWSD continues to monitor this activity closely.

The current DWSD loan receivable balance for fiscal year 2018 is $2.8 million.

All amounts are unaudited unless otherwise noted.

Budget to Actual Analysis (page 3)

- FY 2022 information includes the second quarter budget amendments which were approved by the GLWA Board on April 27, 2022.
- The total Revenue Requirements are on target through February 2022.
- The total overall Operations & Maintenance expenses are at 64.4% of budget through February 2022 which is reasonable within the pro-rata benchmark of 66.7%. The sewer system O&M expenses, however, are at 68.0%, which is higher than the benchmark. The water system O&M expenses are at 59.9%.

Basic Financial Statements (page 9)

- The Basic Financial Statements are prepared on a full accrual basis and reflect preliminary, unaudited results.
- Operating income for February 2022 is $59.2 million for the Water fund (25.6% of total revenues) and $87.0 million for the Sewer fund (27.5 % of total revenues).
- Water Net Position decreased by $ 2.4 million, and Sewage Disposal Net Position decreased by $ 0.4 million for the year to date through February 2022.

Capital Improvement Plan Financial Summary (page 27)

- Water systems exceed the 75% Capital Spend Ratio assumption.
- Sewer systems also exceed the 75% Capital Spend Ratio assumption.

Master Bond Ordinance Transfers (page 30)

- For February, transfers of $13.6 million and $17.6 million were completed for the GLWA Water and Sewer funds, respectively.
- Also for February, transfers of $3.2 million and $7.4 million were completed for the DWSD Water and Sewer funds, respectively.

Cash Balances & Investment Income (page 36)

- Total cash & investments are $425 million in the Water fund and $458 million in the Sewer fund.
- Total, combined, cumulative, FY 2022 investment income through February is $2.4 million.

DWSD Retail Revenues, Receivables & Collections (page 41)

- Water usage through February 28, 2022 is at 109.23% and revenues at 100.42% of budget.
- Sewer usage through February 28, 2022 is at 104.65% and revenues at 100.14% of budget.
- Combined accounts receivable balances for the water and sewer funds report an increase of $46.1 million over the prior year.
- Past dues over 180 days make up 66.5% of the total accounts receivable balance. The current bad debt allowance covers 101.0% of past dues over 60 days.

GLWA Wholesale Billing, Receivables & Collections (page 47)

- GLWA accounts receivable past due balance net of Highland Park is 9.66% of the total accounts receivable balance, with the majority of that balance related to one water account dispute currently under discussion.
- The Highland Park past due balance is $53.0 million. It includes $40.6 million for wastewater treatment services, $1.8 million for industrial waste control services, and $10.5 million for water supply services. Highland Park has not made a payment in since April 2021.

Questions? Contact the Office of the Chief Financial Officer at CFO@glwater.org

The Monthly Budget to Actual Analysis report includes the following three sections.

1. Revenue Requirement Budget Basis Analysis
2. Operations & Maintenance Budget – Major Budget Categories
3. Alignment of Operations & Maintenance Budget Priorities – Expense Variance Analysis

The FY 2022 information presented in these sections includes the second quarter budget amendments approved by the GLWA Board on April 27, 2022.

Revenue Requirement Budget Basis Analysis

GLWA's annual revenue requirement represents the basis for calculating Member Partner charges and aligns with the Master Bond Ordinance flow of funds categories. The budget basis is not the same as the full accrual basis used for financial reporting although the revenues and operations and maintenance expense are largely reported on an accrual basis. The primary difference between the revenue requirement budget basis to the financial reporting basis is the treatment of debt service, legacy pension obligations, and lease related activities. The Revenue Requirement Basis is foundational to GLWA's daily operations, financial plan, and of most interest to key stakeholders.

Table 1A – Water Revenue Requirement Budget and ***Table 1B – Sewer Revenue Requirement Budget*** presents a year-over-year budget to actual performance report. The revenue requirement budget is accounted for in the operations and maintenance fund for each system. Since this report is for February 2022, the pro-rata benchmark is 66.7% (8 of 12 months of the fiscal year).

Items noted below are highlighted in gold on Tables 1A (Water) and 1B (Sewer).

1. ***Revenues***: For *both* systems, FY 2022 revenues are either at or slightly above target. Detailed schedules related to revenues are provided in the *Wholesale Billings, Collections, and Receivables* section of this financial report binder.

   Water revenues presented in Table 1A differ from those presented in *Table 2 – Statement of Revenues, Expenses and Changes in Net Position* found in the *Basic Financial Statement* section of this report. Water Revenues presented in Table 1A for revenue requirement purposes are reduced by the monthly payment to the City of Flint for a license to raw water rights under the Flint Raw Water Contract as documented in Appendix A-2 of the Flint Water Agreement. Through February 28, 2022, these payments total $4.4 million for FY 2022.

2. ***Investment Earnings:*** Investment earnings is above the pro-rata benchmark for FY 2022 for the *water* system at 68.2%; while the *sewer* system is below the pro-rata benchmark at 56.1%. Detailed analysis of investment earnings activity to date can be found in the *Cash & Investment Income* section of this financial report binder.

3. ***Other Revenues:*** These are one-time and unusual items that do not fit an established revenue category. Both the *water* and *sewer* systems actual amount will vary from budget due to the nature of the items recorded in this category.
4. ***Operations & Maintenance Expense:*** Actual expenses[1] for *both* systems have variances from the pro-rata benchmark. The *water* system is below the pro-rata benchmark for FY 2022 at 59.9%. The *sewer* system O&M expenses, at 68.0%, is above the pro-rata benchmark.
5. ***Debt Service:*** For both systems, debt service is on target with the pro-rata benchmark for FY 2022; the *water* system is at 66.8%; while the *sewer* system is at 67.0%. The activity is based on the payment schedules adjusted for the State Revolving Fund loans that are still being drawn down.
6. ***Operating Reserve Deposit:*** GLWA has established a target balance in the O&M Fund of 45 days of operating expense which works in tandem with the I&E Funds to provide liquidity to the utility. Adequate funding is in place to meet this requirement; therefore, it is expected that additional transfers to this reserve will not be required in FY 2022.
7. ***DWSD Budget Shortfall Pending:*** To the extent that the local (DWSD) system experiences budgetary shortfalls as defined by the Water & Sewer Services Agreement, the GLWA budget is impacted.[2] Steps to proactively detect, and ideally prevent, this shortfall scenario were put into place with the 2018 Memorandum of Understanding (dated June 27, 2018). For FY 2021, DWSD management successfully implemented a formal plan to end the year with positive net cash flows for both the DWSD *water* system and the DWSD *sewer* system. For FY 2022, the DWSD *water* system does not have a budgetary shortfall while the DWSD *sewer* system has a budgetary shortfall of $1.9 million through February 28, 2022. GLWA and DWSD staff are meeting regularly to discuss steps to mitigate this shortfall as outlined in the 2018 MOU.
8. ***Improvement & Extension (I&E) Fund Transfer Pending:*** The contribution to the I&E Fund is for improvements, enlargements, extensions, or betterment of the Water System.
9. ***Other Revenue Requirements:*** The remaining revenue requirements for *both* systems are funded on a 1/12th basis each month in accordance with the Master Bond Ordinance.
10. ***Overall:*** Total revenue requirements for *both* systems are in line with the benchmark.

[1]The tables in this analysis reflect actual amounts spent. If this analysis was on a master bond ordinance (MBO) basis, like that used for calculating debt service coverage, O&M "expense" would equal the pro-rata budget because 1/12 of the O&M budget is transferred monthly outside the MBO trust to an O&M bank account.

[2] As a reminder, the monthly O&M transfer for MBO purposes is at 1/12 of the budget to a DWSD O&M bank account outside the trust. Actual budget may be less than that amount providing an actual positive variance for DWSD.

Table 1A – *Water* Revenue Requirement Budget (year-over-year) – ($000)

Water System	FY2021 AMENDED BUDGET	FY 2021 ACTIVITY THRU 2/28/2021	Percent Year-to-Date	FY 2022 BOARD ADOPTED BUDGET	FY 2022 AMENDED BUDGET	FY 2022 ACTIVITY THRU 2/28/2022	Percent Year-to-Date
Revenues							
Suburban Wholesale Customer Charges	$ 317,034	$ 212,702	67.1%	$ 321,111	$ 318,711	$ 212,499	66.7%
Retail Service Charges	21,926	14,748	67.3%	21,697	21,697	14,465	66.7%
Investment Earnings	3,956	3,152	79.7%	1,047	1,924	1,312	68.2%
Other Revenues	229	226	98.9%	175	291	247	84.9%
Total Revenues	$ 343,144	$ 230,829	67.3%	$ 344,031	$ 342,623	$ 228,523	66.7%
Revenue Requirements							
Operations & Maintenance Expense	$ 134,127	$ 81,259	60.6%	$ 143,934	$ 143,934	$ 86,205	59.9%
General Retirement System Legacy Pension	6,048	4,032	66.7%	6,048	6,048	4,032	66.7%
Debt Service	137,436	93,207	67.8%	135,481	135,121	90,263	66.8%
General Retirement System Accelerated Pension	6,268	4,179	66.7%	6,268	6,268	4,179	66.7%
Extraordinary Repair & Replacement Deposit	-	-	0.0%	-	-	-	0.0%
Water Residential Assistance Program Contribution	1,669	1,113	66.7%	1,706	1,706	1,137	66.7%
Regional System Lease	22,500	15,000	66.7%	22,500	22,500	15,000	66.7%
Operating Reserve Deposit	-	-	0.0%	-	-	-	0.0%
DWSD Budget Shortfall Pending	-	1,398	0.0%	-	-	-	0.0%
Improvement & Extension Fund Transfer Pending	35,095	19,436	55.4%	28,094	27,046	18,124	67.0%
Total Revenue Requirements	$ 343,144	$ 219,624	64.0%	$ 344,031	$ 342,623	$ 218,941	63.9%
Net Difference		$ 11,205				$ 9,582	
Recap of Net Positive Variance							
Revenue Variance		$ 2,067				$ 108	
Revenue Requirement Variance		9,139				9,474	
Overall Variance		$ 11,205				$ 9,582	

Table 1B – *Sewer* Revenue Requirement Budget (year-over-year) – ($000)

Sewer System	FY 2021 AMENDED BUDGET	FY 2021 ACTIVITY THRU 2/28/2021	Percent Year-to-Date	FY 2022 BOARD ADOPTED BUDGET	FY 2022 AMENDED BUDGET	FY 2022 ACTIVITY THRU 2/28/2022	Percent Year-to-Date
Revenues							
Suburban Wholesale Customer Charges	$ 272,454	$ 179,718	66.0%	$ 272,130	$ 266,730	$ 181,539	68.1%
Retail Service Charges	187,960	125,755	66.9%	188,662	188,662	125,775	66.7%
Industrial Waste Control Charges	7,685	5,310	69.1%	9,025	8,325	5,529	66.4%
Pollutant Surcharges	6,108	4,032	66.0%	4,189	4,189	3,263	77.9%
Investment Earnings	2,778	2,039	73.4%	1,023	1,876	1,053	56.1%
Other Revenues	2,195	336	15.3%	400	490	323	65.9%
Total Revenues	$ 479,179	$ 317,190	66.2%	$ 475,429	$ 470,272	$ 317,482	67.5%
Revenue Requirements							
Operations & Maintenance Expense	$ 182,296	$ 108,917	59.7%	$ 181,300	$ 181,300	$ 123,209	68.0%
General Retirement System Legacy Pension	10,824	7,216	66.7%	10,824	10,824	7,216	66.7%
Debt Service	201,780	136,608	67.7%	207,210	204,985	137,380	67.0%
General Retirement System Accelerated Pension	11,621	7,747	66.7%	11,621	11,621	7,747	66.7%
Extraordinary Repair & Replacement Deposit	-	-	0.0%	-	-	-	0.0%
Water Residential Assistance Program Contribution	2,415	1,610	66.7%	2,358	2,358	1,572	66.7%
Regional System Lease	27,500	18,333	66.7%	27,500	27,500	18,333	66.7%
Operating Reserve Deposit	-	-	0.0%	-	-	-	0.0%
DWSD Budget Shortfall Pending	-	4,669	0.0%	-	-	1,862	0.0%
Improvement & Extension Fund Transfer Pending	42,743	27,318	63.9%	34,617	31,685	22,473	70.9%
Total Revenue Requirements	$ 479,179	$ 312,419	65.2%	$ 475,429	$ 470,272	$ 319,793	68.0%
Net Difference		$ 4,770				$ (2,311)	
Recap of Net Positive Variance							
Revenue Variance		$ (2,263)				$ 3,967	
Revenue Requirement Variance		7,033				(6,278)	
Overall Variance		$ 4,770				$ (2,311)	

Operations & Maintenance Budget – Major Budget Categories

The year-over-year benchmark ratio as of February 28, 2022, is 66.7% (eight months). When comparing FY 2022 to FY 2021 in ***Table 2 – Operations & Maintenance Budget – Major Budget Categories***, the overall spending is higher in FY 2022, especially in the Sewer category.

In addition to the four major budget categories, an internal charge cost center for employee benefits is shown in the table below. If the number is positive, it indicates that the internal cost allocation rate charges to other cost centers is not sufficient. A negative number indicates a surplus in the internal cost center. A moderate surplus is preferred as it provides a hedge for mid-year benefit program cost adjustments (premiums adjust on January 1 each year) as well as managing risk as the program is partially self-insured.

***Table 2 – Operations & Maintenance Budget – Major Budget Categories* – ($000)**

Major Budget Categories	FY 2021 AMENDED BUDGET	FY 2021 ACTIVITY THRU 2/28/2021	Percent Year-to-Date	FY 2022 BOARD ADOPTED BUDGET	FY 2022 AMENDED BUDGET	FY 2022 ACTIVITY THRU 2/28/2022	Percent Year-to-Date
Water	$ 70,820	$ 45,108	63.7%	$ 74,813	$ 74,813	$ 49,669	66.4%
Sewer	114,975	68,582	59.6%	111,971	111,971	77,443	69.2%
Centralized	100,339	59,242	59.0%	103,846	103,846	60,787	58.5%
Administrative	30,290	18,034	59.5%	34,603	34,603	21,515	62.2%
Employee Benefits	-	(789)	0.0%	-	-	-	0.0%
Total O&M Budget	$ 316,424	$ 190,177	60.1%	$ 325,234	$ 325,234	$ 209,414	64.4%

Totals may be off due to rounding

Alignment of Operations & Maintenance Budget Priorities – Expense Variance Analysis

The purpose of ***Table 3 – Operations & Maintenance Expense Variance Analysis*** is to evaluate whether the actual spend rate within a natural cost category is in alignment with the budget. Given the effort to develop an accurate budget, a variance is a red flag of a *potential* budget amendment or misalignment of priorities.

Total: In total, the overall O&M expenses are at 64.4% which is reasonably within the pro-rata benchmark of 66.7%. This positive variance equates to a dollar amount of $7.4 million. The expense category commentary is provided below for items highlighted on Table 3.

Personnel Costs: The overall category is under the pro-rata benchmark; coming in at 64.0% through February 2022.

Utilities: The overall category is higher than the pro-rata benchmark; coming in at 73.0% through February 2022. Variances within this category, when they occur, are not unexpected as usage varies throughout the year.

- **Electric** is higher than the pro-rata benchmark, coming in at 72.4%. The first three months of GLWA's fiscal year (July, August, and September) are typically peak months for the usage of electricity. June, the last month of GLWA's fiscal year, is typically a peak month as well. Increased demand charges for the Conner Creek Pumping Station and increased usage/charges at the WRRF are the leading drivers for this increase.
- **Gas** is coming in at 79.6% which is higher than the benchmark of 66.7%. Variances within this category are not unexpected as the majority of GLWA's gas usage occurs between November and February. In addition, the cost of natural gas per BTU has increased 125% since July 2021.
- **Sewage service** is higher than the benchmark, coming in at 76.2%. Increased usage is being reported at the WRRF (in part due to bills being received for actual meter readings when in the past the bills had been estimated), the Biosolids Dryer Facility (BDF), and the Southwest Water Plant.
- **Water service** is higher than the benchmark, coming in at 67.9%. As meters have been repaired or replaced at the WRRF, the billings that previously reported estimated readings have been replaced with actual readings. The actual readings are coming in higher than the estimated billings.

Chemicals: This category is higher than the pro-rate benchmark; coming in at 73.1% through February 2022. While variances within this category are not unexpected as usage varies throughout the year, the increase in chemical costs is the primary driver for this variance.

Supplies & Other: This category is lower than the benchmark; coming in at 52.6% through February 2022. Given that the nature of the items in this category are subject to one-time expenses that do not occur evenly throughout the year, variances are not unexpected. A review of this category is being conducted.

Contractual Services: The overall category is on target with the pro-rata benchmark; coming in at 66.3% through February 2022. Variances in this category, when they occur, are not unexpected as the usage of contracts varies throughout the year (projects scheduled to begin during the latter half of the year as well as contracts that are on an as needed basis). Budget amendments will be processed for those projects in which the actual start dates have been delayed from that in which they were budgeted.

Capital Program Allocation: This category is lower than the benchmark; coming in at 48.4% through February 2022. The amount in the Capital Program Allocation account is shown as negative as this is a "contra" account which represents an offset to the Personnel Costs section of the Operations & Maintenance (O&M) budget.

Shared Services: This category is lower than the benchmark; coming in at 58.0% through February 2022. The shared services reimbursement is comprised of both labor (tracked via BigTime) and expenses, such as annual fees for software licensing. Staff from both GLWA and DWSD have been working together to evaluate and refine the budget for the shared services agreements. Based on these evaluations, adjustments have been made to both the billings and accounting accruals to reflect the forecasted activity more accurately for FY 2022. A second quarter budget amendment was entered to adjust the shared services budget to this revised FY 2022 forecast. In addition, it is important to note that some of the shared services agreements are not billed at a monthly rate of 1/12 of the annual budgeted amount.

Table 3 –Operations & Maintenance Expense Variance Analysis – ($000)

Expense Categories Entity-wide	FY 2021 AMENDED BUDGET	FY 2021 ACTIVITY THRU 2/28/2021	Percent Year-to-Date at 2/28/2021	FY 2021 ACTIVITY THRU 6/30/2021	Percent Year-to-Date at 6/30/2021	FY 2022 AMENDED BUDGET	FY 2022 PRORATED AMENDED BUDGET (8 MONTHS)	FY 2022 ACTIVITY THRU 2/28/2022	Percent Year-to-Date 2/28/2022	FY 2022 PRORATED BUDGET LESS FY 2022 ACTIVITY
Salaries & Wages	$ 67,306	$ 42,582	63.3%	$ 64,910	65.6%	$ 70,564	$ 47,043	$ 43,085	61.1%	$ 3,958
Workforce Development	895	564	63.1%	829	68.0%	977	651	505	51.7%	146
Overtime	7,537	5,009	66.5%	7,365	68.0%	6,904	4,602	5,323	77.1%	(721)
Employee Benefits	26,806	17,766	66.3%	25,448	69.8%	26,811	17,874	16,964	63.3%	910
Transition Services	8,557	5,599	65.4%	8,392	66.7%	8,652	5,768	6,968	80.5%	(1,200)
Employee Benefits Fund	-	(789)	0.0%	-	0.0%	-	-	-	0.0%	-
Personnel Costs	*111,100*	*70,731*	*63.7%*	*106,945*	66.1%	*113,908*	*75,939*	*72,845*	*64.0%*	*3,094*
Electric	41,554	27,852	67.0%	41,982	66.3%	39,676	26,451	28,713	72.4%	(2,262)
Gas	5,924	3,584	60.5%	5,706	62.8%	5,566	3,710	4,429	79.6%	(718)
Sewage Service	2,297	1,210	52.7%	2,075	58.3%	2,079	1,386	1,583	76.2%	(197)
Water Service	2,608	1,767	67.8%	2,987	59.2%	3,120	2,080	2,120	67.9%	(40)
Utilities	*52,383*	*34,413*	*65.7%*	*52,749*	65.2%	*50,441*	*33,627*	*36,845*	*73.0%*	*(3,217)*
Chemicals	14,362	9,156	63.8%	13,982	65.5%	17,515	11,676	12,804	73.1%	(1,127)
Supplies & Other	35,595	18,762	52.7%	31,216	60.1%	37,083	24,722	19,503	52.6%	5,219
Contractual Services	99,977	62,089	62.1%	92,020	67.5%	106,793	71,196	70,795	66.3%	401
Capital Program Allocation	(3,447)	(1,936)	56.2%	(3,192)	60.7%	(3,471)	(2,314)	(1,679)	48.4%	(635)
Shared Services	(4,512)	(3,038)	67.3%	(2,567)	118.3%	(2,929)	(1,953)	(1,699)	58.0%	(254)
Unallocated Reserve	10,966	-	0.0%	-	0.0%	5,894	3,929	-	0.0%	3,929
Total Expenses	$ 316,424	$ 190,177	60.1%	$ 291,153	65.3%	$ 325,234	$ 216,822	$ 209,414	64.4%	$ 7,409

Totals may be off due to rounding

The Basic Financial Statements report includes the following four tables.

1. Statement of Net Position - All Funds Combined
2. Statement of Revenues, Expenses and Changes in Net Position – All Funds Combined
3. Supplemental Schedule of Operations & Maintenance Expenses -All Funds Combined
4. Supplemental Schedule of Nonoperating Expenses – All Funds Combined

At a macro level GLWA has two primary funds for financial reporting purposes: *Water Fund* and *Sewage Disposal Fund*. These funds represent the combined total of four sub-funds for each system that are used internally to properly account for sources and uses of funds. Those sub-funds for each system are: *Operations & Maintenance Fund*, *Improvement & Extension Fund*, *Construction Fund, and Capital Asset Fund*.

The June 2021 comparative amounts shown in the tables below are presented based on final audited figures.

Statement of Net Position – All Funds Combined

Explanatory notes follow the Statement of Net Position shown in Table 1 below.

Table 1 – Statement of Net Position - All Funds Combined
As of February 28, 2022
($000)

	Water	Sewage Disposal	Total Business-type Activities	Comparative June 30, 2021
Assets				
Cash - unrestricted (a)	$ 148,815	$ 196,274	$ 345,089	$ 354,351
Cash - restricted (a)	18,858	19,628	38,486	162,646
Investments - unrestricted (a)	144,068	111,522	255,590	322,930
Investments - restricted (a)	91,343	149,232	240,575	70,225
Accounts Receivable	78,876	55,122	133,998	165,059
Due from (to) Other Funds (b)	(229)	229	-	-
Other Assets (c)	678,894	424,736	1,103,630	1,098,362
Capital Assets, net of Depreciation	1,267,424	2,123,666	3,391,091	3,546,027
Land	293,897	124,377	418,274	417,512
Construction Work in Process (e)	286,400	228,628	515,028	395,973
Total assets	3,008,345	3,433,416	6,441,761	6,533,085
Deferred Outflows (f)	52,317	130,001	182,318	225,074
Liabilities				
Liabilities - Liabilities-ST	131,363	160,764	292,126	329,279
Due to (from) Other Funds (b)	-	-	-	-
Other Liabilities (h)	1,830	5,118	6,948	7,500
Cash Held FBO DWSD (d)	8,535	4,706	13,241	6,064
Liabilities - Long-Term (i)	2,948,318	3,427,438	6,375,756	6,529,068
Total liabilities	3,090,046	3,598,026	6,688,072	6,871,911
Deferred Inflows (f)	70,275	78,691	148,966	96,380
Total net position (j)	$ (99,659)	$ (113,300)	$ (212,959)	$ (210,132)

Totals may be off due to rounding

In general, the Statement of Net Position reflects a mature organization with no unexpected trends.

An ongoing challenge is the Net Position Deficit. The underlying causes took years to build (largely heavy use of debt to finance capital asset investment versus a strategic blend of debt, state revolving funds, and cash). The effect is reflected in GLWA's high debt interest expense. The GLWA is regularly updating the FY 2032 forecast which helps to provide a pathway to a positive Net Position in the future.

Footnotes to Statement of Net Position

a. *Cash and Investments* are reported at market value. Investments at June 30, 2021 are also reported at market value. The February 28, 2022 values differ from the Cash and Investment section of this Financial Report Binder due to timing of certain items recognized on a cash versus accrual basis.

b. *Due from Other Funds* and *Due to Other Funds* are shown at gross for sub-fund activity.

c. *Other Assets* primarily consists of the contractual obligation receivable from DWSD related to reimbursement of bonded indebtedness for local system improvements.

d. *Cash Held FBO Advance (for benefit of) DWSD* and *Cash Held FBO DWSD* represents the net difference between DWSD retail cash received from customers and net financial commitments as outlined in the Master Bond Ordinance.

e. *Construction Work in Process* represents the beginning balance of CWIP plus any construction spending during the fiscal year. The balance will fluctuate based on the level of spend less any capitalizations or write-offs.

f. *Deferred Inflow* and *Deferred Outflow* relate mainly to financing activity and GLWA's share of the legacy General Retirement System (GRS) pension obligation.

g. *Liabilities - Short-term* include accounts payable, retainage payable, and certain accrued liabilities. Some items, such as compensated absences and worker's compensation, are reviewed periodically but only adjusted in the interim if there is a material change.

h. *Other Liabilities* account for the cash receipts set aside for the Budget Stabilization Fund and the Water Residential Assistance Program.

i. *Liabilities – Long-term* include bonds payable, lease payable, and legacy General Retirement System pension liabilities.

j. *Net Position Deficit* is defined by accounting standards as the residual of all other elements presented in a statement of financial position. It is the difference between (a) assets and deferred outflows of resources and (b) liabilities and deferred inflows of resources. A net deficit occurs when the liabilities and deferred inflows exceed assets and deferred outflows. GLWA's net deficit is largely driven by an increase in depreciation expense because of the increase in the acquisition valuation approach for recording capital asset values in the opening Statement of Net Position on January 2016. Efforts are underway to evaluate the net operating effect of this matter over the long term.

Statement of Revenues, Expenses and Changes in Net Position – All Funds Combined

This statement, shown in Table 2, is presented in summary format. The accrual basis of revenues and operations and maintenance expense vary from the revenue requirement basis presented in the *Budget to Actual Analysis* and the *Wholesale Billings, Receivables & Collections* sections of the February 2022 Financial Report Binder. Prior year ending balances are provided in the June 30, 2021 column as a reference for comparative purposes. Explanatory notes follow this statement.

Water revenues presented below in Table 2 differ from those presented in *Table 1A – Water Revenue Requirement Budget* found in the *Budget to Actual Analysis* section of this report because water revenues presented in Table 1A for revenue requirement purposes are reduced by the monthly payment to the City of Flint for a license to raw water rights.

Table 2 – Statement of Revenues, Expenses and Changes in Net Position – All Funds Combined For the Eight Months ended February 28, 2022 ($000)

	Water	Percent of Revenue	Sewage Disposal	Percent of Revenue	Total Business-Type Activities	Comparative June 30, 2021
Revenue						
Wholesale customer charges	$ 216,856	93.6%	$ 181,539	57.4%	$ 398,395	$ 589,992
Local system charges	14,465	6.2%	125,775	39.7%	140,240	209,885
Industrial waste charges		0.0%	5,529	1.7%	5,529	8,005
Pollutant surcharges		0.0%	3,263	1.0%	3,263	6,720
Other revenues	247	0.1%	323	0.1%	570	767
Total Revenues	**231,568**	**100.0%**	**316,429**	**100.0%**	**547,997**	**815,369**
Operating expenses						
Operations and Maintenance	87,810	37.9%	125,081	39.5%	212,891	301,740
Depreciation	82,195	35.5%	104,028	32.9%	186,223	274,044
Amortization of intangible assets	2,378	1.0%	293	0.1%	2,671	3,677
Total operating expenses	**172,383**	**74.4%**	**229,403**	**72.5%**	**401,785**	**579,460**
Operating Income	59,185	25.6%	87,026	27.5%	146,211	235,909
Total Nonoperating (revenue) expense	61,578	26.6%	87,460	27.6%	149,038	224,464
Increase/(Decrease) in Net Position	**(2,393)**	**-1.0%**	**(434)**	**-0.1%**	**(2,827)**	**11,445**
Net Position (deficit), beginning of year	(97,266)		(112,867)		(210,132)	(221,578)
Net position (deficit), end of year	$ (99,659)		$ (113,300)		$ (212,959)	$ (210,132)

Totals may be off due to rounding

Water Fund

- ✓ The decrease in Water Fund Net Position is $2.4 million.
- ✓ Wholesale water customer charges of $216.9 million account for 93.6% of Water System revenues.
- ✓ Operating expenses of $172.4 million represent 74.4% of total operating revenue. Depreciation is the largest operating expense at $82.2 million or 47.7% of operating expense.
- ✓ Amortization of intangible assets represents activity for raw water rights.
- ✓ Operating income after operating expenses (including depreciation) equals $59.2 million or 25.6% of operating revenue.
- ✓ The largest category within nonoperating activities is bonded debt interest expense of $52.3 million (this equates to the bonded debt interest expense less the offset from DWSD contractual obligation income).

Sewage Disposal Fund

- ✓ The decrease in the Sewage Disposal Fund Net Position is $0.4 million.
- ✓ Wholesale customer charges of $181.5 million account for 57.4% of Sewer System revenues. Wholesale customer charges are billed one-twelfth each month based on an agreed-upon historical average "share" of each customer's historical flows which are formally revisited on a periodic basis. The result is no revenue shortfall or overestimation.
- ✓ Local system (DWSD) charges of $125.8 million account for 39.7% of total operating revenues. These are also billed at one-twelfth of the annual revenue requirement.
- ✓ Operating expenses of $229.4 million represent 72.5% of total operating revenue. Depreciation is the largest operating expense at $104.0 million or 45.3% of total operating expense.
- ✓ Amortization of intangible assets represents activity for a warehouse lease.
- ✓ Operating income after operating expenses (including depreciation) equals $87.0 million or 27.5% of operating revenue.
- ✓ The largest category within nonoperating activities is bonded debt interest expense of $61.0 million (this equates to the bonded debt interest expense less the offset from DWSD contractual obligation income).

Supplemental Schedule of Operations & Maintenance Expenses – All Funds Combined

This Supplemental Schedule of Operations & Maintenance Expenses (O&M) schedule is shown below in Table 3. This accrual basis of operations and maintenance expense may vary from the revenue requirement basis presented in the *Budget to Actual Analysis* section of the February 2022 Financial Report Binder. Explanatory notes follow this schedule.

Table 3 – Supplemental Schedule of Operations & Maintenance Expenses – All Funds Combined For the Eight Months ended February 28, 2022 ($000)

	Water	Percent of Total	Sewage Disposal	Percent of Total	Total Business-Type Activities	Percent of Total
Operating Expenses						
Personnel						
Salaries & Wages	14,778	16.8%	35,780	28.6%	50,558	23.7%
Overtime	3,389	3.9%	1,934	1.5%	5,323	2.5%
Benefits	11,720	13.3%	5,244	4.2%	16,964	8.0%
Total Personnel	$ 29,887	34.0%	$ 42,958	34.3%	$ 72,845	34.2%
Utilities						
Electric	17,235	19.6%	11,478	9.2%	28,713	13.5%
Gas	857	1.0%	3,571	2.9%	4,429	2.1%
Sewage	533	0.6%	1,050	0.8%	1,583	0.7%
Water	4	0.0%	2,116	1.7%	2,120	1.0%
Total Utilities	$ 18,630	21.2%	$ 18,215	14.6%	$ 36,845	17.3%
Chemicals	4,955	5.6%	7,849	6.3%	12,804	6.0%
Supplies and other	5,967	6.8%	13,337	10.7%	19,304	9.1%
Contractual services	31,064	35.4%	43,645	34.9%	74,710	35.1%
Capital Adjustment	-	0.0%	-	0.0%	-	0.0%
Capital program allocation	(1,037)	-1.2%	(642)	-0.5%	(1,679)	-0.8%
Intergovernmental Agreement	(187)	-0.2%	(53)	0.0%	(240)	-0.1%
Shared services allocation	(1,469)	-1.7%	(230)	-0.2%	(1,699)	-0.8%
Operations and Maintenance Expenses	**$ 87,810**	**100.0%**	**$ 125,081**	**100.0%**	**$ 212,891**	**100.0%**

Totals may be off due to rounding

- ✓ Core expenses for water and sewage disposal systems are utilities (17.3% of total O&M expenses) and chemicals (6.0% of total O&M expenses).
- ✓ Personnel costs (34.2% of total O&M expenses) include all salaries, wages, and benefits for employees as well as staff augmentation contracts that fill a vacant position (contractual transition services).
- ✓ Contractual services (35.1%) includes:
    - Water System costs of sludge removal and disposal services at the Northeast, Southwest and Springwells Water Treatment Plants (approximately $6.2 million);
    - Sewage Disposal System costs for the operation and maintenace of the biosolids dryer facility (approximately $11.4 million); and
    - Centralized and adminisitrative contractual costs allocated to both systems for information technology, building maintenace, field, planning and other services.
- ✓ The Capital Program Allocation, Intergovernmental Agreement and Shared Services Allocation are shown as negative amounts because they are ‘contra’ expense accounts representing offets to associated costs in other Operations and Maintenance expense categories.

Supplemental Schedule of Nonoperating Expenses – All Funds Combined

The Supplemental Schedule of Nonoperating Expenses – All Funds Combined is shown in Table 4. Explanatory notes follow this schedule.

Table 4 – Supplemental Schedule of Nonoperating Expenses – All Funds Combined For the Eight Months ended February 28, 2022 ($000)

	Water	Sewage Disposal	Total Business-type Activities	Comparative June 30, 2021
Nonoperating (Revenue)/Expense				
Interest income contractual obligation	$ (16,704)	$ (11,341)	$ (28,046)	$ (43,087)
Interest income DWSD Shortfall	-	(126)	(126)	(635)
Investment earnings	(1,322)	(1,061)	(2,383)	(7,040)
Net incr (decr) in fair value of invstmt	1,500	1,006	2,505	5,781
Other nonoperating revenue	(432)	(2)	(434)	476
Interest Expense				
Bonded debt	69,011	72,365	141,376	218,857
Lease obligation	11,376	13,904	25,280	38,332
Other obligations	3,005	1,113	4,117	6,296
Total interest expense	83,392	87,382	170,774	263,485
Other non-capital expense	-	-	-	-
Memorandum of Understanding	-	-	-	-
Capital Contribution	-	34	34	(5,960)
Amortization, issuance costs, debt	(10,210)	1,583	(8,627)	(12,966)
(Gain) loss on disposal of capital assets	(15)	532	517	365
Loss on impairment of capital assets	-	-	-	-
Water Residential Assistance Program	381	526	907	1,517
Legacy pension expense	4,988	8,927	13,915	22,528
Total Nonoperating (Revenue)/Expense	**61,578**	**87,460**	**149,038**	**224,464**

Totals may be off due to rounding

- ✓ Interest income on contractual obligation relates to the portion of the total GLWA debt obligation attributable to DWSD. This interest income offsets the total debt interest expense paid by GLWA on behalf of both entities monthly.
- ✓ Interest income DWSD shortfall represents interest from a budgetary shortfall loan from fiscal years 2016, 2017 and 2018 and is paid in accordance with the 2018 Memorandum of Understanding (MOU).
- ✓ Investment earnings in this report are reflected at book value. Any differences between the Basic Financial report and Cash and Investment section of this Financial Report binder are due to accrued interest. FY 2020 market value adjustments for Water and Sewer totaled $4.9 million and $3.3 million, respectively.

FY 2021 market value adjustments for Water and Sewer totaled $1.5 million and $1.0 million, respectively.

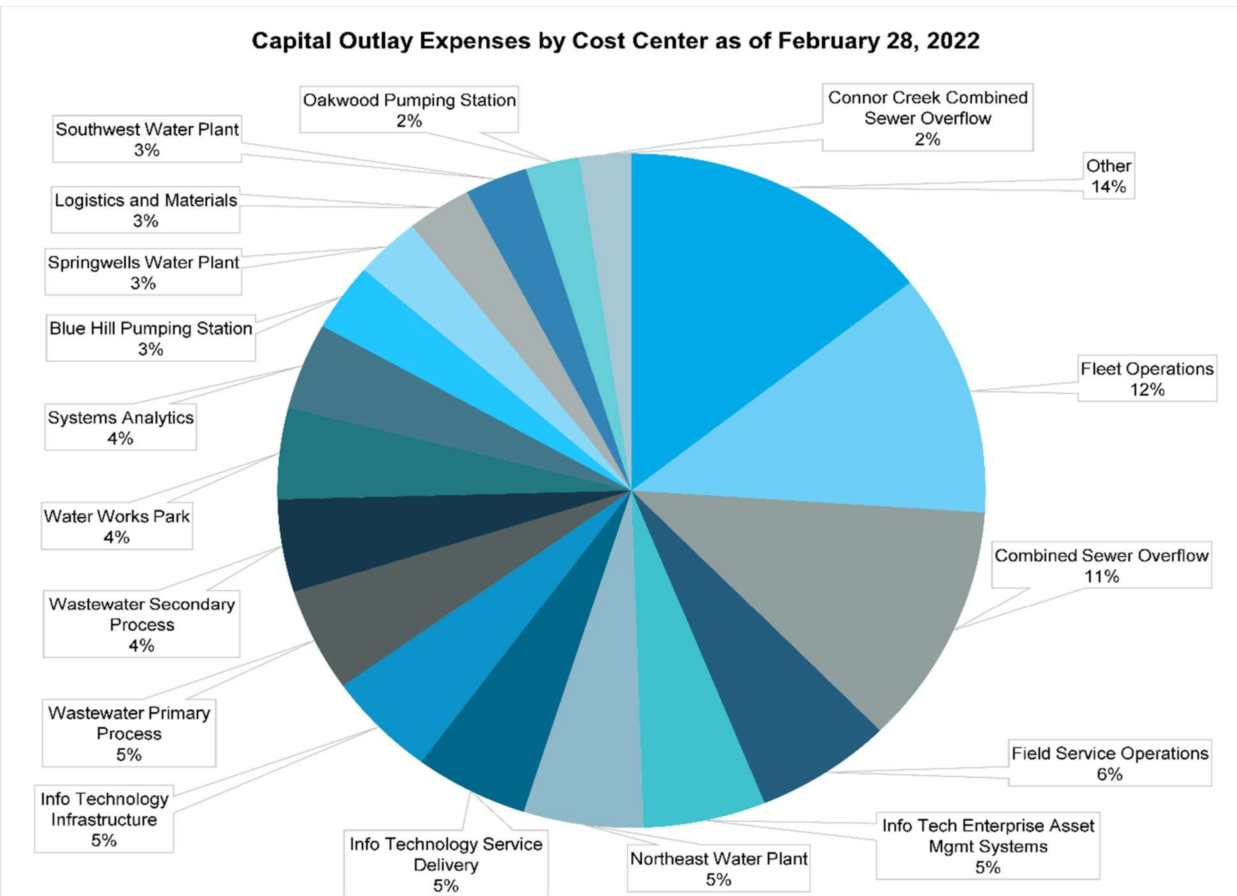
- ✓ Interest expense, the largest category of nonoperating expenses, is made up of three components:
  - Bonded debt;
  - Lease obligation for the regional assets from the City of Detroit; and
  - Other obligations such as an obligation payable to the City of Detroit for an allocation BC Notes related to assumed DWSD liabilities; acquisition of raw water rights related to the KWA Pipeline.
- ✓ The FY 2021 capital contribution in Nonoperating (revenue) expense represents one-half of an $11.92 million payment made by Oakland Macomb Interceptor Drainage District (OMIDD). The payment was part of an amendment to the OMIDD Wastewater Disposal Services Contract and was split between FY 2020 and FY 2021 based on budgeted revenue requirements for those respective years.

Financial Activity Charts

Chart 1 – Capital Outlay – Water and Sewer System Combined

Capital Outlay represents purchases of equipment, software, and small facility improvement projects. It *excludes* any capital investment which is included in the monthly construction work-in-progress report related to the Capital Improvement Program. Some items span several months so the entire cost may not have been incurred yet. In addition, items are capitalized only if they meet GLWA's capitalization policy.

Through February 28, 2022, total capital outlay spend is $6.8 million. Following this chart is a sample list of projects and purchases from the total spend of $6.8 million:



Note: *Due to rounding totals may not equal 100%.*

Water Operations: 14 Mile Water Main Assessment ($350k); Turbidmeter at Northeast Water Plant ($216k); high pressure water tank ($174k); power inverter ($141k); Water Works Park furniture ($115k); Southwest Water Plant furniture ($74k); buoy system

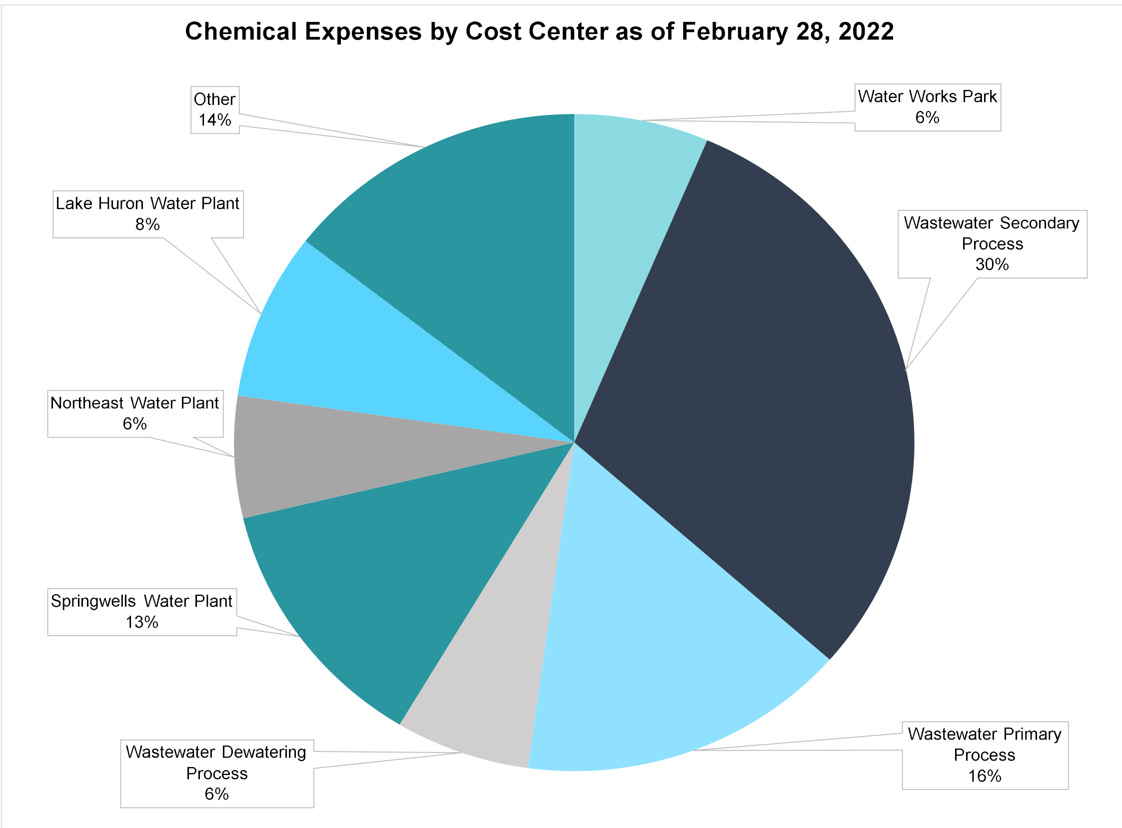
($56k); excitation motor retrofit ($42k); vacuum regulator ($40k) and steam generator ($39k).

Wastewater Operations: PQM Meters for CSO Facilities ($787k); wastewater pump ($347k); Main Lift Pump emergency repair ($267k); flygt pump ($182k); B-houses ($167k); sewer pump ($81k); effluent channel stop-logs ($80k); water champ ($65k); Leib CSO accusonic flow meters ($60k); rotork repairs ($50k); Freud electric backup service installation ($44k); metering pump ($33k) and pump service (32k).

Centralized & Administrative Facilities: Trucks and vehicles ($790k); IT software ($613k); IT computers and hardware ($349k); sewer meter support ($282k); Rialto Security ($199k); chemical monitoring equipment ($78k) and power meters ($42k).

Chart 2 – Chemical Expenses – Water and Sewer System Combined

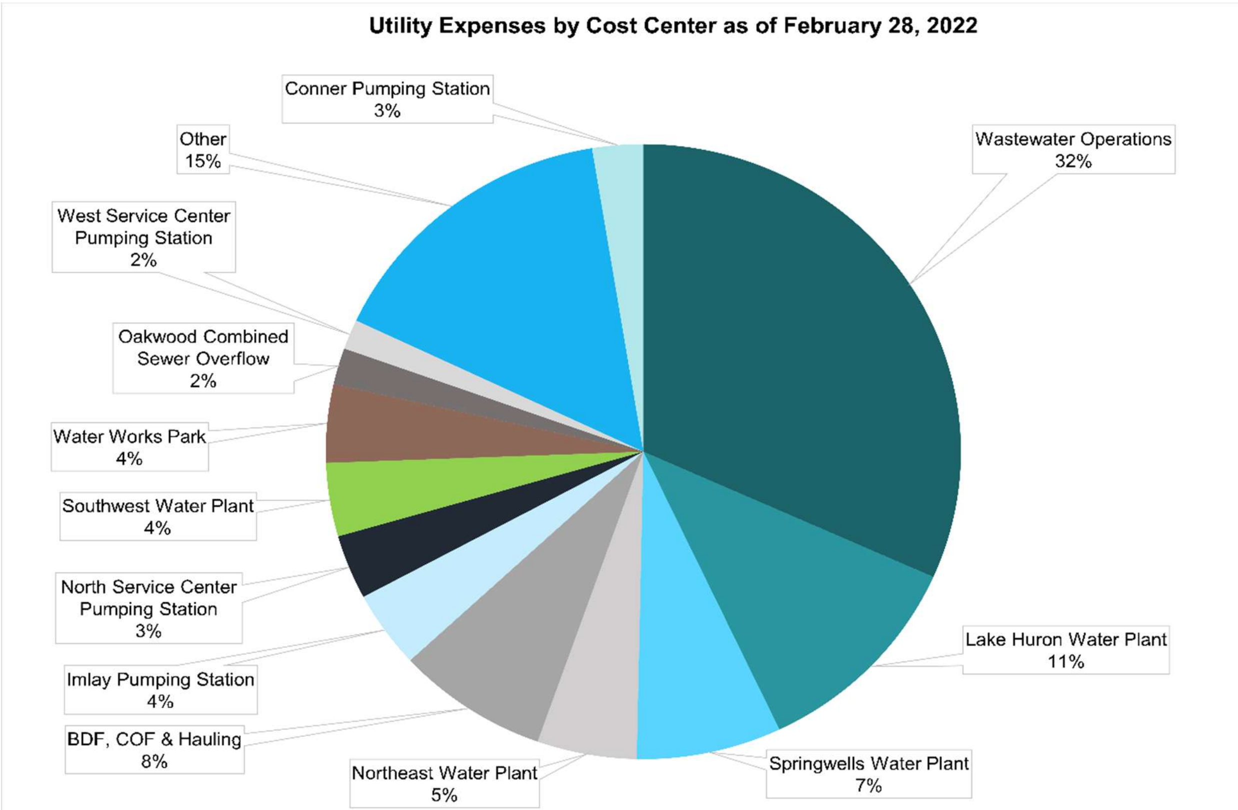
Chemical expenses are $12.8 million through February 28, 2022. The allocation is shown in the chart below and remains consistent with prior periods.



Note: *"Other" includes Combined Sewer Overflow (CSO), portions of the Wastewater process and two departments from Water. Due to rounding totals may not equal 100%.*

Chart 3 – Utility Expenses – Water and Sewer System Combined

Utility expenses are $36.8 million through February 28, 2022. The allocation is shown in the chart below and consistent with prior periods.



Note: *Due to rounding totals may not equal 100%.*

Financial Operations KPI

This key performance indicator shown in ***Chart 1 – Bank Reconciliation Completion Status*** below provides a measure of the progress made in the month-end close process which includes bank reconciliations with a completed status at month end. Through February 28, 2022 all reconciliations are up-to-date and complete.

There were no changes in accounts since January 2022.

Chart 1 – Bank Reconciliation Completion Status

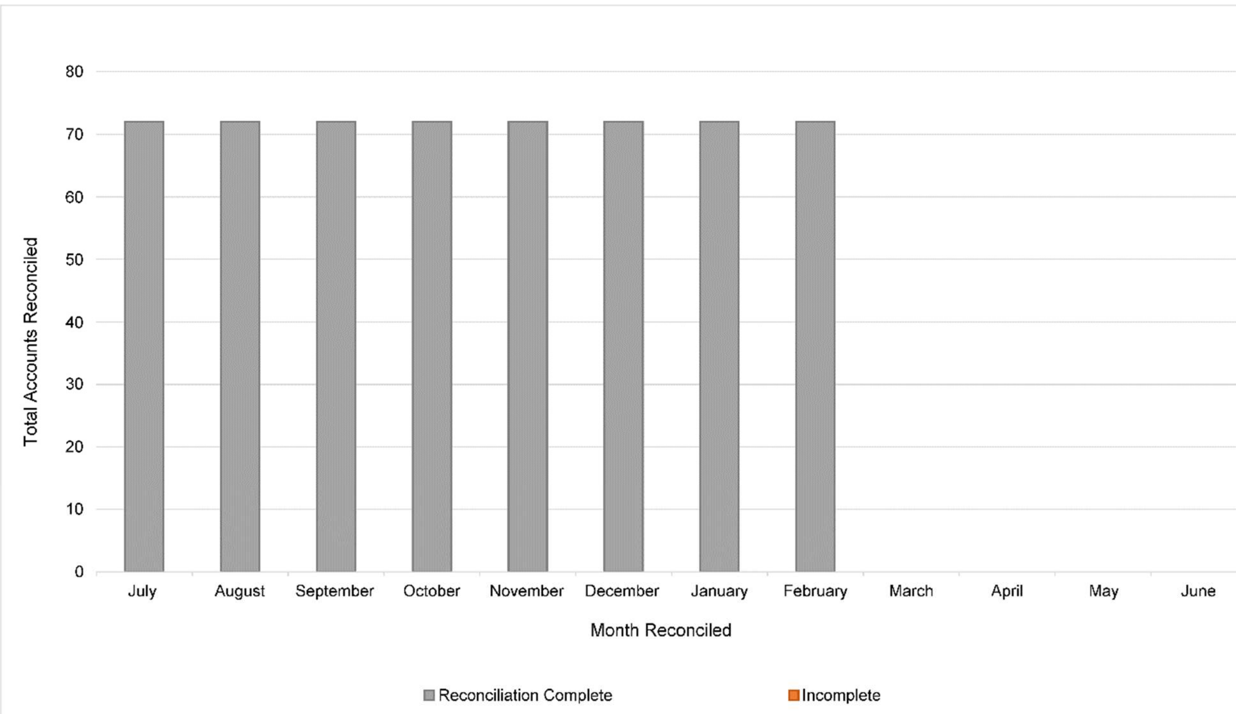


Table 1 – Fiscal Year 2022 GL Cash Account Rollforward

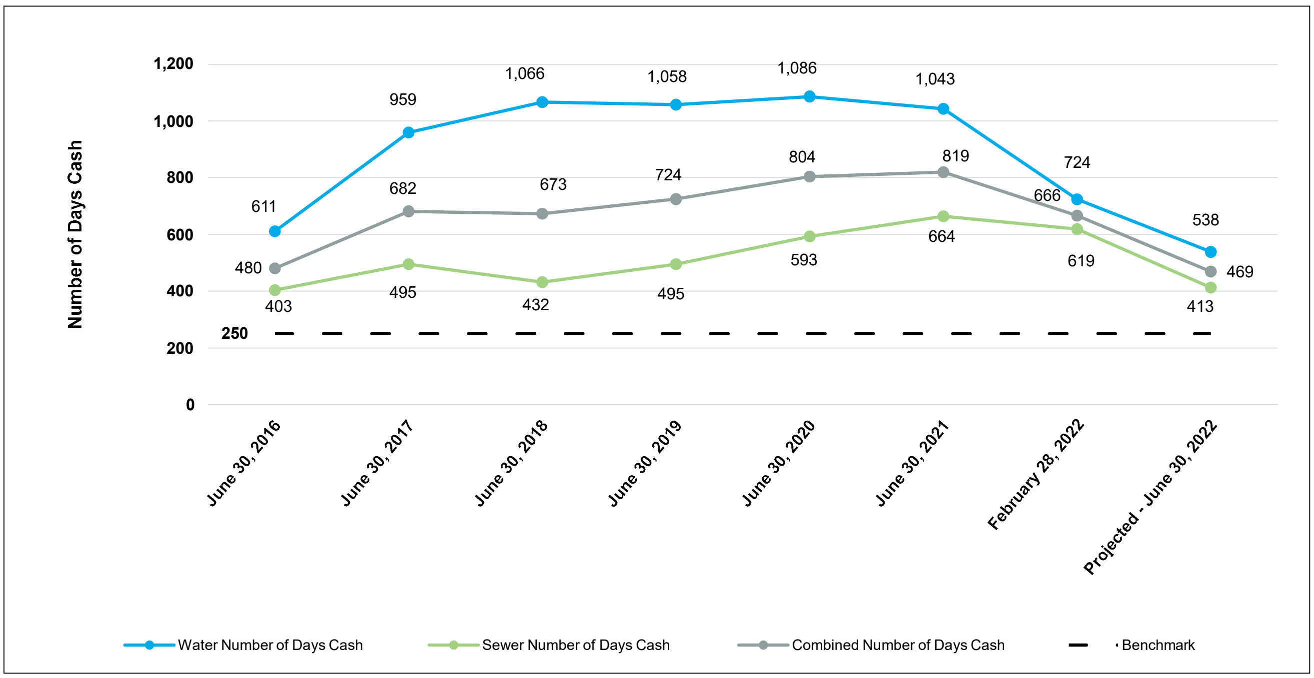
Total GL Cash accounts as of July 1, 2021	72
New GL Cash accounts	0
Inactivated GL Cash accounts	0
Total GL Cash accounts as of February 28, 2022	72

Financial Operations KPI - Liquidity

This key performance indicator shown in ***Chart 1 – Historical Schedule of Days Cash on Hand – Liquidity – Regional System*** and ***Table 1 – Schedule of Days Cash on Hand – Liquidity – Regional System*** below provides a measure of a utility's ability to meet expenses, cope with emergencies and navigate business interruptions. Liquidity is one of several key metrics monitored by bond rating agencies reflecting an organization's financial strength. A best practice benchmark for this key performance indicator is greater than 250 days cash on hand as shown by the dashed line in Chart 1 below.

Both GLWA Water and Sewer funds continue to exceed this target with Water at 724 and Sewer at 619 days cash on hand as of February 28, 2022. These balances remain strong for the regional system in large part due to the need to fund CIP projects with I&E funds but drop in the FY 2022 projection as these funds are depleted and GLWA transitions to a planned bond issue. The FY 2022 projection is calculated based on values from the GLWA FY 2022 – 2026 Budget & Five-Year Plan.

Chart 1 – Historical Schedule of Days Cash on Hand – Liquidity – Regional System



Note: *The GLWA Annual Comprehensive Financial Reports are the source of all historic data referenced. Refer to these reports for detailed calculations by fiscal year.*

Table 1 – Schedule of Days Cash on Hand – Liquidity – Regional System

	June 30, 2021	February 28, 2022	Projected June 30, 2022
Water Fund			
Cash and Investments - Unrestricted	$ 353,308,000	$ 292,882,000	$ 217,600,000
Operating Expense			
Operating Expense (a)	$ 250,476,000	$ 184,267,000	$ 276,400,000
Less: Depreciation (a)	(123,272,000)	(83,556,000)	(125,333,000)
Less: Amortization of Intangible Asset (a)	(3,567,000)	(2,378,000)	(3,567,000)
Net Operating Expense	$ 123,638,000	$ 98,334,000	$ 147,500,000
Operating Expense per Day	$ 339,000	$ 405,000	$ 404,000
Days Cash			
Number of Days Cash	1,043	724	538
Sewage Disposal Fund			
Cash and Investments - Unrestricted	$ 323,973,000	$ 307,796,000	$ 205,000,000
Operating Expense			
Operating Expense (a)	$ 328,983,000	$ 218,733,000	$ 328,100,000
Less: Depreciation (a)	(150,772,000)	(97,867,000)	(146,800,000)
Less: Amortization of Intangible Asset (a)	(110,000)	-	-
Net Operating Expense	$ 178,101,000	$ 120,867,000	$ 181,300,000
Operating Expense per Day	$ 488,000	$ 497,000	$ 497,000
Days Cash			
Number of Days Cash	664	619	413
Combined			
Cash and Investments - Unrestricted	$ 677,281,000	$ 600,679,000	$ 422,600,000
Operating Expense			
Operating Expense (a)	$ 579,460,000	$ 403,000,000	$ 604,500,000
Less: Depreciation (a)	(274,044,000)	(181,422,000)	(272,133,000)
Less: Amortization of Intangible Asset (a)	(3,677,000)	(2,378,000)	(3,567,000)
Net Operating Expense	$ 301,740,000	$ 219,200,000	$ 328,800,000
Operating Expense per Day	$ 827,000	$ 902,000	$ 901,000
Days Cash			
Number of Days Cash	819	666	469

Totals may be off due to rounding

(a) Current year expenses are expressed as a proration of the annual budget for the purposes of this metric.

The monthly Budget to Financial Statements Crosswalk includes the following.

1. Crosswalk Budget Basis to Financial Reporting Basis
2. Explanatory Notes for Crosswalk

Purpose for Crosswalk: The Great Lakes Water Authority establishes a "Revenue Requirements" budget for the purposes of establishing charges for services. The financial report is prepared in accordance with Generally Accepted Accounting Policies for enterprise funds of a local government. Because the budget and the financial statements are prepared using different basis of accounting, the crosswalk reconciles the "Net Difference" to the "Increase/(Decrease) in Net Position" in Table 2 of the Basic Financial Statements in the monthly Financial Report.

The Authority has a Water Master Bond Ordinance and a Sewer Master Bond Ordinance (MBO). The Ordinances provide additional security for payment of the bonds. All revenues of the system are deposited into Revenue Receipts Funds which are held in trust by a trustee. The cash is moved to multiple bank accounts monthly based on 1/12th of the budget as defined in the MBO ("the flow of funds") for all revenue requirements except for the Debt Service monthly transfer. The Debt Service monthly requirement is computed by the trustee, U.S. Bank. The cash transfer for debt is net of investment earnings that remain in the debt service accounts to be used for debt service.

The budget is prepared on a modified cash basis. The revenue requirements are determined based upon the cash needed to meet the financial commitments as required by the Master Bond Ordinance.

- Operation & Maintenance (O&M) expenses based on an accrual basis
- O&M Legacy Pension Allocation (includes administrative fee) and Accelerated Legacy Pension Allocation (includes B&C notes obligation) based on a cash basis
- Debt Service Allocation based on a cash set aside basis to provide the cash for the debt payments on the due dates
- Lease payments based on a cash basis
- Water Residential Assistance Program based on a percentage of budgeted revenue
- Regional System Improvement & Extension Fund Allocation on a cash basis

Budget: In Table 1A and Table 1B of the Budget to Actual Analysis the 'Revenues' section is the accrual basis revenues that are available to meet the 'Revenue Requirements'. The 'Revenue Requirements' section budget column indicates the annual cash transfers to be made.

Financial Reporting: The Authority's financial statements are prepared in conformity with generally accepted accounting principles (GAAP) as applied to government units. The Authority maintains its records on the accrual basis of accounting to conform to GAAP. Revenues from operations, investments and other sources are recorded when earned. Expenses (including depreciation) are recorded when incurred.

Table 1 – Crosswalk Budget Basis to Financial Reporting Basis provides a reconciliation of the "Net Difference" in Table 1A and Table 1B in the Budget to Actual Analysis report to the "Increase/(Decrease) in Net Position" in Table 2 of the Basic Financial Statements in this monthly Financial Report. Explanatory notes follow the Crosswalk shown in Table 1 below.

Table 1 – Crosswalk Budget Basis to Financial Reporting Basis ($000)
For the Eight Months Ended February 28, 2022

	Water	Sewer	Total
Net Revenue Requirement Budget Variance (a)	$ 9,583	$ (2,310)	$ 7,273
Budgetary categories adjustments to financial reporting basis			
Pension delayed accounting election adjustments			
Current year pension transfers/payments recorded as deferral (c)	7,627	13,650	21,277
Prior year pension contribution accounted for in current year (d)	(4,988)	(8,927)	(13,915)
Administrative prepaid adjustment (e)	-	-	-
Debt service (f)	37,956	76,356	114,312
Accelerated pension B&C notes obligation portion (g)	130	291	421
Regional System lease (h)	3,624	4,429	8,053
Right to use lease - warehouse (h)		111	111
WRAP (i)	756	1,046	1,802
DWSD short term allocation (j)	-	1,862	1,862
Improvement & Extension Fund transfers (j)	18,124	22,473	40,597
Nonbudgeted financial reporting categories adjustments			
Depreciation and amortization (k)	(84,573)	(104,321)	(188,894)
Amortization - debt related (k)	10,210	(1,583)	8,627
Other nonoperating income (k)	432	2	434
Other nonoperating expense (k)	-	-	-
Gain(loss) on disposal of capital assets (k)	15	(532)	(517)
Raw water rights obligation (l)	1,810	-	1,810
Investment earnings for construction fund (m)	10	7	17
Interest for Subscription Based Information Tech Arrangements	(4)	(4)	(8)
Interest on DWSD note receivable (n)	-	126	126
Investment earnings unrealized gain/loss (o)	(1,500)	(1,006)	(2,506)
Improvement & extension fund operating expenses (p)	(1,605)	(2,070)	(3,675)
Capital Contribution (q)	-	(34)	(34)
Net Position Increase/(Decrease) per Financial Statements (b)	$ (2,393)	$ (434)	$ (2,827)

Table 2 - Explanatory Notes for Crosswalk

(a) Source: Budget to Actual Table 1A and Table 1B in Monthly Financial Report

(b) Source: Basic Financial Statements Table 2 in Monthly Financial Report

(c) Current year pension payments are an expense for budget purposes but not for financial reporting purposes.

(d) Prior year pension payments are accounted for in the current year financial statements.

(e) The administrative fee is part of the O&M Legacy Pension shown as an expense for budget purposes. For financial reporting purposes part of the administrative fee is considered prepaid based on the prior year General Retirement System audit information and therefore not an expense for the current year financial reporting. The prepaid portion is adjusted in June each year.

(f) Debt service (principal and interest payments) are shown as an expense for budget purposes. Most of the adjustment relates to principal payments which are not an expense for financial reporting purposes. A portion of the adjustment relates to interest expense variances on state revolving fund debt due to the timing of payment draws. The cash set aside basis for interest expense generally is the same as the accrual basis for financial reporting.

(g) The accelerated pension payment includes the obligation payable for the B&C notes. The pension portion is included in item (c) above. This adjustment relates to the B&C note obligation payments. The principal and interest cash basis payments are treated as an expense for budget purposes. The principal portion is not an expense for financial reporting purposes. For financial reporting purposes interest is expensed on an accrual basis which is different from the cash basis.

(h) The lease payment is included as an expense for budget and includes both principal and interest payments. Most of the adjustment relates to the principal payments which are not an expense for financial reporting purposes. A portion of the adjustment relates to interest expense which is recorded on an accrual basis for financial reporting which is different from the cash basis.

(i) WRAP is shown as an expense for budget purposes. For financial reporting purposes the expense is not recognized until the funds have been transferred to the WRAP administrator. The adjustment shown is the amount of current year transfers that have not been transferred to the WRAP administrator. Note that there are funds from the prior year that have not been transferred to the WRAP administrator.

(j) The DWSD short term allocation and Improvement & Extension Fund transfers are shown as an expense for budget purposes but not for financial reporting purposes.

(k) Certain nonoperating income and expenses are reported in financial statements only.

(l) The water service contract with Flint includes a license for raw water rights which has been recorded as an asset and liability by the Authority. The contract provides a credit to Flint as Flint satisfies its monthly bond payment obligation to KWA. This KWA credit is treated as a noncash payment of principal and interest on the liability recorded for the raw water rights. For budget, wholesale customer charges are net of the anticipated KWA credits to Flint as that is the cash that will be received and available to meet the budgeted revenue requirements. For financial reporting basis the Flint wholesale charges are recorded at the total amount billed. When the KWA credit is issued, the receivable from Flint is reduced and the principal and interest payments on the liability for the raw water rights are recorded as a noncash transaction. Most of the adjustment shown relates to the principal reduction made for the credits applied which are not an expense for financial reporting basis.

(m) Investment earnings from the construction fund are not shown as revenue in the budget and are shown as revenue in the financial statements. Construction fund investment earnings are excluded from the definition of revenue for budget purposes as they are used for construction costs and are not used to meet the revenue requirements in the budget.

(n) Interest on the DWSD note receivable is budgeted as part of the Sewer improvement and extension fund and is transferred directly to that fund as payments are made.

(o) Unrealized gains and losses are recorded annually as required for financial reporting purposes but do not reflect actual investment earnings and are not included in cash basis reporting.

(p) For FY 2022, the Water Improvement and Extension fund reflects $1.6 million, and the Sewer Improvement and Extension fund reflects $2.1 million in expenses relating to repairs paid for through the Water and Sewer Improvement and Extension funds, respectively. These are consolidated expenses for financial reporting purposes but are not reflected in the current Operations and Maintenance budget expenses. In addition, GLWA enters interlocal agreements with other local governments to coordinate projects and services and reduce overlapping expense. Many of these agreements relate to current capital improvement projects. Where another local government reimburses GLWA for direct expenses associated with a capital improvement project financed using improvement and extension funds, those reimbursements received under the agreement are transferred back to the Improvement and Extension fund.

he Monthly Capital Improvement Plan Financial Summary includes the following.

1. Water System Capital Improvement Plan Spend Incurred to date
2. Sewer System Capital Improvement Plan Spend Incurred to date

Capital Improvement Plan Financial Summary

Great Lakes Water Authority (GLWA) capital improvement projects generally span two or more years due to size and complexity. Therefore, the GLWA Board of Directors adopts a five-year capital improvement plan (CIP). The CIP is a five-year, rolling plan which is updated annually and formally adopted by the GLWA Board of Directors. In addition, the Board of Directors adopts a capital spending ratio assumption (SRA) which allows the realities of capital program delivery to align with the financial plan. The SRA is an analytical approach to bridge the total dollar amount of projects in the CIP with what can realistically be spent due to limitations beyond GLWA's control and/or delayed for nonbudgetary reasons. Those limitations, whether financial or non-financial, necessitate the SRA for budgetary purposes, despite the prioritization established.

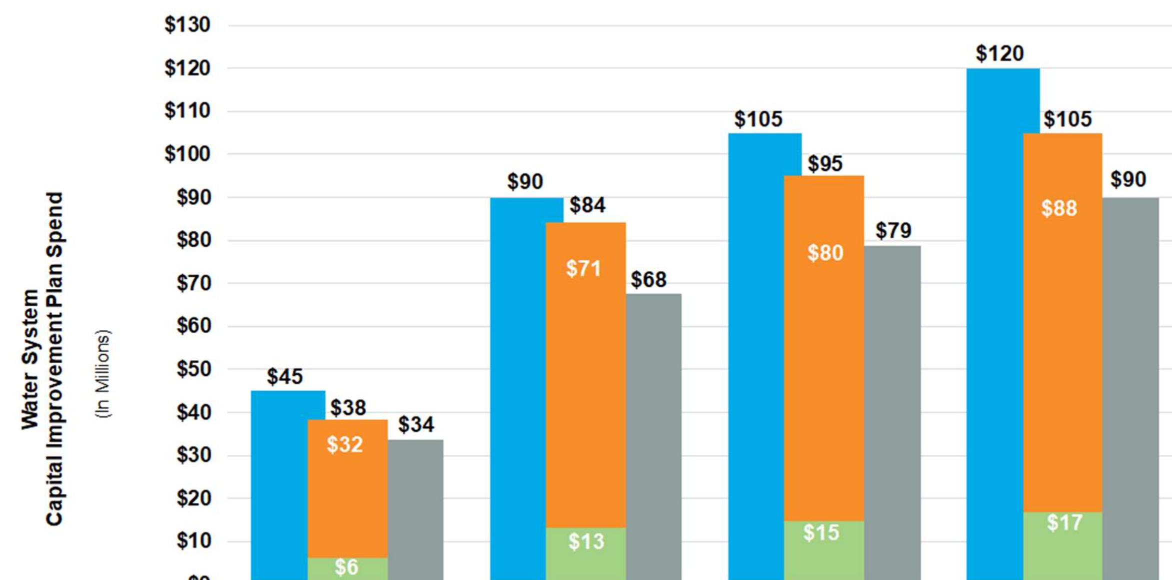
This report presents quarterly and monthly CIP spending against the prorated CIP in total and the CIP adjusted for the SRA. The prorated CIP is calculated by dividing the total fiscal year 2022 board-approved CIP plan by twelve equal months. It should be noted that for operational purposes, GLWA utilizes Primavera P6 for refined monthly projections for cash management and project management.

Beginning January 1, 2021, GLWA has intentionally depleted Bond funds and has moved to solely using I&E and State Revolving Loans to fund CIP expenditures to lower the cost of debt. It is expected that the I&E funds will be sufficient to fund the capital program through FY 2022 including an allowance to provide flexibility in the timing of future bond issues.

Chart 1 – Water System Capital Improvement Plan Spend Incurred to Date

As of February 2022, the Water system incurred over $105 million of construction costs to date. This is 88% of the fiscal year 2022 CIP through February and 117% of the financial plan which is labeled as the FY 2022 CIP w/SRA in the chart below.

Chart 1 – Water System Capital Improvement Plan Spend Incurred to Date

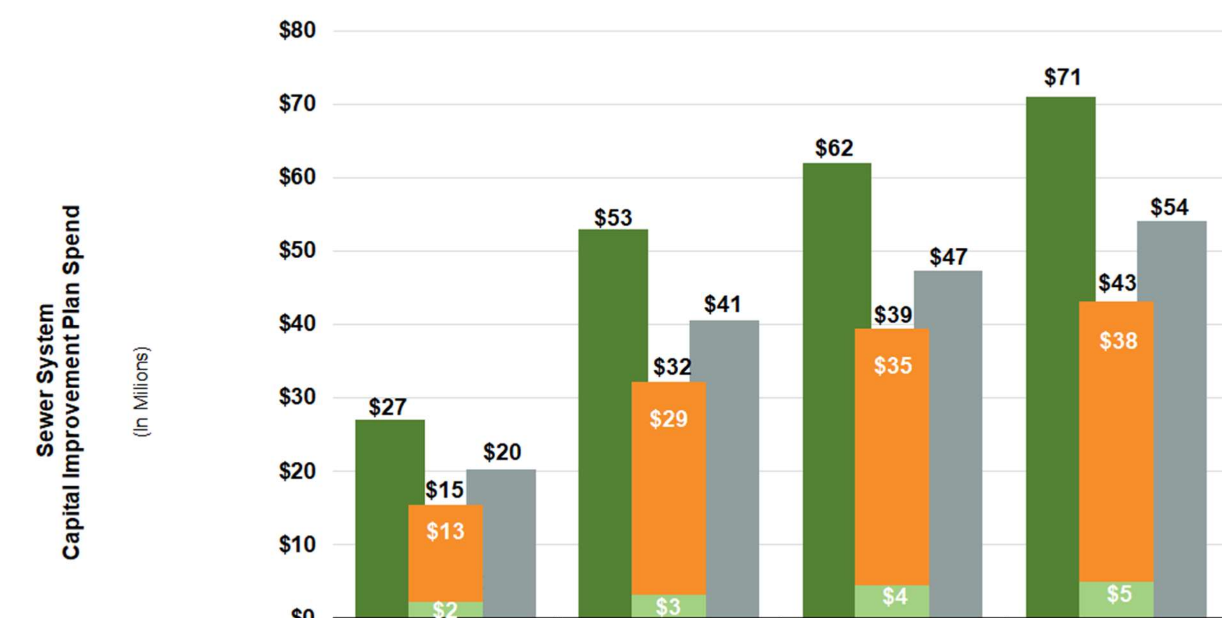


	YTD Thru FY 2022 Q1	YTD Thru FY 2022 Q2	YTD Thru 1/31/22	YTD Thru 2/28/22
FY 2022 CIP	$45	$90	$105	$120
Spend Rate Assumption	$34	$68	$79	$90
Actual Spend - I & E	$32	$71	$80	$88
Actual Spend - SRF	$6	$13	$15	$17

Chart 2 – Sewer System Capital Improvement Plan Spend Incurred to Date

As of February 2022, the Sewer system incurred over $43 million of construction costs to date. This is 61% of the fiscal year 2022 CIP through February and 80% of the financial plan which is labeled as the FY 2022 CIP w/SRA in the chart below.

Chart 2 – Sewer System Capital Improvement Plan Spend Incurred to Date



	YTD Thru FY 2022 Q1	YTD Thru FY 2022 Q2	YTD Thru 1/31/22	YTD Thru 2/28/22
FY 2022 CIP	$27	$53	$62	$71
Spend Rate Assumption	$20	$41	$47	$54
Actual Spend - I & E	$13	$29	$35	$38
Actual Spend - SRF	$2	$3	$4	$5

This report includes the following.

1. Master Bond Ordinance (MBO) Required Transfers to Accounts Held by GLWA
2. Master Bond Ordinance (MBO) Required Transfers to Accounts Held by DWSD

MBO Transfers to Accounts Held by GLWA

GLWA Transfers: The Treasury team completes required MBO transfers on the first business day of each month. These transfers are completed in accordance with the Great Lakes Water Authority (GLWA) and Detroit Water & Sewerage Department (DWSD) budgets as approved and adopted by the GLWA Board of Directors and DWSD Board of Water Commissioners annually.

Monthly transfers for Operations & Maintenance (O&M), Pension, and Water Residential Assistance Program (WRAP) are one-twelfth of the annual, budgeted amount. Budget stabilization should not require additional funding due to new, baseline funding levels established as part of the June 2018 Memorandum of Understanding but is included to reflect historical activity. Transfers to the Extraordinary Repair & Replacement (ER&R) fund are completed annually based on budget and year-end fund status.

Table 1 – GLWA FY 2022 Water MBO Transfers reflects the required transfers for FY 2022 completed through February 1, 2022. MBO transfers for water totaling $108.7 million have been transferred to GLWA accounts.

Table 2 – GLWA FY 2022 Sewer MBO Transfers reflects the required transfers for FY 2022 completed through February 1, 2022. MBO transfers for sewer totaling $140.5 million have been transferred to GLWA accounts.

Table 3 – GLWA MBO Transfer History reflects historical transfers for FY 2016 through FY 2022 to date.

Table 1 – GLWA FY 2022 Water MBO Transfers

WATER							
	Operations & Maintenance	Pension Sub Account	Pension Obligation	WRAP	Budget Stabilization (For Benefit of DWSD)	Extraordinary Repair & Replacement (ER&R)	Total Water
FY 2022							
July 2021	$ 11,994,483	$504,000	$921,308	$198,050	-	-	$13,617,841
August 2021	11,994,483	504,000	921,308	198,050	-	-	13,617,841
September 2021	11,994,483	504,000	831,488	198,050	-	-	13,528,021
October 2021	11,994,483	504,000	921,308	198,050	-	-	13,617,841
November 2021	11,994,483	504,000	861,308	198,050	-	-	13,557,841
December 2021	11,994,483	504,000	891,308	198,050	-	-	13,587,841
January 2022	11,994,483	504,000	891,308	198,050	-	-	13,587,841
February 2022	11,994,483	504,000	891,308	198,050	-	-	13,587,841
Total FY 2022	$ 95,955,864	$4,032,000	$7,130,644	$1,584,400	$ -	$ -	$108,702,908

Table 2 – GLWA FY 2022 Sewer MBO Transfers

SEWER							
	Operations & Maintenance	Pension Sub Account	Pension Obligation	WRAP	Budget Stabilization (For Benefit of DWSD)	Extraordinary Repair & Replacement (ER&R)	Total Sewer
FY 2022							
July 2021	$ 15,108,317	$902,000	$1,223,950	$322,392	-	-	$17,556,659
August 2021	15,108,317	902,000	1,223,950	322,392	-	-	17,556,659
September 2021	15,108,317	902,000	1,223,950	322,392	-	-	17,556,659
October 2021	15,108,317	902,000	1,223,950	322,392	-	-	17,556,659
November 2021	15,108,317	902,000	1,223,950	322,392	-	-	17,556,659
December 2021	15,108,317	902,000	1,223,950	322,392	-	-	17,556,659
January 2022	15,108,317	902,000	1,223,950	322,392	-	-	17,556,659
February 2022	15,108,317	902,000	1,223,950	322,392	-	-	17,556,659
Total FY 2022	$120,866,536	$7,216,000	$9,791,600	$2,579,136	$ -	$ -	$140,453,272

Table 3 – GLWA MBO Transfer History

GLWA MBO Transfer History

WATER							
	Operations & Maintenance	Pension Sub Account	Pension Obligation	WRAP	Budget Stabilization (For Benefit of DWSD)	Extraordinary Repair & Replacement (ER&R)	Total Water
Total FY 2016	$71,052,000	$6,037,100	$10,297,200	$1,983,300	$2,326,900	$606,000	$92,302,500
Total FY 2017	111,879,600	6,037,200	10,297,200	2,077,200	360,000	-	130,651,200
Total FY 2018	121,562,604	6,048,000	10,695,696	2,159,400	-	-	140,465,700
Total FY 2019	121,562,604	6,048,000	10,695,696	2,061,000	-	-	140,367,300
Total FY 2020	126,840,204	6,048,000	10,695,683	1,980,804	-	-	145,564,691
Total FY 2021	134,127,300	6,048,000	10,695,700	2,324,200	-	-	153,195,200
Total FY 2022 (8 months)	95,955,864	4,032,000	7,130,644	1,584,400	-	-	108,702,908
Life to Date	$782,980,176	$40,298,300	$70,507,819	$14,170,304	$2,686,900	$606,000	$911,249,499

SEWER							
	Operations & Maintenance	Pension Sub Account	Pension Obligation	WRAP	Budget Stabilization (For Benefit of DWSD)	Extraordinary Repair & Replacement (ER&R)	Total Sewer
Total FY 2016	$100,865,600	$10,838,400	$14,025,800	$2,523,400	$5,591,700	$779,600	$134,624,500
Total FY 2017	175,858,800	10,838,400	14,026,800	2,654,400	2,654,400	-	206,032,800
Total FY 2018	191,079,396	10,824,000	14,687,496	2,760,804	-	-	219,351,696
Total FY 2019	191,079,396	10,824,000	14,687,496	2,870,992	-	-	219,461,884
Total FY 2020	181,925,800	10,824,000	14,687,517	2,887,300	-	-	210,324,617
Total FY 2021	182,296,000	10,824,000	14,687,500	3,764,300	-	-	211,571,800
Total FY 2022 (8 months)	120,866,536	7,216,000	9,791,600	2,579,136	-	-	140,453,272
Life to Date	$1,143,971,528	$72,188,800	$96,594,209	$20,040,332	$8,246,100	$779,600	$1,341,820,569

MBO Required and Lease Payment Transfers to DWSD

DWSD Transfers: The GLWA Treasury team completes the required MBO transfers on the first business day of each month. These transfers are completed in accordance with the GLWA and DWSD budgets as approved and adopted by the GLWA Board of Directors and DWSD Board of Water Commissioners annually. Transfers are coordinated with other areas of GLWA Financial Services in advance of the first business day of each month. GLWA Treasury sends confirmation of transfers made to DWSD Treasury.

Monthly transfers for O&M and O&M Pension are one-twelfth of the annual, budgeted amount. The annual lease payment, as stated in the Water & Sewer Lease Agreements, is $22,500,000 for Water and $27,500,000 for Sewer. The monthly lease transfer is one-twelfth of the amount as stated in the Lease agreements unless otherwise designated by DWSD. Per Section 3.5 of the Lease, the Lease payment may be used for (a) bond principal and interest for Local System Improvements, (b) bond principal and interest for the City's share of common-to-all System Improvements, and (c) Local System improvements.

> ***Table 4 – DWSD FY 2022 <u>Water</u> MBO Transfers*** reflects the required transfers for FY 2022 completed through February 1, 2022. MBO transfers for Water totaling $29.7 million have been transferred to accounts held by DWSD. For FY 2022, DWSD originally requested that $6,690,600 of the lease payment be utilized to offset a portion of debt service. Beginning with the October transfers, DWSD amended budget required an additional portion of the lease payment be directed to offset debt service. A calculation correction which will be made in April 2022 will result in a revised lease payment offset of $8,925,400 for FY 2022.
>
> ***Table 5 – DWSD FY 2022 <u>Sewer</u> MBO Transfers*** reflects the required transfers for FY 2022 completed through February 1, 2022. MBO transfers for Sewer totaling $62.0 million have been transferred to accounts held by DWSD. For FY 2022, DWSD has requested that $5,529,300 of the lease payment be utilized to offset a portion of debt service.
>
> ***Table 6 – DWSD <u>Water</u> MBO and Lease Payment Transfer History*** reflects historical transfers for FY 2016 through FY 2022 to date.
>
> ***Table 7 – DWSD <u>Sewer</u> MBO and Lease Payment Transfer History*** reflects historical transfers for FY 2016 through FY 2022 to date.

Table 4 – DWSD FY 2022 Water MBO Transfers

WATER	Operations & Maintenance	Pension	Lease Payment (I&E Fund)	Total Water
FY 2022				
July 2021	$2,887,383	$356,000	$1,317,450	$4,560,833
August 2021	2,887,383	356,000	1,317,450	4,560,833
September 2021	2,887,383	356,000	1,317,450	4,560,833
October 2021	2,369,650	356,000	479,983	3,205,633
November 2021	2,369,650	356,000	479,983	3,205,633
December 2021	2,369,650	356,000	479,983	3,205,633
January 2022	2,369,650	356,000	479,983	3,205,633
February 2022	2,369,650	356,000	479,983	3,205,633
Total FY 2022	$20,510,399	$2,848,000	$6,352,265	$29,710,664

Table 5 – DWSD FY 2022 Sewer MBO Transfers

SEWER	Operations & Maintenance	Pension	Lease Payment (I&E Fund)	Total Sewer
FY 2022				
July 2021	$5,769,417	$238,000	$2,291,667	$8,299,084
August 2021	5,769,417	238,000	2,291,667	8,299,084
September 2021	5,769,417	238,000	2,291,667	8,299,084
October 2021	4,888,083	238,000	2,291,667	7,417,750
November 2021	4,888,083	238,000	2,291,667	7,417,750
December 2021	4,888,083	238,000	2,291,667	7,417,750
January 2022	4,888,083	238,000	2,291,667	7,417,750
February 2022	4,888,083	238,000	2,291,667	7,417,750
Total FY 2022	$41,748,666	$1,904,000	$18,333,336	$61,986,002

Table 6 – DWSD Water MBO and Lease Payment Transfer History

Transfers to DWSD				
WATER				
	Operations & Maintenance	Operations & Maintenance Pension	Lease Payment (I&E Fund)	Total Water
FY 2016 *				
MBO/Lease Requirement	$26,185,600	$4,262,700	$22,500,000	$52,948,300
Offset to Debt Service	-	-	(2,326,900)	(2,326,900)
Net MBO Transfer	26,185,600	4,262,700	20,173,100	50,621,400
FY 2017				
MBO/Lease Requirement	33,596,400	4,262,400	22,500,000	60,358,800
Offset to Debt Service	-	-	-	-
Net MBO Transfer	33,596,400	4,262,400	22,500,000	60,358,800
FY 2018				
MBO/Lease Requirement	35,059,704	4,272,000	22,500,000	61,831,704
Offset to Debt Service	-	-	(1,875,000)	(1,875,000)
Net MBO Transfer	35,059,704	4,272,000	20,625,000	59,956,704
FY 2019				
MBO/Lease Requirement	35,484,300	4,272,000	22,500,000	62,256,300
Offset to Debt Service	-	-	(3,972,200)	(3,972,200)
Net MBO Transfer	35,484,300	4,272,000	18,527,800	58,284,100
FY 2020				
MBO/Lease Requirement	34,662,400	4,272,000	22,500,000	61,434,400
Offset to Debt Service	-	-	(3,548,000)	(3,548,000)
Net MBO Transfer	34,662,400	4,272,000	18,952,000	57,886,400
FY 2021				
MBO/Lease Requirement	35,833,900	4,272,000	22,500,000	62,605,900
Offset to Debt Service	-	-	(8,278,300)	(8,278,300)
Net MBO Transfer	35,833,900	4,272,000	14,221,700	54,327,600
FY 2022 (8 months)				
MBO/Lease Requirement	20,510,399	2,848,000	15,000,000	38,358,399
Offset to Debt Service	-	-	(8,647,735)	(8,647,735)
Net MBO Transfer	20,510,399	2,848,000	6,352,265	29,710,664
Life-to-Date				
MBO/Lease Requirement	221,332,703	28,461,100	150,000,000	399,793,803
Offsets	-	-	(28,648,135)	(28,648,135)
Total Water	**221,332,703**	**28,461,100**	**121,351,865**	**371,145,668**

Table 7 – DWSD Sewer MBO and Lease Payment Transfer History

SEWER				
	Operations & Maintenance	Operations & Maintenance Pension	Lease Payment (I&E Fund)	Total Sewer
FY 2016 *				
MBO/Lease Requirement	$19,774,300	$2,861,800	$27,500,000	$50,136,100
Offset to Debt Service	-	-	(19,991,500)	(19,991,500)
Total MBO Transfer	19,774,300	2,861,800	7,508,500	30,144,600
FY 2017				
MBO/Lease Requirement	41,535,600	2,862,000	27,500,000	71,897,600
Offset to Debt Service	-	-	-	-
Total MBO Transfer	41,535,600	2,862,000	27,500,000	71,897,600
FY 2018				
MBO/Lease Requirement	60,517,992	2,856,000	27,500,000	90,873,992
Offset to Debt Service	-	-	(9,166,664)	(9,166,664)
Total MBO Transfer	60,517,992	2,856,000	18,333,336	81,707,328
FY 2019				
MBO/Lease Requirement	56,767,920	2,856,000	27,500,000	87,123,920
Offset to Debt Service	-	-	(4,415,000)	(4,415,000)
Total MBO Transfer	56,767,920	2,856,000	23,085,000	82,708,920
FY 2020				
MBO/Lease Requirement	62,343,500	2,856,000	27,500,000	92,699,500
Offset to address shortfall	(7,100,000)	-	-	(7,100,000)
Offset to Debt Service	-	-	(5,032,700)	(5,032,700)
Total MBO Transfer	55,243,500	2,856,000	22,467,300	80,566,800
FY 2021				
MBO/Lease Requirement	69,915,700	2,856,000	27,500,000	100,271,700
Offset to Debt Service	-	-	(3,257,200)	(3,257,200)
Total MBO Transfer	69,915,700	2,856,000	24,242,800	97,014,500
FY 2022 (8 months)				
MBO/Lease Requirement	41,748,666	1,904,000	18,333,336	61,986,002
Offset to Debt Service	-	-	-	-
Total MBO Transfer	41,748,666	1,904,000	18,333,336	61,986,002
Life-to-Date				
MBO/Lease Requirement	352,603,678	19,051,800	183,333,336	554,988,814
Offsets	(7,100,000)	-	(41,863,064)	(48,963,064)
Total Sewer	**345,503,678**	**19,051,800**	**141,470,272**	**506,025,750**

* Note: FY 2016 lease transfer amounts shown do not incude prepayment on the lease amount for the 6 months period before bifurcation.

This report includes the following:

1. Monthly Cash Balances Compared to Investment Income
2. Cash Balance Detail

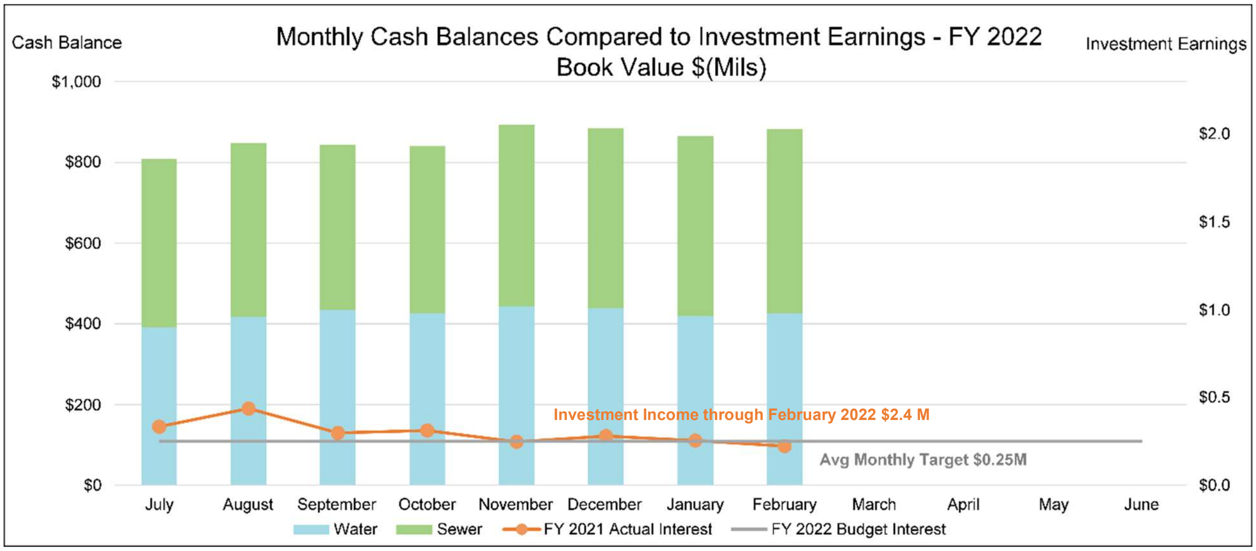
Monthly Cash Balances Compared to Investment Income

GLWA's investment holdings comply with the requirements of Public Act 20 of 1948, as amended and the GLWA Investment Policy. The cash balances shown in this report include bank deposits, money market funds, a local government investment pool, U.S. Treasuries, Federal Agencies, and commercial paper.

Cash and investment balances change each month based on Master Bond Ordinance (MBO) funding requirements, operational needs, capital spending pace, and mandatory debt payments. Investment income fluctuates monthly based on cash and investment balances as well as market conditions and investment strategy. For the month of February 2022, GLWA earned investment income of $0.2 million and the cumulative FY 2022 earnings through February 2022 is $2.4 million. Total investment income reported includes earnings from revenue requirement funds as well as construction bond funds.

GLWA continues to refine cash flows and work with its investment advisor to identify strategies to maximize future investment income while meeting the objectives of safety and liquidity.

Chart 1 – Monthly Cash Balances Compared to Investment Income – Through February 2022



$(Mils)	July	August	September	October	November	December	January	February	March	April	May	June
Water	$391	$416	$433	$426	$443	$439	$418	$425	-	-	-	-
Sewer	$417	$432	$410	$414	$450	$445	$446	$458	-	-	-	-
Total	$808	$848	$844	$840	$893	$884	$864	$883	-	-	-	-
Investment Income	$0.3	$0.4	$0.3	$0.3	$0.2	$0.3	$0.3	$0.2	-	-	-	-

Cash Balance Detail

Funds Held By GLWA: GLWA cash balances are held in accounts as defined by the Master Bond Ordinance. The accounts are funded by monthly transfers, as stipulated in the MBO, on the first business day of each month. The "operations and maintenance" (O&M) fund transfer amounts are based upon the annual O&M budget approved by the GLWA Board of Directors for the regional systems and by the Board of Water Commissioners for the Detroit Water & Sewerage Department (DWSD) local system budgets. The water and sewer funds held by GLWA and their purpose, as defined by the MBO, are listed below.

Funds Held Within Trust:

- Receiving – all retail and wholesale revenues collected which are distributed in subsequent month(s)
- Debt Service – funds set aside for debt service and debt reserve requirements
- Pension Obligation – funds set aside to meet GLWA's annual funding requirements for the legacy General Retirement System Pension Plan
- Water Residential Assistance Program (WRAP) – funds set aside to be used to provide financial assistance to qualified residents throughout the local and regional water system as directed by program guidelines
- Budget Stabilization – funds held by GLWA on behalf of DWSD that can be applied against shortfalls in retail revenues
- Emergency Repair & Replacement (ER&R) – funds set aside to pay the costs for major unanticipated repairs and replacements of the local and regional systems
- Improvement & Extension (I&E) – funds set aside to be used for the improvements, enlargements, and extensions of the regional system

Funds Held Outside Trust:

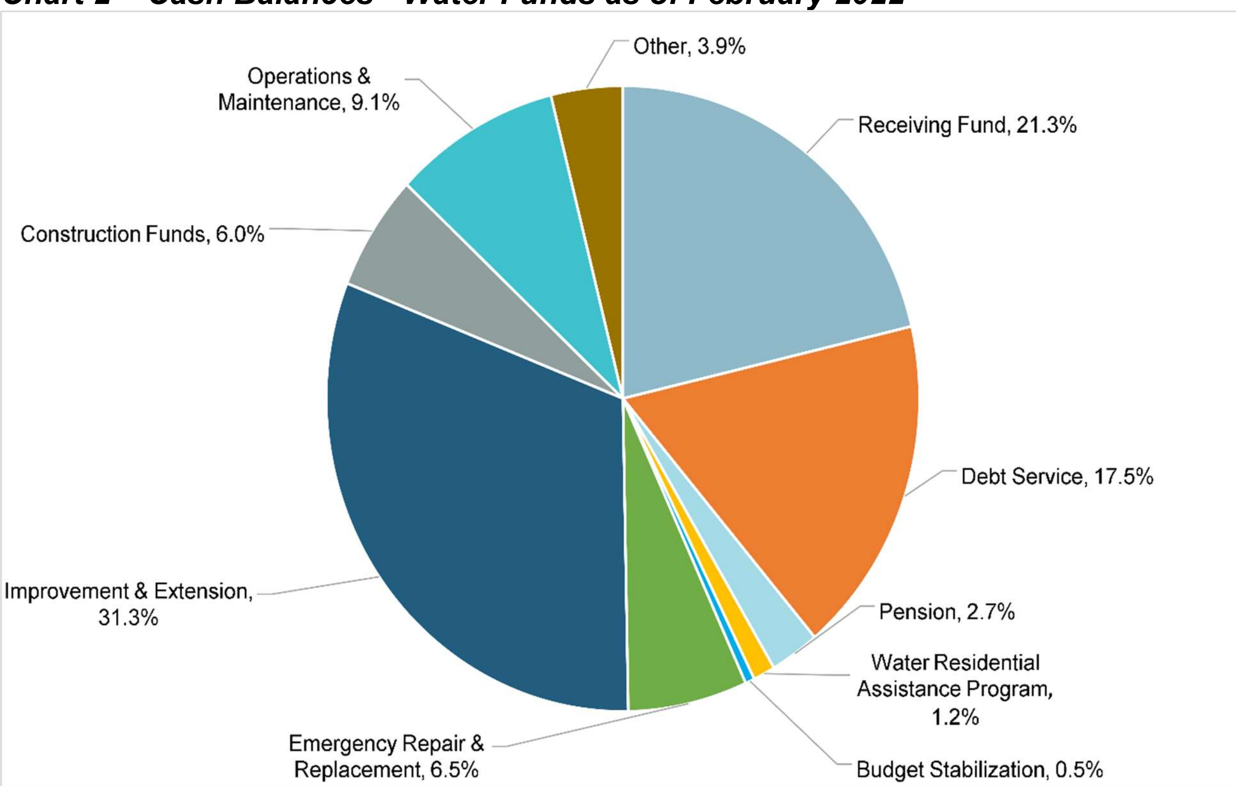
- Bond Proceeds – funds raised from debt issuance used for costs of repairs, construction, and improvements of the regional system
- Operations & Maintenance (O&M) – funds used to meet the operational and maintenance requirements of the regional system
- Other – retainage funds held on behalf of contractors and security deposit funds held on behalf of the City of Flint

A chart depicting the follow of funds is online at glwater.org as well as the MBO documents.

Chart 2 – Cash Balances - Water Funds as of February 2022 - Shows the allocation of the balance among the different categories defined in the section above. The total cash balance for Water Funds as of February 28, 2022 is $425 million. The allocation of balances among the I&E, bond proceeds, and debt service reserve funds reflects GLWA's commitment to funding capital improvements and meeting debt reserve requirements while simultaneously increasing I&E resources to fund pay-as-you-go capital funding to reduce long-term debt in the future.

It should be noted existing proceeds from revenue bonds are depleted. This means that all capital projects will now be funded with Improvement & Extension (I&E) funds, except for SRF funded projects. It is expected that the I&E funds supplemented with SRF low-interest loan funding will be sufficient to fund the capital program through FY 2022 including an allowance to provide flexibility in the timing of future bond issues.

Chart 2 – Cash Balances - Water Funds as of February 2022

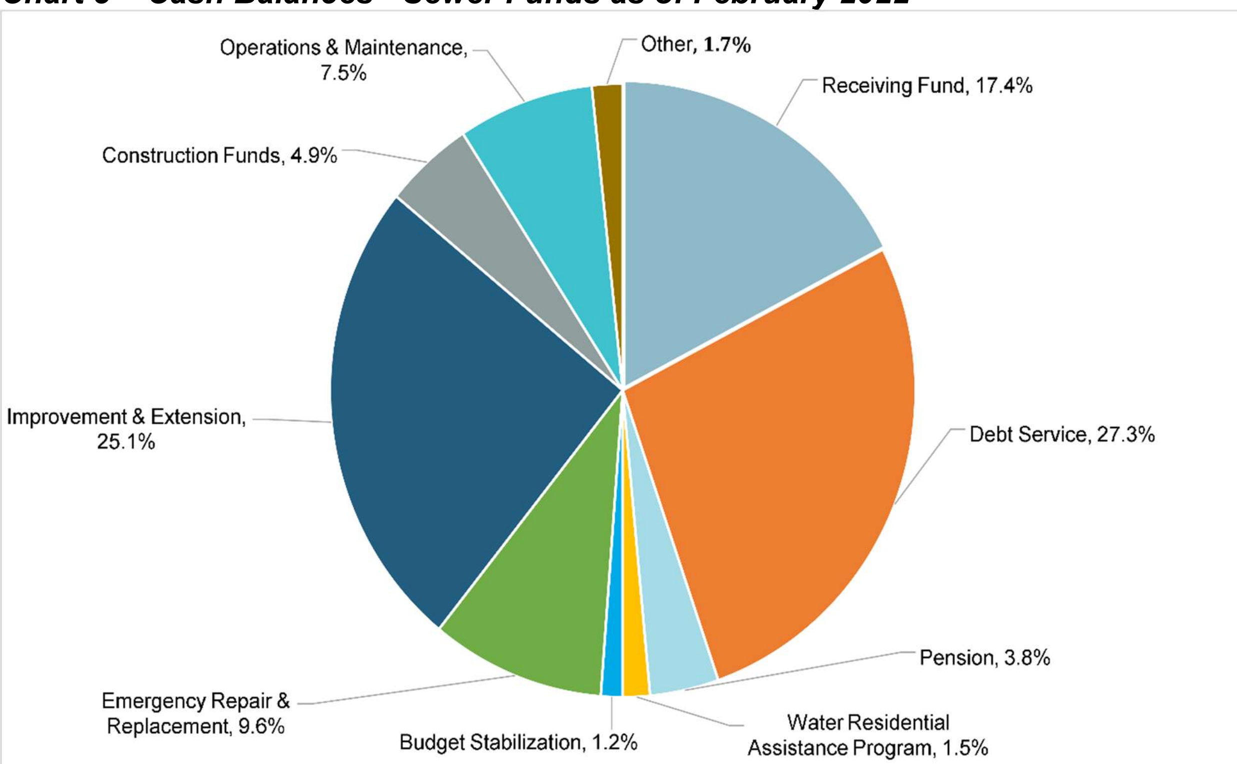


Note: *Due to rounding totals may not equal 100%.*

Chart 3 – Cash Balances - Sewer Funds as of February 2022 - Shows the allocation of the balance among the different funds defined in the section above. The total cash balance for Sewer Funds as of February 28, 2022 is $458 million. Like the Water Funds, the allocation of balances among the I&E, bond proceeds, and debt service reserve funds reflects GLWA's commitment to funding capital improvements and meeting debt reserve requirements while simultaneously increasing I&E resources to fund pay-as-you-go capital funding to reduce long-term debt in the future.

It should be noted existing proceeds from revenue bonds are depleted. This means that all capital projects will now be funded with Improvement & Extension (I&E) funds, except for SRF funded projects. It is expected that the I&E funds supplemented with SRF low-interest loan funding will be sufficient to fund the capital program through FY 2022 including an allowance to provide flexibility in the timing of future bond issues.

Chart 3 – Cash Balances - Sewer Funds as of February 2022



Note: *Due to rounding totals may not equal 100%.*

Retail Revenues, Receivables, and Collections: Pursuant to the terms of the lease agreement between the City of Detroit and the Great Lakes Water Authority (GLWA), the Detroit Water & Sewerage Department (DWSD) serves as GLWA's agent for billing activities for the City of Detroit retail customer class. All water and sewer service collections from DWSD customers are deposited in a trust account and are administered in accordance with the GLWA Master Bond Ordinance.

The Monthly Retail Revenues, Receivables, & Collections Report includes the following.

1. DWSD Retail Water Revenue Billings and Collections
2. DWSD Retail Sewer Revenue Billings and Collections
3. DWSD Retail Water & Sewer System Accounts Receivable Aging Report

Note: *Wholesale customer revenues are billed by the Great Lakes Water Authority.*

DWSD Retail Water Billings and Collections

Retail Billing Basis: DWSD bills retail customers monthly. Customers are billed throughout the month in cycles based on a meter reading schedule beginning with residential accounts and ending with commercial and industrial customers.

> ***Table 1 - DWSD Retail Billings*** shows the FY 2022 water usage and billed revenue which are provided by DWSD staff. As of February 28, 2022, the DWSD usage was at 109.23% of the budget and billed revenue was at 100.42% of budget.

DWSD Retail Water Collections: The collections represent payments made by DWSD retail customers. These receipts are deposited directly into a lockbox with a trustee for administration of the flow of funds defined by GLWA's Master Bond Ordinance.

> ***Table 2 - Retail Water Collections*** shows collections by month for the past 12 months compared to collections for the prior year as well as the calculated difference between the periods.

Table 1 – DWSD Retail Water Billing

RETAIL WATER CUSTOMERS	FY 2022 - Original Budget		FY 2022 - Actual		FY 2022 - Variance		FY 2021 - Actuals	
Month (1)	Volume Mcf	Revenue $	Volume Mcf	Revenue (2) $	Volume Mcf	Revenue $	Volume Mcf	Revenue $
July	245,000	9,963,800	266,704	10,064,683	21,704	100,883	265,796	9,747,518
August	235,000	9,697,500	264,644	9,994,589	29,644	297,089	250,308	9,378,385
September	210,000	9,032,500	232,348	9,169,300	22,348	136,800	218,840	8,544,457
October	195,000	8,633,500	204,290	8,422,092	9,290	(211,408)	197,362	7,978,833
November	195,000	8,633,500	209,830	8,544,611	14,830	(88,889)	194,648	7,952,436
December	195,000	8,633,500	204,072	8,442,152	9,072	(191,348)	197,125	7,985,955
January	190,000	8,500,500	221,369	8,819,430	31,369	318,930	190,289	7,827,536
February	190,000	8,500,500	204,489	8,438,300	14,489	(62,200)	191,180	7,895,496
March	200,080	8,768,700					205,631	8,242,563
April	210,000	9,032,500					214,288	8,438,333
May	210,000	9,032,500					214,232	8,519,154
June	240,000	9,830,500					243,301	9,249,694
Total	2,515,080	108,259,500	1,807,746	71,895,157	152,746	299,857	2,583,000	101,760,360
Subtotals ytd	*1,655,000*	*71,595,300*	*1,807,746*	*71,895,157*	*152,746*	*299,857*		
Achievement of Budget			*109.23%*	*100.42%*				

(1) Figures are stated as "Service Months"; that is, July figures represent bills issued in August, etc.

(2) Retail Revenues include Miscellaneous Revenues and Penalties

Table 2 – DWSD Retail Water Collections

Water				
Month	**Current Year**	**Prior Year**	**Variance**	**Ratio**
March	8,458,827	6,948,308	1,510,519	21.74%
April	7,536,272	5,956,105	1,580,167	26.53%
May	7,365,204	8,109,469	(744,265)	-9.18%
June	8,917,831	7,821,791	1,096,040	14.01%
July	8,387,705	8,017,490	370,215	4.62%
August	8,588,507	7,135,456	1,453,051	20.36%
September	8,041,683	9,031,966	(990,283)	-10.96%
October	8,512,614	9,079,199	(566,585)	-6.24%
November	7,926,331	10,803,009	(2,876,678)	-26.63%
December	8,121,586	7,409,888	711,698	9.60%
January	6,919,040	7,884,889	(965,849)	-12.25%
February	10,156,126	6,426,553	3,729,573	58.03%
Rolling, 12-Month Total	98,931,726	94,624,123		
Rolling, 12-Month Average	8,244,311	7,885,344		

DWSD Retail Sewer Billings and Collections

Retail billing basis: DWSD bills retail customers monthly. Customers are billed throughout the month in cycles based on a meter reading schedule beginning with residential accounts and ending with commercial and industrial customers.

> ***Table 3 - DWSD Retail Sewer Billings*** shows the FY 2022 sewer billed revenue which are provided by DWSD staff. As of February 28, 2022, the DWSD usage was at 104.65% of the budget and billed revenue was at 100.14% of budget.

DWSD Retail Sewer Collections: The collections represent payments made by DWSD retail customers. These receipts are deposited directly into a lockbox with a trustee for administration of the flow of funds defined by GLWA's Master Bond Ordinance.

> ***Table 4 – DWSD Retail Sewer Collections*** shows collections by month for the past 12 months compared to collections for the prior year as well as the calculated difference between the periods.

Table 3 - DWSD Retail Sewer Billings

RETAIL SEWER CUSTOMERS								
	FY 2022 - Original Budget		FY 2022 - Actual		FY 2022 - Variance		FY 2021 - Actuals	
Month (1)	Volume	Revenue	Volume	Revenue (2)	Volume	Revenue	Volume	Revenue
	Mcf	$	Mcf	$	Mcf	$	Mcf	$
July	233,100	30,779,300	219,791	29,462,804	(13,309)	(1,316,496)	252,929	29,802,377
August	225,700	30,357,000	249,522	31,231,624	23,822	874,624	240,390	29,261,344
September	198,500	28,805,000	215,748	29,401,234	17,248	596,234	206,880	27,232,400
October	186,000	28,091,700	190,483	27,936,280	4,483	(155,420)	188,816	26,230,683
November	186,000	28,091,700	194,135	28,032,939	8,135	(58,761)	184,240	25,933,888
December	186,000	28,091,700	189,283	27,836,982	3,283	(254,718)	187,397	26,628,891
January	178,700	27,675,200	203,526	28,493,782	24,826	818,582	179,115	26,098,738
February	184,600	28,011,800	189,525	27,837,984	4,925	(173,816)	185,696	26,370,674
March	192,030	28,435,800					197,486	27,090,940
April	199,600	28,867,800					203,684	27,447,662
May	200,100	28,896,300					204,107	27,765,537
June	228,500	30,516,800					231,627	29,058,129
Total	2,398,830	346,620,100	1,652,013	230,233,629	73,413	330,229	2,462,367	328,921,263
Subtotals ytd	*1,578,600*	*229,903,400*	*1,652,013*	*230,233,629*		*330,229*		
Achievement of Budget/Goal			*104.65%*	*100.14%*				

(1) Figures are stated as "Service Months"; that is, July figures represent bills issued in August, etc.
(2) Retail Revenues include Miscellaneous Revenues and Penalties

Table 4 – DWSD Retail Sewer Collections

Sewer				
Month	**Current Year**	**Prior Year**	**Variance**	**Ratio**
March	25,002,508	19,325,377	5,677,131	29.38%
April	21,196,170	17,105,146	4,091,024	23.92%
May	21,888,687	23,639,652	(1,750,965)	-7.41%
June	32,508,249	22,558,827	9,949,422	44.10%
July	24,185,252	20,652,159	3,533,093	17.11%
August	25,036,198	22,395,220	2,640,978	11.79%
September	22,635,796	26,463,387	(3,827,591)	-14.46%
October	25,119,240	26,683,109	(1,563,869)	-5.86%
November	23,505,249	28,730,139	(5,224,890)	-18.19%
December	24,880,743	22,856,217	2,024,526	8.86%
January	23,020,491	22,057,276	963,215	4.37%
February	24,495,922	22,777,467	1,718,455	7.54%
Rolling 12-Month Total	293,474,505	275,243,976		
Rolling, 12-Month Average	24,456,209	22,936,998		

DWSD Retail Water and Sewer Accounts Receivable Aging Report

The DWSD detailed accounts receivable aging is categorized by customer category.

Table 5 is a summary of the monthly sales, total receivables, bad debt allowance and net Water and Sewer receivables as of February 28, 2022 with comparative totals from June 30, 2021 and June 30, 2020. This table does not include past due accounts that have been transferred to the City of Detroit for collection as tax liens.

The table provides a comparison of days in accounts receivable calculated as net receivables divided by daily sales and confirms that over time days in AR is declining due in large part to a consistent practice of recognizing past due amounts over 60 days as bad debt expense. To the extent this allowance is adjusted, and bad debt expense is recognized in the DWSD budget, it does not impact GLWA.

Table 6 is a summary of the total, current and non-current Water and Sewer receivables by category as of February 28, 2022 with comparative totals from February 28, 2021. This table does not include past due accounts that have been transferred to the City of Detroit for collection as tax liens.

The Total Balance and Total Bad Debt Allowance as of February 28, 2022 are reflective of the values in both the Table 5 Summary and Table 6 breakdown.

Table 5 – DWSD Retail Accounts Receivable Aging Report – Summary

Summary					
	Monthly	Receivables			
Period Ending	Sales	Total	Allowance	Net	Days in AR (1)
June 30, 2020	$ 33,061,000	$ 213,846,000	$ (142,882,000)	$ 70,964,000	64
June 30, 2021	$ 36,335,000	$ 248,055,000	$ (200,146,000)	$ 47,909,000	40
February 28, 2022	$ 37,401,000	$ 280,560,000	$ (232,111,000)	$ 48,449,000	39

Totals may be off due to rounding

(1) Days in AR is calculated as net receivables divided by daily sales (monthly sales/30 days)

Table 6 – DWSD Retail Accounts Receivable Aging Report – Water & Sewer Combined

Sales Class	# of Accounts	Avg. Balance	Current	> 30 Days	> 60 Days	> 180 Days	Balance
Residential	209,783	$ 707.20	$ 15,280,000	$ 7,872,000	$ 25,319,000	$ 99,886,000	$ 148,358,000
			10.3%	*5.3%*	*17.1%*	*67.3%*	*100.0%*
Commercial	21,173	1,490.30	9,427,000	3,049,000	7,170,000	11,908,000	31,554,000
			29.9%	*9.7%*	*22.7%*	*37.7%*	*100.0%*
Industrial	3,476	4,455.01	4,902,000	1,620,000	2,270,000	6,694,000	15,486,000
			31.7%	*10.5%*	*14.7%*	*43.2%*	*100.0%*
Tax Exempt	3,658	767.22	544,000	184,000	572,000	1,507,000	2,806,000
			19.4%	*6.6%*	*20.4%*	*53.7%*	*100.0%*
Government	55,776	353.93	1,953,000	1,491,000	2,993,000	13,304,000	19,741,000
			9.9%	*7.6%*	*15.2%*	*67.4%*	*100.0%*
Drainage	40,914	728.17	2,778,000	1,542,000	5,003,000	20,469,000	29,792,000
			9.3%	*5.2%*	*16.8%*	*68.7%*	*100.0%*
Subtotal - Active Accounts	**334,780**	**$ 740.00**	**$ 34,883,000**	**$ 15,759,000**	**$ 43,327,000**	**$ 153,769,000**	**$ 247,738,000**
			14.1%	*6.4%*	*17.5%*	*62.1%*	*100.0%*
Inactive Accounts	309,024	106.21	(28,000)	35,000	64,000	32,751,000	32,822,000
			(0.1%)	*0.1%*	*0.2%*	*99.8%*	*100.0%*
Total	**643,804**	**$ 435.78**	**$ 34,856,000**	**$ 15,794,000**	**$ 43,390,000**	**$ 186,520,000**	**$ 280,560,000**
% of Total A/R			*12.4%*	*5.6%*	*15.5%*	*66.5%*	*100.0%*
Water Fund	240,223	226.51	$ 7,274,000	$ 3,324,000	$ 8,656,000	$ 35,158,000	$ 54,412,000
Sewer Fund	280,636	805.84	$ 27,582,000	$ 12,470,000	$ 34,734,000	$ 151,361,000	$ 226,148,000
Total February 28, 2022 (a)	**643,804**	**435.78**	**$ 34,856,000**	**$ 15,794,000**	**$ 43,390,000**	**$ 186,520,000**	**$ 280,560,000**
Water Fund- Allowance							$ (43,368,000)
Sewer Fund- Allowance							$ (188,743,000)
Total Bad Debt Allowance							**$ (232,111,000)**
Comparative - February 2021 (b)	**627,165**	**373.92**	**$ 28,103,000**	**$ 14,935,000**	**$ 40,131,000**	**$ 151,341,000**	**$ 234,509,000**
Difference (a) - (b)	**16,639**	**61.86**	**$ 6,753,000**	**$ 859,000**	**$ 3,260,000**	**$ 35,179,000**	**$ 46,050,000**

The Monthly Wholesale Billings, Receivables, & Collections Report includes the following.

1. Wholesale Water Billings and Collections
2. Wholesale Sewer Billings and Collections
3. City of Highland Park Billings and Collections
4. Wholesale Water & Sewer Accounts Receivable Aging Report

Wholesale Water Billings and Collections

Wholesale Water Contracts: Great Lakes Water Authority (GLWA) provides wholesale water service to 87 member-partners through a variety of service arrangements.

Service Arrangement Type

Model Contract	83
Emergency	1
Older Contracts	3
Total	87

Note: *Services are provided to the Detroit Water & Sewerage Department (DWSD) via a Water and Sewer Services Agreement (WSSA). See the "Retail Revenues, Receivables, and Collections Report" section of this monthly report.*

Wholesale Water Billing Basis: Beginning with FY 2016, wholesale water charges were restructured to create a more stable revenue stream by using a historical rolling average to project customer volumes which accounts for 40% of the monthly charges and 60% of the annual customer revenue requirement as a monthly fixed charge.

Table 1 - Wholesale Water Billings shows the FY 2022 water billed usage and revenues. As of February 28, 2022, the billed usage was at 94.85% of the original plan and billed revenue at 97.85% of the original plan. Billings and usage from the City of Flint *are* included as they were assumed in the FY 2022 Budget.

This table also reflects the positive impact of approved FY 2022 budget amendments and known billing adjustments on the original plan.

Wholesale Water Collections: The collections represent payments made by wholesale customers. These receipts are deposited directly into a lockbox with a trustee for administration of the flow of funds defined by GLWA's Master Bond Ordinance.

Table 2 - Wholesale Water Collections shows collections by month for the past 12 months compared to collections for the prior year as well as the calculated difference between the periods. Current year collections are trending slightly above prior year for the twelve month period ending February 28, 2022.

Table 1 – FY 2022 Wholesale Water Billings Report

WHOLESALE WATER CHARGES

	FY 2022 Charges (3)		FY 2022 - Actual		FY 2022 - Variance		FY 2021 - Actuals	
Month (1)	Volume	Revenue	Volume	Revenue (2)	Volume	Revenue	Volume	Revenue
	Mcf	$	Mcf	$	Mcf	$	Mcf	$
July	1,677,100	33,302,700	1,342,686	29,642,785	(334,414)	(3,659,915)	1,862,791	33,583,619
August	1,509,200	31,598,500	1,417,142	30,604,230	(92,058)	(994,270)	1,622,324	31,230,027
September	1,316,400	29,141,000	1,298,750	29,065,588	(17,650)	(75,412)	1,313,440	27,836,560
October	1,034,000	26,280,800	1,006,217	26,123,483	(27,783)	(157,317)	1,070,660	25,454,840
November	896,800	25,001,500	905,525	25,117,181	8,725	115,681	956,542	24,390,303
December	972,100	25,612,000	958,879	25,542,432	(13,221)	(69,568)	981,770	24,600,202
January	972,000	25,650,600	979,803	25,791,405	7,803	140,805	969,483	25,235,130
February	884,400	24,852,700	875,553	24,800,493	(8,847)	(52,207)	920,467	24,794,259
March	979,500	25,678,200					1,001,073	25,450,418
April	914,000	25,117,700					954,308	25,140,003
May	1,059,200	26,721,900					1,181,186	27,569,969
June	1,374,300	30,029,900					1,424,230	30,066,884
Total	13,589,000	328,987,500	8,784,555	216,687,596	(477,445)	(4,752,204)	14,258,274	325,352,214
Subtotals ytd	*9,262,000*	*221,439,800*	*8,784,555*	*216,687,596*	*(477,445)*	*(4,752,204)*		
Achievement of Original Plan			*94.85%*	*97.85%*				
1st Quarter Budget Amendments	*(220,000)*	*(2,400,000)*			220,000	2,400,000		
Billing Adjustments			*65,470*	*544,190*	*65,470*	*544,190*		
Revised Subtotal	*9,042,000*	*219,039,800*	*8,850,025*	*217,231,786*	*(191,975)*	*(1,808,014)*		
Achievement of Amended Plan			*97.88%*	*99.17%*				

(1) Figures are stated as "Service Months"; that is, July figures represent bills issued in August, etc.

(2) Water Revenues differ from Table 1A because amounts are reduced by the monthly payment to the City of Flint for a license to raw water rights under the Flint Raw Water Contract in Table 1A

(3) Charges are based on the approved FY 2022 water supply system charge schedule.

Table 2 - Wholesale Water Collections

Water				
Month	**Current Year**	**Prior Year**	**Variance**	**Ratio**
March	20,854,506	25,017,989	(4,163,483)	-16.64%
April	23,545,123	17,856,644	5,688,479	31.86%
May	24,878,479	24,811,582	66,897	0.27%
June	25,403,968	27,098,783	(1,694,815)	-6.25%
July	23,709,847	25,080,575	(1,370,728)	-5.47%
August	31,668,492	26,241,018	5,427,474	20.68%
September	23,849,618	26,078,015	(2,228,397)	-8.55%
October	29,212,277	29,292,690	(80,413)	-0.27%
November	25,265,770	32,218,822	(6,953,052)	-21.58%
December	25,302,369	29,609,061	(4,306,692)	-14.55%
January	31,280,599	20,716,948	10,563,651	50.99%
February	24,919,847	25,694,176	(774,329)	-3.01%
Rolling 12-Month Total	309,890,895	309,716,303		
Rolling, 12-Month Average	25,824,241	25,809,692		

Wholesale Sewer Billings and Collections

Wholesale Sewer Contracts: GLWA provides wholesale sewer service to 18 member-partners via multiple service arrangements.

Service Arrangement Type

Model Contract	11
Emergency	0
Older Contracts	7
Total	18

Note: *Services are provided to the Detroit Water & Sewerage Department via a Water and Sewer Services Agreement (WSSA). See the "Retail Revenues, Receivables, and Collections Report" section of the monthly report.*

Wholesale Sewer Billing Basis: Beginning in FY 2015, the "sewer rate simplification" initiative was applied which provides for a stable revenue stream and predictability for our member partners. Wholesale sewer customers are billed a fixed monthly fee based upon the annual revenue requirement.

Table 3 - Wholesale Sewer Billings shows the FY 2022 sewer billed revenue. As of February 28, 2022 the billed revenue is at 100.00% of the original plan.

Wholesale Sewer Collections: The collections represent payments made by wholesale customers. These receipts are deposited directly into a lockbox with a trustee for administration of the flow of funds defined by GLWA's Master Bond Ordinance.

Table 4 - Wholesale Sewer Collections shows collections by month for the past 12 months compared to collections for the prior year as well as the calculated difference between the periods. The year-over-year rolling average from FY 2021 to FY 2022 shows continued improvement through February 28.

The shift in wholesale sewer collection patterns is largely attributable to the timing of payments received. There are several large accounts whose payments swing between the end of the current month and the beginning of the next month.

Table 3 – FY 2022 Wholesale Sewer Billings Report

WHOLESALE SEWER CHARGES								
	FY 2022 Charges		FY 2022 - Actual		FY 2022 - Variance		FY 2021 - Actuals	
Month (1)	Volume (2)	Revenue	Volume (2)	Revenue	Volume (2)	Revenue	Volume	Revenue
	Mcf	*$*	*Mcf*	*$*	*Mcf*	*$*	*Mcf*	*$*
July	N/A	22,615,000	N/A	22,615,000	N/A	-	N/A	22,323,183
August	N/A	22,615,000	N/A	22,615,000	N/A	-	N/A	22,323,183
September	N/A	22,615,000	N/A	22,615,000	N/A	-	N/A	22,323,183
October	N/A	22,615,000	N/A	22,615,000	N/A	-	N/A	22,323,183
November	N/A	22,615,000	N/A	22,615,000	N/A	-	N/A	22,323,183
December	N/A	22,615,000	N/A	22,615,000	N/A	-	N/A	22,323,183
January	N/A	22,615,000	N/A	22,615,000	N/A	-	N/A	22,633,025
February	N/A	22,615,000	N/A	22,615,000	N/A	-	N/A	22,633,025
March	N/A	22,615,000	N/A		N/A		N/A	22,633,025
April	N/A	22,615,000	N/A		N/A		N/A	22,633,025
May	N/A	22,615,000	N/A		N/A		N/A	22,633,025
June	N/A	22,615,000	N/A		N/A		N/A	22,633,025
Total		271,380,000		180,920,000		-		269,737,248
Subtotals ytd		*180,920,000*		*180,920,000*		-		
Achievement of Budget				*100.00%*				

(1) Figures are stated as "Service Months"; that is, July figures represent bills issued in August, etc.
(2) Not tracked as part of the wholesale sewer charges.

Table 4 - Wholesale Sewer Collections

Sewer				
Month	**Current Year**	**Prior Year**	**Variance**	**Ratio**
March	22,368,124	21,108,100	1,260,024	5.97%
April	28,128,933	10,024,575	18,104,358	180.60%
May	15,972,800	21,189,047	(5,216,247)	-24.62%
June	28,523,650	28,598,467	(74,817)	-0.26%
July	21,842,125	22,297,737	(455,612)	-2.04%
August	22,191,725	25,354,280	(3,162,555)	-12.47%
September	26,706,558	19,593,613	7,112,945	36.30%
October	22,176,058	16,853,983	5,322,075	31.58%
November	16,534,758	18,966,208	(2,431,450)	-12.82%
December	21,765,958	25,232,649	(3,466,691)	-13.74%
January	26,436,258	25,968,849	467,409	1.80%
February	23,937,258	16,872,900	7,064,358	41.87%
Rolling 12-Month Total	276,584,205	252,060,408		
Rolling, 12-Month Average	23,048,684	21,005,034		

City of Highland Park Billings and Collections

The City of Highland Park is provided water service pursuant to an emergency service basis. Sewer service is provided pursuant to a 1982 amended contract which indicates that the parties are guided in their legal relationship by a Michigan Supreme Court decision from 1949.

As of February 28, 2022, Highland Park had a delinquent balance of $53.0 million, including $40.6 million for wastewater treatment services, $1.8 million for industrial waste control services, and $10.5 million for water supply services.

Table 5 - City of Highland Park Billings and Collections provides a life-to-date balance summary of the billing and collection history for Highland Park with detail provided for fiscal year 2022 through February 28, 2022. Please note the numbers below reflect the month the billing was sent and not the month the service was provided. A life-to-date summary is provided as an appendix to this monthly financial report.

Table 5 - City of Highland Park Billings and Collections

	Water	Sewer	IWC	Total
March 31, 2021 Balance	9,428,064	35,818,458	1,757,594	47,004,116
April 2021 Billing	96,950	478,900	4,051	579,901
April 2021 Payments	-	(224,583)	-	(224,583)
April 30, 2021 Balance	9,525,014	36,072,775	1,761,645	47,359,434
May 2021 Billing	94,839	478,900	4,065	577,804
May 2021 Payments	-	-	-	-
May 31, 2021 Balance	9,619,853	36,551,675	1,765,710	47,937,238
June 2021 Billing	99,337	478,900	4,053	582,290
June 2021 Payments	-	-	-	-
June 30, 2021 Balance	9,719,190	37,030,575	1,769,763	48,519,528
July 2021 Billing	102,730	478,900	3,972	585,602
July 2021 Payments	-	-	-	-
July 31, 2021 Balance	9,821,920	37,509,475	1,773,735	49,105,130
August 2021 Billing	109,067	446,400	4,067	559,534
August 2021 Payments	-	-	-	-
August 31, 2021 Balance	9,930,987	37,955,875	1,777,802	49,664,664
September 2021 Billing	110,440	446,400	4,062	560,902
September 2021 Payments	-	-	-	-
September 30, 2021 Balance	10,041,427	38,402,275	1,781,864	50,225,566
October 2021 Billing	109,853	446,400	4,053	560,306
October 2021 Payments	-	-	-	-
October 31, 2021 Balance	10,151,280	38,848,675	1,785,917	50,785,872
November 2021 Billing	103,417	446,400	4,069	553,886
November 2021 Payments	-	-	-	-
November 30, 2021 Balance	10,254,697	39,295,075	1,789,986	51,339,758
December 2021 Billing	100,908	446,400	4,075	551,383
December 2021 Payments	-	-	-	-
December 31, 2021 Balance	10,355,605	39,741,475	1,794,061	51,891,141
January 2022 Billing	96,633	446,400	4,002	547,035
January 2022 Payments	-	-	-	-
January 31, 2022 Balance	10,452,238	40,187,875	1,798,063	52,438,176
February 2022 Billing	97,203	446,400	4,002	547,605
February 2022 Payments	-	-	-	-
February 28, 2022 Balance	10,549,441	40,634,275	1,802,065	52,985,781

Wholesale Water & Sewer Accounts Receivable Aging Report

The detailed accounts receivable aging is in the Appendix to this monthly report. This report reflects the wholesale receivables only and does not include DWSD.

Table 6** - **Wholesale Accounts Receivable Aging Report Summary is a summary of the total, current and non-current receivables by category as of February 28, 2022.

Table 7 - Wholesale Accounts Receivable Aging Report, Net of Highland Park is the same summary *without* the past due balances for the City of Highland Park. One member partner contract dispute accounts for $4.56 million of the current water past due balance. The remaining water past due accounts were paid in early March.

Pollutant surcharge past dues generally consist of smaller account holders that GLWA staff continue to communicate with. The pollutant surcharge balance over 105 days is related to a bankruptcy that is currently pending further court action.

Table 6 - Wholesale Accounts Receivable Aging Report Summary

	Total	Current	46-74 Days	75-104 Days	>105 Days
Water	$ 51,267,637.89	$ 35,434,772.28	$ 1,744,582.79	$ 1,058,179.06	$ 13,030,103.76
Sewer	$ 55,963,621.09	$ 15,775,745.93	$ 446,400.00	$ 446,400.00	$ 39,295,075.16
IWC	$ 2,354,972.73	$ 558,170.91	$ 6,815.17	$ 4,069.23	$ 1,785,917.42
Pollutant Surcharge	$ 518,942.80	$ 480,361.00	$ 9,768.66	$ 439.60	$ 28,373.54
Total	$ 110,105,174.51	$ 52,249,050.12	$ 2,207,566.62	$ 1,509,087.89	$ 54,139,469.88
	100.00%	47.45%	2.00%	1.37%	49.17%

Table 7 - Wholesale Accounts Receivable Aging Report, Net of Highland Park

	Total	Current	46-74 Days	75-104 Days	>105 Days
Water	$ 40,718,197.35	$ 35,240,936.31	$ 1,643,674.98	$ 954,762.15	$ 2,878,823.91
Sewer	$ 15,329,345.93	$ 15,329,345.93	$ -	$ -	$ -
IWC	$ 552,907.60	$ 550,166.97	$ 2,740.63	$ -	$ -
Pollutant Surcharge	$ 518,942.80	$ 480,361.00	$ 9,768.66	$ 439.60	$ 28,373.54
Total	$ 57,119,393.68	$ 51,600,810.21	$ 1,656,184.27	$ 955,201.75	$ 2,907,197.45
	100.00%	90.34%	2.90%	1.67%	5.09%

Note: *percentages vary from 100% due to rounding.*

The Monthly Trust Receipts & Disbursements Report includes the following.

1. GLWA Trust Receipts & Disbursements – Net Cash Flows and Receipts
2. DWSD Trust Receipts & Disbursements – Net Cash Flows, Receipts & Loan Receivable
3. Combined System Trust Receipts & Disbursements – Net Cash Flows

GLWA Trust Receipts & Disbursements

Net Cash Flows and Receipts Basis: The trusts established pursuant to the Master Bond Ordinance (MBO) outline a flow of funds that governs the priority of the application of cash receipts from both the regional wholesale (i.e., Great Lakes Water Authority or GLWA) and local retail (i.e., Detroit Water & Sewerage Department or DWSD) activities which are further separated by the water system and the sewage disposal system.

This report provides an ongoing status of the net cash flow of both organizations (GLWA and DWSD) to fund their allocated share of Master Bond Ordinance requirements in accordance with the leases for the regional systems.

Table 1 – GLWA Net Cash Flows from Trust Receipts & Disbursements provides a summary of cash receipt collections and required MBO transfers by fiscal year. Fiscal year 2022 reflects eight months of activity to date.

Water fund receipts exceeded required disbursements by 10% through February 28, 2022 compared to the four-year historical average ratio of required receipts exceeding disbursements by 13% since July 1, 2017.

Sewer fund receipts exceeded required disbursements by 9% through February 28, 2022 consistent with the four-year historical average ratio of required receipts exceeding disbursements by 6% since July 1, 2017.

Chart 1 – GLWA 12-Month Net Receipts – Water outlines monthly cash receipt trends across two points of reference for the regional water system—current year and prior year. The black line at the zero highlights the minimum goal for net receipts.

Chart 2 – GLWA 12-Month Net Receipts – Sewer outlines monthly cash receipt trends across two points of reference for the regional sewer system—current year and prior year. The black line at the zero highlights the minimum goal for net receipts.

Table 1 – GLWA Net Cash Flows from Trust Receipts & Disbursements

		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022 Thru Feb 28
	Water					
1	Receipts	$ 338,452,001	$ 336,594,234	$ 332,606,196	$ 336,642,021	$ 231,747,880
2	MOU Adjustments	-	-	-	-	-
3	Adjusted Receipts	338,452,001	336,594,234	332,606,196	336,642,021	231,747,880
4	Disbursements	(297,064,810)	(289,230,481)	(296,190,425)	(308,713,407)	(210,567,368)
5	Receipts Net of Required	41,387,191	47,363,753	36,415,771	27,928,614	21,180,512
6	I&E Transfer	(25,739,700)	(47,695,000)	(25,719,751)	(31,991,687)	(20,116,612)
7	Net Receipts	$ 15,647,491	$ (331,247)	$ 10,696,020	$ (4,063,073)	$ 1,063,900
8	*Ratio of Receipts to Required Disbursements (Line 3/Line 4)*	*114%*	*116%*	*112%*	*109%*	*110%*
	Sewer					
9	Receipts	$ 476,269,761	$ 467,743,744	$ 490,461,356	$ 472,871,853	$ 318,680,871
10	MOU Adjustments	-	-	-	-	-
11	Adjusted Receipts	476,269,761	467,743,744	490,461,356	472,871,853	318,680,871
12	Disbursements	(458,903,335)	(453,406,636)	(445,604,952)	(436,600,883)	(293,115,671)
13	Receipts Net of Required	17,366,426	14,337,108	44,856,404	36,270,970	25,565,200
14	I&E Transfer	(22,698,100)	(22,547,700)	(19,096,200)	(40,504,727)	(31,928,138)
15	DWSD Shortfall Advance	(24,113,034)	-	-	-	-
16	Shortfall Repayment (principal)	-	9,367,355	17,542,669	18,206,431	5,501,474
17	Net Receipts	$ (29,444,708)	$ 1,156,763	$ 43,302,873	$ 13,972,674	$ (861,464)
18	*Ratio of Receipts to Required Disbursements (Line 11/Line 12)*	*104%*	*103%*	*110%*	*108%*	*109%*
	Combined					
19	Receipts	$ 814,721,762	$ 804,337,978	$ 823,067,552	$ 809,513,874	$ 550,428,751
20	MOU Adjustments	-	-	-	-	-
21	Adjusted Receipts	814,721,762	804,337,978	823,067,552	809,513,874	550,428,751
22	Disbursements	(755,968,145)	(742,637,117)	(741,795,377)	(745,314,290)	(503,683,039)
23	Receipts Net of Required	58,753,617	61,700,861	81,272,175	64,199,584	46,745,712
24	I&E Transfer	(48,437,800)	(70,242,700)	(44,815,951)	(72,496,414)	(52,044,750)
25	Shortfall Advance	(24,113,034)	-	-	-	-
26	Shortfall Repayment	-	9,367,355	17,542,669	18,206,431	5,501,474
27	Net Receipts	$ (13,797,217)	$ 825,516	$ 53,998,893	$ 9,909,601	$ 202,436
28	*Ratio of Receipts to Required Disbursements (Line 21/Line 22)*	*108%*	*108%*	*111%*	*109%*	*109%*

Chart 1 – GLWA 12-Month Net Receipts – Water

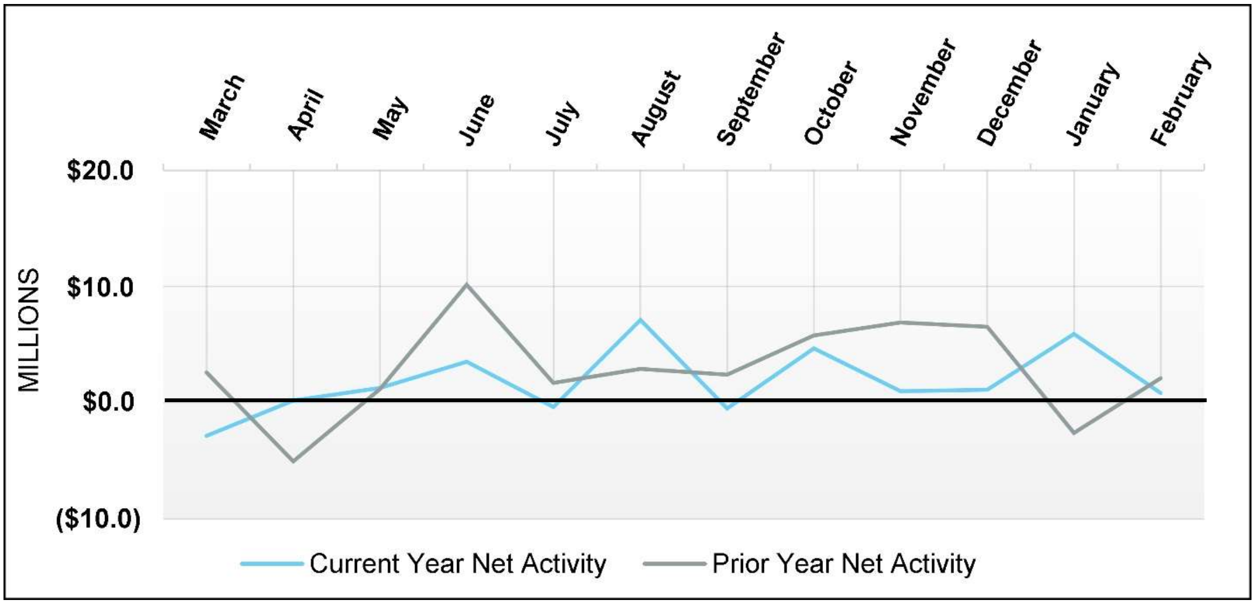
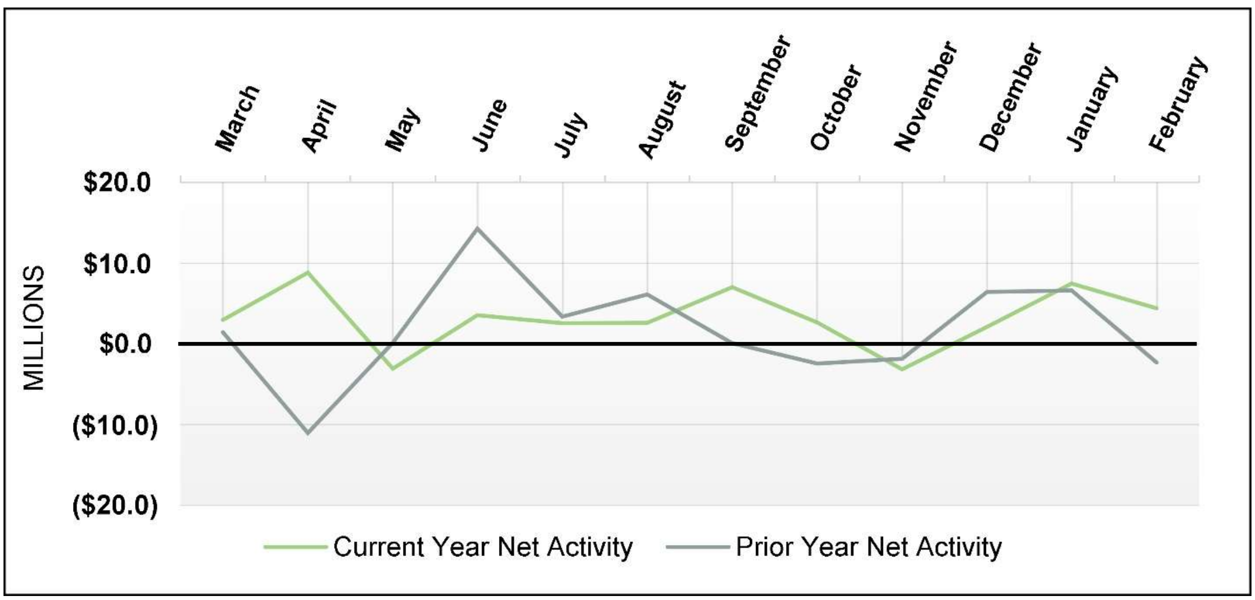


Chart 2 – GLWA 12-Month Net Receipts – Sewer



DWSD Trust Receipts & Disbursements

Net Cash Flows and Receipts Basis: The trusts established pursuant to the Master Bond Ordinance (MBO) outline a flow of funds that governs the priority of the application of cash receipts from both the regional wholesale (i.e. Great Lakes Water Authority or GLWA) and local retail (i.e. Detroit Water & Sewerage Department or DWSD) activities which are further separated by the water system and the sewage disposal system.

This report provides an ongoing status of the net cash flow of both organizations (GLWA and DWSD) to fund their allocated share of Master Bond Ordinance requirements in accordance with the leases for the regional systems.

Table 2 – DWSD Net Cash Flows from Trust Receipts & Disbursements provides a summary of cash receipt collections and required MBO transfers by fiscal year. Fiscal year 2022 reflects eight months of activity to date.

Water fund receipts exceeded required disbursements by 10% through February 28, 2022 compared to the four-year historical average ratio of required receipts exceeding disbursements by 3% since July 1, 2017.

Sewer fund receipts fell short of required disbursements by 1% through February 28, 2022 compared to the four-year historical average ratio of required receipts falling short of disbursements by 2% since July 1, 2017.

Table 3 – FY 2018 DWSD Loan Receivable - Sewer provides an activity summary of the loan receivable established under the terms of the April 2018 MOU addressing the cash shortfall from FY 2018.

Table 4 – FY 2018 DWSD Loan Receivable Payments - Sewer provides an activity summary of loan receivable payments to date on the FY 2018 Sewer Loan Receivable including the interest on the loan. This payment is transferred directly to GLWA Sewer Improvement & Extension fund monthly.

The Reconciliation Committee monitors this balance and repayment progress as part of its quarterly meetings.

Chart 3 – DWSD 12-Month Net Receipts – Water outlines monthly activity trends across two points of reference for the local water system—current year and prior year. The black line at the zero highlights the breakeven goal for net receipts.

Chart 4 – DWSD 12-Month Net Receipts – Sewer outlines monthly activity trends across two points of reference for the local sewer system—current year and prior year. The black line at the zero highlights the breakeven goal for net receipts.

Table 2 – DWSD Net Cash Flows from Trust Receipts & Disbursements

		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022 Thru Feb 28
	Water					
1	Receipts	$ 101,233,147	$ 99,868,219	$ 96,885,723	$ 102,067,423	$ 66,653,739
2	MOU Adjustments	-	-	-	-	-
3	Adjusted Receipts	101,233,147	99,868,219	96,885,723	102,067,423	66,653,739
4	Disbursements	(93,049,457)	(97,694,600)	(97,823,097)	(100,707,200)	(60,817,328)
5	Receipts Net of Required	8,183,690	2,173,619	(937,374)	1,360,223	5,836,411
6	I&E Transfer	-	(8,407,080)	-	-	-
7	Net Receipts	$ 8,183,690	$ (6,233,461)	$ (937,374)	$ 1,360,223	$ 5,836,411
8	*Ratio of Receipts to Required Disbursements (Line 3/Line 4)*	*109%*	*102%*	*99%*	*101%*	*110%*
	Sewer					
9	Receipts	$ 242,104,791	$ 265,339,797	$ 264,689,559	$ 308,210,767	$ 192,879,173
10	MOU Adjustments	-	6,527,200	-	-	-
11	Adjusted Receipts	242,104,791	271,866,997	264,689,559	308,210,767	192,879,173
12	Disbursements	(266,217,825)	(271,018,306)	(275,507,374)	(295,100,771)	(194,741,416)
13	Receipts Net of Required	(24,113,034)	848,691	(10,817,815)	13,109,996	(1,862,243)
14	I&E Transfer	-	-	-	-	-
15	Shortfall Advance from GLWA	24,113,034	-	-	-	-
16	Net Receipts	$ -	$ 848,691	$ (10,817,815)	$ 13,109,996	$ (1,862,243)
17	*Ratio of Receipts to Required Disbursements (Line 11/Line 12)*	*91%*	*100%*	*96%*	*104%*	*99%*
	Combined					
18	Receipts	$ 343,337,938	$ 365,208,016	$ 361,575,282	$ 410,278,190	$ 259,532,912
19	MOU Adjustments	-	6,527,200	-	-	-
20	Adjusted Receipts	343,337,938	371,735,216	361,575,282	410,278,190	259,532,912
21	Disbursements	(359,267,282)	(368,712,906)	(373,330,471)	(395,807,971)	(255,558,744)
22	Receipts Net of Required	(15,929,344)	3,022,310	(11,755,189)	14,470,219	3,974,168
23	I&E Transfer	-	(8,407,080)	-	-	-
24	Shortfall Advance from GLWA	24,113,034	-	-	-	-
25	Net Receipts	$ 8,183,690	$ (5,384,770)	$ (11,755,189)	$ 14,470,219	$ 3,974,168
26	*Ratio of Receipts to Required Disbursements (Line 20/Line 21)*	*96%*	*101%*	*97%*	*104%*	*102%*

Table 3 – FY 2018 DWSD Loan Receivable – Sewer

Date	Transaction	Amount	Balance
06-30-19	Record Loan Receivable		24,113,034
07-15-19	Payment for July 2019	638,978	23,474,056
08-08-19	Payment for August 2019	640,686	22,833,370
09-06-19	Payment for September 2019	642,400	22,190,970
10-02-19	Payment for October 2019	644,118	21,546,852
11-04-19	Payment for November 2019	645,840	20,901,012
12-03-19	Payment for December 2019	647,567	20,253,445
01-06-20	Payment for January 2020	649,299	19,604,146
02-04-20	Payment for February 2020	651,035	18,953,111
03-03-20	Payment for March 2020	652,776	18,300,335
04-15-20	Payment for April 2020	654,522	17,645,813
05-06-20	Payment for May 2020	656,272	16,989,541
06-02-20	Payment for June 2020	658,027	16,331,514
07-07-20	Payment for July 2020	659,787	15,671,727
08-04-20	Payment for August 2020	661,551	15,010,176
09-02-20	Payment for September 2020	663,320	14,346,855
10-05-20	Payment for October 2020	665,094	13,681,761
11-03-20	Payment for November 2020	666,873	13,014,888
12-03-20	Payment for December 2020	668,656	12,346,232
01-05-21	Payment for January 2021	670,444	11,675,788
02-02-21	Payment for February 2021	672,237	11,003,551
03-03-21	Payment for March 2021	674,035	10,329,517
04-05-21	Payment for April 2021	675,837	9,653,679
05-04-21	Payment for May 2021	677,644	8,976,035
06-03-21	Payment for June 2021	679,457	8,296,578
07-02-21	Payment for July 2021	681,274	7,615,305
08-03-21	Payment for August 2021	683,095	6,932,209
09-03-21	Payment for September 2021	684,922	6,247,287
10-05-21	Payment for October 2021	686,754	5,560,534
11-03-21	Payment for November 2021	688,590	4,871,944
12-06-21	Payment for December 2021	690,432	4,181,512
01-05-22	Payment for January 2022	692,278	3,489,234
02-04-22	Payment for February 2022	694,129	2,795,105
		21,317,929	**2,795,105**

Table 4 – FY 2018 DWSD Loan Receivable Payments – Sewer

Date	Transaction	Principal	Interest	Total Paid
07-15-19	Payment for July 2019	638,978	64,482	703,460
08-08-19	Payment for August 2019	640,686	62,774	703,460
09-06-19	Payment for September 2019	642,400	61,060	703,460
10-02-19	Payment for October 2019	644,118	59,342	703,460
11-04-19	Payment for November 2019	645,840	57,620	703,460
12-03-19	Payment for December 2019	647,567	55,893	703,460
01-06-20	Payment for January 2020	649,299	54,161	703,460
02-04-20	Payment for February 2020	651,035	52,425	703,460
03-03-20	Payment for March 2020	652,776	50,684	703,460
04-15-20	Payment for April 2020	654,522	48,938	703,460
05-06-20	Payment for May 2020	656,272	47,188	703,460
06-02-20	Payment for June 2020	658,027	45,433	703,460
07-07-20	Payment for July 2020	659,787	43,673	703,460
08-04-20	Payment for August 2020	661,551	41,909	703,460
09-02-20	Payment for September 2020	663,320	40,140	703,460
10-05-20	Payment for October 2020	665,094	38,366	703,460
11-03-20	Payment for November 2020	666,873	36,587	703,460
12-03-20	Payment for December 2020	668,656	34,804	703,460
01-05-21	Payment for January 2021	670,444	33,016	703,460
02-02-21	Payment for February 2021	672,237	31,223	703,460
03-03-21	Payment for March 2021	674,035	29,425	703,460
04-05-21	Payment for April 2021	675,837	27,623	703,460
05-04-21	Payment for May 2021	677,644	25,816	703,460
06-03-21	Payment for June 2021	679,457	24,003	703,460
07-02-21	Payment for July 2021	681,274	22,186	703,460
08-03-21	Payment for August 2021	683,095	20,365	703,460
09-03-21	Payment for September 2021	684,922	18,538	703,460
10-05-21	Payment for October 2021	686,754	16,706	703,460
11-03-21	Payment for November 2021	688,590	14,870	703,460
12-06-21	Payment for December 2021	690,432	13,028	703,460
01-05-22	Payment for January 2022	692,278	11,182	703,460
02-04-22	Payment for February 2022	694,129	9,331	703,460
		21,317,929	**1,192,791**	**22,510,720**

Chart 3 – DWSD 12-Month Net Receipts – Water

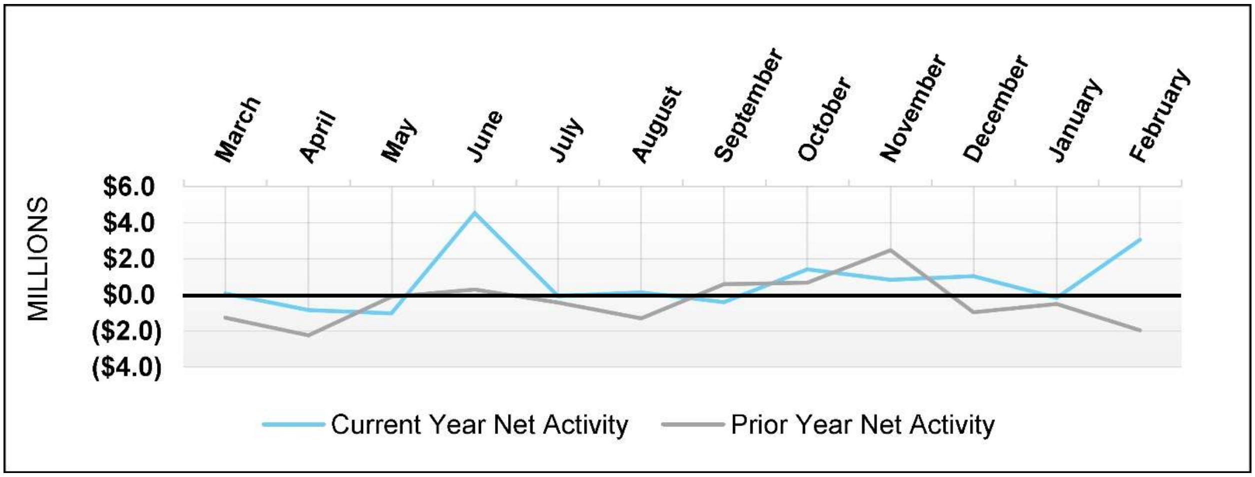
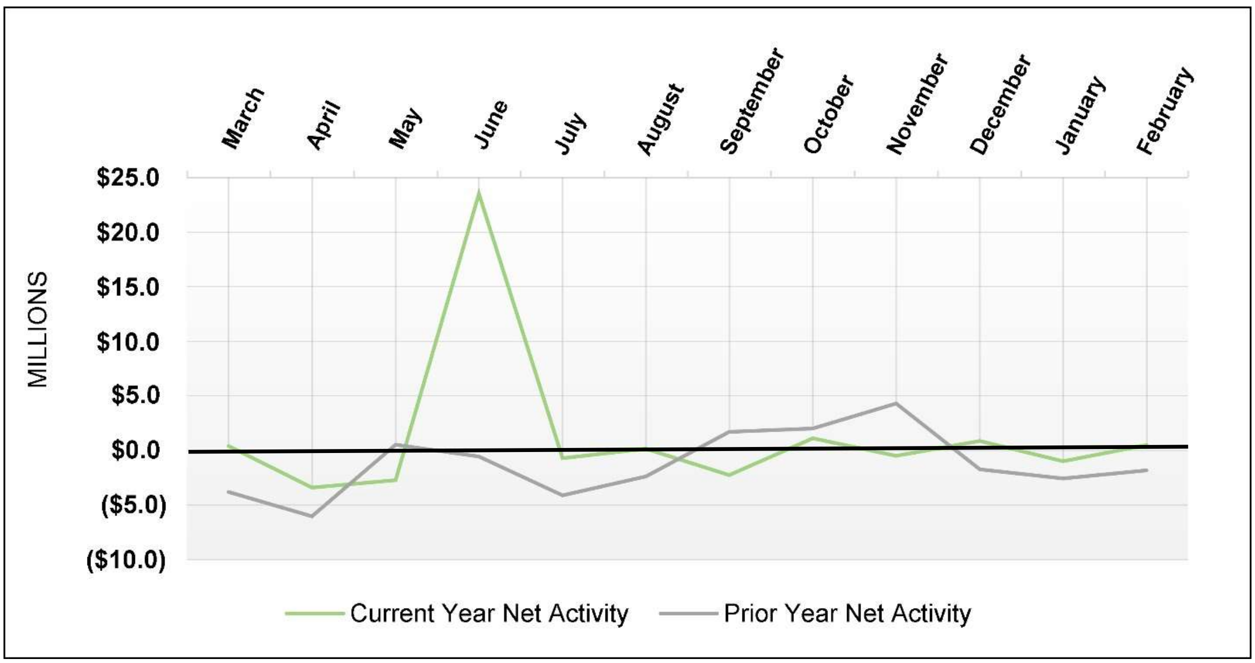


Chart 4 – DWSD 12-Month Net Receipts – Sewer



Combined System Trust Receipts & Disbursements

Net Cash Flows and Receipts Basis: The trusts established pursuant to the Master Bond Ordinance (MBO) outline a flow of funds that governs the priority of the application of cash receipts from both the regional wholesale (i.e., Great Lakes Water Authority or GLWA) and local retail (i.e. Detroit Water & Sewerage Department or DWSD) activities which are further separated by the water system and the sewage disposal system.

Table 5 – Combined Net Cash Flows from Trust Receipts & Disbursements provides a summary of cash receipt collections and required MBO transfers by fiscal year. Fiscal year 2022 reflects eight months of activity to date.

Water fund net receipts exceeded required disbursements by 10% through February 28, 2022 consistent with the four-year historical average ratio of required receipts exceeding disbursements by 10% since July 1, 2017.

Sewer fund receipts exceeded required disbursements by 5% through February 28, 2022 compared to the four-year historical average ratio of required receipts exceeding disbursements by 3% since July 1, 2017.

Table 5 – Combined Net Cash Flows from Trust Receipts & Disbursements

		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022 Thru Feb 28
	Water					
1	Receipts	$ 439,685,148	$ 436,462,453	$ 429,491,919	$ 438,709,444	$ 298,401,619
2	MOU Adjustments	-	-	-	-	-
3	Adjusted Receipts	439,685,148	436,462,453	429,491,919	438,709,444	298,401,619
4	Disbursements	(390,114,267)	(386,925,081)	(394,013,522)	(409,420,607)	(271,384,696)
5	Receipts Net of Required	49,570,881	49,537,372	35,478,397	29,288,837	27,016,923
6	I&E Transfer	(25,739,700)	(56,102,080)	(25,719,751)	(31,991,687)	(20,116,612)
7	Net Receipts	$ 23,831,181	$ (6,564,708)	$ 9,758,646	$ (2,702,850)	$ 6,900,311
8	*Ratio of Receipts to Required Disbursements (Line 3/Line 4)*	*113%*	*113%*	*109%*	*107%*	*110%*
	Sewer					
9	Receipts	$ 718,374,552	$ 733,083,541	$ 755,150,915	$ 781,082,620	$ 511,560,044
10	MOU Adjustments	-	6,527,200	-	-	-
11	Adjusted Receipts	718,374,552	739,610,741	755,150,915	781,082,620	511,560,044
12	Disbursements	(725,121,160)	(724,424,942)	(721,112,326)	(731,701,654)	(487,857,087)
13	Receipts Net of Required	(6,746,608)	15,185,799	34,038,589	49,380,966	23,702,957
14	I&E Transfer	(22,698,100)	(22,547,700)	(19,096,200)	(40,504,727)	(31,928,138)
15	Shortfall Advance	-	-	-	-	-
16	Shortfall Repayment (principal)	-	9,367,355	17,542,669	18,206,431	5,501,474
17	Net Receipts	$ (29,444,708)	$ (7,361,901)	$ 32,485,058	$ 27,082,670	$ (2,723,707)
18	*Ratio of Receipts to Required Disbursements (Line 11/Line 12)*	*99%*	*102%*	*105%*	*107%*	*105%*
	Combined					
19	Receipts	$1,158,059,700	$1,169,545,994	$1,184,642,834	$1,219,792,064	$ 809,961,663
20	MOU Adjustments	-	6,527,200	-	-	-
21	Adjusted Receipts	1,158,059,700	1,176,073,194	1,184,642,834	1,219,792,064	809,961,663
22	Disbursements	(1,115,235,427)	(1,111,350,023)	(1,115,125,848)	(1,141,122,261)	(759,241,783)
23	Receipts Net of Required	42,824,273	64,723,171	69,516,986	78,669,803	50,719,880
24	I&E Transfer	(48,437,800)	(78,649,780)	(44,815,951)	(72,496,414)	(52,044,750)
25	Shortfall Advance	-	-	-	-	-
26	Shortfall Repayment	-	9,367,355	17,542,669	18,206,431	5,501,474
27	Net Receipts	$ (5,613,527)	$ (4,559,254)	$ 42,243,704	$ 24,379,820	$ 4,176,604
28	*Ratio of Receipts to Required Disbursements (Line 21/Line 22)*	*104%*	*106%*	*106%*	*107%*	*107%*

APPENDIX

GLWA Aged Accounts Receivable- WATER ACCOUNTS

Balances as of 02/28/22

Customer Name	Total Due	Current	46 - 74 Days	75 - 104 Days	>105 Days
ALLEN PARK	$198,257.04	$198,257.04	$0.00	$0.00	$0.00
ALMONT VILLAGE	$20,329.52	$20,329.52	$0.00	$0.00	$0.00
ASH TOWNSHIP	$67,350.41	$67,350.41	$0.00	$0.00	$0.00
BELLEVILLE	$27,458.73	$27,458.73	$0.00	$0.00	$0.00
BERLIN TOWNSHIP	$61,978.53	$61,978.53	$0.00	$0.00	$0.00
BROWNSTOWN TOWNSHIP	$301,850.50	$301,850.50	$0.00	$0.00	$0.00
BRUCE TOWNSHIP	$22,860.80	$22,860.80	$0.00	$0.00	$0.00
BURTCHVILLE TOWNSHIP	$24,766.18	$24,766.18	$0.00	$0.00	$0.00
CANTON TOWNSHIP	$861,399.65	$861,399.65	$0.00	$0.00	$0.00
CENTER LINE	$81,434.58	$81,434.58	$0.00	$0.00	$0.00
CHESTERFIELD TOWNSHIP	$723,936.45	$723,936.45	$0.00	$0.00	$0.00
CLINTON TOWNSHIP	$617,218.57	$617,218.57	$0.00	$0.00	$0.00
COMMERCE TOWNSHIP	$283,249.14	$283,249.14	$0.00	$0.00	$0.00
DEARBORN	$6,391,055.00	$1,832,150.45	$725,318.49	$954,762.15	$2,878,823.91
DEARBORN HEIGHTS	$626,889.97	$626,889.97	$0.00	$0.00	$0.00
EASTPOINTE	$273,839.57	$273,839.57	$0.00	$0.00	$0.00
ECORSE	$117,245.54	$117,245.54	$0.00	$0.00	$0.00
FARMINGTON	$85,489.58	$85,489.58	$0.00	$0.00	$0.00
FARMINGTON HILLS	$1,356,004.11	$1,356,004.11	$0.00	$0.00	$0.00
FERNDALE	$94,998.06	$94,998.06	$0.00	$0.00	$0.00
FLAT ROCK	$107,552.28	$107,552.28	$0.00	$0.00	$0.00
FLINT	$298,459.27	$298,459.27	$0.00	$0.00	$0.00
FRASER	$104,326.40	$104,326.40	$0.00	$0.00	$0.00

GLWA Aged Accounts Receivable- WATER ACCOUNTS

Balances as of 02/28/22

Customer Name	Total Due	Current	46 - 74 Days	75 - 104 Days	>105 Days
GARDEN CITY	$131,429.69	$131,429.69	$0.00	$0.00	$0.00
GIBRALTAR	$29,022.84	$29,022.84	$0.00	$0.00	$0.00
GROSSE ILE TOWNSHIP	$188,983.35	$188,983.35	$0.00	$0.00	$0.00
GROSSE POINTE PARK	$214,248.03	$214,248.01	$0.02	$0.00	$0.00
GROSSE POINTE SHORES	$46,953.89	$46,953.89	$0.00	$0.00	$0.00
GROSSE POINTE WOODS	$103,476.50	$103,476.50	$0.00	$0.00	$0.00
HAMTRAMCK	$69,995.41	$69,995.41	$0.00	$0.00	$0.00
HARPER WOODS	$79,538.24	$79,538.24	$0.00	$0.00	$0.00
HARRISON TWP	$140,137.89	$140,137.89	$0.00	$0.00	$0.00
HAZEL PARK	$62,797.17	$62,797.17	$0.00	$0.00	$0.00
HIGHLAND PARK	$10,549,440.54	$193,835.97	$100,907.81	$103,416.91	$10,151,279.85
HURON TOWNSHIP	$129,530.56	$129,530.56	$0.00	$0.00	$0.00
IMLAY CITY	$113,036.53	$113,036.53	$0.00	$0.00	$0.00
IMLAY TOWNSHIP	$1,409.36	$1,409.36	$0.00	$0.00	$0.00
INKSTER	$7,696.75	$7,696.75	$0.00	$0.00	$0.00
KEEGO HARBOR	$48,418.09	$48,418.09	$0.00	$0.00	$0.00
LAPEER	$137,343.60	$137,343.60	$0.00	$0.00	$0.00
LENOX TOWNSHIP	$51,954.85	$51,001.83	$953.02	$0.00	$0.00
LINCOLN PARK	$208,666.19	$208,666.19	$0.00	$0.00	$0.00
LIVONIA	$932,221.56	$932,221.56	$0.00	$0.00	$0.00
MACOMB TWP	$1,017,730.61	$1,017,730.61	$0.00	$0.00	$0.00
MADISON HEIGHTS	$340,410.95	$340,410.95	$0.00	$0.00	$0.00

GLWA Aged Accounts Receivable- WATER ACCOUNTS

Balances as of 02/28/22

Customer Name	Total Due	Current	46 - 74 Days	75 - 104 Days	>105 Days
MAYFIELD TOWNSHIP	$54.91	$54.91	$0.00	$0.00	$0.00
MELVINDALE	$114,853.11	$114,853.11	$0.00	$0.00	$0.00
NEW HAVEN	$32,565.18	$32,565.18	$0.00	$0.00	$0.00
NOCWA	$1,805,438.52	$1,805,438.52	$0.00	$0.00	$0.00
NORTHVILLE	$66,641.75	$66,641.75	$0.00	$0.00	$0.00
NORTHVILLE TOWNSHIP	$441,227.64	$441,227.64	$0.00	$0.00	$0.00
NOVI	$1,470,183.30	$1,470,183.30	$0.00	$0.00	$0.00
OAK PARK	$119,714.97	$119,714.97	$0.00	$0.00	$0.00
OAKLAND CO DR COM	$11,159.52	$11,159.52	$0.00	$0.00	$0.00
PLYMOUTH	$89,739.54	$89,739.54	$0.00	$0.00	$0.00
PLYMOUTH TOWNSHIP	$353,730.76	$353,730.76	$0.00	$0.00	$0.00
REDFORD TOWNSHIP	$273,424.64	$273,424.64	$0.00	$0.00	$0.00
RIVER ROUGE	$179,844.66	$121,164.12	$58,680.54	$0.00	$0.00
RIVERVIEW	$74,979.78	$74,979.78	$0.00	$0.00	$0.00
ROCKWOOD	$25,081.10	$25,081.10	$0.00	$0.00	$0.00
ROMEO	$42,854.78	$42,854.78	$0.00	$0.00	$0.00
ROMULUS	$347,366.15	$347,366.15	$0.00	$0.00	$0.00
ROSEVILLE	$453,825.99	$453,825.99	$0.00	$0.00	$0.00
ROYAL OAK TOWNSHIP	$31,947.29	$31,947.29	$0.00	$0.00	$0.00
SHELBY TOWNSHIP	$1,130,414.79	$1,130,414.79	$0.00	$0.00	$0.00
SOCWA	$3,771,340.94	$3,771,340.94	$0.00	$0.00	$0.00
SOUTH ROCKWOOD	$10,006.30	$10,006.30	$0.00	$0.00	$0.00
SOUTHGATE	$199,339.43	$199,339.43	$0.00	$0.00	$0.00

GLWA Aged Accounts Receivable- WATER ACCOUNTS

Balances as of 02/28/22

Customer Name	Total Due	Current	46 - 74 Days	75 - 104 Days	>105 Days
ST. CLAIR CNTY-GREENWOOD ENE	$68,415.69	$68,415.69	$0.00	$0.00	$0.00
ST. CLAIR SHORES	$545,694.85	$545,694.85	$0.00	$0.00	$0.00
STERLING HEIGHTS	$2,549,135.23	$2,549,135.23	$0.00	$0.00	$0.00
SUMPTER TOWNSHIP	$128,323.75	$128,323.75	$0.00	$0.00	$0.00
SYLVAN LAKE	$20,309.35	$20,309.35	$0.00	$0.00	$0.00
TAYLOR	$397,867.91	$397,867.91	$0.00	$0.00	$0.00
TRENTON	$282,884.72	$282,884.72	$0.00	$0.00	$0.00
TROY (SEOC)	$1,076,108.23	$1,076,108.23	$0.00	$0.00	$0.00
UTICA	$47,981.43	$47,981.43	$0.00	$0.00	$0.00
VAN BUREN TOWNSHIP	$288,561.81	$288,561.81	$0.00	$0.00	$0.00
WALLED LAKE	$69,488.91	$69,488.91	$0.00	$0.00	$0.00
WARREN	$904,478.26	$904,478.26	$0.00	$0.00	$0.00
WASHINGTON TOWNSHIP	$186,032.64	$186,032.64	$0.00	$0.00	$0.00
WAYNE	$544,708.60	$544,708.60	$0.00	$0.00	$0.00
WEST BLOOMFIELD TWP (C-O)	$1,740,477.84	$1,740,477.84	$0.00	$0.00	$0.00
WESTLAND	$1,064,775.90	$1,064,775.90	$0.00	$0.00	$0.00
WIXOM	$199,591.39	$199,591.39	$0.00	$0.00	$0.00
WOODHAVEN	$142,788.95	$142,788.95	$0.00	$0.00	$0.00
YCUA	$2,611,884.90	$1,753,161.99	$858,722.91	$0.00	$0.00
TOTAL WATER ACCOUNTS	$51,267,637.89	$35,434,772.28	$1,744,582.79	$1,058,179.06	$13,030,103.76

GLWA Aged Accounts Receivable- SEWER ACCOUNTS

Balances as of 02/28/22

Customer Name	Total Due	Current	46 - 74 Days	75 - 104 Days	>105 Days
ALLEN PARK	$0.00	$0.00	$0.00	$0.00	$0.00
CENTER LINE	$85,799.50	$85,799.50	$0.00	$0.00	$0.00
DEARBORN	$0.00	$0.00	$0.00	$0.00	$0.00
EVERGREEN-FARMINGTON	$2,980,500.00	$2,980,500.00	$0.00	$0.00	$0.00
FARMINGTON	$0.00	$0.00	$0.00	$0.00	$0.00
GROSSE POINTE	$0.00	$0.00	$0.00	$0.00	$0.00
GROSSE POINTE FARMS	$0.00	$0.00	$0.00	$0.00	$0.00
GROSSE POINTE PARK	$0.00	$0.00	$0.00	$0.00	$0.00
HAMTRAMCK	$332,800.00	$332,800.00	$0.00	$0.00	$0.00
HARPER WOODS	$0.00	$0.00	$0.00	$0.00	$0.00
HIGHLAND PARK	$40,634,275.16	$446,400.00	$446,400.00	$446,400.00	$39,295,075.16
MELVINDALE	$129,500.00	$129,500.00	$0.00	$0.00	$0.00
OAKLAND COUNTY GWK DD	$3,819,000.00	$3,819,000.00	$0.00	$0.00	$0.00
OMID	$5,895,146.43	$5,895,146.43	$0.00	$0.00	$0.00
REDFORD TOWNSHIP	$22,200.00	$22,200.00	$0.00	$0.00	$0.00
ROUGE VALLEY	$0.00	$0.00	$0.00	$0.00	$0.00
SOUTH MACOMB SANITATION DIST	$2,064,400.00	$2,064,400.00	$0.00	$0.00	$0.00
WAYNE COUNTY-AREA #3	$0.00	$0.00	$0.00	$0.00	$0.00
TOTAL SEWER ACCOUNTS	$55,963,621.09	$15,775,745.93	$446,400.00	$446,400.00	$39,295,075.16

GLWA Aged Accounts Receivable- IWC ACCOUNTS

Balances as of 02/28/22

Customer Name	Total Due	Current	46 - 74 Days	75 - 104 Days	>105 Days
ALLEN PARK	$1,605.39	$1,605.39	$0.00	$0.00	$0.00
AUBURN HILLS (C-O)	$0.00	$0.00	$0.00	$0.00	$0.00
AUBURN HILLS (C-O) ADMIN	$0.00	$0.00	$0.00	$0.00	$0.00
AUBURN HILLS (E-F)	$0.00	$0.00	$0.00	$0.00	$0.00
BERKLEY	$3,147.06	$3,147.06	$0.00	$0.00	$0.00
BEVERLY HILLS	$994.74	$994.74	$0.00	$0.00	$0.00
BINGHAM FARMS	$0.00	$0.00	$0.00	$0.00	$0.00
BIRMINGHAM (E-F)	$2,431.98	$2,431.98	$0.00	$0.00	$0.00
BIRMINGHAM (SEOC)	$5,667.54	$5,667.54	$0.00	$0.00	$0.00
BLOOMFIELD HILLS	$0.00	$0.00	$0.00	$0.00	$0.00
BLOOMFIELD TOWNSHIP	$7,545.51	$7,545.51	$0.00	$0.00	$0.00
CANTON TOWNSHIP	$84.96	$84.96	$0.00	$0.00	$0.00
CENTER LINE	$7,334.88	$7,334.88	$0.00	$0.00	$0.00
CHESTERFIELD TOWNSHIP	$12,565.23	$12,565.23	$0.00	$0.00	$0.00
CITY OF FARMINGTON (E-F)	$200.01	$200.01	$0.00	$0.00	$0.00
CITY OF FERNDALE	$8,867.70	$8,867.70	$0.00	$0.00	$0.00
CITY OF ROCHESTER	$3,708.15	$3,708.15	$0.00	$0.00	$0.00
CLARKSTON (C-O) ADMIN	$69.06	$69.06	$0.00	$0.00	$0.00
CLAWSON	$3,079.80	$3,079.80	$0.00	$0.00	$0.00
CLINTON TOWNSHIP	$26,411.94	$26,411.94	$0.00	$0.00	$0.00
DEARBORN	$36,854.94	$36,854.94	$0.00	$0.00	$0.00
DEARBORN HEIGHTS	$9,202.23	$9,202.23	$0.00	$0.00	$0.00
DETROIT METRO WC AIRPORT	$212.40	$212.40	$0.00	$0.00	$0.00

GLWA Aged Accounts Receivable- IWC ACCOUNTS

Balances as of 02/28/22

Customer Name	Total Due	Current	46 - 74 Days	75 - 104 Days	>105 Days
EASTPOINTE	$6,426.87	$6,426.87	$0.00	$0.00	$0.00
FARMINGTON	$4,019.67	$4,019.67	$0.00	$0.00	$0.00
FARMINGTON HILLS	$0.00	$0.00	$0.00	$0.00	$0.00
FRASER	$4,938.30	$4,938.30	$0.00	$0.00	$0.00
GARDEN CITY	$6,111.81	$6,111.81	$0.00	$0.00	$0.00
GROSSE POINTE	$1,573.53	$1,573.53	$0.00	$0.00	$0.00
GROSSE POINTE FARMS	$2,079.75	$2,079.75	$0.00	$0.00	$0.00
GROSSE POINTE PARK	$1,177.05	$1,177.05	$0.00	$0.00	$0.00
GROSSE POINTE SHORES	$339.84	$339.84	$0.00	$0.00	$0.00
GROSSE POINTE WOODS	$2,646.15	$2,646.15	$0.00	$0.00	$0.00
HAMTRAMCK	$4,155.96	$4,155.96	$0.00	$0.00	$0.00
HARPER WOODS	$1,900.98	$1,900.98	$0.00	$0.00	$0.00
HARRISON TWP	$2,955.90	$2,955.90	$0.00	$0.00	$0.00
HAZEL PARK	$3,297.51	$3,297.51	$0.00	$0.00	$0.00
HIGHLAND PARK	$1,802,065.13	$8,003.94	$4,074.54	$4,069.23	$1,785,917.42
HUNTINGTON WOODS	$0.00	$0.00	$0.00	$0.00	$0.00
INDEPENDENCE (C-O) ADMIN	$1,295.83	$1,295.83	$0.00	$0.00	$0.00
INKSTER	$0.00	$0.00	$0.00	$0.00	$0.00
KEEGO HARBOR	$0.00	$0.00	$0.00	$0.00	$0.00
LAKE ORION	$1,600.08	$1,600.08	$0.00	$0.00	$0.00
LATHRUP	$4,200.21	$2,800.14	$1,400.07	$0.00	$0.00
LENOX TOWNSHIP	$971.73	$647.82	$323.91	$0.00	$0.00

GLWA Aged Accounts Receivable- IWC ACCOUNTS

Balances as of 02/28/22

Customer Name	Total Due	Current	46 - 74 Days	75 - 104 Days	>105 Days
LIVONIA	$40,225.02	$40,225.02	$0.00	$0.00	$0.00
MACOMB TWP	$205.32	$205.32	$0.00	$0.00	$0.00
MADISON HEIGHTS	$18,930.15	$18,930.15	$0.00	$0.00	$0.00
MELVINDALE	$7,002.12	$7,002.12	$0.00	$0.00	$0.00
NEW HAVEN	$612.42	$612.42	$0.00	$0.00	$0.00
NORTHVILLE	$1,773.54	$1,773.54	$0.00	$0.00	$0.00
NOVI	$17,615.04	$17,615.04	$0.00	$0.00	$0.00
OAK PARK	$7,173.81	$7,173.81	$0.00	$0.00	$0.00
OAKLAND TOWNSHIP	$0.00	$0.00	$0.00	$0.00	$0.00
ORCHARD LAKE VILLAGE	$0.00	$0.00	$0.00	$0.00	$0.00
ORION TOWNSHIP (C-O)	$7,927.70	$7,927.70	$0.00	$0.00	$0.00
ORION TOWNSHIP (C-O) ADMIN	$1,460.64	$973.76	$486.88	$0.00	$0.00
OXFORD TOWNSHIP	$(47.79)	$(47.79)	$0.00	$0.00	$0.00
OXFORD VILLAGE	$1,253.16	$1,253.16	$0.00	$0.00	$0.00
PLEASANT RIDGE	$272.58	$272.58	$0.00	$0.00	$0.00
PLYMOUTH	$3,883.38	$3,883.38	$0.00	$0.00	$0.00
PLYMOUTH TOWNSHIP	$272.58	$272.58	$0.00	$0.00	$0.00
REDFORD TOWNSHIP	$12,450.18	$12,450.18	$0.00	$0.00	$0.00
ROCHESTER HILLS	$18,581.46	$18,581.46	$0.00	$0.00	$0.00
ROMULUS	$778.80	$778.80	$0.00	$0.00	$0.00
ROSEVILLE	$14,528.16	$14,528.16	$0.00	$0.00	$0.00
ROYAL OAK	$13,836.09	$13,836.09	$0.00	$0.00	$0.00
ROYAL OAK TOWNSHIP	$0.00	$0.00	$0.00	$0.00	$0.00

GLWA Aged Accounts Receivable- IWC ACCOUNTS

Balances as of 02/28/22

Customer Name	Total Due	Current	46 - 74 Days	75 - 104 Days	>105 Days
SHELBY TOWNSHIP	$14,749.41	$14,749.41	$0.00	$0.00	$0.00
SOUTHFIELD (E-F)	$56,033.75	$56,033.75	$0.00	$0.00	$0.00
SOUTHFIELD (SEOC)	$7,126.56	$6,596.79	$529.77	$0.00	$0.00
ST. CLAIR SHORES	$12,089.10	$12,089.10	$0.00	$0.00	$0.00
STERLING HEIGHTS	$63,865.14	$63,865.14	$0.00	$0.00	$0.00
TROY (E-F)	$0.00	$0.00	$0.00	$0.00	$0.00
TROY (SEOC)	$0.00	$0.00	$0.00	$0.00	$0.00
UTICA	$3,035.55	$3,035.55	$0.00	$0.00	$0.00
VAN BUREN TOWNSHIP	$2,039.04	$2,039.04	$0.00	$0.00	$0.00
VILLAGE OF FRANKLIN	$0.00	$0.00	$0.00	$0.00	$0.00
WASHINGTON TOWNSHIP	$1,513.35	$1,513.35	$0.00	$0.00	$0.00
WATERFORD TOWNSHIP DPW (ADMI	$3,115.28	$3,115.28	$0.00	$0.00	$0.00
WAYNE	$4,996.71	$4,996.71	$0.00	$0.00	$0.00
WEST BLOOMFIELD TWP (E-F)	$12,699.84	$12,699.84	$0.00	$0.00	$0.00
WEST BLOOMFIELD TWP. (C-O) A	$486.78	$486.78	$0.00	$0.00	$0.00
WESTLAND	$22,748.04	$22,748.04	$0.00	$0.00	$0.00
TOTAL IWC ACCOUNTS	$2,354,972.73	$558,170.91	$6,815.17	$4,069.23	$1,785,917.42

GLWA Aged Accounts Receivable- POLLUTANT SURCHARGE ACCOUNTS

Balances as of 02/28/22

Customer Name	Total Due	Current	46 - 74 Days	75 - 104 Days	>105 Days
3M COMPANY (MINNESOTA MINING	$1,748.40	$1,748.40	$0.00	$0.00	$0.00
A & R PACKING CO., LLC	$1,472.00	$1,472.00	$0.00	$0.00	$0.00
AACTRON	$0.00	$0.00	$0.00	$0.00	$0.00
ACADEMY PACKING CO.	$0.00	$0.00	$0.00	$0.00	$0.00
ACME RUSTPROOF	$59.61	$59.61	$0.00	$0.00	$0.00
ADORING PET FUNERAL HOME	$162.08	$162.08	$0.00	$0.00	$0.00
AEVITAS SPECIALITY SERVICES	$509.16	$509.16	$0.00	$0.00	$0.00
ALEXANDER & HORNUNG	$0.00	$0.00	$0.00	$0.00	$0.00
ALEXANDER & HORNUNG	$0.00	$0.00	$0.00	$0.00	$0.00
ALL CHEM CORP, LLC.	$0.00	$0.00	$0.00	$0.00	$0.00
ALPHA STAMPING COMPANY	$0.00	$0.00	$0.00	$0.00	$0.00
AMERICAN WASTE TECH INC.	$0.00	$0.00	$0.00	$0.00	$0.00
AMERITI MFG. CO.	$0.00	$0.00	$0.00	$0.00	$0.00
APPLIED TECHNOLOGY INDUSTRIE	$764.13	$764.13	$0.00	$0.00	$0.00
ATWATER IN THE PARK	$0.00	$0.00	$0.00	$0.00	$0.00
AUTOMOTIVE FINISH	$0.00	$0.00	$0.00	$0.00	$0.00
AXLE BREWING COMPANY, LLC	$0.00	$0.00	$0.00	$0.00	$0.00
B. NEKTAR MEADERY	$0.00	$0.00	$0.00	$0.00	$0.00
BAFFIN BREWING COMPANY	$108.43	$108.43	$0.00	$0.00	$0.00
BARON INDUSTRIES	$0.00	$0.00	$0.00	$0.00	$0.00
BARTZ BAKERY	$0.00	$0.00	$0.00	$0.00	$0.00
BATCH BREWING COMPANY	$1,053.13	$61.16	$0.00	$0.00	$991.97
BAYS MICHIGAN CORPORATION	$0.00	$0.00	$0.00	$0.00	$0.00

GLWA Aged Accounts Receivable- POLLUTANT SURCHARGE ACCOUNTS

Balances as of 02/28/22

Customer Name	Total Due	Current	46 - 74 Days	75 - 104 Days	>105 Days
BEIRUT BAKERY, INC.	$37.00	$0.00	$0.00	$0.00	$37.00
BETTER MADE SNACK FOOD	$22,991.81	$22,991.81	$0.00	$0.00	$0.00
BLACK LOTUS BREWING CO.	$61.25	$0.00	$0.00	$0.00	$61.25
BOZEK'S MARKET	$13.27	$13.27	$0.00	$0.00	$0.00
BREW DETROIT	$3,906.38	$3,906.38	$0.00	$0.00	$0.00
BROADWAY MKT CORNED BEEF	$0.00	$0.00	$0.00	$0.00	$0.00
BROOKS BREWING, LLC.	$0.00	$0.00	$0.00	$0.00	$0.00
BROWN IRON BREWHOUSE	$0.00	$0.00	$0.00	$0.00	$0.00
CADILLAC STRAITS BREWING CO.	$0.00	$0.00	$0.00	$0.00	$0.00
CANTON BREW WORKS	$0.00	$0.00	$0.00	$0.00	$0.00
CAPITAL REPRODUCTIONS	$0.00	$0.00	$0.00	$0.00	$0.00
CF BURGER CREAMERY	$9,828.93	$9,828.93	$0.00	$0.00	$0.00
CHILANGO'S BAKERY	$2,013.05	$20.46	$11.37	$10.23	$1,970.99
CINTAS CORP. - MACOMB TWP.	$23,395.27	$23,395.27	$0.00	$0.00	$0.00
CINTAS CORPORATION	$8,953.88	$8,953.88	$0.00	$0.00	$0.00
CINTAS CORPORATION	$8,076.11	$8,076.11	$0.00	$0.00	$0.00
CITY LAUNDRY, INC.	$3.20	$3.20	$0.00	$0.00	$0.00
CLASSIC CONTAINER CORP.	$0.00	$0.00	$0.00	$0.00	$0.00
COCA-COLA REFRESHMENTS USA,	$0.00	$0.00	$0.00	$0.00	$0.00
COSTCO WHOLESALE STORE	$0.00	$0.00	$0.00	$0.00	$0.00
COSTCO WHOLESALE STORE	$0.00	$0.00	$0.00	$0.00	$0.00
COSTCO WHOLESALE STORE	$0.00	$0.00	$0.00	$0.00	$0.00

GLWA Aged Accounts Receivable- POLLUTANT SURCHARGE ACCOUNTS

Balances as of 02/28/22

Customer Name	Total Due	Current	46 - 74 Days	75 - 104 Days	>105 Days
COSTCO WHOLESALE STORE	$0.00	$0.00	$0.00	$0.00	$0.00
COUNTRY FRESH DAIRY CO.	$0.00	$0.00	$0.00	$0.00	$0.00
CROSS CHEMICAL COMPANY, INC.	$678.81	$678.81	$0.00	$0.00	$0.00
DARLING INGREDIENTS, INC.	$11,576.40	$11,576.40	$0.00	$0.00	$0.00
DAVE'S SAUSAGE FACTORY 2	$0.00	$0.00	$0.00	$0.00	$0.00
DEARBORN BREWING	$(29.48)	$0.00	$0.00	$0.00	$(29.48)
DEARBORN SAUSAGE	$0.00	$0.00	$0.00	$0.00	$0.00
DEARBORN SAUSAGE CO., INC.	$0.00	$0.00	$0.00	$0.00	$0.00
DETROIT BEER CO.	$(14.72)	$0.00	$0.00	$0.00	$(14.72)
DETROIT LINEN SERVICE	$0.00	$0.00	$0.00	$0.00	$0.00
DETROIT METRO WC AIRPORT	$0.00	$0.00	$0.00	$0.00	$0.00
DETROIT RIVERTOWN BREWERY CC	$665.05	$665.05	$0.00	$0.00	$0.00
DETROIT SAUSAGES CO INC	$17.70	$17.70	$0.00	$0.00	$0.00
DETRONIC INDUSTRIES, INC.	$74.38	$74.38	$0.00	$0.00	$0.00
DIFCO LABORATORIES, INC.	$0.00	$0.00	$0.00	$0.00	$0.00
DIVERSIFIED CHEM TECH. INC.	$88.70	$88.70	$0.00	$0.00	$0.00
DOMESTIC UNIFORM RENTAL	$3,890.90	$3,890.90	$0.00	$0.00	$0.00
DOMESTIC UNIFORM RENTAL	$1,648.69	$1,648.69	$0.00	$0.00	$0.00
DOWNEY BREWING COMPANY	$53.72	$23.83	$0.00	$0.00	$29.89
E.W. GROBBEL'S SONS, INC.	$4,525.89	$4,525.89	$0.00	$0.00	$0.00
EASTERN MARKET BREWING COMPA	$81.91	$81.91	$0.00	$0.00	$0.00
ENVIROSOLIDS, L.L.C.	$0.00	$0.00	$0.00	$0.00	$0.00
EQ DETROIT, INC.	$6,660.14	$5,795.83	$864.31	$0.00	$0.00

GLWA Aged Accounts Receivable- POLLUTANT SURCHARGE ACCOUNTS

Balances as of 02/28/22

Customer Name	Total Due	Current	46 - 74 Days	75 - 104 Days	>105 Days
EQ DETROIT, INC.	$16,868.30	$11,971.23	$4,897.07	$0.00	$0.00
EQ DETROIT, INC.	$233.42	$44.29	$95.61	$77.63	$15.89
EQ DETROIT, INC.	$0.00	$0.00	$0.00	$0.00	$0.00
ETON ST BREWERY- GRIFFIN CLA	$1,613.39	$1,613.39	$0.00	$0.00	$0.00
EXTRUDE HONE CORPORATION	$152.26	$152.26	$0.00	$0.00	$0.00
EXTRUDEHODE	$0.00	$0.00	$0.00	$0.00	$0.00
FARMINGTON BREWING COMPANY	$0.22	$0.22	$0.00	$0.00	$0.00
FAYGO BEVERAGES, INC.	$20,525.07	$20,525.07	$0.00	$0.00	$0.00
FIVES CINETIC CORP.	$3,532.86	$3,532.86	$0.00	$0.00	$0.00
FOUNDERS BREWING COMPANY	$22.36	$22.36	$0.00	$0.00	$0.00
FRESH-PAK	$614.32	$614.32	$0.00	$0.00	$0.00
FRESH-PAK	$0.00	$0.00	$0.00	$0.00	$0.00
GENERAL LINEN SUPPLY CO.	$2,794.32	$2,794.32	$0.00	$0.00	$0.00
GLOBAL TITANIUM, INC.	$0.00	$0.00	$0.00	$0.00	$0.00
GRANITE CITY FOOD & BREWERY	$(38.34)	$0.00	$(38.34)	$0.00	$0.00
GRANITE CITY FOOD & BREWERY	$0.00	$0.00	$0.00	$0.00	$0.00
GRANITE CITY FOOD & BREWERY	$0.00	$0.00	$0.00	$0.00	$0.00
GREAT BARABOO BREWING CO.	$0.00	$0.00	$0.00	$0.00	$0.00
HACIENDA MEXICAN FOODS	$1,710.81	$1,035.26	$475.59	$199.96	$0.00
HENKEL CORPORATION	$0.00	$0.00	$0.00	$0.00	$0.00
HOME STYLE FOOD INC.	$(285.99)	$(285.99)	$0.00	$0.00	$0.00
HOMEGROWN BREWING COMPANY	$37.35	$37.35	$0.00	$0.00	$0.00

GLWA Aged Accounts Receivable- POLLUTANT SURCHARGE ACCOUNTS

Balances as of 02/28/22

Customer Name	Total Due	Current	46 - 74 Days	75 - 104 Days	>105 Days
HOODS CLEANERS	$211.33	$0.00	$0.00	$0.00	$211.33
HOUGHTON INTERNATIONAL INC.	$(117.70)	$0.00	$0.00	$0.00	$(117.70)
HOUGHTON INTERNATIONAL INC.	$280.56	$105.32	$80.94	$94.30	$0.00
HOUGHTON INTERNATIONAL INC.	$(6,140.72)	$0.00	$0.00	$0.00	$(6,140.72)
HUNTINGTON CLEANERS	$287.69	$287.69	$0.00	$0.00	$0.00
IDP, INC.	$0.00	$0.00	$0.00	$0.00	$0.00
INDUSTRIAL METAL COATING	$898.57	$565.45	$333.12	$0.00	$0.00
INTRASTATE DISTRIBUTORS	$1,409.54	$1,409.54	$0.00	$0.00	$0.00
ISLAMIC SLAUGHTER HOUSE	$475.32	$475.32	$0.00	$0.00	$0.00
ITALIAN BUTTER BREAD STICKS	$0.00	$0.00	$0.00	$0.00	$0.00
JAMEX BREWING CO.	$46.13	$21.09	$0.00	$0.00	$25.04
KAR NUT PRODUCTS	$0.00	$0.00	$0.00	$0.00	$0.00
KOWALSKI SAUSAGES, CO.	$697.07	$697.07	$0.00	$0.00	$0.00
KUHNHENN BREWING	$0.00	$0.00	$0.00	$0.00	$0.00
LA MICHOACANA FLOUR TORTILLA	$455.10	$440.75	$14.35	$0.00	$0.00
LA MICHOACANA FLOUR TORTILLA	$34.84	$32.78	$2.06	$0.00	$0.00
LEAR CORPORATION DBA EAGLE (	$2,743.38	$2,743.38	$0.00	$0.00	$0.00
LIBERTY STREET PROD. BREWERY	$0.00	$0.00	$0.00	$0.00	$0.00
LILY'S SEAFOOD GRILL & BREWE	$0.00	$0.00	$0.00	$0.00	$0.00
LIQUID ENVIRONMENTAL SOLUTIC	$1,443.60	$1,443.60	$0.00	$0.00	$0.00
MACDERMID, INC.	$984.89	$984.89	$0.00	$0.00	$0.00
MCCLURE'S PICKLES	$515.93	$515.93	$0.00	$0.00	$0.00
MCNICHOLS POLISHING & ANODIZ	$15.58	$0.00	$15.58	$0.00	$0.00

GLWA Aged Accounts Receivable- POLLUTANT SURCHARGE ACCOUNTS

Balances as of 02/28/22

Customer Name	Total Due	Current	46 - 74 Days	75 - 104 Days	>105 Days
MELLO MEATS INC, - KUBISCH S	$66.33	$66.33	$0.00	$0.00	$0.00
METROPOLITAN BAKERY	$603.61	$603.61	$0.00	$0.00	$0.00
MIBA HYDRAMECHANICA CORP.	$0.00	$0.00	$0.00	$0.00	$0.00
MICHIGAN DAIRY	$107,486.40	$107,486.40	$0.00	$0.00	$0.00
MICHIGAN PROD. MACHINING	$0.00	$0.00	$0.00	$0.00	$0.00
MICHIGAN SOY PRODUCTS CO.	$416.15	$416.15	$0.00	$0.00	$0.00
MIDWEST WIRE PRODUCTS, INC.	$0.00	$0.00	$0.00	$0.00	$0.00
MILANO BAKERY	$688.01	$688.01	$0.00	$0.00	$0.00
MILTON CHILI CO.	$0.00	$0.00	$0.00	$0.00	$0.00
MINNIE MARIE BAKERS, INC	$1,442.41	$1,442.41	$0.00	$0.00	$0.00
MISTER UNIFORM & MAT RENTALS	$(2.66)	$0.00	$0.00	$0.00	$(2.66)
MOTOR CITY BREWING WORKS	$398.90	$85.67	$0.00	$0.00	$313.23
NATIONAL CHILI COMPANY	$0.00	$0.00	$0.00	$0.00	$0.00
NEAPCO DRIVELINES	$2,534.31	$0.00	$2,534.31	$0.00	$0.00
NORTH CENTER BREWING COMPANY	$0.00	$0.00	$0.00	$0.00	$0.00
NORTHERN LAKES SEAFOOD & MEA	$16.51	$16.51	$0.00	$0.00	$0.00
OAKWOOD BAKERY	$0.00	$0.00	$0.00	$0.00	$0.00
PARKER'S HILLTOP BREWER & SP	$63.53	$23.92	$0.00	$0.00	$39.61
PELLERITO FOODS INC.	$18.14	$16.12	$2.02	$0.00	$0.00
PEPSI COLA, INC.	$35,299.46	$35,299.46	$0.00	$0.00	$0.00
PERDUE PREMIUM MEAT COMPANY	$38,143.24	$38,143.24	$0.00	$0.00	$0.00
PERDUE PREMIUM MEAT COMPANY	$13,068.71	$13,068.71	$0.00	$0.00	$0.00

GLWA Aged Accounts Receivable- POLLUTANT SURCHARGE ACCOUNTS

Balances as of 02/28/22

Customer Name	Total Due	Current	46 - 74 Days	75 - 104 Days	>105 Days
PERDUE PREMIUM MEAT COMPANY	$1,099.13	$1,099.13	$0.00	$0.00	$0.00
PERSONAL UNIFORM SERVICE, IN	$41.51	$41.51	$0.00	$0.00	$0.00
PETRO ENVIRON TECH, INC.	$0.00	$0.00	$0.00	$0.00	$0.00
PINE TREE ACRES, INC.	$20,706.00	$20,706.00	$0.00	$0.00	$0.00
PLATING SPEC	$0.00	$0.00	$0.00	$0.00	$0.00
POWER VAC OF MICHIGAN, INC.	$0.00	$0.00	$0.00	$0.00	$0.00
PREMIER PLATING, LLC	$1,612.66	$1,612.66	$0.00	$0.00	$0.00
PRODUCTION SPRING, LLC.	$0.00	$0.00	$0.00	$0.00	$0.00
QUALA SERVICES, LLC	$196.87	$196.87	$0.00	$0.00	$0.00
RAY'S ICE CREAM CO.	$0.00	$0.00	$0.00	$0.00	$0.00
RED SPOT PAINT #409139	$0.00	$0.00	$0.00	$0.00	$0.00
RIVER ROUGE BREWING COMPANY	$440.60	$0.00	$0.00	$0.00	$440.60
ROCHESTER MILLS BEER COMPANY	$502.03	$175.52	$0.00	$0.00	$326.51
ROCHESTER MILLS PROD BREWERY	$4,016.98	$1,618.75	$0.00	$0.00	$2,398.23
ROYAL OAK BREWERY	$(183.95)	$0.00	$0.00	$0.00	$(183.95)
RTT	$27,772.36	$0.00	$0.00	$0.00	$27,772.36
SEAFARE FOODS, INC.	$49.20	$49.20	$0.00	$0.00	$0.00
SHERWOOD BREWING COMPANY	$0.00	$0.00	$0.00	$0.00	$0.00
SMITH-WATKINS, LLC	$0.00	$0.00	$0.00	$0.00	$0.00
SPRAYTEK, INC.	$14.52	$0.00	$0.00	$0.00	$14.52
SUPERNATURAL SPIRITS & BREWI	$62.28	$62.28	$0.00	$0.00	$0.00
SWEETHEART BAKERY, INC.	$352.04	$104.68	$56.45	$57.48	$133.43
THERMO FISHER SCIENTIFIC	$25,359.50	$24,935.28	$424.22	$0.00	$0.00

GLWA Aged Accounts Receivable- POLLUTANT SURCHARGE ACCOUNTS

Balances as of 02/28/22

Customer Name	Total Due	Current	46 - 74 Days	75 - 104 Days	>105 Days
TOM LAUNDRY CLEANERS	$0.00	$0.00	$0.00	$0.00	$0.00
TRAFFIC JAM & SNUG	$(31.16)	$0.00	$0.00	$0.00	$(31.16)
TURRI'S ITALIAN FOODS	$0.00	$0.00	$0.00	$0.00	$0.00
TURRI'S ITALIAN FOODS	$0.00	$0.00	$0.00	$0.00	$0.00
U-METCO, INC.	$593.88	$593.88	$0.00	$0.00	$0.00
UNCLE RAYS SNACKS, LLC	$44,241.01	$44,241.01	$0.00	$0.00	$0.00
UNCLE RAYS SNACKS, LLC	$3,259.54	$3,259.54	$0.00	$0.00	$0.00
UNIQUE LINEN SERVICES, INC.	$0.00	$0.00	$0.00	$0.00	$0.00
UNITED FISH DISTRIBUTORS	$0.94	$0.94	$0.00	$0.00	$0.00
UNITED LINEN SERVICE, LLC.	$195.60	$195.60	$0.00	$0.00	$0.00
UNITED MEAT & DELI	$0.00	$0.00	$0.00	$0.00	$0.00
URBANREST BREWING COMPANY	$76.44	$76.44	$0.00	$0.00	$0.00
US ECOLOGY MICHIGAN	$563.52	$563.52	$0.00	$0.00	$0.00
US ECOLOGY ROMULUS, INC.	$1,925.09	$1,925.09	$0.00	$0.00	$0.00
USHER OIL SERVICES	$3,427.40	$3,427.40	$0.00	$0.00	$0.00
VALICOR ENVIROMENTAL SERVICE	$1,191.72	$1,191.72	$0.00	$0.00	$0.00
VAUGHAN INDUSTRIES, INC.	$31.73	$31.73	$0.00	$0.00	$0.00
VERNDALE PRODUCTS	$4,900.67	$4,900.67	$0.00	$0.00	$0.00
VERNDALE PRODUCTS, INC.	$475.98	$475.98	$0.00	$0.00	$0.00
VERNOR FOOD PRODUCTS	$(32.16)	$0.00	$0.00	$0.00	$(32.16)
WIGLEY'S MEAT PROCESS	$431.14	$431.14	$0.00	$0.00	$0.00
WINTER SAUSAGE MFG. CO.	$983.88	$983.88	$0.00	$0.00	$0.00

GLWA Aged Accounts Receivable- POLLUTANT SURCHARGE ACCOUNTS

Balances as of 02/28/22

Customer Name	Total Due	Current	46 - 74 Days	75 - 104 Days	>105 Days
WINTER SAUSAGE MFG. CO.	$302.89	$302.89	$0.00	$0.00	$0.00
WOLVERINE PACKING CO	$4,555.28	$4,555.28	$0.00	$0.00	$0.00
WOLVERINE PACKING CO.	$2,323.75	$2,323.75	$0.00	$0.00	$0.00
WOODWARD AVENUE BREWERS	$144.24	$0.00	$0.00	$0.00	$144.24
TOTAL POLLUTANT SURCHARGE ACCOUNTS	$518,942.80	$480,361.00	$9,768.66	$439.60	$28,373.54

City of Highland Park Billings and Collections

	Water	Sewer	IWC	Cumulative Total
June 30, 2012 Balance	$ -	$ 10,207,956	$ 852,987	$ 11,060,943
FY 2013 Billings	485,887	4,987,635	154,444	5,627,966
FY 2013 Payments	(65,652)	(2,206,211)	-	(2,271,863)
				-
June 30, 2013 Balance	$ 420,235	$ 12,989,380	$ 1,007,431	$ 14,417,046
FY 2014 Billings	1,004,357	6,980,442	161,951	8,146,750
FY 2014 Payments	-	(1,612,633)	-	(1,612,633)
				-
June 30, 2014 Balance	$ 1,424,592	$ 18,357,189	$ 1,169,382	$ 20,951,163
FY 2015 Billings	1,008,032	5,553,123	165,739	6,726,894
FY 2015 Payments	-	(1,444,623)	-	(1,444,623)
				-
June 30, 2015 Balance	$ 2,432,625	$ 22,465,689	$ 1,335,121	$ 26,233,435
FY 2016 Billings	1,157,178	5,612,167	106,431	6,875,776
FY 2016 Payments	-	(2,022,335)	-	(2,022,335)
				-
June 30, 2016 Balance	$ 3,589,803	$ 26,055,521	$ 1,441,551	$ 31,086,875
FY 2017 Billings	1,245,267	5,802,000	101,999	7,149,265
FY 2017 Payments	-	(2,309,186)	-	(2,309,186)
				-
June 30, 2017 Balance	$ 4,835,070	$ 29,548,335	$ 1,543,550	$ 35,926,954
FY 2018 Billings	1,277,179	5,657,101	80,472	7,014,752
FY 2018 Payments	-	(4,108,108)	-	(4,108,108)
June 30, 2018 Balance	$ 6,112,248	$ 31,097,327	$ 1,624,022	$ 38,833,597
FY 2019 Billings	1,238,797	5,617,100	51,220	6,907,117
FY 2019 Payments	-	(5,241,583)	-	(5,241,583)
June 30, 2019 Balance	$ 7,351,045	$ 31,472,844	$ 1,675,243	$ 40,499,132
FY 2020 Billings	1,182,639	5,665,400	47,097	6,895,136
FY 2020 Payments	-	(3,026,117)	-	(3,026,117)
June 30, 2020 Balance	$ 8,533,684	$ 34,112,127	$ 1,722,340	$ 44,368,151
FY 2021 Billings	1,185,506	5,702,000	47,423	6,934,929
FY 2021 Payments	-	(2,783,552)	-	(2,783,552)
June 30, 2021 Balance	$ 9,719,190	$ 37,030,575	$ 1,769,763	$ 48,519,528
FY 2022 Billings (8 Months)	830,251	3,603,700	32,302	4,466,253
FY 2022 Payments (8 Months)	-	-	-	-
Balance as of February 28, 2022	**$ 10,549,441**	**$ 40,634,275**	**$ 1,802,065**	**$ 52,985,781**

AGENDA ITEM #8C

Financial Services
Audit Committee Communication

Date: May 27, 2022

To: Great Lakes Water Authority Audit Committee

From: Megan Savage, Vendor Outreach Coordinator

Re: Business Inclusion & Diversity Program Update

Background: On November 25, 2020, the GLWA Board of Directors approved an amendment to the Procurement Policy allowing for the formation of a new Business Inclusion & Diversity (B.I.D.) Program within the Financial Services' Procurement Group. The B.I.D. Program Team, which includes internal GLWA Team Members as well as external consultants, executed a Phase I launch of the program on February 1, 2021 and a Phase II launch on July 1, 2021.

Analysis: This month we present tables to recap B.I.D. Program activity from the date of the program launch on February 1, 2021 through April 30, 2022 for procurements budgeted to exceed $1 million.

Table 1: B.I.D. Eligible Procurements as of April 30, 2022

Table 1 provides an overview of the total number of B.I.D. Program-eligible Procurements awarded, in evaluation, or advertised as active opportunities in GLWA's Bonfire Procurement Portal. Each vendor who submits a response to a B.I.D. Program-eligible procurement must also submit a Business Inclusion and Diversity Plan. The total number of Diversity Plans that GLWA has received for B.I.D.-eligible procurements that have been awarded and that are in evaluation is also provided.

	Awarded	In Evaluation Phase	Active (Advertised)	Total
Procurements Requiring B.I.D. Submittals	28	14	5	47
Total Number of Diversity Plans Submitted	84	41	n/a	125

Table 2: Scored Criteria for Awarded Procurements

Table 2 provides a breakdown of the percentage of B.I.D. Program-eligible procurements awarded thus far that met the B.I.D. Program scored criteria. The scored criteria is based on whether the vendor has a business presence in the state of Michigan, GLWA's Member Partner service area, or a disadvantaged municipality within GLWA's service area.

	Procurements Awarded Meeting B.I.D. Criteria as a % of Total Awards
Michigan Location	93%
Member Partner Service Area	86%
Disadvantaged Service Area Territory	54%

Table 3: Non-Scored Criteria - Disadvantaged, Minority-owned, Women-owned, and Small Businesses

Table 3 provides a breakdown of the percentage of B.I.D. Program-eligible procurements awarded thus far that met the B.I.D. Program Non-Scored Criteria. This Non-Scored Criteria refers to any diversity certifications that the vendor may hold as a Disadvantaged Business Enterprise (DBE), Minority-Owned Business Enterprise (MBE), Women-Owned Business Enterprise (WBE), or Small Business Enterprise (SBE).

	Procurements Awarded as a % of Total Awards
Awarded	64%

Table 4: Overall Contracts Awarded

Table 4 provides a breakdown of overall dollars awarded under the B.I.D. Program thus far, distinguishing between firms that met all four B.I.D. Program scoring criteria (including scored and non-scored criteria) and firms that met all three criteria (scored criteria only).

	Total Contract Count	Total Contract Amount (in millions)
Eligible Procurements	28	$284.5
Firms that met four criteria	18	$115.8
Firms that met three criteria	10	$168.7

Other activities completed this month to expand awareness of the B.I.D. Program and to foster the development of effective diversity plans included the following.

- Delivered virtual presentation on GLWA's procurement process and B.I.D. Program to U.S. Small Business Administration (SBA) small business vendors on May 12, 2022.
- Continued attendance of the B.I.D. Program Liaison at all Pre-Bid and Pre-Proposal solicitation meetings to overview the B.I.D. Program requirements and answer any questions from vendors/contractors.
- Contract language for B.I.D. Program requirements reviewed with Legal and being added to contract templates.
- Confirmed vendor registration and reporting capabilities within Bonfire to track identified criteria.

Additionally, the following tasks remain at the top of our priority list.

- Continued evaluation of the insurance and bonding requirements for small, minority-owned, and disadvantaged business enterprises.
- Identifying meaningful reporting and performances measures.

Proposed Action: Receive and file this report.

The Quarterly WRAP Report includes the following:

1. Key Takeaways
2. Background
3. Community Participation
4. Approved Program Changes
5. Current Year Budget and Allocations
6. Reallocation Activity
7. Current Program Year Objectives
8. Looking Ahead

Key Takeaways

- To leverage the availability of one-time funding from Low-Income Household Water Assistance Program (LIHWAP), demand for WRAP enrollments decreased by 46 percent in Q3. This provides for increased funding in future quarters as the LIHWAP funding is depleted.
- Total enrollments overall have increased by 26 percent and are on track to exceed enrollment numbers from FY2021 and FY2020.
- Assistance provided through plumbing repairs for Q3 is nearly three times the level of activity in Q2.
- Reallocations proposed at the May 27, 2022 Audit Committee will address timing issues related to an overcommitment of approximately $281,000 within the categories for the cities of Detroit and Flint as a result in delays in the reallocation request.

Background

The Water Residential Assistance Program ("WRAP") provides sustainable funding for qualifying low-income residents served by the Great Lakes Water Authority's ("GLWA") member partners. The program is funded by GLWA at an amount equal to 0.5 percent of budgeted revenues for the Regional System and not less than 0.5 percent, but not greater than 1.0 percent of budgeted revenues for the DWSD Local System. The budgeted WRAP funding for FY 2022 is $6.2 million combined for water and sewer services.

The approved guidelines include funding for a) payment assistance and b) water audit and water conservation measures. Eligible residential customers with a past due bill and/or who are in active shut off can receive assistance with paying down arrears and receive $25 toward monthly bill payment assistance annually up to $1,000. Households are offered a home audit and home water conservation services of an average $1,500 per household. To participate in WRAP, an applicant must have household gross incomes at or below 200% of the federal poverty income thresholds. WRAP participants are also encouraged to participate in both financial coaching and water conservation workshops as well as other support services. The program is administered through partnership with local community action agencies (CAAs).

The WRAP began assisting residents in the GLWA service area on March 1, 2016. Since inception through March 31, 2022, WRAP has committed over $26.5 million in assistance and conservation funds to qualified participants. This program has the potential to serve over 100 communities within the GLWA service area.

The detailed performance metrics for the FY 2022 WRAP program as prepared by Public Sector Consultants, follows in Appendix A. Overall performance information as well as separate reporting for Wayne Metro, OLHSA, MCA and GCCARD are included.

Community Participation

A community must receive water and/or sewer service from GLWA to be eligible for WRAP. Each eligible community can choose their level of participation. Option 1 includes bill assistance, arrearage assistance and conservation. Option 2 includes bill assistance and conservation, and Option 3 includes conservation only. To receive bill and arrearage assistance, eligible communities must formally opt into the program by signing a memorandum of agreement with their respective community action agency. To date, 80 communities have opted into WRAP. ***Table 1 – WRAP Community Participation*** shows the level of participation that each community has chosen.

Table 1 – WRAP Community Participation

Member Community	County	Option #1	Option #2	Option #3	In Progress	Not Opted In
Flint	Genesee	X				
Almont	Lapeer		X			
Imlay City	Lapeer					X
Lapeer	Lapeer	X				
Mayfield Township	Lapeer					X
Bruce Township	Macomb					X
Center Line	Macomb	X				
Chesterfield Township	Macomb	X				
Clinton Township	Macomb		X			
Eastpointe	Macomb	X				
Fraser	Macomb					X
Harrison Township	Macomb	X				
Lenox Township	Macomb					X
Macomb Township	Macomb	X				
New Haven	Macomb	X				
Romeo	Macomb					X
Roseville	Macomb					X
Shelby Township	Macomb	X				
St. Clair Shores	Macomb	X				
Sterling Heights	Macomb	X				
Utica	Macomb	X				
Warren	Macomb	X				
Washington Township	Macomb		X			
Ash Township	Monroe	X				
Berlin Township	Monroe					X
Carleton	Monroe					X
Estral Beach	Monroe					X
South Rockwood	Monroe					X
Auburn Hills	Oakland					X
Berkley	Oakland	X				
Beverly Hills	Oakland	X				
Bingham Farms	Oakland	X				
Birmingham	Oakland	X				
Bloomfield Hills	Oakland	X				
Bloomfield Township	Oakland	X				
Clarkston	Oakland					X
Clawson	Oakland	X				
Commerce Township	Oakland	X				
Farmington	Oakland	X				
Farmington Hills	Oakland	X				
Ferndale	Oakland	X				
Franklin	Oakland					X
Hazel Park	Oakland		X			
Huntington Woods	Oakland	X				
Independence Township	Oakland					X
Keego Harbor	Oakland	X				
Lake Angelus	Oakland					X
Lake Orion	Oakland	X				
Lathrup Village	Oakland	X				
Madison Heights	Oakland	X				
Novi	Oakland					X
Oak Park	Oakland		X			
Oakland Township	Oakland					X
Orchard Lake	Oakland	X				
Orion Township	Oakland	X				
Oxford Township	Oakland					X
Oxford Village	Oakland	X				
Pleasant Ridge	Oakland	X				
Pontiac	Oakland	X				
Rochester	Oakland					X
Rochester Hills	Oakland					X
Royal Oak, City of	Oakland	X				
Royal Oak Township	Oakland	X				
Southfield, City of	Oakland	X				
Southfield Township	Oakland					X
Sylvan Lake	Oakland					X
Troy	Oakland					X
Walled Lake	Oakland	X				
Waterford Township	Oakland		X			
West Bloomfield Twp.	Oakland		X			
Wixom	Oakland					X
Burtchville Township	St. Clair					X
Augusta Township	Washtenaw	X				
Pittsfield Township	Washtenaw	X				
Superior Township	Washtenaw	X				
York Township	Washtenaw					X
Ypsilanti, City of	Washtenaw	X				
Ypsilanti Township	Washtenaw	X				
Allen Park	Wayne	X				
Belleville	Wayne					X
Brownstown Township	Wayne	X				
Canton Township	Wayne	X				
Dearborn	Wayne	X				
Dearborn Heights	Wayne	X				
Detroit	Wayne	X				
Ecorse	Wayne	X				
Flat Rock	Wayne	X				
Garden City	Wayne	X				
Gibraltar	Wayne		X			
Grosse Ile Township	Wayne					X
Grosse Pointe	Wayne					X
Grosse Pointe Farms	Wayne					X
Grosse Pointe Park	Wayne					X
Grosse Pointe Shores	Wayne	X				
Grosse Pointe Woods	Wayne					X
Hamtramck	Wayne	X				
Harper Woods	Wayne	X				
Huron Charter Township	Wayne					X
Inkster	Wayne	X				
Lincoln Park	Wayne		X			
Livonia	Wayne	X				
Melvindale	Wayne	X				
Northville, City of	Wayne	X				
Northville Township	Wayne					X
Plymouth, City of	Wayne		X			
Plymouth Township	Wayne					X
Redford Township	Wayne	X				
River Rouge	Wayne	X				
Riverview	Wayne					X
Rockwood	Wayne					X
Romulus	Wayne	X				
Southgate	Wayne	X				
Sumpter Township	Wayne					X
Taylor	Wayne		X			
Trenton	Wayne	X				
Van Buren Township	Wayne	X				
Wayne, City of	Wayne	X				
Westland	Wayne	X				
Woodhaven	Wayne		X			
119		68	12	0	0	39

Color Key
Wayne Metro
Macomb Community Action
OLHSA

Approved Program Changes

As a first-of-its-kind assistance program in the state of Michigan, changes to WRAP may be required as the program matures. Following is a summary of program changes made to WRAP since 2016, as approved by the GLWA Board of Directors.

November 30, 2016:

Allow member communities to opt into program features that best meet the needs of their community. This is captured in the three options below:

Option 1

- Assistance up to $300 per year in the form of $25 monthly bill credits. (Applicable if client continues to pay all current monthly/quarterly charges).
- Up to $700 in arrearage assistance to be paid 50% (up to $350) after six months in the program, and 50% (up to $350) after one year. Enrollees are eligible for a second-year arrearage assistance totaling $700.
- One-time home water audit for households above 120% of average usage.
- Home repairs up to $1,000 per household to fix minor plumbing issues leading to high usage (finding and fixing leaks, upgrading water using fixtures) and/or minor lead replacement assistance.

Option 2

- Assistance up to $300 per year in the form of $25 monthly bill credits. (Applicable if client continues to pay all current monthly/quarterly charges).
- One-time home water audit for households above 120% of average usage.
- Home repairs up to $1,000 per household to fix minor plumbing issues leading to high usage (finding and fixing leaks, upgrading water using fixtures) and/or minor lead replacement assistance.

Option 3

- One-time home water audit for households above 120% of average usage.
- Home repairs up to $1,000 per household to fix minor plumbing issues leading to high usage (finding and fixing leaks, upgrading water using fixtures) and/or minor lead replacement assistance.

August 22, 2018:

- Removal of the 120% usage requirement for the lead fixture replacement for in-home faucets that pre-date the lead-free plumbing code change.

January 23, 2019:

- Extend the 2-year time limitation to provide monthly bill assistance to senior citizens and disabled citizens.

March 11, 2020:

- Increase eligibility for residential customers from 150% to 200% or less of federal poverty level;
- Increase conservation and plumbing repairs spending per household from $1,000 to

an average of $1,500 and a cap of $2,000 per customer for eligible residential customers; and

- Allow eligible residential customers that are renters to take advantage of conservation and plumbing repairs to reduce their water consumption, upon landlord executing an agreement not to raise rents for one year.

October 28, 2020:

- Temporary change to 1) allow program participants who are unable to make monthly payments on time to remain in WRAP if they demonstrate a significant loss of income or inability to make a timely payment due to COVID-19; and 2) participants will still be eligible to receive monthly bill credits and arrears payments if applicable, until December 31, 2020.

April 28, 2021:

- Enabled the use of categorical eligibility to determine if a household can receive WRAP funds.
- Increased the WRAP arrearages payment cap to $1,200 per household, per year, for a total of $2,400 per household if they complete two years of the program.
- Updated the program reporting to include additional data on number of applicants deemed not eligible for WRAP, timeframe from application submission to program enrollment, number of participants making on-time bill payments, amount of arrearages paid per household, number of water audits completed, average cost of repairs per household, water consumption per household, number of program referrals, and additional forms of assistance provided via supplemental funding.

September 22, 2021:

- Created the ability for community action agencies to use special allowances for an additional $1,000 in certain plumbing repair circumstances.
- Expanded eligibility to conservation and minor plumbing repair services to any household within a GLWA member partner community, regardless of whether the community participates in WRAP
- Removed the high-water user eligibility requirement for conservation and minor plumbing repair services

Proposed July 1, 2022:

Proposed Board Action	Administrative Task
Authorize a WRAP "Sliding Scale Assistance <u>Approach</u>" that is based on relative average residential bill by community and household income to determine the level of payment assistance. The scale is established administratively with reporting to the Audit Committee to adapt to changing bill amounts by community.	Utilizing data from a number of sources, including individual communities, establish and publish the WRAP "Sliding Scale Assistance <u>Schedule</u>".

Proposed Board Action	Administrative Task
Authorize the elimination of the opt-in/opt-out and service level options for GLWA Member Communities, thereby allowing all eligible households in the GLWA service region to take advantage of the program.	Communicate this change to Member Partner Communities and service delivery partners

Current Year Budget and Allocations

Consistent with the previous fiscal years funding allocation for WRAP, the FY 2022 budgeted allocation is based on the proportionality of the revenues derived from each county and the city of Detroit, based on the approved FY 2022 water and sewer service charges and budget.

Table 2 - FY 2022 WRAP Budget and Allocations - This table shows the allocation of the budgeted WRAP funds, which is reflective of the approved FY 2022 budget of $6.2 million. The city of Detroit is shown separately from the remaining Wayne County allocation. The city of Detroit is currently allocated 26% of total wholesale WRAP funding and contributes additional, local WRAP funding which increases the overall program impact.

Table 2 - FY 2022 WRAP Budget and Allocations

Community	Budgeted Direct Assistance	Budgeted Conservation Assistance	Budgeted Administration Cost Cap - 12%	Total Budgeted Revenue	Revenue Allocation
WAYNE METRO					
CITY OF DETROIT					
Wholesale Funding	$756,264	$189,066	$116,839	$1,062,169	26.14%
Local Funding	1,553,228	388,307	239,965	2,181,500	
TOTAL DETROIT	$2,309,492	$577,373	$356,804	$3,243,669	26.14%
WAYNE COUNTY	731,249	182,812	112,974	1,027,034	25.27%
GENESSE COUNTY	16,660	4,165	2,574	23,399	0.58%
WASHTENAW COUNTY	39,392	9,848	6,086	55,326	1.36%
MONROE COUNTY	6,350	1,587	981	8,918	0.22%
TOTAL WAYNE METRO	3,103,142	775,786	479,418	4,358,346	53.57%
OAKLAND LIVINSTON HUMAN SERVICE AGENCY					
OAKLAND COUNTY	806,739	201,685	124,637	1,133,060	27.88%
MACOMB COMMUNITY ACTION AGENCY					
MACOMB COUNTY	519,461	129,865	80,254	729,580	17.95%
LAPEER COUNTY	12,487	3,122	1,929	17,538	0.43%
ST. CLAIR COUNTY	4,825	1,206	745	6,777	0.17%
TOTAL MACOMB COMMUNITY ACTION AGENCY	536,773	134,193	82,928	753,895	18.55%
GRAND TOTAL	$4,446,654	$1,111,663	$686,983	$6,245,300	100.00%

(1) Based on allocation of assistance funds of 80% Direct Bill Asst. and 20% Conservation Asst.
(2) Based on FY 2022 Budgeted WRAP Funding of:

Wholesale Funding	$4,063,800
Detroit Local Funding	2,181,500
Total WRAP Funding	$6,245,300

Reallocation Activity

After the completion of each fiscal year, a GLWA staff makes a recommendation to the GLWA Board of Directors for the reallocation of uncommitted assistance and conservation funds to those member communities that have fully committed their annual budgeted funds due to the increased need within their community. The next reallocation analysis is complete and will be presented at the Audit Committee meeting on May 27, 2022, for recommendation to the GLWA Board of Directors.

The Board authorized reallocation of uncommitted FY 2016 to FY 2019 WRAP funds to the City of Detroit and the City of Flint is captured in Table 3 below. To date, $4.4 million has been reallocated to Detroit and $1.4 million to the City of Flint from the other counties within GLWA.

Table 3 – Total WRAP Reallocation of Uncommitted Funds

Reallocated Funds	Detroit	Flint	Total
FY 2016	$1,664,833	$117,485	$1,782,318
FY 2017	786,981	425,635	1,212,616
FY 2018	794,400	427,755	1,222,155
FY 2019	1,182,593	471,562	1,654,155
Total Reallocation	**$4,428,807**	**$1,442,437**	**$5,871,244**

Current Program Year Objectives

GLWA, PSC, the CAAs and participating communities have been working together to improve WRAP program effectiveness. The table below details the objectives that were identified for the FY 2022 program year, as well as their status update.

1. Provide flexibility for the community action agencies to administer the program
   - Clarifications has been provided to CAAs to allow for instances of non-traditional income, or no documented income.
   - GLWA has a plan in place for improvements taking effect in FY2023, to allow for additional flexibility.
2. Codify decentralized program delivery model
   - Separate contracts for WRAP administration have been executed with Wayne Metro and Macomb Community Action.
   - Additional service delivery partners are actively being explored.
3. Recruit nonparticipating member communities
   - GLWA has a plan in place taking effect in FY2023 that will allow for all eligible households in the GLWA service area to participate in WRAP.
4. Make WRAP more accessible for residents

   - GLWA has a plan in place taking effect in FY2023 that will improve program accessibility.
5. Improve performance reporting, financial monitoring, cost of service, and program effectiveness
   - GLWA has a plan in place taking effect in FY2023 that will address these needed improvements.
6. Simplify monthly bill payment process
   - GLWA has a plan in place taking effect in FY2023 that will address the bill payment process.
7. Enhance conservation and water repair services
   - Program changes made in September 2021 enabled a higher cap on funds available for conservation and minor plumbing repairs, as well as who was eligible for the services.
   - An emphasis on creating a healthy home, rather than just reducing water consumption has been made.
8. Leverage other forms of assistance:
   - Other forms of assistance are being leveraged alongside WRAP. The current program that is being significantly leveraged is LIHWAP. Service delivery partners are enrolling clients in LIHWAP, paying down arrears, and then enrolling them in WRAP through categorical eligibility.
   - GLWA continues to explore ways to align WRAP with other assistance programs and relies on our service delivery partners to provide wraparound service to clients upon intake.

Looking Ahead

At the March 25, 2022, Audit Committee meeting, proposed program improvements beginning in FY 2023 were presented. The Audit Committee expressed their alignment with these proposed changes, which has allowed us to engage additional stakeholder and service delivery partner engagement in the work to achieve those program improvements. A report is being prepared for a Board of Directors presentation in June as well as the One Water Partnership in June. Below is a summary of those changes.

- Create a sliding scale for bill payment assistance based on the size of the water bill and household income.
  - GLWA has partnered with Raftelis to conduct a survey of member communities to provide an understanding of water and sewer bills throughout the region.
- Reduce the administrative burden on our member communities through empowering service delivery partners to work directly with households to review their progress in making payments as a pathway to long-term success.
- Provide WRAP as a core service to GLWA Member Communities, thereby eliminating the opt-in/opt-out and service levels and simplifying the program.

- Form advisory panels for Member Partners and Stakeholder to maintain engagement, provide feedback, and evaluate success.
- Track data more closely and directly to allow for better monitor the program's effectiveness.
- Allow for flexibility of documented income to fully enable categorical eligibility.
- Engage other potential service delivery partners in addition to the CAAs to help with program aspects like outreach and conservation measures.
- Provide more frequent reviews to stakeholders of overall program utilization.

GLWA - WRAP Program Summary Report (FY 2022) - All Jurisdictions							
	Total FY 2022	**Total FY 2021**	**Total FY 2020**				
Budgeted Program Funding	**$6,245,300**	**$6,888,500**	**$4,868,100**				
Total Funds Allocated - Direct Assistance	$4,446,654	$4,428,320	$3,528,422				
Total Funds Allocated - Conservation Assistance	$1,111,663	$1,107,080	$882,105				
NEW Total Funds Allocated- Adminstrative Costs	$686,983						
Allocation Percentage	100.0%	100.0%	100.0%				
	FY 2022 - Q1 **July - September 2021**	**FY 2022 - Q2** **October - December 2021**	**FY 2022 - Q3** **January -March 2022**	**FY 2022 - Q4** **April - June 2022**	**FY 2022** **YTD**	**FY 2021** **Total**	**FY 2020** **Total**
Bill Payment Assistance							
Number of households enrolled	1,401	3,084	1,664		6,149	6,245	5,627
Year 1	817	2,137	1,112		4,066	4,169	2,965
Year 2	477	794	350		1,621	1,580	1,903
WRAPFinity	107	153	131		391	496	759
Amount ($) of total assistance provided (Committed)	$ 1,226,896.09	$ 2,186,651.01	$ 1,314,362.82		$ 4,727,909.92	$ 4,213,964.12	$ 3,521,396.66
Amount ($) of total assistance remaining (Uncommitted)	$ 3,219,757.91	$ 1,033,106.90	$ (281,255.92)		$ (281,255.92)	$ 214,355.88	$ 7,025.34
Amount ($) of average assistance awarded per household	$ 875.73	$ 709.03	$ 789.88		$ 768.89	$ 674.77	$ 625.80
Arrearage Assistance							
Number of shut-offs avoided	1	74	98		173	864	2,210
Number of households enrolled with an arrearage balance	1,209	1,526	1,212		3,947	5,483	4,546
Percentage of enrolled households	86%	49%	73%		64%	88%	81%
Average arrearage balance per household	$ 1,049.64	$ 1,090.88	$ 1,021.35		$ 1,044.32	$ 1,187.49	$ 1,004.64
Amount of arrearages paid (awarded) per household	$ 746.43	$ 515.29	$ 703.07		$ 613.47	$ 501.51	$ 478.81
Conservation and Plumbing Repairs Assistance							
Number of households enrolled in Conservation	438	310	394		1,142	2,257	1,445
Number of water audits completed	438	286	377		1,101	1,206	567
NEW Amount ($) of conservation assistance provided*	$ 171,200.00	$ 114,400.00	$ 150,800.00		$ 436,400.00	N/A	N/A
NEW Amount ($) of plumbing repairs assistance provided*	$ 217,360.00	$ 131,905.85	$ 370,910.96		$ 720,176.81	$ 450,159.28	$ 157,568.25

*Data for FY 22 has been disaggregated between conservation and plumbing repairs

PUBLIC SECTOR CONSULTANTS

GLWA - WRAP Program Summary Report (FY 2022) - Wayne Metro							
	Total FY 2022	**Total FY 2021**	**Total FY 2020**				
Budgeted Program Funding	**$4,358,346**	**$4,148,306**	**$2,990,311**				
Total Funds Allocated - Direct Assistance	$3,103,142	$2,991,124	$2,137,540				
Total Funds Allocated - Conservation Assistance	$775,786	$747,781	$534,384				
Total Funds Allocated- Adminstrative Costs	$479,418						
Allocation Percentage	69.8%	60.2%	61.4%				
	FY 2022 - Q1 July - September 2021	**FY 2022 - Q2 October - December 2021**	**FY 2022 - Q3 January -March 2022**	**FY 2022 - Q4 April - June 2022**	**FY 2022 YTD**	**FY 2021 Total**	**FY 2020 Total**
Bill Payment Assistance							
Number of households enrolled	1,051	2,696	1,386		5,133	5,310	4,680
Year 1	669	1,839	944		3,452	3,686	2,570
Year 2	292	717	317		1,326	1,235	1,437
WRAPFinity	90	140	125		355	389	673
Amount ($) of total assistance provided (Committed)	$ 917,242.34	$ 1,918,330.89	$ 1,095,679.40		$ 3,931,252.63	$ 3,771,259.23	$ 2,922,264.91
Amount ($) of total assistance remaining (Uncommitted)	$ 2,185,899.66	$ 267,568.77	$ (828,110.63)		$ (828,110.63)	$ (780,135.23)	$ (784,724.91)
Amount ($) of average assistance awarded per household	$ 872.73	$ 711.55	$ 790.53		$ 765.88	$ 710.22	$ 624.42
Number of participants dropped from WRAP							
Arrearage Assistance							
Number of shut-offs avoided	N/A	12	5		17	822	2,160
Number of households enrolled with an arrearage balance	1,038	1,308	1,040		3,386	4,906	3,980
Percentage of enrolled households	99%	49%	75%		66%	92%	85%
Average arrearage balance per household (reported for newly enrolled households)	$ 1,077.97	$ 1,121.56	$ 1,082.66		$ 1,095.76	$ 1,241.94	$ 1,025.39
Amount of arrearages paid per household	$ 730.51	$ 507.07	$ 717.17		$ 603.52	$ 508.43	$ 478.76
Conservation and Plumbing Repairs Assistance							
Number households enrolled in Conservation	385	256	336		977	2037	1,280
Number of water audits completed	385	256	336		977	1,163	488
Amount ($) of conservation assistance provided*	$ 154,000.00	$ 102,400.00	$ 134,400.00		$ 390,800.00	N/A	N/A
NEW Amount ($) of plumbing repairs assistance provided*	$ 207,076.00	$ 120,688.37	$ 341,604.00		$ 669,368.37	$ 437,022.28	$ 138,487.25

*Data for FY 22 has been disaggregated between conservation and plumbing repairs

PSC PUBLIC SECTOR CONSULTANTS

GLWA - WRAP Program Summary Report (FY 2022) - Macomb County Community Action

	Total FY 2022	Total FY 2021	Total FY 2020				
Budgeted Program Funding	**$753,894**	**$766,064**	**$740,103**				
Total Funds Allocated - Direct Assistance	$536,773	$567,491	$548,215				
Total Funds Allocated - Conservation Assistance	$134,193	$141,873	$137,053				
Total Funds Allocated- Adminstrative Costs	$82,928						
Allocation Percentage	12.1%	11.1%	15.2%				
	FY 2022 - Q1 July - September 2021	**FY 2022 - Q2 October - December 2021**	**FY 2022 - Q3 January -March 2022**	**FY 2022 - Q4 April - June 2022**	**FY 2022 YTD**	**FY 2021 Total**	**FY 2020 Total**
Bill Payment Assistance							
Number of households enrolled	121	144	207		472	407	270
Year 1	62	103	168		333	258	100
Year 2	52	38	33		123	74	71
WRAPFinity	7	3	6		16	75	57
Amount ($) of total assistance provided (Committed)	$ 71,635.94	$ 108,416.80	$ 163,612.77		$ 343,665.51	$ 101,329.36	$ 99,981.04
Amount ($) of total assistance remaining (Uncommitted)	$ 465,137.06	$ 356,720.26	$ 193,107.49		$ 193,107.49	$ 466,161.64	$ 448,233.96
Amount ($) of average assistance awarded per household	$ 592.03	$ 752.89	$ 790.40		$ 728.10	$ 248.97	$ 370.30
Number of participants dropped from WRAP							
Arrearage Assistance							
Number of shut-offs avoided	1	62	93		156	41	50
Number of households enrolled with an arrearage balance	63	98	122		283	199	93
Percentage of enrolled households	52%	68%	59%		60%	49%	34%
Average arrearage balance per household (reported for newly enrolled households)	$ 541.84	$ 592.65	$ 619.43		$ 590.19	$ 393.90	$ 475.38
Amount of arrearages paid per household	$ 552.12	$ 579.57	$ 621.57		$ 594.62	$ 151.55	$ 321.59
Conservation and Plumbing Repairs Assistance							
Number of households enrolled in Conservation	10	34	45		89	$ 106.00	$ 38.00
Number of water audits completed	10	10	28		48	5	11
Amount ($) of conservation assistance provided*	N/A	$ 4,000.00	$ 11,200.00		$ 15,200.00	N/A	N/A
NEW Amount ($) of plumbing repairs assistance provided*	$ 5,618.00	$ 10,480.48	$ 22,264.96		$ 38,363.44	$ 697.00	$ 2,909.00

*Data for FY 22 has been disaggregated between conservation and plumbing repairs

PSC PUBLIC SECTOR CONSULTANTS

GLWA - WRAP Program Summary Report (FY 2022) - Oakland Livingston Human Services Agency							
	Total FY 2022	**Total FY 2021**	**Total FY 2020**				
Budgeted Program Funding	**$1,133,061**	**$1,149,643**	**$1,114,023**				
Total Funds Allocated - Direct Assistance	$806,739	$851,554	$825,138				
Total Funds Allocated - Conservation Assistance	$201,685	$212,889	$206,285				
Total Funds Allocated- Adminstrative Costs	$124,637						
Allocation Percentage	18.1%	16.7%	22.9%				
	FY 2022 - Q1 July - September 2021	**FY 2022 - Q2 October - December 2021**	**FY 2022 - Q3 January -March 2022**	**FY 2022 - Q4 April - June 2022**	**FY 2022 YTD**	**FY 2021 Total**	**FY 2020 Total**
Bill Payment Assistance							
Number of households enrolled*	129	167	71		367	355	353
Year 1	86	123	N/A		209	223	224
Year 2	34	36	N/A		70	100	105
WRAPFinity	9	8	N/A		17	32	24
Amount ($) of total assistance provided (Committed)*	$ 117,523.98	$ 63,301.66	$ 55,070.65		$ 235,896.29	$ 247,099.36	$ 247,113.54
Amount ($) of total assistance remaining (Uncommitted)	$ 689,215.02	$ 625,913.36	$ 570,842.71		$ 570,842.71	$ 604,454.91	$ 578,024.69
Amount ($) of average assistance awarded per household	$ 911.04	$ 379.05	$ 775.64		$ 642.77	$ 696.05	$ 700.04
Number of participants dropped from WRAP							
Arrearage Assistance							
Number of shut-offs avoided	N/A	N/A	N/A		N/A	1	0
Number of households enrolled with an arrearage balance	108	69	50		227	313	306
Percentage of enrolled households	84%	41%	70%		62%	88%	87%
Average arrearage balance per household (reported for newly enrolled households)	$ 1,073.56	$ 770.64	$ 726.83		$ 905.11	$ 951.50	$ 874.00
Amount of arrearages paid per household	$ 804.33	$ 233.41	N/A		$ 529.44	$ 578.37	$ 495.87
Conservation and Plumbing Repairs Assistance							
Number of households enrolled in Conservation	0	2	13		15	102	124
Number of water audits completed	0	2	13		15	38	11
Amount ($) of conservation assistance provided**	0	$ 800.00	$ 5,200.00		$ 6,000.00	N/A	N/A
NEW Amount ($) of plumbing repairs assistance provided**	0	$ -	$ 7,042.00		$ 7,042.00	$ 12,440.00	$ 3,632.00

*For FY22 Q3, data source is March 2022 Statement of Expense

**Data for FY 22 has been disaggregated between conservation and plumbing repairs

PUBLIC SECTOR CONSULTANTS

GLWA - WRAP Program Summary Report (FY 2022) - Genesee County Community Action Resource Department							
	Total FY 2022	Total FY 2021	Total FY 2020				
Budgeted Program Funding	**$23,399**	**$24,488**	**$23,663**				
Total Funds Allocated - Direct Assistance	$16,660	$18,150	$17,528				
Total Funds Allocated - Conservation Assistance	$4,165	$4,538	$4,382				
Allocation Percentage	0.4%	0.4%	0.5%				
	FY 2022 - Q1 July - September 2021	**FY 2022 - Q2 October - December 2021**	**FY 2022 - Q3 January -March 2022**	**FY 2022 - Q4 April - June 2022**	**FY 2022 YTD**	**FY 2021 Total**	**FY 2020 Total**
Bill Payment Assistance							
Number of households enrolled*	100	77	0		177	173	324
Year 1	0	72	0		72	2	49
Year 2	99	3	0		102	171	275
WRAPFinity	1	2	0		3	0	0
Amount ($) of total assistance provided (Committed)*	$ 120,493.83	$ 96,601.66	$ -		$ 217,095.49	$ 94,275.17	$ 252,037.17
Amount ($) of total assistance remaining (Uncommitted)	$ (103,833.83)	$ (200,435.49)	$ (200,435.49)		$ (200,435.49)	$ (76,124.98)	$ (234,508.99)
Amount ($) of average assistance awarded per household	$ 1,204.94	$ 1,254.57	N/A		$ 1,226.53	$ 544.94	$ 777.89
Number of participants dropped from WRAP							
Arrearage Assistance							
Number of shut-offs avoided	0	N/A	N/A		0	0	0
Number of households enrolled with an arrearage balance	45	51	N/A		96	65	167
Percentage of enrolled households	45%	66%	N/A		54%	38%	52%
Average arrearage balance per household (reported for newly enrolled households)	$ 1,609.41	$ 1,694.56	N/A		$ 1,654.65	$ 1,196.31	$ 1,044.24
Amount of arrearages paid per household	$ 955.72	$ 1,015.09	N/A		$ 981.52	$ 472.22	$ 513.81
Conservation and Plumbing Repairs Assistance							
Number of households enrolled in Conservation	43	18	N/A		61	12	3
Number of water audits completed	43	18	N/A		61	-	57
Amount ($) of conservation assistance provided**	$ 17,200	$ 7,200	N/A		$ 24,400.00	N/A	N/A
NEW Amount ($) of plumbing repairs assistance provided**	$ 4,666	$ 737	N/A		$ 5,403.00	$ -	$ 12,540.00
*For FY22 Q3, data source is March 2022 Statement of Expense							
**Data for FY 22 has been disaggregated between conservation and plumbing repairs							

PSC PUBLIC SECTOR CONSULTANTS

Financial Services
Audit Committee Communication

Date: May 27, 2022

To: Great Lakes Water Authority Audit Committee

From: Deirdre Henry, Treasury Manager

Re: Quarterly Investment Report (Unaudited)

Background: As stated in section 14 of the Great Lakes Water Authority (GLWA) Investment Policy, quarterly reporting shall be presented to provide a clear picture of the status of the current GLWA investment portfolio. The attached report, prepared and presented by PFM Asset Management LLC, summarizes portfolio information through March 31, 2022 (unaudited).

Analysis: The Quarterly Investment Report complies with the requirements of Public Act 20 of 1948, as amended and the GLWA Investment Policy. GLWA is investing its funds in a diversified portfolio which includes bank deposits, money market funds, a local government investment pool (LGIP), U.S. Treasuries, Federal Agencies, and commercial paper. All securities in the portfolio comply with the GLWA investment policy. Key metrics are provided below with additional commentary in the attached report.

- Yield at Cost:
  - As of March 31, 2022: 0.38%
  - As of December 31, 2021: 0.38%

- Yield at Market:
  - As of March 31, 2022: 0.77%
  - As of December 31, 2021: 0.28%

- Portfolio Allocation in Cash/Money Market/LGIP Securities:
  - As of March 31, 2022: 44%
  - As of December 31, 2021: 48%

The Treasury group continues to work with PFM Asset Management LLC to identify strategies to maximize investment returns while meeting the GLWA standards for safety and liquidity.

Proposed Action: Receive and file this report.

Great Lakes Water Authority

Investment Performance Report – March 2022

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Executive Summary

PORTFOLIO RECAP

- Safety – The aggregate portfolio is diversified amongst cash, bank deposits, U.S. Treasuries, Federal Agencies, commercial paper, SEC-registered money market funds, and a local government investment pool. The total credit profile of the portfolio is strong with over 97% of the assets invested in bank deposits or securities that are rated within the two highest short and long-term rating classifications as established by Standard and Poor's.

- Liquidity – Great Lakes Water Authority ("GLWA") has continued to monitor its portfolio with the goal of limiting the allocation to cash and bank deposit accounts and maximizing the use of short-term investments to meet cash requirements. As of March 31, 2022, approximately 44% of the funds were held in cash and money market accounts maturing overnight.

- Return – The overall yield at market increased to 0.77% as of March 31, 2022, versus 0.28% as of December 31, 2021. The higher yield is reflective of the rise in interest rates that the market is currently experiencing. GLWA earned almost $2.7 million (unaudited) in investment income for the first nine months of fiscal year 2022 on a book value basis. We expect the investment income for GLWA for FY 2022 to be approximately $3.8 million.

AVAILABLE FUNDS (Unaudited)

Type	Financial Institution	Book Value	Market Value	Yield @ Cost *(as of 3/31/22)*	Yield @ Market *(as of 3/31/22)*
Deposit Account	Comerica	$14,281,306	$14,281,306	0.01%	0.01%
Deposit Account - Retainage	First Independence	$21,190,672	$21,190,672	0.01%	0.01%
Deposit Account – Flint Security Deposit	Chase	$3,814,090	$3,814,090	0.01%	0.01%
Deposit Account	Chase	$7,059,419	$7,059,419	0.05%	0.05%
Trust Money Market Fund	U.S. Bank	$242,183,373	$242,183,373	0.02%	0.02%
Money Market Fund	JP Morgan	$101,775,314	$101,775,314	0.02%	0.02%
Local Government Investment Pool	GovMIC	$2,855,915	$2,855,915	0.18%	0.18%
Managed Funds	PFMAM	$509,220,344	$503,698,118	0.66%	1.36%
MARCH 2022 TOTALS:		***$902,380,433***	***$896,858,207***	***0.38%***	***0.77%***
PREVIOUS QUARTER TOTALS:		*$883,511,270*	*$883,269,029*	*0.38%*	*0.28%*

The accounts at Comerica Bank get an earnings credit to offset bank fees. The funds and earnings in the Retainage account are held on behalf of the contractors and do not belong to GLWA. The funds and earnings in the Flint Security Deposit account are held on behalf of the City of Flint and do not belong to GLWA. In addition to the above, there also exists surety bonds in the amount of $323,059,258 as of 3/31/2022.

Investment Strategy

OVERALL STRATEGY

- All investment activity is conducted subject to GLWA's investment policy and state statutes while meeting the primary objectives of safety and liquidity. The portfolio is managed to a disciplined investment plan to provide improved safety and diversification while putting every dollar to work.
- GLWA, working with its investment advisor PFM Asset Management ("PFMAM"), has continued to invest its funds in a mixture of short and intermediate-term individual investment securities to ensure adequate liquidity to cover upcoming debt, pension payments, and operational requirements.
- PFMAM will continue to actively manage long-term portfolios with full discretion and align short-term balances with expected liabilities and identify strategies to maximize future investment income in the current interest rate environment, subject to GLWA's investment policy and state statutes.

PORTFOLIO PERFORMANCE – CURRENT PERIOD*

- The overall portfolio's original yield at cost stayed the same at 0.38% as of March 31, 2022.
- GLWA's total portfolio had a market yield of 0.77% at the end of March, compared to 0.28% as of 12/31/2021. Yield at market represents what the market would provide in return if the portfolio was purchased on March 31, 2022 (versus purchased in prior months / years). The higher yield at market is a result of the higher interest rate environment.
  - We utilize a variety of investment sectors, and because of that, this 0.77% yield at market as of 3/31/2022 is beneficial when compared to the 0.52% yield of the 3-Month U.S. Treasury Bill Index, which is a comparable market indicator.

PORTFOLIO PERFORMANCE – PROJECTIONS

- GLWA earned almost $2.7 million (unaudited) in investment income for fiscal year-to-date 2022 (as of March 31, 2022) on a book value basis.
- The current period earnings are in line with budget expectations, especially with multiple Federal Reserve interest rate hikes priced into the market.
- The FY 2022 total interest earnings projection forecast is currently $3.8 million, consistent with the budget.

** Yield at cost is based on the original cost of the individual investments from the purchase date to maturity. On the other hand, yield at market is calculated on a specific day (in this case, March 31, 2022) and assumes that all the securities in the portfolio are purchased given the market price/yield on that particular day. If one is to generally hold their investments to the stated maturity date, then the yield at cost would be the better number to use to gauge how the portfolio is performing.*

Summary Market Overview and Outlook

ECONOMIC HIGHLIGHTS UPDATE

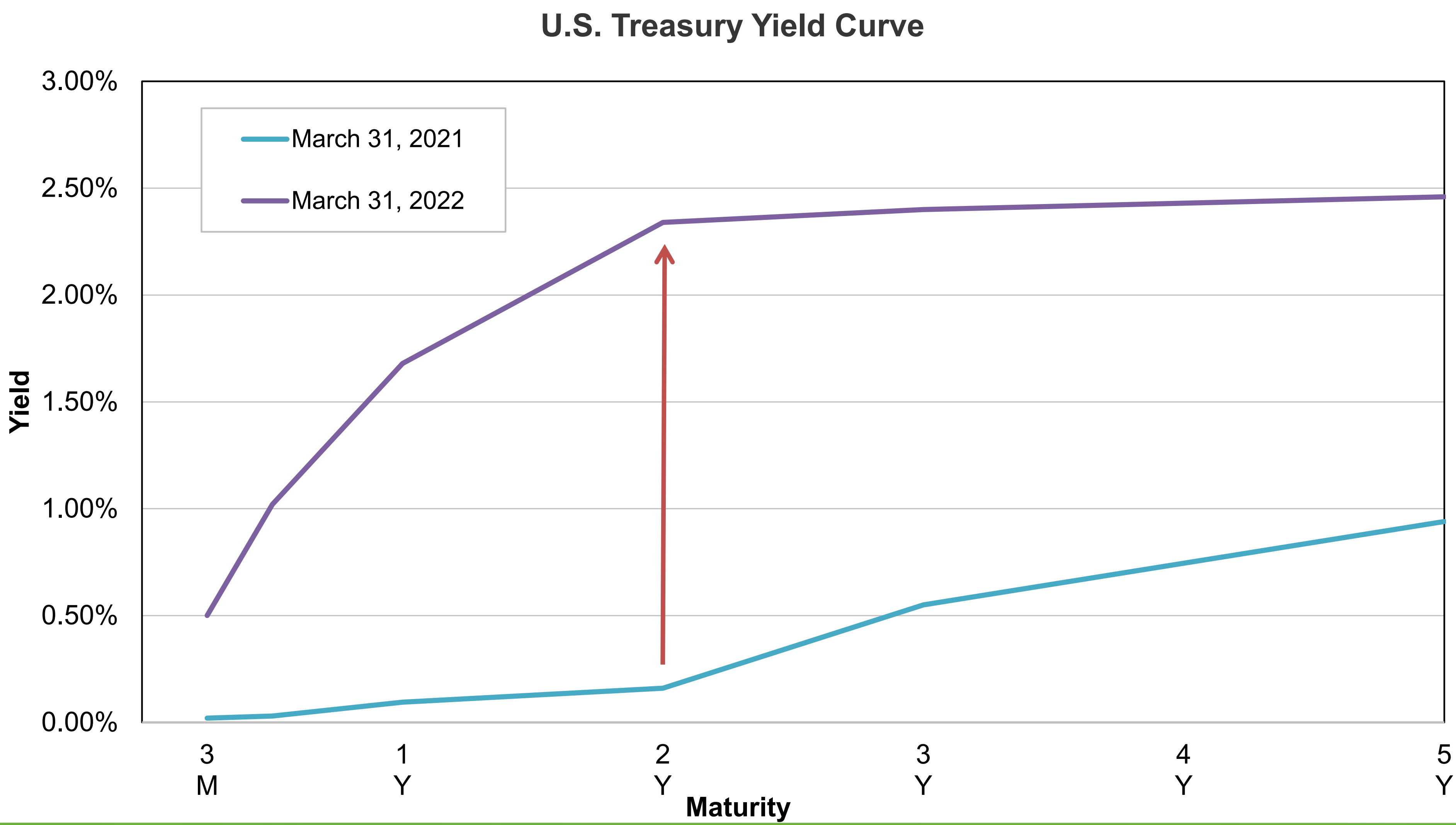
- In the last quarter, U.S. economic conditions were characterized by: (i) persistent high inflation; (ii) the Federal Reserve (the "Fed") kicking off a shift to tighter monetary policy; (iii) rapidly rising interest rates; (iv) elevated energy and commodity prices; (v) increased volatility and risk-off sentiment in credit and equity markets; and (vi) stronger than ever labor market.
- Just as Omicron's potential to impact the economy waned, geopolitical tensions in Ukraine dominated headlines, applying further pressure to an already fragile inflation narrative. Simultaneously, the macro focus on economic growth and continued recovery shifted from elevated virus infections to surging consumer prices.
- On the heels of rising consumer prices, geopolitical uncertainty stemming from Russia's invasion of Ukraine has stoked risks for both hampering global economic growth and creating additional pressures on supply chains and commodity prices. While the U.S. is largely insulated from the direct conflict, the global impact on energy prices is undeniable, as Russia produces about 12% of global crude oil supplies. Europe's heavier dependence on Russian natural gas suggests that the European Union's economy may face stiffer headwinds, ultimately dampening global growth in 2022 and beyond.
- As a result of surging inflation that proved not to be transitory, the Fed raised the Fed Funds target rate to 0.25% in March for the first time since 2018, underscoring the risk that inflation now poses to economic growth and stability. The Fed also forecasts as many as six more rate hikes this year. Additionally, the Fed will likely begin reducing its balance sheet through a reduction in the reinvestment of maturities and principal payments on its nearly $9 trillion holdings of Treasuries and mortgage-backed securities.

ECONOMIC IMPACT ON PORTFOLIO

- U.S. Treasury yields rose meaningfully in the past quarter on surging inflation data and growing expectations for multiple Fed rate hikes in 2022. Given their maturity horizon, two and three-year yields were most impacted by the increased probability of future rate hikes, with both tenors increasing over 150 basis points (1.50%) during the quarter.
- Ten-year yields, which are more influenced by inflation expectations than Fed policy, increased by 83 basis points, resulting in a briefly inverted yield curve between three and ten-year maturities, suggesting markets expect inflation levels to ease over the longer run. Fed policy remains on a rate-hiking trajectory for the foreseeable future.
- As a result of sharply higher Treasury yields, fixed income indices posted some of the worst total returns dating back over 40 years.
- Diversification away from U.S. Treasury securities generally detracted from fixed-income performance during the quarter as no sector was immune from spread widening caused by risk-off sentiment during the quarter.
- Portfolio Impact: Given continued upward pressure on Treasury yields, PFMAM plans to maintain a defensive duration bias relative to benchmarks. Federal Agency spreads remain tight, which means there is limited opportunities to add to this sector. PFMAM will also look to increase allocations to commercial paper investments as wider spreads are attractive.

Summary Market Overview and Outlook
Treasury Yields Continue Their Upward Surge

- Yields generally increased across the yield curve during the quarter, with the biggest increases happening at the shorter end of the curve.



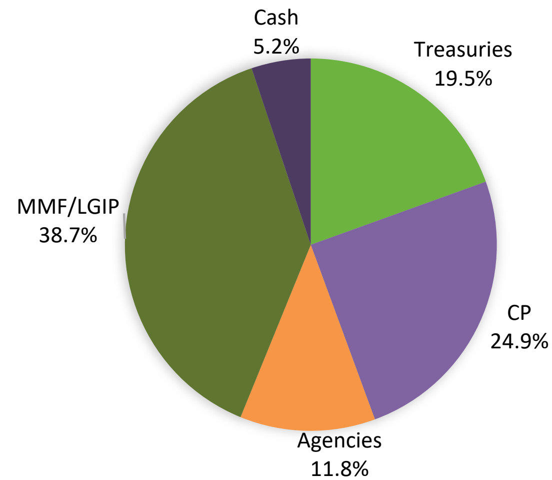
Portfolio Snapshot

Overall Portfolio Composition Summary

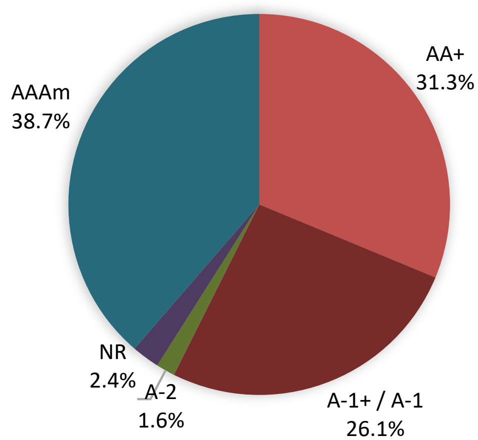
PORTFOLIO STATISTICS

Invested Amount	$896.858 Million
Duration	0.46 Years
Yield at Cost	0.38%
Yield at Market	0.77%

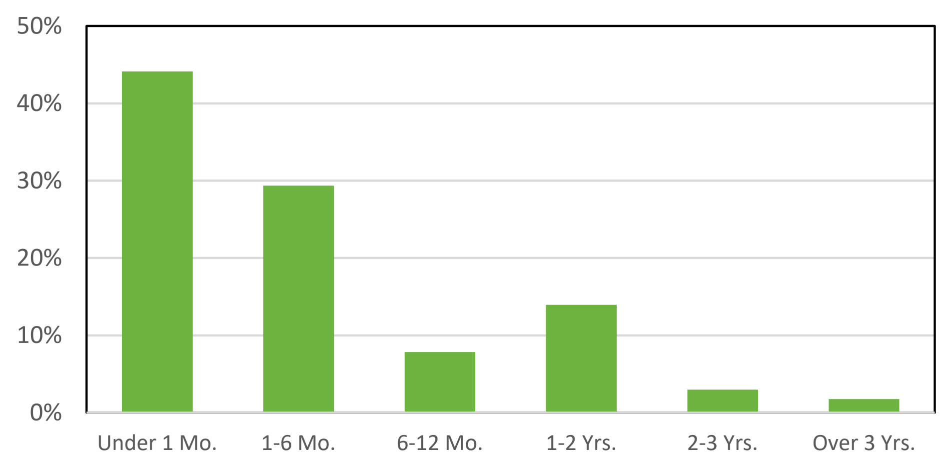
SECTOR ALLOCATION



CREDIT QUALITY



MATURITY DISTRIBUTION



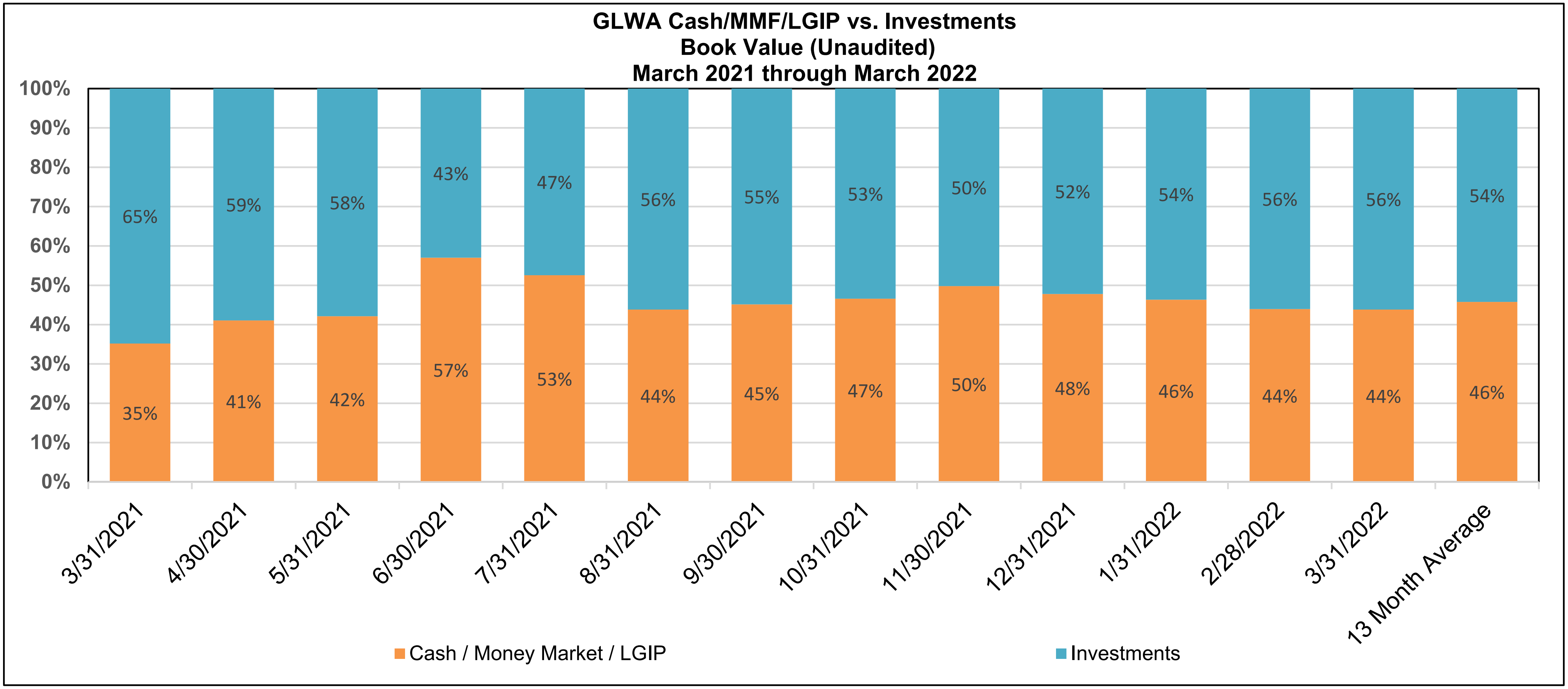
In addition to the totals listed above, there also exists surety bonds in the amount of $323,059,258 as of March 31, 2022.

Portfolio Snapshot

Portfolio Mix – Cash / Money Market vs. Investments

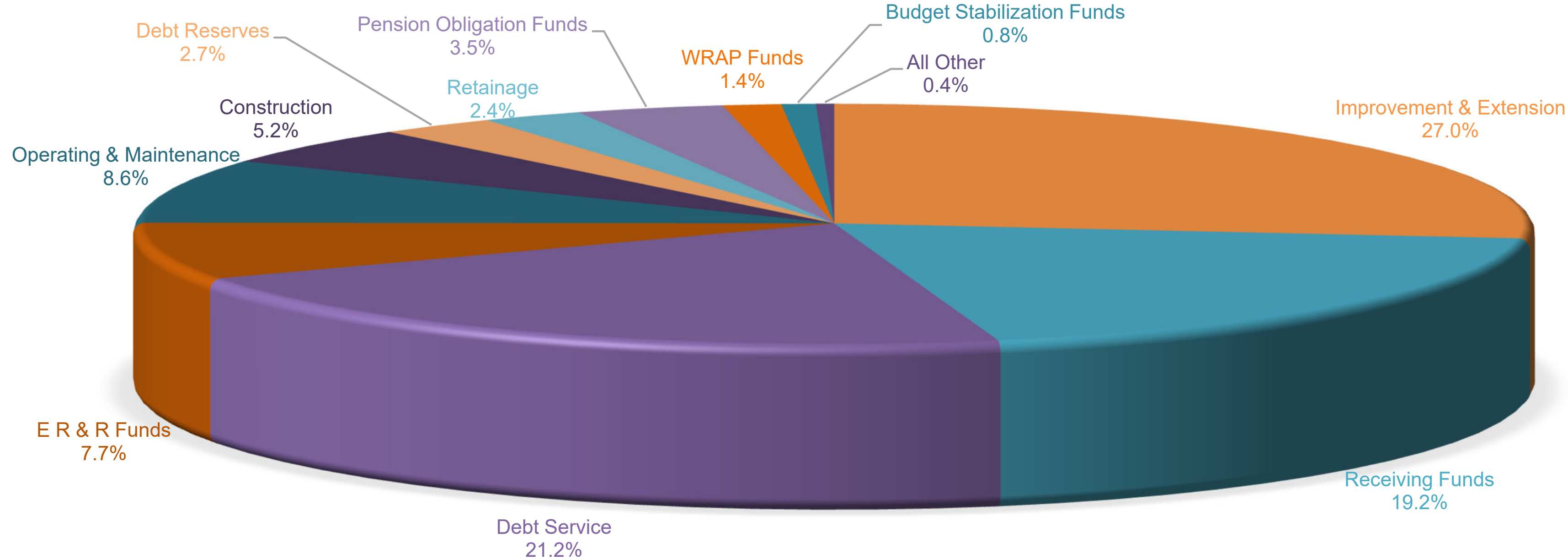
- GLWA's liquidity requirements fluctuate each month based on operational requirements, capital funding, and debt payments. Based on a review of historical activity and refinement of cash flow projections, GLWA has continually tried to balance the allocation of the portfolio's holdings to cash & money market accounts versus the allocation to investments for the portfolio holdings.

- The chart below compares the monthly allocation of the portfolio holdings to the 13-month average. The allocation between cash and investments will vary each month based on liquidity requirements. For March of 2022, 44% of the overall portfolio was invested in cash, LGIP, and/or overnight money market fund accounts.



Portfolio Snapshot

Investments – By Account Purpose



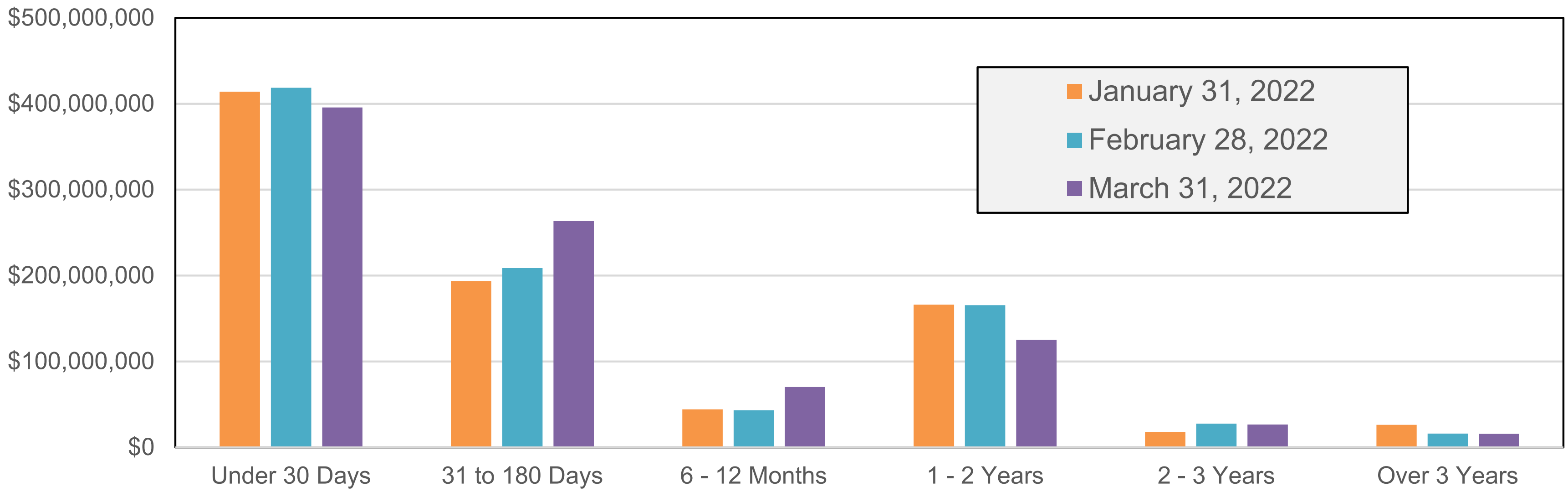
Account Purpose		Market Value	Allocation %	Cost Yield at	Market Yield at	Duration
Improvement & Extension	$	242,026,370	27.0%	0.74%	1.09%	0.630 Years
Debt Service	$	190,479,722	21.2%	0.51%	0.90%	0.254 Years
Receiving Funds (includes lockbox account)	$	172,309,855	19.2%	0.02%	0.02%	0.003 Years
Operating & Maintenance	$	76,937,749	8.6%	0.02%	0.02%	0.003 Years
Extraordinary Repair & Replacement Funds	$	68,651,255	7.7%	0.46%	2.24%	2.186 Years
Construction	$	46,198,865	5.2%	0.02%	0.02%	0.003 Years
Pension Obligation Funds	$	31,124,350	3.5%	0.33%	0.75%	0.177 Years
Debt Reserves	$	24,662,478	2.7%	0.28%	2.08%	1.637 Years
Retainage	$	21,190,672	2.4%	0.01%	0.01%	0.003 Years
WRAP Funds	$	12,241,403	1.4%	0.36%	0.70%	0.151 Years
Budget Stabilization Funds	$	7,221,397	0.8%	0.44%	2.14%	2.038 Years
Flint Security Deposit Account	$	3,814,090	0.4%	0.01%	0.01%	0.003 Years
Total	**$**	**896,858,207**	**100.0%**	**0.38%**	**0.77%**	**0.462 Years**

In addition to the totals listed above, there also exists surety bonds in the amount of $323,059,258 as of March 31, 2022.

Portfolio Snapshot

Investments – By Maturity

Maturity Distribution		January 31, 2022	%		February 28, 2022	%		March 31, 2022	%
Under 30 Days	$	414,133,906	48.0%	$	418,635,731	47.6%	$	395,738,220	44.1%
31 to 180 Days		193,662,262	22.5%		208,578,699	23.7%		263,305,333	29.4%
6 - 12 Months		44,390,306	5.1%		43,265,103	4.9%		70,290,672	7.8%
1 - 2 Years		166,090,562	19.3%		165,526,701	18.8%		125,135,877	14.0%
2 - 3 Years		17,909,895	2.1%		27,739,852	3.2%		26,671,796	3.0%
Over 3 Years		26,284,579	3.0%		16,145,575	1.8%		15,716,309	1.8%
Totals	**$**	**862,471,509**	**100.0%**	**$**	**879,891,661**	**100.0%**	**$**	**896,858,207**	**100.0%**



In addition to the totals listed above, there also exists surety bonds in the amount of $323,059,258 as of March 31, 2022.

Portfolio Snapshot

Investment Accounts – Yield at Cost & Market

	As of March 31, 2022		As of December 31, 2021	
	YTM @ Cost	YTM @ Market	YTM @ Cost	YTM @ Market
Bank Deposits				
Comerica	0.01%	0.01%	0.01%	0.01%
First Indenpedence	0.01%	0.01%	0.01%	0.01%
Flint Deposit Account	0.01%	0.01%	0.01%	0.01%
JP Morgan Chase	0.05%	0.05%	0.01%	0.01%
Sub-Total Bank Deposits	**0.02%**	**0.02%**	**0.01%**	**0.01%**
Money Market Funds / LGIPs				
GovMIC	0.18%	0.18%	0.03%	0.03%
U.S. Bank - First American MMF	0.02%	0.02%	0.02%	0.02%
JP Morgan Securities - Blackrock MMF	0.02%	0.02%	0.02%	0.02%
Sub-Total MMF / LGIPs	**0.02%**	**0.02%**	**0.02%**	**0.02%**
Investment Portfolios				
Sewage SR Debt Serv 5403	0.48%	0.87%	0.29%	0.39%
Sewage SR Res 5400	0.29%	2.11%	0.29%	0.70%
Sew SRF Debt Serv 5410	0.84%	1.22%	0.21%	0.26%
Sewage ER & R	0.46%	2.24%	0.46%	0.82%
Sewer Improvement & Extension	1.07%	1.57%	1.18%	0.49%
Sewer Pension Obligation	0.33%	0.77%	0.24%	0.37%
Sewer Wrap Fund	0.41%	0.87%	0.27%	0.31%
Sewer Budget Stabilization Fund	0.44%	2.15%	0.44%	0.78%
Sewer O&M Pension Sub Account	0.34%	0.78%	0.25%	0.34%
Water SR Debt Ser 5503	0.47%	0.84%	0.29%	0.40%
Water SR Reserve 5500	0.27%	2.10%	0.27%	0.69%
Water SRF Debt Serv 5575	0.66%	1.15%	0.22%	0.27%
Water ER & R	0.46%	2.25%	0.46%	0.82%
Water Improvement & Extension	0.99%	1.50%	1.15%	0.49%
Water Pension Obligation	0.33%	0.77%	0.24%	0.37%
Water Wrap Fund	0.43%	0.74%	0.23%	0.28%
Water Budget Stabilization Fund	0.44%	2.12%	0.44%	0.77%
Water O&M Pension Sub Account	0.35%	0.79%	0.25%	0.34%
Sub-Total Investment Portfolios	**0.66%**	**1.36%**	**0.72%**	**0.52%**
Grand Total	***0.38%***	***0.77%***	***0.38%***	***0.28%***

The accounts at Comerica Bank get an earnings credit to offset bank fees. The earnings in the accounts at First Independence Bank is credited to the contractors and not the Authority. The funds in the Flint Security Deposit account are held on behalf of the City of Flint and the earnings do not belong to GLWA. YTM @ Cost is the expected return, based on the original cost, the annual interest receipts, maturity value and the time period from purchase date to maturity, stated as a percentage, on an annualized basis. YTM @ Market is the rate of return, based on the current market value, the annual interest receipts, maturity value and time period remaining until maturity, stated as a percentage, on an annualized basis.

Portfolio Snapshot
Peer Analysis Comparison

- The comparison agencies included in the list below were selected based on type and/or other non-performance-based criteria to show a broad range of water entities/utilities; this peer group list does not represent an endorsement of any of the public agencies or their services.
- The overall yield of GLWA's aggregate portfolio compares somewhat favorably to those of other short-term market indices (i.e., the S&P LGIP index and the 3-month U.S. Treasury index), despite the volatility of short-term interest rates and the limited ability in managing assets to a longer-term strategy.
- GLWA does have some limitations and unique constraints related to its ordinance and covenants that restricts the potential for a longer duration portfolio when compared to other similar water agencies.

	As of March 31, 2022			
	Market Value	*YTM @ Market*	*Effective Duration*	*Weighted Average Maturity*
GLWA				
Great Lakes Water Authority	$896,858,207	0.77%	0.46 Years	168 Days
Short/Intermediate-Term Indices				
S&P Rated Government Investment Pool Index		0.18%	0.08 Years	30 Days
BoA / ML 3-Month Treasury Index		0.52%	0.15 Years	55 Days
BoA / ML 6-Month Treasury Index		0.89%	0.40 Years	146 Days
BoA / ML 1-Year Treasury Index		1.60%	0.91 Years	332 Days
BoA / ML 1-3 Year Treasury Index		2.18%	1.80 Years	672 Days
BoA / ML 1-5 Year Treasury Index		2.30%	2.54 Years	956 Days
Peer Analysis (Water Entities / Utilities)				
District of Columbia Water & Sewer Authority, DC	$216,379,297	1.78%	1.31 Years	522 Days
DuPage Water Commission, IL	$171,238,992	2.22%	2.14 Years	1,033 Days
Fairfax County Water Authority, VA	$154,741,640	2.12%	2.00 Years	763 Days
Metro Wastewater Reclamation District, CO	$292,874,141	2.01%	1.79 Years	703 Days
Metropolitan Water District of Southern California, CA	$1,126,109,188	1.50%	0.84 Years	377 Days
Philadelphia Water Department, PA	$228,205,745	1.42%	0.75 Years	273 Days
San Bernardino Valley Municipal Water District, CA	$356,849,600	2.20%	1.70 Years	649 Days
Tohopekaliga Water Authority, FL	$197,968,956	2.24%	1.75 Years	814 Days
Truckee Meadows Water Authority, NV	$99,047,393	2.13%	2.08 Years	791 Days

The BoA / ML indexes are unmanaged indexes tracking on-the-run Treasuries. These indexes are produced and maintained by Bank of America / Merrill Lynch & Co. Yield to maturity is the rate of return, based on the current market value, the annual interest receipts, maturity value and time period remaining until maturity, stated as a percentage, on an annualized basis.

Portfolio Snapshot

Monthly Investment Income

(Book Value in 000's)

FY 2022 INVESTMENT INCOME BY MONTH (Unaudited)

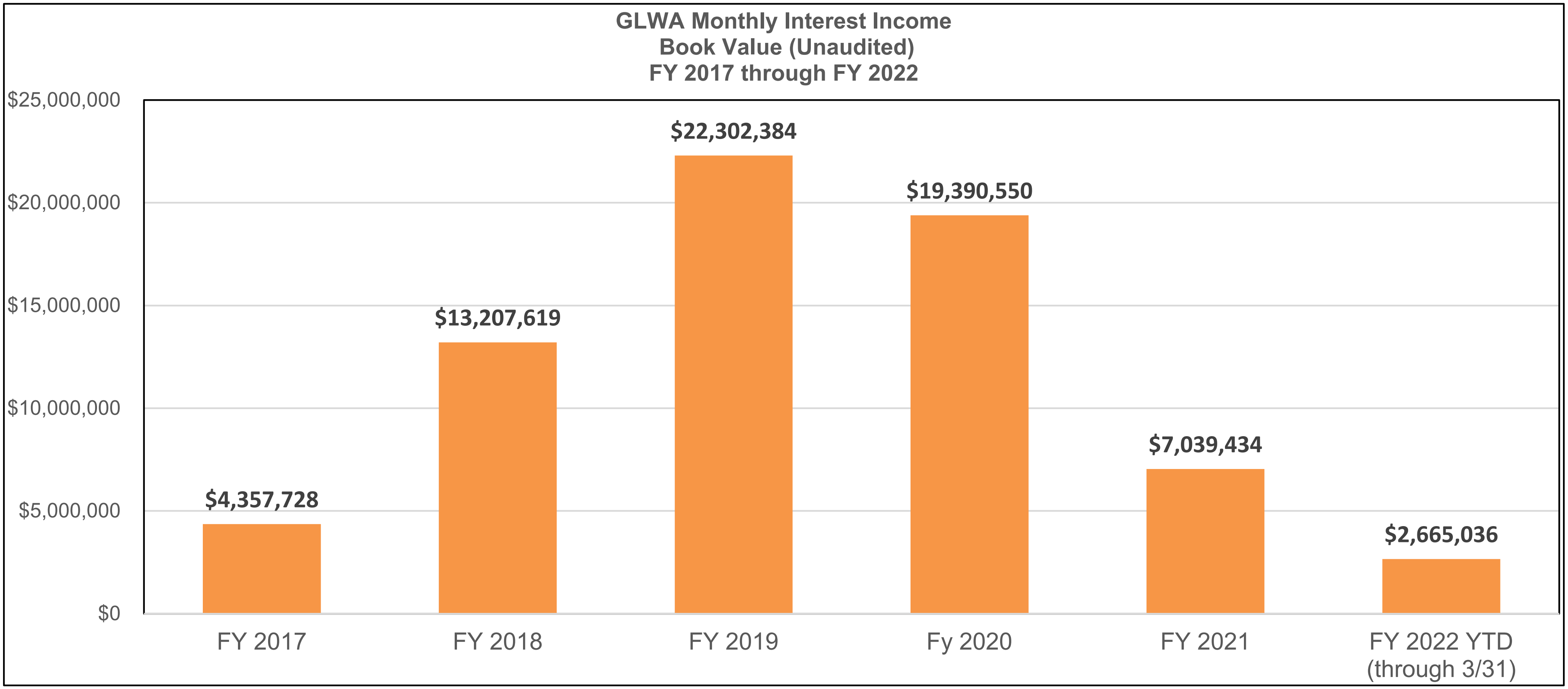
Month	Interest Earned During Period *(in thousands)*	Realized Gain / Loss *(in thousands)*	Investment Income *(in thousands)*
July 2021	$332.7	$0.0	$332.7
August 2021	$327.7	$108.7	$436.4
September 2021	$297.6	$0.0	$297.6
October 2021	$311.4	$0.0	$311.4
November 2021	$247.2	$0.0	$247.2
December 2021	$280.1	$0.0	$280.1
January 2022	$253.9	$0.0	$253.9
February 2022	$222.6	$0.0	$222.6
March 2022	$283.3	$0.0	$283.3
FY 2022 Y-T-D	***$2,556.4***	***$108.7***	***$2,665.0***

These figures are based upon actual interest earned and posted to the Authority's various accounts via book value and does not include any earnings credit rate tied to the Authority's bank deposits.

Portfolio Snapshot

Year-Over-Year Investment Income

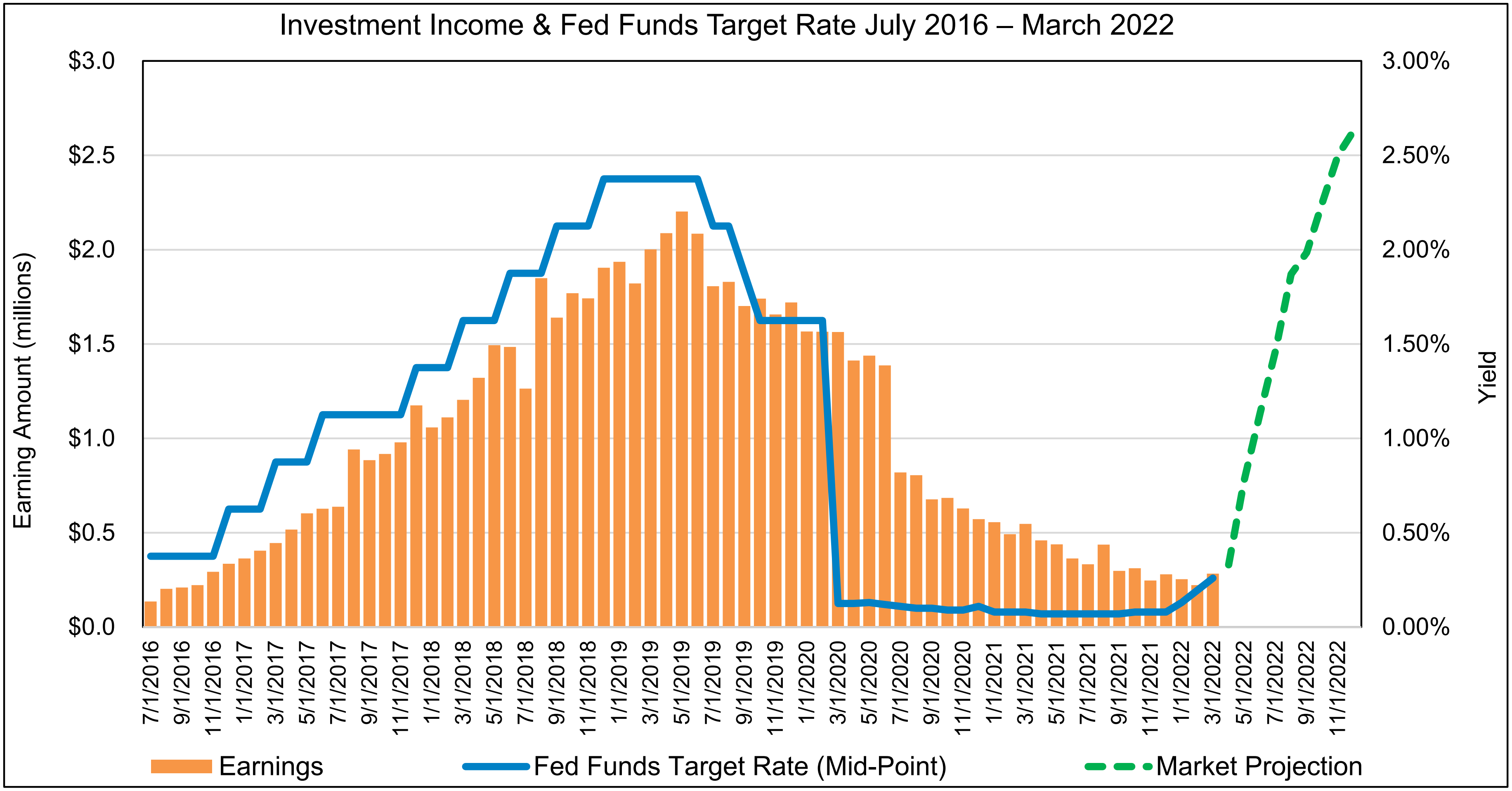
- GLWA earned $2,665,036 in investment income for the first nine months of fiscal year 2022 on a book value basis compared to $5,778,927 for the first nine months of fiscal year 2021.
- Based on current market assumptions, projected investment income for fiscal year 2022 is forecasted to be around $3.8 million, as the market expects the overnight lending rate to significantly increase over the next few months.



Portfolio Snapshot

Monthly Investment Income Compared to Fed Funds Rate

- At least 50% of the GLWA portfolio is designated for obligations that are 12 months or less. As a result of the short-term duration of GLWA's portfolio, it is heavily impacted by changes in the Fed Funds target rate; the chart below illustrates that GLWA's investment income has consistently followed the trend of the Fed Funds rate.
- According to effective Fed Funds futures, the market is pricing in over 200 basis points more in rate hikes in calendar year 2022; based on the historical trend, this will translate into higher interest earnings for GLWA in fiscal year 2023 and beyond.



Pooling of Cash / Investment Accounts

- PFMAM & GLWA are working toward reducing the number of bank accounts by pooling. Benefits of pooling accounts include the ability to take advantage of economies of scale when purchasing securities and reducing unnecessary liquidity. The steps to be taken for the recommended pooling strategy is shown below. Water and Sewer accounts will not be pooled.

Putting Money To Work Safely – Investment Progression

Step 1 – Competed (June 2021)

Debt Service Accounts

- Senior Lien Accounts
- Second Lien Accounts

Step 2 – Completed (June 2021)

Debt Reserve Accounts

- Senior Lien Accounts
- Second Lien Accounts

Step 3 - In process

Operating & Maintenance Accounts

- O&M General Accounts
- Health & Welfare Accounts

Step 4

U.S. Bank Trust Accounts

- Receiving Funds
- Pension Obligation Funds
- WRAP Funds
- Budget Stabilization Funds
- ER&R Funds
- I&E Funds

Non-pooled accounts include the lockbox accounts, payroll accounts, accounts payable, P-Card accounts, construction bond accounts, retainage accounts, and the Flint Security Deposit account.

Appendix I:
Portfolio Holdings

Portfolio Holdings
As of March 31, 2022

DESCRIPTION	CUSIP	PAR AMOUNT	MATURITY DATE	SETTLEMENT DATE	YTM AT COST	ORIGINAL COST	DAYS TO MATURITY	ACCRUED INTEREST	TOTAL VALUE
Short-Term Bank Deposits / MMF / LGIP									
COMERICA BANK		$ 14,281,306	4/1/2022	3/31/2022	0.01%	$ 14,281,306	1	$ -	$ 14,281,306
FIRST INDEPENDENCE BANK		21,190,672	4/1/2022	3/31/2022	0.01%	21,190,672	1	-	21,190,672
FLINT DEPOSIT ACCOUNT		3,814,090	4/1/2022	3/31/2022	0.01%	3,814,090	1	-	3,814,090
JP MORGAN CHASE		7,059,419	4/1/2022	3/31/2022	0.05%	7,059,419	1	-	7,059,419
GovMIC		2,855,915	4/1/2022	3/31/2022	0.18%	2,855,915	1	-	2,855,915
U.S. BANK - FIRST AMERICAN MMF		242,183,373	4/1/2022	3/31/2022	0.02%	242,183,373	1	-	242,183,373
JP MORGAN SECURITIES - BLACKROCK MMF		101,775,314	4/1/2022	3/31/2022	0.02%	101,775,314	1	-	101,775,314

In addition to the totals listed above, there also exists surety bonds in the amount of $323,059,258 as of March 31, 2022.

Portfolio Holdings
As of March 31, 2022

DESCRIPTION	CUSIP	PAR AMOUNT	MATURITY DATE	SETTLEMENT DATE	YTM AT COST	ORIGINAL COST	DAYS TO MATURITY	ACCRUED INTEREST	TOTAL VALUE
Commercial Paper									
Beford Row Funding 0 6/17/2022	07644BFH0	$ 9,385,000	6/17/2022	3/11/2022	1.00%	$ 9,359,452	78	$ -	$ 9,367,732
BNZ International Funding 0 6/15/2022	0556X1FF4-1	10,000,000	6/15/2022	2/4/2022	0.42%	9,984,717	76	-	9,982,100
Collat CP Co 0 6/14/2022	19424JFE1	10,000,000	6/14/2022	12/13/2021	0.35%	9,982,208	75	-	9,982,300
Goldman Sachs 0 7/1/2022	38150UG13	4,915,000	7/1/2022	3/11/2022	1.21%	4,896,651	92	-	4,901,975
Natixis Bank NY 0 7/1/2022	63873KG19	4,285,000	7/1/2022	2/4/2022	0.46%	4,276,951	92	-	4,273,645
Nordea Bank ABP 0 7/1/2022	65558KG16	14,415,000	7/1/2022	1/11/2022	0.35%	14,391,035	92	-	14,376,800
Toronto Dominion Bank 0 6/17/2022	89119BFH4	14,285,000	6/17/2022	10/20/2021	0.21%	14,265,001	78	-	14,258,716
Westpac Securities 0 6/17/2022	96122HFH1	12,545,000	6/17/2022	12/14/2021	0.33%	12,523,726	78	-	12,521,917
CitiGroup Global Markets 0 9/19/2022	17327BJK2	1,005,000	9/19/2022	3/11/2022	1.46%	997,228	172	-	998,367
Royal Bank of Canada 0 9/19/2022	78015DJK7	500,000	9/19/2022	1/11/2022	0.43%	498,501	172	-	496,700
BNZ International Funding 0 6/15/2022	0556X1FF4-2	505,000	6/15/2022	2/4/2022	0.42%	504,228	76	-	504,107
Collat CP Co 0 5/20/2022	19424JEL6-2	390,000	5/20/2022	8/23/2021	0.18%	389,474	50	-	389,643
MacQuarie Bank LTD 0 6/13/2022	55607LFD1-1	1,915,000	6/13/2022	12/7/2021	0.30%	1,912,000	74	-	1,911,798
Manhattan Asset Funding 0 6/6/2022	56274MF64-2	505,000	6/6/2022	3/3/2022	0.75%	504,001	67	-	504,199
MUFG Bank LTD NY 0 6/13/2022	62479MFD0-2	505,000	6/13/2022	1/10/2022	0.35%	504,244	74	-	504,102
Svenska Handel Sbanken 0 5/27/2022	86960KET5-2	505,000	5/27/2022	9/3/2021	0.17%	504,366	57	-	504,520
BNZ International Funding 0 6/15/2022	0556X1FF4-1	895,000	6/15/2022	2/4/2022	0.42%	893,632	76	-	893,398
Collat CP Co 0 5/20/2022	19424JEL6-1	2,200,000	5/20/2022	8/23/2021	0.18%	2,197,030	50	-	2,198,086
MacQuarie Bank LTD 0 6/13/2022	55607LFD1-2	2,310,000	6/13/2022	12/7/2021	0.30%	2,306,381	74	-	2,305,981
Manhattan Asset Funding 0 6/6/2022	56274MF64-1	890,000	6/6/2022	3/3/2022	0.75%	888,239	67	-	888,594
MUFG Bank LTD NY 0 6/13/2022	62479MFD0-1	895,000	6/13/2022	1/10/2022	0.35%	893,660	74	-	893,443
Svenska Handel Sbanken 0 5/27/2022	86960KET5-1	435,000	5/27/2022	9/3/2021	0.17%	434,454	57	-	434,565
Aust & NZ Banking Group 0 5/31/2022	05253CEX0	850,000	5/31/2022	2/7/2022	0.44%	848,826	61	-	849,091
Collat CP Co 0 6/30/2022	19424JFW1	1,100,000	6/30/2022	3/3/2022	0.80%	1,097,091	91	-	1,097,635
LMA Americas LLC 0 5/4/2022	53944RE46	1,175,000	5/4/2022	12/7/2021	0.27%	1,173,696	34	-	1,174,307
Old Line Funding LLC 0 4/4/2022	67983UD42	1,175,000	4/4/2022	12/7/2021	0.22%	1,174,153	4	-	1,174,965
BNZ International Funding 0 6/15/2022	0556X1FF4-1	10,000,000	6/15/2022	2/4/2022	0.42%	9,984,717	76	-	9,982,100

In addition to the totals listed above, there also exists surety bonds in the amount of $323,059,258 as of March 31, 2022.

Portfolio Holdings
As of March 31, 2022

DESCRIPTION	CUSIP	PAR AMOUNT	MATURITY DATE	SETTLEMENT DATE	YTM AT COST	ORIGINAL COST	DAYS TO MATURITY	ACCRUED INTEREST	TOTAL VALUE
Commercial Paper									
Collat CP Co 0 6/14/2022	19424JFE1	10,000,000	6/14/2022	12/13/2021	0.35%	9,982,208	75	-	9,982,300
Goldman Sachs 0 7/1/2022	38150UG13	15,085,000	7/1/2022	3/11/2022	1.21%	15,028,683	92	-	15,045,025
Natixis Bank NY 0 6/17/2022	63873KFH5	5,000,000	6/17/2022	12/14/2021	0.31%	4,992,035	78	-	4,990,800
Natixis Bank NY 0 7/1/2022	63873KG19	5,080,000	7/1/2022	2/4/2022	0.46%	5,070,458	92	-	5,066,538
Nordea Bank ABP 0 7/1/2022	65558KG16	14,900,000	7/1/2022	1/11/2022	0.35%	14,875,229	92	-	14,860,515
Sheffield Receivables 0 4/1/2022	82124MD15	450,000	4/1/2022	1/11/2022	0.22%	449,780	1	-	450,000
Toronto Dominion Bank 0 6/17/2022	89119BFH4	15,455,000	6/17/2022	10/20/2021	0.21%	15,433,363	78	-	15,426,563
Westpac Securities 0 6/17/2022	96122HFH1	12,455,000	6/17/2022	12/14/2021	0.33%	12,433,878	78	-	12,432,083
CitiGroup Global Markets 0 9/19/2022	17327BJK2	9,060,000	9/19/2022	3/11/2022	1.46%	8,989,936	172	-	9,000,204
Royal Bank of Canada 0 9/19/2022	78015DJK7	4,505,000	9/19/2022	1/11/2022	0.43%	4,491,494	172	-	4,475,267
BNZ International Funding 0 6/15/2022	0556X1FF4-2	905,000	6/15/2022	2/4/2022	0.42%	903,617	76	-	903,399
Collat CP Co 0 5/20/2022	19424JEL6-2	830,000	5/20/2022	8/23/2021	0.18%	828,880	50	-	829,241
MacQuarie Bank LTD 0 6/13/2022	55607LFD1-1	3,360,000	6/13/2022	12/7/2021	0.30%	3,354,736	74	-	3,354,382
Manhattan Asset Funding 0 6/6/2022	56274MF64-2	905,000	6/6/2022	3/3/2022	0.75%	903,209	67	-	903,564
MUFG Bank LTD NY 0 6/13/2022	62479MFD0-2	905,000	6/13/2022	1/10/2022	0.35%	903,645	74	-	903,391
Svenska Handel Sbanken 0 5/27/2022	86960KET5-2	905,000	5/27/2022	9/3/2021	0.17%	903,863	57	-	904,139
BNZ International Funding 0 6/15/2022	0556X1FF4-1	1,225,000	6/15/2022	2/4/2022	0.42%	1,223,128	76	-	1,222,807
Collat CP Co 0 5/20/2022	19424JEL6-1	2,950,000	5/20/2022	8/23/2021	0.18%	2,946,018	50	-	2,947,434
MacQuarie Bank LTD 0 6/13/2022	55607LFD1-2	3,070,000	6/13/2022	12/7/2021	0.30%	3,065,190	74	-	3,064,658
Manhattan Asset Funding 0 6/6/2022	56274MF64-1	1,230,000	6/6/2022	3/3/2022	0.75%	1,227,566	67	-	1,228,057
MUFG Bank LTD NY 0 6/13/2022	62479MFD0-1	1,225,000	6/13/2022	1/10/2022	0.35%	1,223,166	74	-	1,222,869
Svenska Handel Sbanken 0 5/27/2022	86960KET5-1	575,000	5/27/2022	9/3/2021	0.17%	574,278	57	-	574,425
LMA Americas LLC 0 5/4/2022	53944RE46	1,025,000	5/4/2022	12/7/2021	0.27%	1,023,862	34	-	1,024,395
MacQuarie Bank LTD 0 6/1/2022	55607LF17	1,025,000	6/1/2022	12/7/2021	0.30%	1,023,497	62	-	1,023,504
Natixis Bank NY 0 8/1/2022	63873KH18	1,025,000	8/1/2022	12/7/2021	0.35%	1,022,638	123	-	1,020,695
Natixis Bank NY 0 9/1/2022	63873KJ16	1,025,000	9/1/2022	3/4/2022	1.05%	1,019,640	154	-	1,018,942
Old Line Funding LLC 0 4/4/2022	67983UD42	1,025,000	4/4/2022	12/7/2021	0.22%	1,024,261	4	-	1,024,969
Svenska Handel Sbanken 0 7/1/2022	86960KG14	1,025,000	7/1/2022	12/7/2021	0.30%	1,023,240	92	-	1,022,284

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Portfolio Holdings
As of March 31, 2022

DESCRIPTION	CUSIP	PAR AMOUNT	MATURITY DATE	SETTLEMENT DATE	YTM AT COST	ORIGINAL COST	DAYS TO MATURITY	ACCRUED INTEREST	TOTAL VALUE
Federal Agencies									
FHLB 2.125 6/10/2022	313379Q69	$ 10,000,000	6/10/2022	7/11/2019	1.92%	$ 10,059,200	71	$ 65,521	$ 10,031,100
FHLMC 0.375 5/5/2023	3137EAER6	6,000,000	5/5/2023	6/5/2020	0.38%	6,000,060	400	9,125	5,906,700
FNMA 0.25 5/22/2023	3135G04Q3	10,000,000	5/22/2023	6/5/2020	0.36%	9,968,400	417	8,958	9,808,500
FNMA 0.25 7/10/2023	3135G05G4	1,250,000	7/10/2023	7/16/2020	0.29%	1,248,425	466	703	1,221,325
FHLB 2.125 6/10/2022	313379Q69	25,000,000	6/10/2022	7/11/2019	1.92%	25,148,000	71	163,802	25,077,750
FHLMC 0.375 5/5/2023	3137EAER6	14,650,000	5/5/2023	6/5/2020	0.38%	14,650,147	400	22,280	14,422,193
FNMA 0.25 5/22/2023	3135G04Q3	25,000,000	5/22/2023	6/5/2020	0.36%	24,921,000	417	22,396	24,521,250
FNMA 0.25 7/10/2023	3135G05G4	1,650,000	7/10/2023	7/16/2020	0.29%	1,647,921	466	928	1,612,149
FNMA 0.25 5/22/2023	3135G04Q3	240,000	5/22/2023	6/5/2020	0.35%	239,292	417	215	235,404
FNMA 0.25 5/22/2023	3135G04Q3	3,400,000	5/22/2023	6/5/2020	0.35%	3,389,970	417	3,046	3,334,890
FNMA 0.25 5/22/2023	3135G04Q3	670,000	5/22/2023	6/5/2020	0.35%	668,024	417	600	657,170
FHLMC 0.25 6/26/2023	3137EAES4	3,150,000	6/26/2023	7/2/2020	0.29%	3,146,189	452	2,078	3,083,472
FNMA 0.25 5/22/2023	3135G04Q3	5,750,000	5/22/2023	6/5/2020	0.35%	5,733,038	417	5,151	5,639,888

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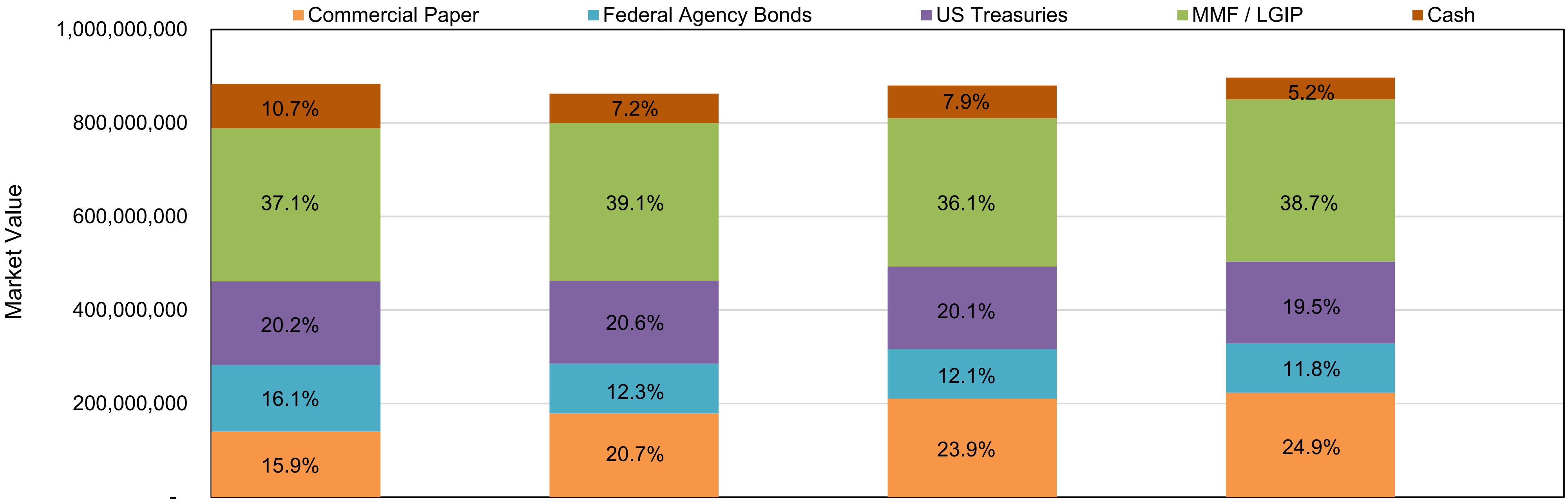
Portfolio Holdings
As of March 31, 2022

DESCRIPTION	CUSIP	PAR AMOUNT	MATURITY DATE	SETTLEMENT DATE	YTM AT COST	ORIGINAL COST	DAYS TO MATURITY	ACCRUED INTEREST	TOTAL VALUE
U.S. Treasuries									
T-Note 0 8/15/2023	912833LM0	$ 10,500,000	8/15/2023	2/7/2020	1.41%	$ 9,992,745	502	$ -	$ 10,209,150
T-Note 0.5 3/15/2023	912828ZD5	10,000,000	3/15/2023	3/16/2020	0.58%	9,977,344	349	2,174	9,890,600
T-Note 1.5 1/15/2023	912828Z29	15,000,000	1/15/2023	2/7/2020	1.39%	15,045,703	290	46,616	14,998,200
T-Note 0 8/15/2023	912833LM0	10,500,000	8/15/2023	2/7/2020	1.41%	9,992,745	502	-	10,209,150
T-Note 0.5 3/15/2023	912828ZD5	20,000,000	3/15/2023	3/16/2020	0.58%	19,954,688	349	4,348	19,781,200
T-Note 1.5 1/15/2023	912828Z29	15,000,000	1/15/2023	2/7/2020	1.39%	15,045,703	290	46,616	14,998,200
T-Note 0.125 1/15/2024	91282CBE0	260,000	1/15/2024	1/25/2021	0.18%	259,563	655	67	250,180
T-Note 0.125 10/31/2022	91282CAR2	200,000	10/31/2022	5/27/2021	0.10%	200,063	214	104	198,766
T-Note 0.25 3/15/2024	91282CBR1	125,000	3/15/2024	3/15/2021	0.33%	124,712	715	14	120,079
T-Note 0.375 12/31/2025	91282CBC4	250,000	12/31/2025	1/25/2021	0.43%	249,287	1,371	233	230,850
T-Note 0.375 4/30/2025	912828ZL7	125,000	4/30/2025	3/11/2021	0.61%	123,789	1,126	196	117,046
T-Note 0.5 3/15/2023	912828ZD5	250,000	3/15/2023	3/16/2020	0.59%	249,336	349	54	247,265
T-Note 1.375 1/31/2025	912828Z52	280,000	1/31/2025	12/6/2021	0.94%	283,773	1,037	627	271,382
T-Note 1.5 10/31/2024	912828YM6	130,000	10/31/2024	5/27/2021	0.42%	134,773	945	813	126,832
T-Note 1.625 10/31/2023	912828T91	130,000	10/31/2023	5/27/2021	0.20%	134,489	579	881	128,908
T-Note 1.75 12/31/2024	912828YY0	1,100,000	12/31/2024	8/30/2021	0.49%	1,145,719	1,006	4,786	1,077,912
T-Note 2.625 6/30/2023	9128284U1	3,250,000	6/30/2023	8/30/2021	0.19%	3,394,727	456	21,210	3,276,910
T-Note 1.5 9/15/2022	912828YF1	1,560,000	9/15/2022	12/14/2021	0.22%	1,574,930	168	1,017	1,563,713
T-Note 0.125 1/15/2024	91282CBE0	3,420,000	1/15/2024	1/25/2021	0.18%	3,414,255	655	886	3,290,827
T-Note 0.375 12/31/2025	91282CBC4	3,400,000	12/31/2025	1/25/2021	0.43%	3,390,305	1,371	3,170	3,139,560
T-Note 0.375 4/30/2025	912828ZL7	2,400,000	4/30/2025	8/24/2021	0.59%	2,381,531	1,126	3,754	2,247,288
T-Note 0.375 7/15/2024	91282CCL3	1,345,000	7/15/2024	8/23/2021	0.42%	1,343,266	837	1,045	1,283,735
T-Note 0.5 3/15/2023	912828ZD5	3,410,000	3/15/2023	3/16/2020	0.59%	3,400,942	349	741	3,372,695
T-Note 1.375 1/31/2025	912828Z52	3,346,000	1/31/2025	12/7/2021	0.95%	3,390,570	1,037	7,498	3,243,010
T-Note 1.5 10/31/2024	912828YM6	3,300,000	10/31/2024	5/28/2021	0.42%	3,421,301	945	20,648	3,219,579
T-Note 1.625 10/31/2023	912828T91	3,300,000	10/31/2023	5/28/2021	0.20%	3,414,082	579	22,368	3,272,280
T-Note 0.125 1/15/2024	91282CBE0	695,000	1/15/2024	1/25/2021	0.18%	693,833	655	180	668,750
T-Note 0.125 10/31/2022	91282CAR2	425,000	10/31/2022	5/27/2021	0.10%	425,133	214	222	422,378
T-Note 0.25 3/15/2024	91282CBR1	340,000	3/15/2024	3/15/2021	0.33%	339,216	715	37	326,614
T-Note 0.375 12/31/2025	91282CBC4	685,000	12/31/2025	1/25/2021	0.43%	683,047	1,371	639	632,529
T-Note 0.375 4/30/2025	912828ZL7	350,000	4/30/2025	3/11/2021	0.61%	346,609	1,126	547	327,730
T-Note 0.5 3/15/2023	912828ZD5	688,000	3/15/2023	3/16/2020	0.59%	686,173	349	150	680,473
T-Note 1.375 1/31/2025	912828Z52	740,000	1/31/2025	12/6/2021	0.94%	749,973	1,037	1,658	717,223
T-Note 1.5 10/31/2024	912828YM6	450,000	10/31/2024	5/27/2021	0.42%	466,523	945	2,816	439,034
T-Note 1.625 10/31/2023	912828T91	425,000	10/31/2023	5/27/2021	0.20%	439,676	579	2,881	421,430
T-Note 1.75 12/31/2024	912828YY0	5,550,000	12/31/2024	8/30/2021	0.49%	5,780,672	1,006	24,147	5,438,556
T-Note 2.625 6/30/2023	9128284U1	11,350,000	6/30/2023	8/30/2021	0.19%	11,855,430	456	74,073	11,443,978
T-Note 1.5 9/15/2022	912828YF1	5,950,000	9/15/2022	12/14/2021	0.22%	6,006,943	168	3,880	5,964,161
T-Note 0.125 1/15/2024	91282CBE0	5,790,000	1/15/2024	1/25/2021	0.18%	5,780,275	655	1,499	5,571,312
T-Note 0.375 12/31/2025	91282CBC4	5,750,000	12/31/2025	1/25/2021	0.43%	5,733,604	1,371	5,361	5,309,550
T-Note 0.375 4/30/2025	912828ZL7	3,965,000	4/30/2025	8/24/2021	0.59%	3,934,488	1,126	6,202	3,712,707
T-Note 0.5 3/15/2023	912828ZD5	5,765,000	3/15/2023	3/16/2020	0.59%	5,749,687	349	1,253	5,701,931
T-Note 1.375 1/31/2025	912828Z52	5,664,000	1/31/2025	12/7/2021	0.95%	5,739,446	1,037	12,693	5,489,662
T-Note 1.5 10/31/2024	912828YM6	5,500,000	10/31/2024	5/28/2021	0.42%	5,702,168	945	34,413	5,365,965
T-Note 1.625 10/31/2023	912828T91	5,500,000	10/31/2023	5/28/2021	0.20%	5,690,137	579	37,281	5,453,800

In addition to the totals listed above, there also exists surety bonds in the amount of $323,059,258 as of March 31, 2022.

Portfolio Snapshot

Investments – By Security Type

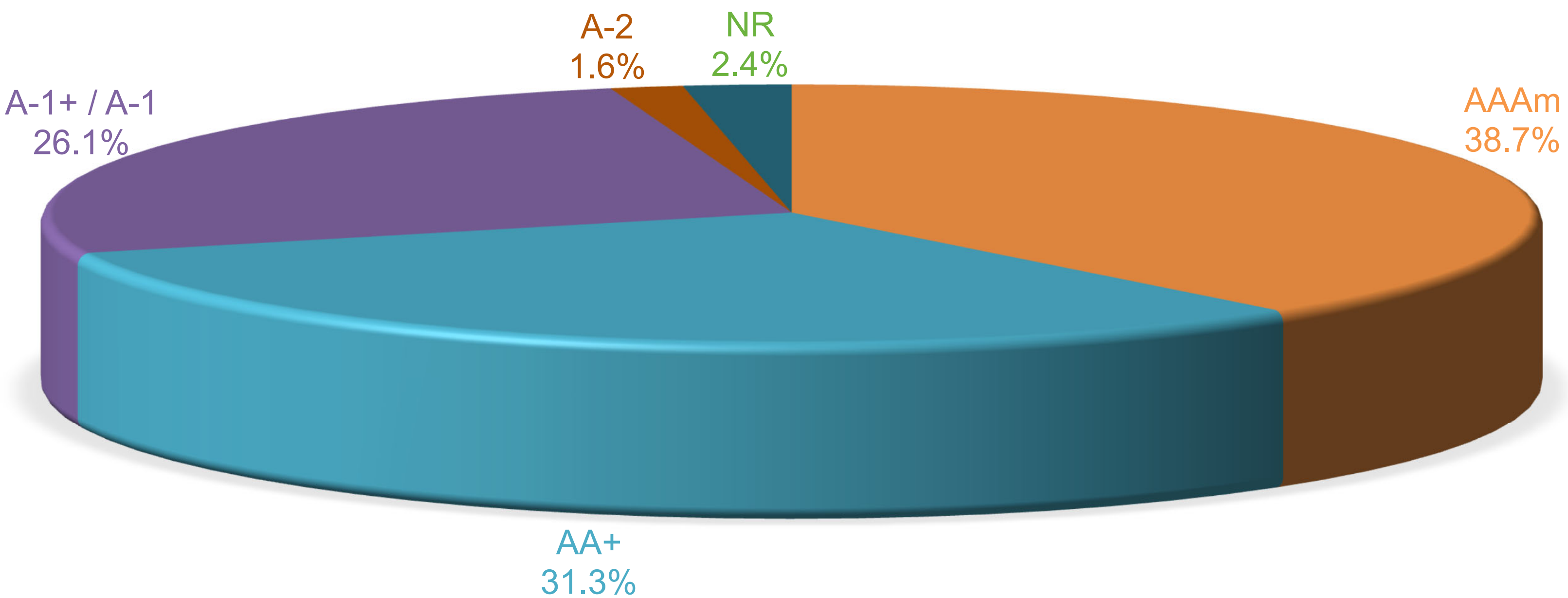


Security Type	December Market Value	December Asset Allocation	January Market Value	January Asset Allocation	February Market Value	February Asset Allocation	March Market Value	March Asset Allocation
Commercial Paper	140,558,113	15.9%	178,848,934	20.7%	210,285,614	23.9%	223,323,067	24.9%
Federal Agencies	141,811,811	16.1%	106,355,568	12.3%	106,049,977	12.1%	105,605,764	11.8%
U.S. Treasuries	178,749,200	20.2%	177,532,707	20.6%	176,812,919	20.1%	174,841,002	19.5%
MMF / LGIP	327,709,258	37.1%	337,289,365	39.1%	317,324,886	36.1%	346,814,603	38.7%
Cash	94,440,647	10.7%	62,444,935	7.2%	69,418,266	7.9%	46,273,771	5.2%
Total	**883,269,029**	**100.0%**	**862,471,509**	**100.0%**	**879,891,661**	**100.0%**	**896,858,207**	**100.0%**

In addition to the totals listed above, there also exists surety bonds in the amount of $323,059,258 as of March 31, 2022.

Portfolio Snapshot

Investments – By Credit Quality

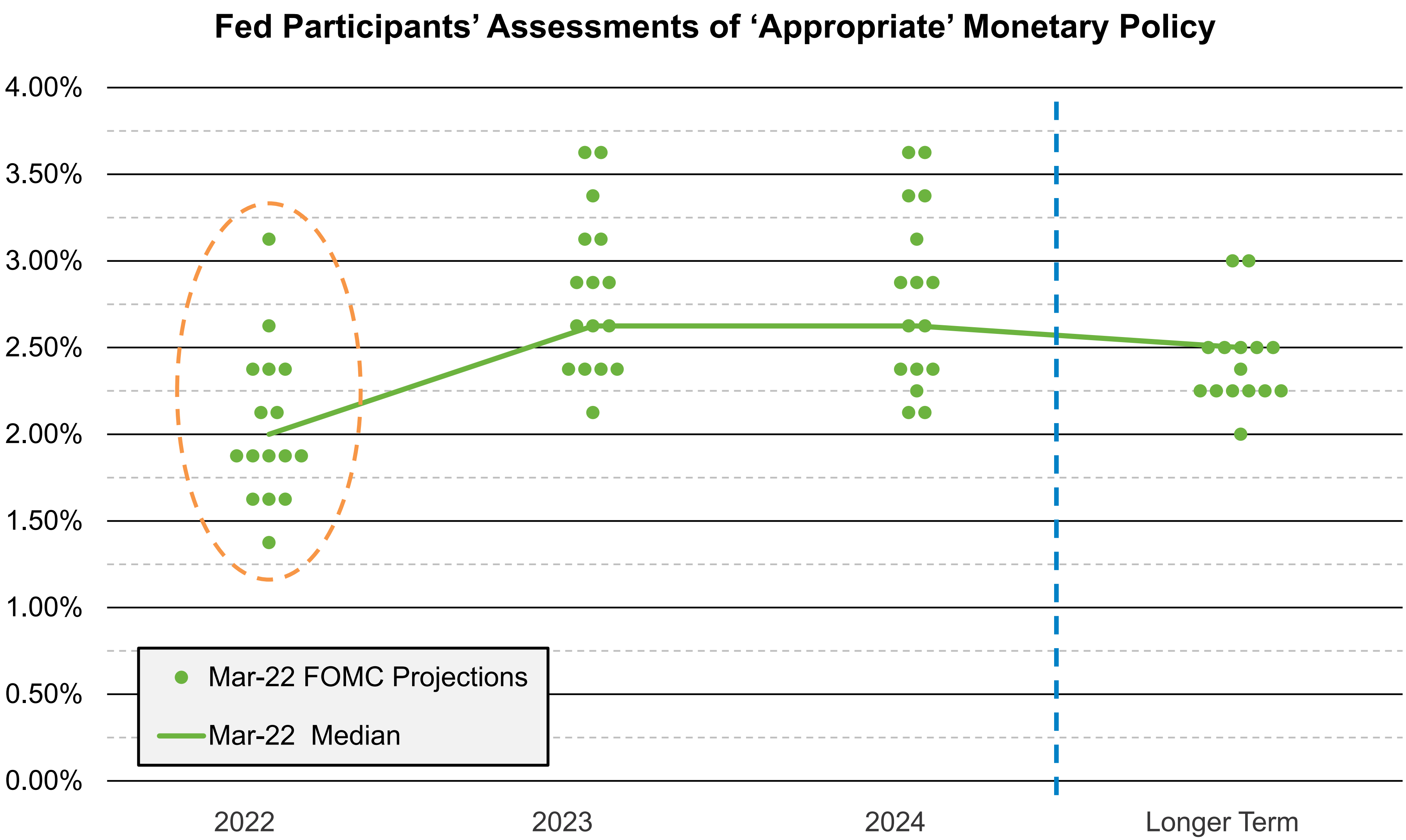


Credit Quality	Market Value	Asset Allocation
Ratings		
AAAm	346,814,603	38.7%
AA+	280,404,887	31.3%
A-1 + / A-1	234,166,740	26.1%
A-2	14,281,306	1.6%
NR	21,190,672	2.4%
Totals	**896,858,207**	**100.0%**

In addition to the totals listed above, there also exists surety bonds in the amount of $323,059,258 as of March 31, 2022.

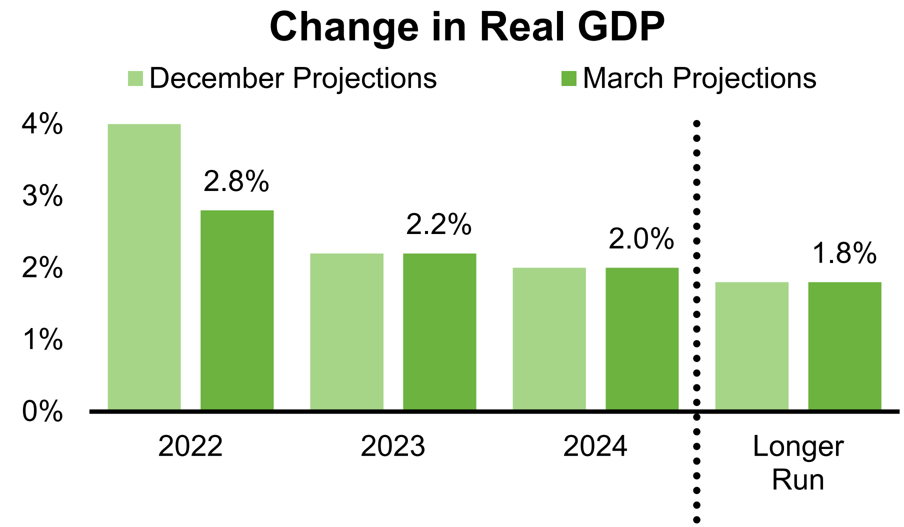
Appendix II: Economic Update

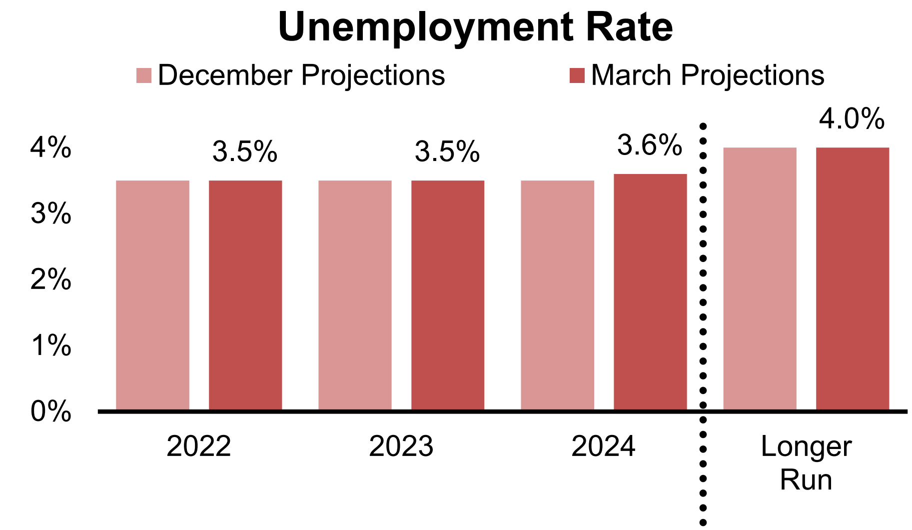
Federal Reserve Officials Project 7 Rate Hikes in 2022, 4 more in 2023

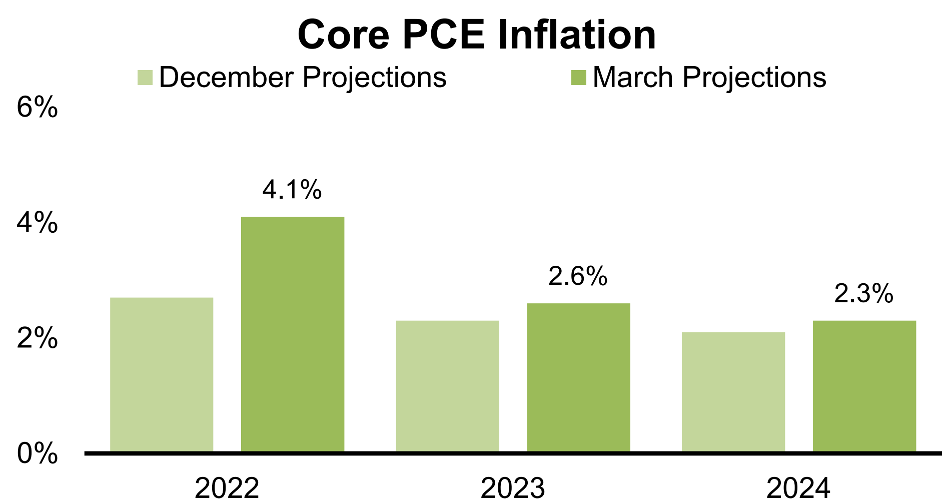


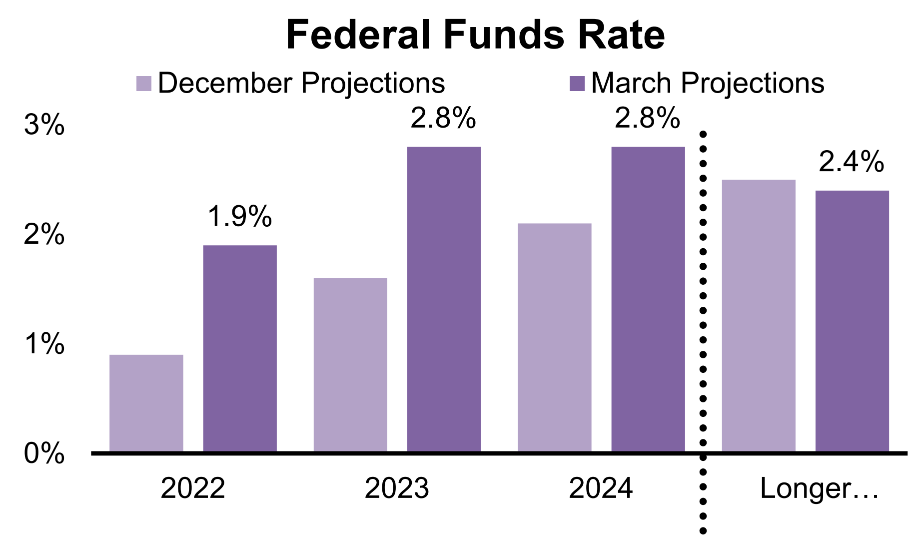
Source: Federal Reserve and Bloomberg. Individual dots represent each Fed members' judgement of the midpoint of the appropriate target range for the federal funds rate at each year-end.

Fed's Projections Show Recent Surge in Growth and Inflation to Wane



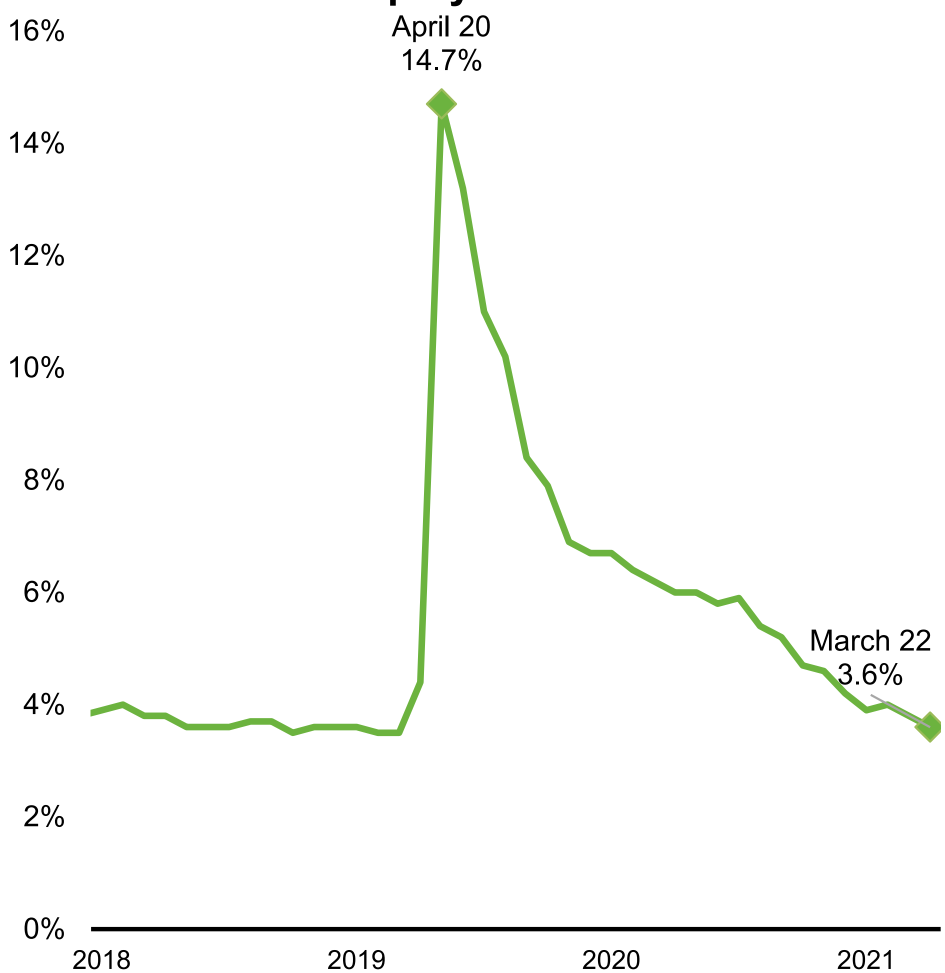


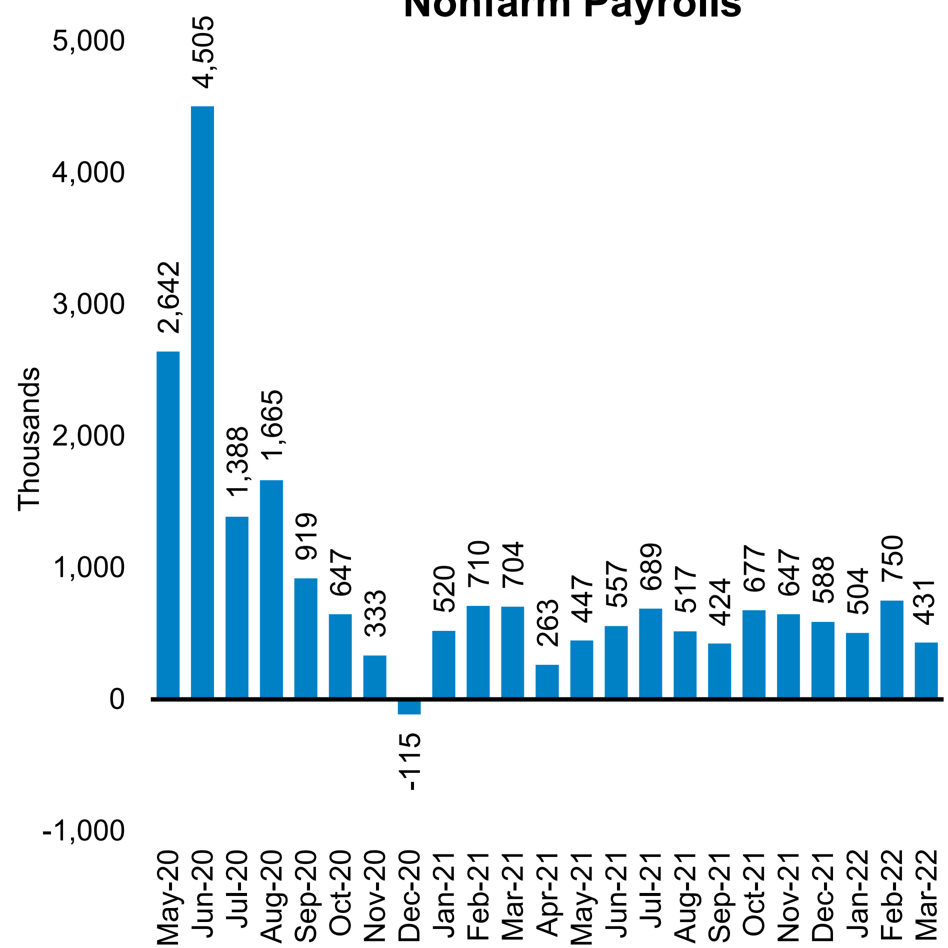




Source: Federal Reserve, latest economic projections as of March 2022.

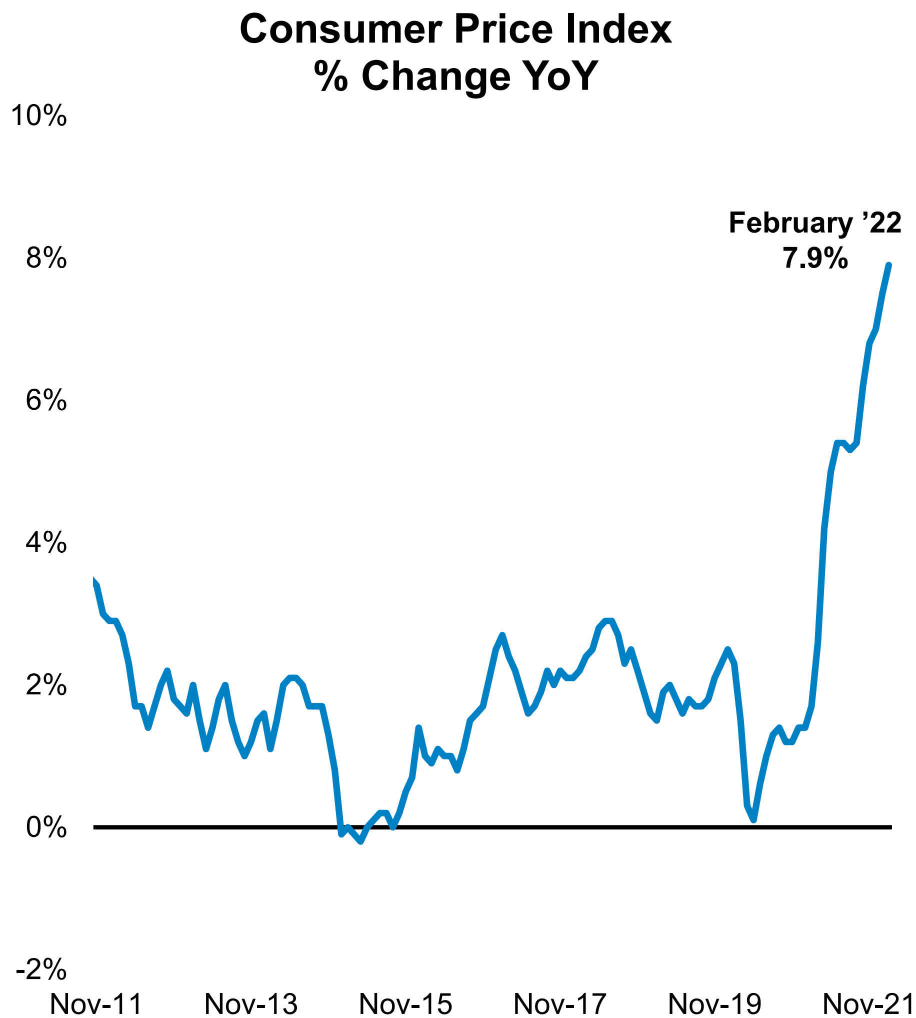
U.S. Economy Added 431,000 Jobs in March; Unemployment Rate Falls to 3.6%

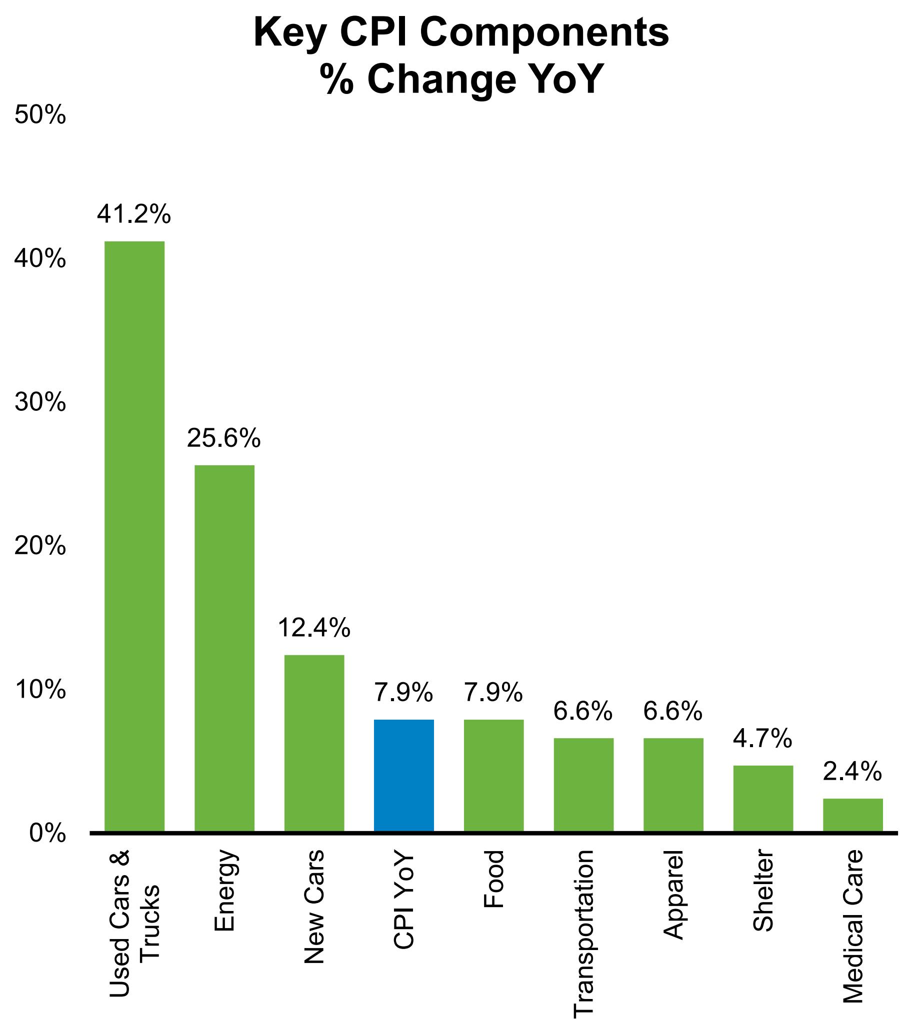




Source: Bloomberg, as of March 2022. Data is seasonally adjusted.

Consumer Inflation Rose at Fastest Rate Since 1982

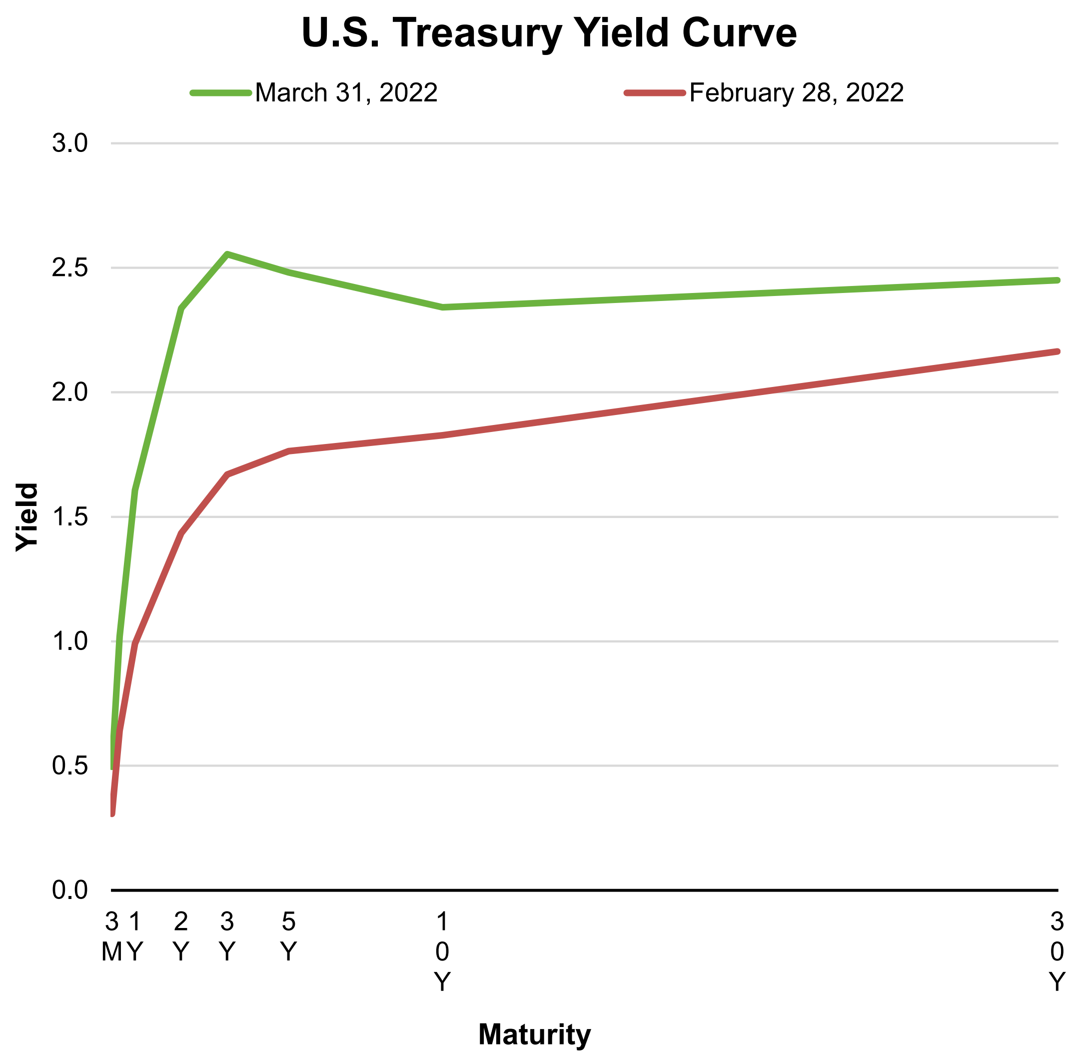




Source: Bloomberg, as of February 2022.

Treasury Yield Curve Inverts

	02/28/2022	03/31/2022	Change
3 month	0.31%	0.50%	0.19%
6 month	0.64%	1.02%	0.38%
1 year	0.99%	1.61%	0.62%
2 year	1.43%	2.34%	0.90%
3 year	1.67%	2.55%	0.89%
5 year	1.76%	2.48%	0.72%
10 year	1.83%	2.34%	0.51%
30 year	2.16%	2.45%	0.29%



Source: Bloomberg, as of 02/28/2022 and 03/31/2022, as indicated.

Fixed Income
Market Overview and Outlook

FIXED INCOME MARKET – ECONOMIC HIGHLIGHTS

- During the quarter, U.S. economic conditions were characterized by:
  - Unresolved Russia-Ukraine crisis and high commodity prices.
  - A strong labor market, inflation at a 40-year high, and depressed consumer confidence.
  - Federal Reserve tightening monetary policy and the Fed initiating the first of what will be many rate hikes in 2022.

- Treasury yields continued to rise significantly.
  - The jump in yields comes as Fed policymakers are increasingly voicing support for front-loading the rate hike cycle to curb pressing inflation.
  - Prospects of aggressive rate increases inspired a selloff in Treasuries.

- Inflation has continued to run hot with the Consumer Price Index increasing by 8.5% over the past year – a new 40 year high.
  - Energy costs again led the surge, with gasoline prices nearly doubling and fuel oil rising by 70% from a year ago.
  - Used car prices moderated, but food, transportation and shelter costs all rose at a strong clip.
  - Rising costs are negatively impacting consumer finances, felt most acutely by lower-income households, pushing consumer sentiment readings to a decade low.

- Manufacturing activity trended lower, falling to its lowest level since 2020 on slower growth in new orders and production.
  - Meanwhile, service sector activity picked up.
  - Survey commentary was less upbeat, noting supply-chain challenges, rising inflation, and global uncertainty.

- Currency markets have been volatile as supply chains worsen amid the Russia and Ukraine crisis, commodity prices spiking, and the U.S. and its allies imposing additional sanctions on Russia.
  - The U.S. dollar index (DXY) appreciated by 1.7% in the last month of the quarter alone.

Fixed Income
Market Overview and Outlook

FIXED INCOME MARKET – ECONOMIC HIGHLIGHTS

- The Fed raised interest rates by 25 basis points in March and signaled 7 total rate hikes in 2022.
  - The rate hike occurred after two years of highly accommodative monetary policy to support the economy amid the Covid-19 pandemic.
  - The Fed has taken a decidedly hawkish tilt, suggesting that reduction of its $8.9 trillion balance sheet will begin soon and 50 basis point rate hikes could occur at the next few FOMC meetings.

- The yield on the benchmark 2 and 10-year Treasury note finished the quarter at 2.33% and 2.34%, respectively.
  - As a result of the surge in rates, U.S. Treasuries posted some of the worst returns over the past 40 years.
  - In March, 30-year fixed rate mortgages spiked to 4.67%, a level not seen since December of 2018; this compares to 3.18% a year ago and the record low of 2.65% in January of 2021.

- The fog of war clouded the global economic outlook as Russia continued its assault on Ukraine.
  - The U.S. and its allies have imposed additional sanctions on Russia, and progress on peace negotiations seem to have now stalled.
  - Although Europe is highly vulnerable to conflict between Russia and Ukraine due to its reliance on Russian oil and gas, the impact on the United States' economy largely results from just higher prices for agricultural goods, metals, and energy commodities.

- Concerns over the economic implications of the Russian invasion of Ukraine and the potential need for a faster pace of interest rate hikes to combat higher inflation has weighed on the financial markets.
  - The market expects to see a continued upward pressure on Treasury yields.
  - In short-term markets, commercial paper and negotiable bank CDs look quite attractive, and shorter maturities and floating-rate issues seem to offer the best value, especially if the Fed moves to larger incremental rate hikes; on the other hand, yields on short-term T-Bills and Agencies seem less compelling.

Disclosure

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Bank Deposits are not managed by PFMAM, and therefore we cannot guarantee the accuracy of holdings.

GLWA
Great Lakes Water Authority

Financial Services
Audit Committee Communication

Date: May 27, 2022

To: Great Lakes Water Authority Audit Committee

From: Deirdre Henry, Treasury Manager

Re: Qualified Financial Institution Review

Background: One of the ways that a public entity manages risk is to actively monitor and evaluate each financial institution and broker/dealer for credit worthiness with whom it may conduct business for managing public funds. This approach is in alignment with the Great Lakes Water Authority (GLWA) Investment Policy and Michigan Public Act 20. As stated in section 9 of the GLWA Investment Policy, the Treasury Manager shall maintain a listing of Qualified Institutions that provide banking and investment services to GLWA. This list shall be reviewed and approved periodically by the GLWA Audit Committee.

Analysis: GLWA has maintained consistent relationships with the institutions listed on the Qualified list since 2016. The Treasury Manager conducts a quarterly review of each institution. The latest quarterly review was conducted based on information as of December 31, 2021.

For Broker/Dealers, the following documents were reviewed.

- Audited financial statements
- Financial Industry Regulatory Authority (FINRA) registration
- Federal Deposit Insurance Corporation (FDIC) insurance coverage
- Bank ratings service provider reports

For Financial Institutions, the following documents were reviewed.

- Audited financial statements
- FDIC insurance coverage
- Bank ratings service provider reports

For the Local Government Investment Pools, the following documents were reviewed,

- Information Statement which explains the investment objectives of the investment pool
- Audited financial statements for investment pool
- Audited financial statements for investment advisor
- Credit rating

PFM Asset Management LLC (PFM), the Investment Advisor for GLWA, annually provides a list of their approved broker/dealers. PFM evaluated this list for credit worthiness. Reliance on the investment advisor's analysis of qualified institutions is provided for in the GLWA investment policy.

Based upon the analysis described above, Table 1 below provides a listing of the GLWA qualified financial institutions for GLWA along with the respective amount of GLWA funds held by that entity as of December 31, 2021. The GLWA Treasury team interacts directly with these organizations.

Table 1 – GLWA Qualified Financial Institutions

Name	Relationship Established	Book Value Bal as of 12/31/2021
Financial Institutions		
Comerica Bank	Jan 2016	$ 14,793,195
Fifth Third Bank (custodian for MILAF funds managed by PFM)	Jul 2017	-
First Independence Bank	Jan 2016	22,181,281
J.P. Morgan Chase	Jan 2016	57,381,953
Huntington Bank	-	-
U.S. Bank - Trustee (includes funds managed by PFM)	Jan 2016	742,631,257
Broker / Dealers		
Comerica Securities Corporation	-	-
Fifth Third Securities	-	-
J.P. Morgan Securities	Jun 2017	44,765,701
U.S. Bancorp Investments	-	-
Local Government Investment Pool		
Michigan Liquid Asset Fund Plus (MILAF)	Nov 2016	1,757,883
Total		$883,511,270

Following this memo are PFM's qualified broker/dealer list and a summary of the qualified financial institution review.

Proposed Action: Receive and file this report.

PFM Asset Management LLC
Approved Broker/Dealer List

First Quarter 2022

‡ Academy Securities Inc.
* Amherst Pierpont Securites LLC
‡ Bancroft Capital LLC
* Barclays Capital Inc.
BGC Financial, L.P.
† Blaylock Van LLC
* BMO Capital Markets Corp.
* BNP Paribas Securities Corp.
BNY Mellon Capital Markets LLC
* BofA Securities, Inc.
Brean Capital LLC
† Cabrera Capital Markets LLC
* Cantor Fitzgerald & Co.
† CastleOak Securities
CIBC World Markets Corp.
* Citigroup Global Markets Inc.
† C.L. King & Associates, Inc.
Commerz Markets LLC
Commonwealth Australia Securities LLC
Credit Agricole Securities (USA), Inc.
* Credit Suisse Securities (USA) LLC
* Daiwa Capital Markets America Inc.
* Deutsche Bank Securities Inc.
‡ Drexel Hamilton LLC
Fifth Third Securities, Inc.
FHN Financial Securities Corp.
* Goldman Sachs & Co. LLC
Guggenheim Securities, LLC
Hilltop Securities Inc.
* HSBC Securities (USA) Inc.
ICAP Corporates, LLC
ING Financial Markets, LLC
Incapital LLC
Jane Street Execution Services LLC
* Jefferies LLC
* J.P. Morgan Securities LLC
Keybanc Capital Markets
† Loop Capital Markets LLC
Lloyds Securities Inc.
MarketAxess Corporation
† Mischler Financial Group, Inc.
* Mizuho Securities USA Inc.
* Morgan Stanley & Co. LLC
MUFG Securities America Inc.
* NatWest Markets Securities Inc.
* Nomura Securities International, Inc.
Oppenheimer & Co, Inc.
Performance Trust Capital Partners, LLC
Piper Sandler & Co.
PNC Capital Markets LLC
† R. Seelaus & Co., LLC
Rabo Securities USA, Inc.
* RBC Capital Markets, LLC
Robert W. Baird & Co.
‡ Roberts & Ryan Investments, Inc.
Scotia Capital (USA), Inc.
* SG Americas Securities LLC
† Siebert Williams Shank & Co LLC
SMBC Nikko Securities America Inc
Stifel, Nicolaus & Company, Incorporated
StoneX Financial Inc
Susquehanna Financial Group, LP
* TD Securities (USA) LLC
Tradeweb LLC
Tradition Securities and Derivatives LLC
Truist Securities Inc.
* UBS Securities LLC
Vining Sparks IBG, L.P.
* Wells Fargo Securities, LLC

* *Primary Government Securities Dealer*
† *Minority or woman owned business enterprise*
‡ *Service Disabled-Veteran Owned*

Note: Direct issuers of CP and CDs are considered to be approved counterparties if approved as an issuer.

Important Disclosures

This list is current as of the effective date only and is subject to change without notice. This list is for informational purposes only, and may not be relied upon for any other purpose. The list does not imply counterparty approval for deriviatives of any type. This information is confidential and may not be distributed without prior written consent of PFM Asset Management LLC.

Great Lakes Water Authority
Financial Institutions / Brokers / Investment Funds
Qualified Institutions Review Matrix as of December 31, 2021

Bank Name	Broker/Dealer Name	Investment Funds	FDIC Insured	FINRA Registered	Approved to do business in MI	Audited Financial Statements	Rating	Bauer Financial Rating	Robinson Capital Rating
Comerica	Comerica Securities [a]	-	Yes	Yes	Yes	Yes	Moody's - A3	4 Stars	A-
Fifth Third Bank	Fifth Third Securities [a]	-	Yes	Yes	Yes	Yes	Moody's - Baa1	4 Stars	A-
First Independence Bank	-	-	Yes	n/a1	Yes	Yes	n/a1	5 Stars	A-
JPMorgan Chase	JPMorgan Securities LLC	-	Yes	Yes	Yes	Yes	Moody's - A2	5 Stars	B+
U.S. Bank	U.S. Bancorp Investments Inc [a]	-	Yes	Yes	Yes	Yes	Moody's - A1	4 Stars	B+
Huntington Bank [a]	Huntington Investment company [a]	-	Yes	n/a1	Yes	Yes	Moody's - A3	5 Stars	B+
-	-	MILAF	n/a2	n/a2	n/a2	Yes	S&P - AAAm	n/a2	n/a2

(a) Currently, GLWA has not opened accounts with this institution.

n/a1 These entities are not broker/dealers and are not registered with FINRA and may not be rated by Moodys.

n/a2 Not Applicable for Investment Funds

FDIC The Federal Deposit Insurance Corporation (FDIC) is an independent agency of the U. S. government that protects the funds deposited in banks and savings associations. FDIC insurance is backed by the full faith and credit of the U.S. government. FDIC insurance covers all deposit accounts, including checking accounts, savings accounts, money market deposit accounts, and certificates of deposits. It does not cover other financial products and services that banks may offer, such as stocks, bonds, mutual funds, life insurance policies, annuities or securities.

FINRA The Financial Industry Regulatory Authority (FINRA) resulted from the merger of the New York Stock Exchange's regulatory committee and the National Association of Securities Dealers (NASD). FINRA's mission is to safeguard the investing public against fraud and bad practices by enforcing rules and regulations for every broker/dealer and monitoring compliance to FINRA rules as well as federal securities laws and rules of the Municipal Securities Rulemaking Board. Only entities that are broker/dealers need to be registered with FINRA.

Moody's / S&P Rating Moody's Investors Service and Standard & Poors are leading global providers of credit ratings, research, and risk analysis.

Bauer Financial Rating Bauer Financial is an independent bank research firm that is a source for unbiased, independent bank and credit union ratings. They have been analyzing and reporting on the financial condition of the nation's banking industry since 1983. Independent analysis is performed on the raw data as reported to federal regulators and supplemented with historical and other data to assign ratings.

Robinson Capital Rating Founded in December 2012, Robinson Capital is an independent investment advisor who offers banking research to Michigan based counties, cities, townships and school districts. Credit scores are assigned using a number of data sources and approaches. Credit scores are based on analysis of creditworthiness, taking into account the risk of default for each entity. For each bank, Robinson starts with the traditional financial statement analysis to calculate a base credit score, similar to most banking research offerings. In addition, they consider a number of other factors that enhance detection of instability, including; size, diversity of loans, geographic region, and financial data trends.

Great Lakes Water Authority
Rating Agency Legend

Moody's

Rating	Explanation
Aaa	Obligations rated Aaa are judged to be of the highest quality, subject to the lowest level of credit risk.
Aa	Obligations rated Aa are judged to be of high quality and are subject to very low credit risk
A	Obligations rated A are judged to be upper-medium grade and are subject to low credit risk.
Baa	Obligations rated Baa are judged to be medium-grade and subject to moderate credit risk and as such may possess certain speculative characteristics.
Ba	Obligations rated Ba are judged to be speculative and are subject to substantial credit risk.
B	Obligations rated B are considered speculative and are subject to high credit risk.
Caa	Obligations rated Caa are judged to be speculative of poor standing and are subject to very high credit risk
Ca	Obligations rated Ca are highly speculative and are likely in, or very near, default, with some prospect of recovery of principal and interest.
C	Obligations rated C are the lowest rated and are typically in default, with little prospect for recovery of principal or interest.

NOTE: Moody's appends numerical modifiers 1, 2, and 3 to each generic rating classification from Aa through Caa. The modifier 1 indicates that the obligation ranks in the higher end of its generic rating category; the modifier 2 indicates a mid-range ranking; and the modifier 3 indicates a ranking in the lower end of that generic rating category.

Standard & Poors (S&P)

Rating	Explanation
AAA	Obligations rated AAA indicate the obligor's capacity to meet its financial commitments is extremely strong.
AA	Obligations rated AA indicate the obligor's capacity to meet its financial commitments is very strong.
A	Obligations rated A indicate the obligor's capacity to meet its financial commitments is strong, but more susceptible to adverse conditions.
BBB	Obligations rated BBB indicate the obligor's capacity to meet its financial commitments is adequate, but could be weakened by adverse conditions.
BB	Obligations rated BB indicate the obligor's capacity to meet its financial commitments is adequate, but could become inadequate by the effects of adverse conditions.
B	Obligations rated B indicate the obligor's capacity to meet its financial commitments is adequate, but could be substancially impaired by adverse conditions.
CCC	Obligations rated CCC indicate the obligor is vulnerable and dependent on favorable conditions to meet its financial commitments.
CC	Obligations rated CCC indicate the obligor is highly vulnerable and a default is expected.
SD / D	Obligations rated SD / D indicator the obligor has defaulted.

NOTE: Ratings from AA to CCC may be modified by the adition of a plus (+) or minut (-) to show relative standing within the rating categories.

Bauer Financial

Rating	Explanation
★★★★★	Superior
★★★★	Excellent
★★★½	Good
★★★	Adequate
★★	Problematic
★	Troubled
ZERO	Troubled & Problematic

Robinson Capital

Rating	Explanation
A / B / C	Represents a high level of comfort with the institution's ability to make debt payments over the next 6-12 months.
F	Below investment grade, and represents concern with the institution's ability to continue to operate independently

Financial Services
Audit Committee Communication

Date: May 27, 2022

To: Great Lakes Water Authority Audit Committee

From: Kim Garland, CPA, Financial Services Area Chief of Staff

Re: General Retirement System Financial Report and Annual Actuarial Valuation for Year End June 30, 2021 (City of Detroit Component II)

Background: The Great Lakes Water Authority (GLWA) assumed a portion of the legacy pension commitment assigned to the Detroit Water & Sewerage Department (DWSD) pursuant to the terms of the regional water and sewer system leases. For this reason, GLWA monitors activity related to the City of Detroit General Retirement System (GRS). While there are two plans managed by GRS, GLWA is impacted by only the Component II plan. Component II was closed as of June 30, 2014 under the City of Detroit bankruptcy plan of adjustment and is commonly referred to as the 'legacy plan'.

The following reports have been presented to the GRS Board and are attached.

1. Letter from the GRS external audit firm to those charged with governance for the General Retirement System of the City of Detroit for the year ending June 30, 2021
2. Audited Financial Report for the General Retirement System of the City of Detroit (dated November 30, 2021)
3. GASB Statement No. 67 and 68 Accounting and Financial Reporting of Financial Plans of Component II June 30, 2020 (dated October 29, 2021)
4. Annual Actuarial Valuation as of June 30, 2021 (dated March 11, 2022)

While the external auditor letter (#1 above) to those charged with governance did highlight areas for improvement, the overall financial audit for the GRS combined plans received an unqualified opinion for the year ending June 30, 2021. The balance of this discussion will focus on the remaining reports: the results of the Audited Financial Report (#2 above) and GASB Statement No. 67 and 68 Report (#3 above) which are based on prior year actuarial results and serve as the basis for the DWSD and GLWA pension expense and liability to be reported in FY 2022. Finally, we will address the most recent June 30, 2021 Actuarial Valuation Report (#4 above) which provides insight into future pension expense and liability expectations.

Analysis: This report addresses five key areas.

1. Financial Position of the GRS as a Whole
2. Financial Position of the DWSD Unit with the GRS
3. Administrative Expenses
4. Planning for the Tail Liability (Unfunded Actuarial Accrued Liability - UAAL)
5. Impact on GLWA Financial Forecast

Financial Position of the GRS as a Whole

As reported in the GASB Statement No. 67 and 68 Accounting and Financial Report, and shown below in Table 1, the June 30, 2021 Component II Net Pension Liability is $885.5 million as of June 30, 2021 (approximately 20%) for the GRS as whole. This is a decrease of approximately 20% from the prior year liability of $1.1 billion.

Table 1: GASB Statement No. 67 and 68 Report - Executive Summary

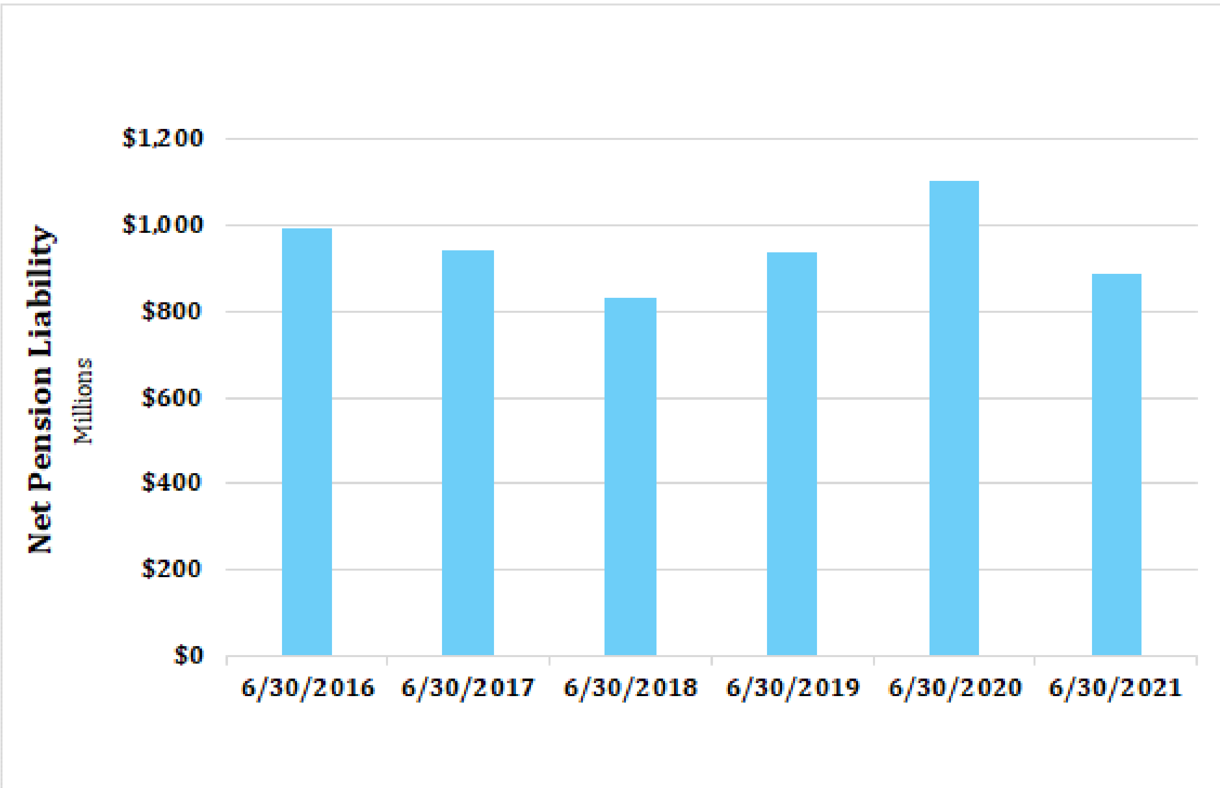
Executive Summary
as of June 30, 2021

Actuarial Valuation Date	June 30, 2020
Measurement Date of the Net Pension Liability	June 30, 2021
Employer's Fiscal Year Ending Date (GASB No. 68 Reporting Date)	June 30, 2022
Membership	
Number of	
- Retirees and Beneficiaries	11,220
- Inactive, Nonretired Members	2,728
- Active Members	2,403
- Total	16,351
Covered Payroll	$ 111,124,304
Net Pension Liability	
Total Pension Liability	$ 2,704,110,233
Plan Fiduciary Net Position	1,818,649,298
Net Pension Liability	$ 885,460,935
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	67.25%
Net Pension Liability as a Percentage of Covered Payroll	796.82%
Development of the Single Discount Rate	
Single Discount Rate	6.50%
Long-Term Expected Rate of Investment Return	6.50%
Long-Term Municipal Bond Rate*	1.92%
Last year ending June 30 in the 2022 to 2121 projection period for which projected benefit payments are fully funded	2121
Total Pension Expense	$ 97,970,192

Source: GASB Statement Nos. 67 and 68 Accounting and Financial Reporting for Pension Plans of Component II, June 30, 2021 (dated October 29, 2021), p 1.

The June 30, 2021 pension liability decrease is largely attributed to the increase in the actual net investment return which was 28.31% as compared to June 30, 2020 long-term expected rate of investment return of 7.06% and to the June 30, 2021 long-term expected rate of return of 6.50%. Chart 1 below highlights the overall net pension liability trend for the GRS as a whole since GLWA was formed in 2016.

Chart 1: Net Pension Liability Trend for GRS in Total



Source: GASB Statement Nos. 67 and 68 Accounting and Financial Reporting for Pension Plans of Component II. Multiple Years.

Financial Position of the DWSD Unit with the GRS

The GASB Statement No. 67 and 68 Accounting and Financial Report also provides a breakdown by unit as shown below in Table 2. The DWSD unit reflects the combined DWSD and GLWA pension obligation. As of June 30, 2021, the DWSD Net Pension Liability is $92.8 million. This is a decrease of nearly 54.8% from $205.3 million DWSD Net Pension Liability as of June 30, 2020). This decrease is largely a result of actual net investment return exceeding the expected rate of investment return.

Table 2: GASB Statement No. 67 and 68 Report - DWSD Changes in Net Pension Liability

Schedule of Changes in Net Pension Liability and Related Ratios Current Period Fiscal Year Ended June 30, 2021*

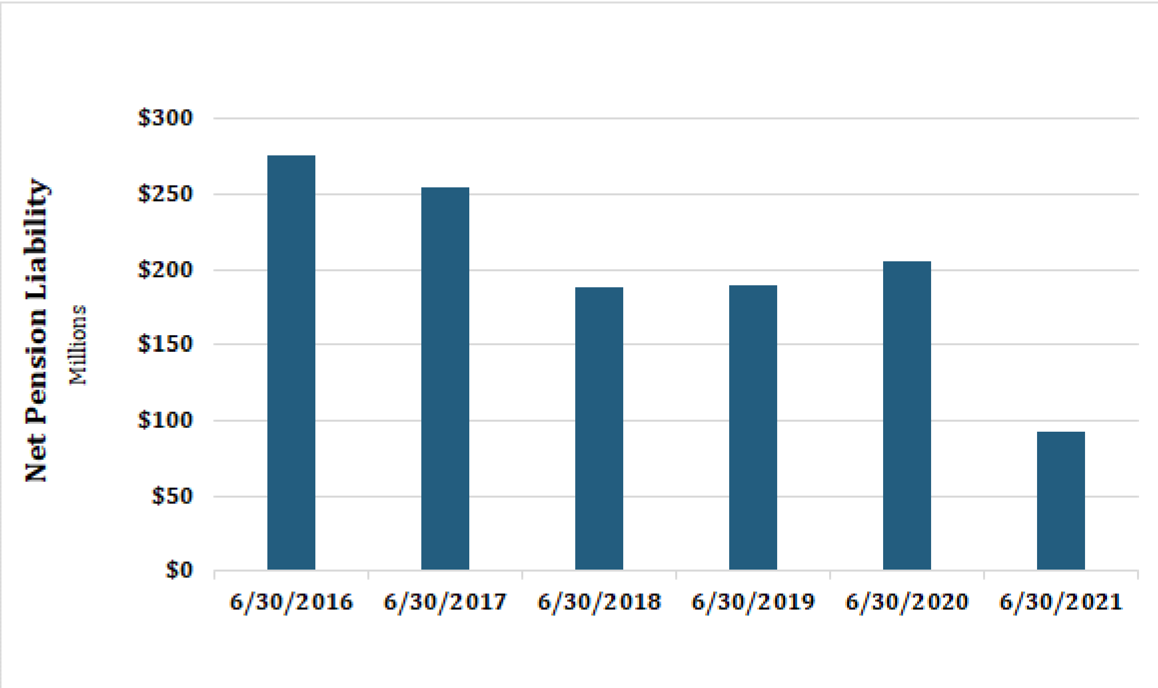
A. Total Pension Liability	General	DOT	DWSD	Library	Total
1. Service Cost	$ -	$ -	$ -	$ -	$ -
2. Interest on the Total Pension Liability	98,821,058	28,380,977	48,808,307	6,129,763	182,140,105
3. Changes of benefit terms	-	-	-	-	-
4. Difference between expected and actual experience of the Total Pension Liability	(35,563,723)	(10,172,786)	(13,092,918)	(403,422)	(59,232,849)
5. Changes of assumptions	63,835,479	19,062,298	33,101,322	3,877,595	119,876,694
6. Benefit payments, including refunds of employee contributions	(129,915,040)	(36,393,303)	(63,209,867)	(7,605,567)	(237,123,777)
7. Net change in Total Pension Liability	$ (2,822,226)	$ 877,186	$ 5,606,844	$ 1,998,369	$ 5,660,173
8. Total Pension Liability – Beginning	1,464,689,205	420,193,498	722,940,733	90,626,624	2,698,450,060
9. Total Pension Liability – Ending	$ 1,461,866,979	$ 421,070,684	$ 728,547,577	$ 92,624,993	$ 2,704,110,233
B. Plan Fiduciary Net Position					
1. Contributions – employer	$ 2,765,012	$ 109,988	$ 42,900,000	$ 2,500,000	$ 48,275,000
2. Contributions – employee	-	-	-	-	-
3. Net investment income	220,167,491	31,642,313	136,536,628	18,631,485	406,977,917
4. Benefit payments, including refunds of employee contributions	(129,915,040)	(36,393,303)	(63,209,867)	(7,605,567)	(237,123,777)
5. Pension Plan Administrative Expense	(1,717,931)	(174,636)	-	(94,626)	(1,987,193)
6. Other	3,462,963	929,607	1,874,921	137,871	6,405,362
7. Net change in Plan Fiduciary Net Position	$ 94,762,495	$ (3,886,031)	$ 118,101,682	$ 13,569,163	$ 222,547,309
8. Plan Fiduciary Net Position – Beginning	862,162,401	140,266,264	517,670,180	76,003,144	1,596,101,989
9. Plan Fiduciary Net Position – Ending	$ 956,924,896	$ 136,380,233	$ 635,771,862	$ 89,572,307	$ 1,818,649,298
C. Net Pension Liability	$ 504,942,083	$ 284,690,451	$ 92,775,715	$ 3,052,686	$ 885,460,935
D. Plan Fiduciary Net Position as a percentage of the Total Pension Liability	65.46%	32.39%	87.27%	96.70%	67.25%
E. Covered-employee payroll	$ 72,060,511	$ 15,783,013	$ 14,485,553	$ 8,795,227	$ 111,124,304
F. Net Pension Liability as a percentage of covered-employee payroll	700.72%	1803.78%	640.47%	34.71%	796.82%

**Totals may not add due to rounding.*

Source: GASB Statement Nos. 67 and 68 Accounting and Financial Reporting for Pension Plans of Component II, June 30, 2021 (dated October 29, 2021), p 22.

Chart 2 below provides the trend of the overall net pension liability trend for the DWSD unit since GLWA was formed in 2016.

Chart 2: Net Pension Liability Trend for DWSD Unit



On January 24, 2017, under a pension reporting agreement, the parties agreed that 70.3 percent of the liability allocated to the DWSD unit in the table above was attributable to GLWA regional operations and 29.7 percent to DWSD. This is the basis of allocation for future pension contributions with additional allocation within each entity between Water and Sewer funds. This is summarized in Table 3 below and applied to the current June 30, 2021 liability.

Table 3: Liability Allocation Between GLWA and DWSD as of June 30, 2021

Entity	Percent	Liability Allocation	
DWSD - Water	17.80%	$	16,514,077
DWSD - Sewer	11.90%	$	11,040,310
GLWA - Water	25.20%	$	23,379,480
GLWA - Sewer	45.10%	$	41,841,847
	100.00%	**$**	**92,775,715**

Administrative Expenses

Through June 30, 2023, as part of the City of Detroit bankruptcy plan of adjustment (POA), GLWA and DWSD contribute $2.5 million annually towards administrative expenses for the combined plan. GRS allocates 60% of overall administrative expenses to Component II and 40% to Component I. An allocation of overall pension administrative expense is provided in the GRS Annual Financial Report Statement of Changes in Fiduciary Net Position by Division shown in Table 4 below.

Table 4: Statement of Changes in Fiduciary Net Position by Division

Combined Plan for the General Retirement System of the City of Detroit

Statement of Changes in Fiduciary Net Position by Division - Legacy Defined Benefit Plan

For the Year Ended June 30, 2021

	DWSD Subdivisions			General Retirement System - Divisions			
	GLWA	DWSD-R	DWSD - Division Total (all DWSD Subdivisions)	General Division	DOT	Library	Total - General Retirement System (all Divisions)
Beginning Net Position - July 1, 2020	$ 363,922,133	$ 153,748,047	$ 517,670,180	$ 862,162,401	$ 140,266,264	$ 76,003,144	$ 1,596,101,989
Additions:							
Investment income:							
Interest and dividends	7,725,429	3,263,801	10,989,230	18,464,632	3,218,894	1,671,668	34,344,424
Net increase in fair value of investments	90,314,459	38,155,612	128,470,071	206,398,388	29,085,100	17,354,631	381,308,190
Net unrealized gain on collateralized securities	62,296	26,319	88,615	142,367	20,062	11,971	263,015
Investment related expenses	(2,116,935)	(894,353)	(3,011,288)	(4,837,896)	(681,743)	(406,786)	(8,937,713)
Net investment income	95,985,249	40,551,379	136,536,628	220,167,491	31,642,313	18,631,484	406,977,916
Contributions:							
Employer contributions:							
Originating from DWSD:							
Regular pension contribution	30,158,700	12,741,300	42,900,000	-	-	-	42,900,000
Contribution for administrative expenses	1,757,500	742,500	2,500,000	-	-	-	2,500,000
DWSD transfer to General Division for administrative expenses	(1,757,500)	(742,500)	(2,500,000)	2,500,000	-	-	-
Total contributions originating from DWSD	30,158,700	12,741,300	42,900,000	2,500,000	-	-	45,400,000
Contributions from other divisions	-	-	-	-	-	2,500,000	2,500,000
Total employer contributions	30,158,700	12,741,300	42,900,000	2,500,000	-	2,500,000	47,900,000
Foundation for Detroit's Future	-	-	-	265,012	109,988	-	375,000
Total contributions	30,158,700	12,741,300	42,900,000	2,765,012	109,988	2,500,000	48,275,000
ASF recoupment interest	1,297,270	548,064	1,845,334	3,604,194	1,136,912	153,418	6,739,858
Other income	203,320	85,898	289,218	454,041	57,070	36,690	837,019
Total additions - net	127,644,539	53,926,641	181,571,180	226,990,738	32,946,283	21,321,592	462,829,793
Deductions:							
Member refunds and withdrawals	1,040,916	439,761	1,480,677	4,066,345	4,875,528	911,054	11,333,604
Retirees' pension and annuity benefits	43,395,620	18,333,569	61,729,189	125,848,697	31,517,775	6,694,512	225,790,173
General and administrative expenses	453,093	191,421	644,514	1,073,418	174,636	94,626	1,987,194
ASF Recoupment Write-off	182,521	77,111	259,632	595,269	264,375	52,237	1,171,513
Transfer of general and administrative expenses to General Division	(453,093)	(191,421)	(644,514)	644,514	-	-	-
Total deductions	44,619,057	18,850,441	63,469,498	132,228,243	36,832,314	7,752,429	240,282,484
Net Increase (Decrease) in Net Position	83,025,482	35,076,200	118,101,682	94,762,495	(3,886,031)	13,569,163	222,547,309
End of Year Net Position Restricted for Pensions - June 30, 2021	**$ 446,947,615**	**$ 188,824,247**	**$ 635,771,862**	**$ 956,924,896**	**$ 136,380,233**	**$ 89,572,307**	**$ 1,818,649,298**

Source: Audited Financial Report for the General Retirement System of the City of Detroit (dated November 30, 2021), p 47.

Of the $2.5 million paid by GLWA and DWSD, $645 thousand is attributable to the current year and is transferred to the General Division. The remainder is recorded as a prepaid toward future administrative expenses after June 30, 2024 summarized in Table 5 below.

Table 5: Schedule of DWSD/GLWA Contributions Toward Administrative Expenses

Combined Plan for the General Retirement System of the City of Detroit

Schedule of DWSD/GLWA Contributions Toward Administrative Expenses as Compared to Actual DWSD/GLWA Allocable Administrative Expenses

For the Year Ended June 30, 2021

	DWSD Division Total	
	GLWA	DWSD-R
Amount Paid in Excess of Administrative Expenses Otherwise Allocable - June 30, 2020	$ 5,630,243	$ 2,378,641
DWSD/GLWA contribution for administrative expenses in accordance with plan of adjustment and bankruptcy order	1,757,500	742,500
Administrative expenses otherwise allocable to DWSD/GLWA	(453,093)	(191,421)
Cumulative Amount Paid in Excess of Administrative Expenses Otherwise Allocable - June 30, 2021	**$ 6,934,650**	**$ 2,929,720**

Source: Audited Financial Report for the General Retirement System of the City of Detroit (dated November 30, 2021), p 48.

Planning for the Tail Liability (UAAL)

Under the POA, GLWA and DWSD make combined, Component II annual pension payments of $45.4 million, of which $2.5 million is specific to administrative expenses discussed above. Those fixed payments are reduced after June 30, 2023 based upon the terms of a pension agreement that addresses the tail liability. The actual amount of this remaining, unfunded liability will vary based upon plan performance and the outstanding liability at that time.

The June 30, 2021 Actuarial Report estimates the total Component II unfunded actuarial accrued liability (UAAL) for the GRS as a whole to be $727.0 million with $17.2 million as the DWSD-GLWA share of that liability June 30, 2022.

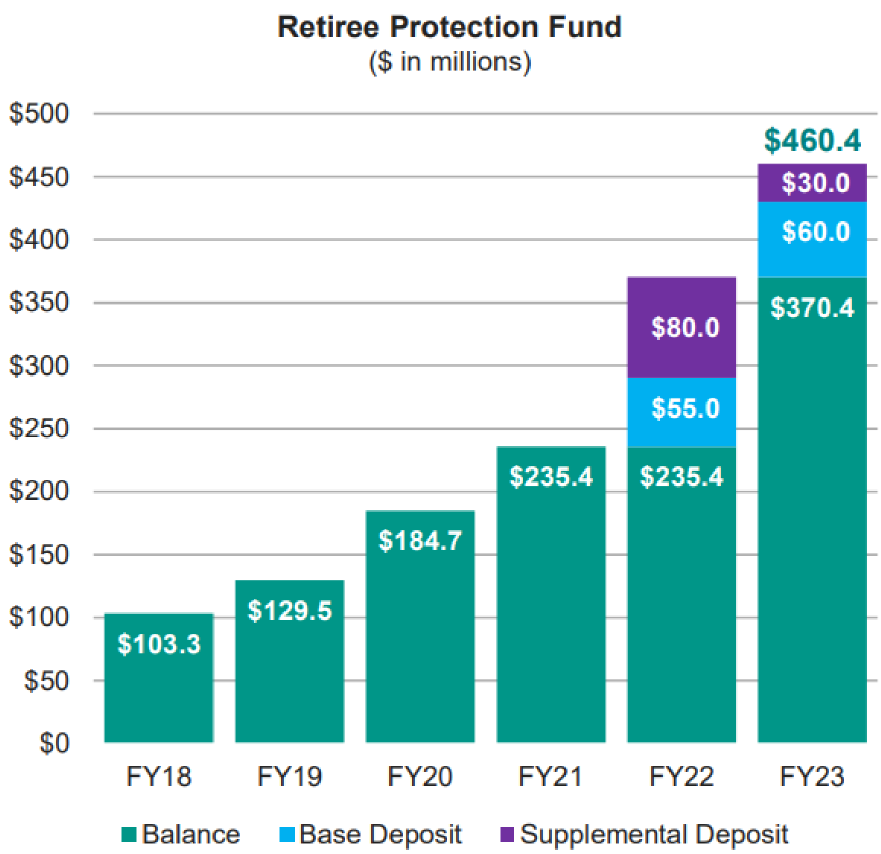
- The City of Detroit is also focused on preparing for the future. Under the POA, the City is not required to make contributions to the GRS until FY 2024. The City is, however, contributing to a Retiree Protection Fund (RPF). The City of Detroit Bankruptcy Plan of Adjustment provided a 10-year deferment of pension costs to allow for investments in the City and to improve City Services. The "Grand Bargain" provided for pension contributions from several sources. Pursuant meeting requirements of the Plan of Adjustment, the City of Detroit created an irrevocable Internal Revenue Code Section 115 trust fund exclusively for satisfying its legacy pension obligations and adopted a funding strategy for its frozen legacy pension plan obligations to set aside $335M in funding by FY 2023. The trust was established to: Build up RPF assets plus investment earnings to be used to partially offset annual required legacy pension contributions that resume in FY 2024.

- Allows the City to begin gradually building up its budget capacity now to meet the annual required contributions in the future.
- Review the funding plan annually based on updated information and revise if needed during the annual budget and planning process. *

**Cited from the FY 2020 Long-Term Forecast Report, March 29, 2019*

The balance in the Retirement Protection Fund by year is shown in Chart 3 below. The chart was taken from the Adopted FY 2023 Budget presented by the Financial Review Commission and confirms the current value of that fund as June 30, 2022, as well as the FY 2023 budget projection.

Chart 3: City of Detroit Retiree Protection Fund



Source: https://detroitmi.gov/sites/detroitmi.localhost/files/2022-05/FY%202023-2026%20Four%20Year%20Financial%20Plan%20Adopted%20-%20Section%20A%20-%20Overview.pdf

Funded ratio is a metric used to measure a plan's ability to cover future obligations based on projected contributions. The Component II funded ratio for the period ending June 30, 2021 is 71.53% up from 58.76% the prior year with best practice benchmarks being a 75% minimum and 100% maximum funded ratio.

As noted above, the POA established a funding policy for GLWA and DWSD. Adoption of a funding policy by the City of Detroit is necessary to reduce the UAAL moving forward. Two funding options available to the City are proposed in the June 30, 2021 Actuarial Report which ultimately impact the amount of the tail liability that GLWA and DWSD will be responsible for beginning in FY 2024. Table 6 below summarizes this UAAL by unit and provides a range for annual contribution requirements beginning in FY 2024.

Strong investment returns in FY 2021, a 30-year amortization period and currently adopted interest rate of 6.75% result in a projected negative UAAL and no annual pension contributions for DWSD. The report reflects a required contribution of $0.6 million for the annual administrative expense, which needs to be reviewed as noted by the actuary based on the various agreements. The actual FY 2022 investment returns, and the actuarial assumptions adopted by the Board and Investment Committee will impact actual FY 2023 results.

Table 6: Projected Annual Contribution & UAAL/Tail Liability

Unfunded Actuarial Accrued Liability (UAAL)

($ Millions)	General City	D.O.T.	DWSD	Library	System Total
UAAL as of June 30, 2021	$ 416.4	$ 257.2	$ 56.3	$ (5.9)	$ 724.0
Anticipated POA Contribution (EOY)	(2.7)	(0.1)	(42.9)	(2.5)	(48.3)
Anticipated Expenses[1]	1.9	0.3	-	0.1	2.3
Interest at 6.75%	28.2	17.4	3.8	(0.4)	48.9
Projected UAAL as of June 30, 2022	$ 443.7	$ 274.8	$ 17.2	$ (8.7)	$ 727.0
Anticipated POA Contributions for FY 2023	**2.7**	**0.1**	**42.9**	**2.5**	**48.3**
Estimated Employer Contributions for FY 2024[2, 3]					
Alternate 1: 30-Year Level Principal					
UAAL Contribution	$ 47.7	$ 29.6	$ (2.5)	$ (1.2)	$ 73.6
$0 Minimum UAAL Contribution	47.7	29.6	-	-	77.3
Administrative Expense Contribution[4]	1.3	0.3	0.6	0.1	2.3
Total Contribution	**$ 49.0**	**$ 29.9**	**$ 0.6**	**$ 0.1**	**$ 79.6**
Alternate 2: 30-Year Level Dollar[5]					
UAAL Contribution	$ 37.2	$ 23.1	$ (1.9)	$ (0.9)	$ 57.4
$0 Minimum UAAL Contribution	37.2	23.1	-	-	60.2
Administrative Expense Contribution[4]	1.3	0.3	0.6	0.1	2.3
Total Contribution	**$ 38.5**	**$ 23.4**	**$ 0.6**	**$ 0.1**	**$ 62.5**

Totals may not add due to rounding.

1 *Administrative expenses for DWSD are paid by General City through 2023.*
2 *Assuming the POA contributions through 2023 and a 30-year closed amortization thereafter. When determining the contributions through 2023, only the total contributions and the DWSD contributions are stipulated in the POA. The remaining amounts were allocated to the other groups as described on page 2. A different allocation would result in different results by group.*
3 *Total employer contributions, including amounts paid by the employer but funded from other sources as required by POA.*
4 *We recommend that the proposed administrative expense contribution for DWSD be reviewed in the context of the 2015 agreement between the City, the Retirement System, and the Great Lakes Water Authority.*
5 ***Contributions at this level may not be sufficient to prevent fund depletion prior to satisfaction of all benefit payments. This scenario is included at Retirement System's request (see page 4).***

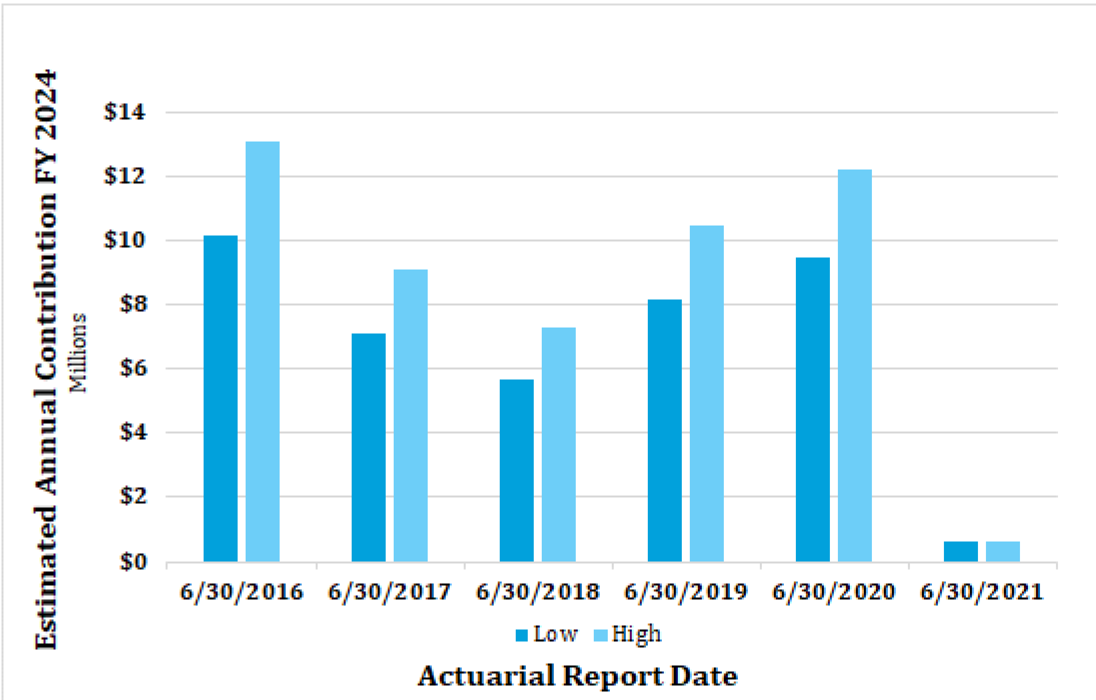
Source: Annual Actuarial Valuation of Component II, June 30, 2021 (dated March 11, 2022), p 3.

GLWA
Great Lakes Water Authority

Impact on GLWA Financial Forecast

Based on the funding policy ultimately adopted by the City of Detroit for FY 2024, the annual contribution for GLWA and DWSD is $0.6 million for administrative expense contribution only. The prior year actuarial for FY 2024 placed that range between $9.5 and $12.2 million. The annual contribution based on the tail liability is highlighted in Chart 4 below.

Chart 4: GLWA and DWSD Estimated Annual Contribution for FY 2024



Source: Annual Actuarial Valuation of Component II, June 30, 2021 (dated March 11, 2022), p 3.

GLWA will continue to monitor and report on Component II activity, specifically as it relates to funding policy actions taken by the City of Detroit. GLWA has also engaged an independent actuarial firm to review the current valuation and the impacts of any funding policy actions taken by the City and GRS. The firm and GLWA staff will report to the GLWA Audit Committee on these findings when they become available. In addition, GLWA staff continues to attend the monthly GRS Board meetings to monitor and report on the current events and impact on the Plan's investment assets.

Proposed Action: Receive and file this report.

plante moran

Plante & Moran, PLLC
P.O. Box 307
3000 Town Center, Suite 100
Southfield, MI 48075
Tel: 248.352.2500
Fax: 248.352.0018
plantemoran.com

November 30, 2021

To the Board of Trustees and the
Investment Committee
General Retirement System
of the City of Detroit

We have audited the financial statements of the General Retirement System of the City of Detroit (the "System") as of and for the year ended June 30, 2021 and have issued our report thereon dated November 30, 2021. Professional standards require that we provide you with the following information related to our audit, which is divided into the following sections:

Section I - Internal Control Related Matters Identified in an Audit - This includes any deficiencies we observed in the System's accounting principles and internal control that we believe are significant. Current auditing standards require us to formally communicate on an annual basis matters we note about the System's accounting policies and internal control. The System has been diligent in its efforts to remedy many of the previously identified internal control deficiencies. Due to its efforts, the condition of the accounting records at the start of the audit and supporting documentation continues to improve.

Section II - Required Communications with Those Charged with Governance - This includes information that current auditing standards require independent auditors to communicate to those individuals charged with governance. We will report this information annually to the board of trustees and the investment committee of the System.

Section III - Other Recommendations and Related Information - This presents recommendations related to internal control, procedures, and other matters noted during our current year audit. These comments are offered in the interest of helping the System in its efforts toward continuous improvement, not just in the areas of internal control and accounting procedures, but also in operational or administrative efficiency and effectiveness.

We would like to take this opportunity to thank the System's staff for the cooperation and courtesy extended to us during our audit. The assistance and professionalism of the System's staff are invaluable and greatly appreciated.

This report is intended solely for the use of the board of trustees, the investment committee, and management of the General Retirement System of the City of Detroit and is not intended to be and should not be used by anyone other than these specified parties.

We welcome any questions you may have regarding the following communications, and we would be willing to discuss these or any other questions that you might have at your convenience.

Very truly yours,

Plante & Moran, PLLC

Michelle Watterworth

Michelle M. Watterworth, CPA

Spencer Tawa

Spencer Tawa, CPA

Section I - Internal Control Related Matters Identified in an Audit

In planning and performing our audit of the financial statements of the System as of and for the year ended June 30, 2021, in accordance with auditing standards generally accepted in the United States of America, we considered the System's internal control over financial reporting (internal control) as a basis for designing audit procedures that are appropriate in the circumstances for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the System's internal control. Accordingly, we do not express an opinion on the effectiveness of the System's internal control.

Our consideration of internal control was for the limited purpose described in the preceding paragraph and was not designed to identify all deficiencies in internal control that might be significant deficiencies or material weaknesses, and, therefore, material weaknesses or significant deficiencies may exist that were not identified. However, as discussed below, we identified certain deficiencies in internal control that we consider to be material weaknesses and another deficiency that we consider to be a significant deficiency.

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 entity’s financial statements will not be prevented, or detected and corrected, on a timely basis.

We consider the following deficiencies in the System’s internal control to be material weaknesses:

<u>Controls Over the System’s Census Data and Actuarial Valuation Process (Repeat Finding)</u>

<u>Background</u>: The System has to accumulate and transmit voluminous member data to the actuary. The System accumulates member data based on information from the City of Detroit, Michigan (the “City”), as well as data the System independently obtains. The System relies on data it extracts from the City of Detroit, Michigan’s databases primarily for active and deferred members. The System is responsible for data on retirees, as it will obtain additional information when a member commences retirement.

The actuary then uses this information to prepare the actuarial valuation, which impacts the calculation of the actuarially determined contribution (ADC) and the actuarial accrued liability (AAL) for funding purposes and, under GASB Statement No. 67, impacts the total pension liability disclosed in the System’s financial statements.

It is key that the information provided to the actuary is complete and accurate in order to ensure that the funding levels, AAL, and disclosures under GASB Statement No. 67, including the total pension liability, also are accurate.

<u>Issues and recommendations</u>: The System has had issues with the accuracy of the member data for many years. While some data appears to have improved (i.e., active payroll for Component I members), we continued to identify a number of errors with the census data. The more significant errors are as follows:

- Inaccuracies with the average final compensation (AFC) and service years being used in the calculation of frozen accrued benefits (Component II only). Based on our procedures, it was noted that the majority of our sample’s actual AFC was higher than reported in the census data. The majority of the discrepancies ranged from 3 to 8 percent of AFC. Reporting lower AFC than actual leads to a potential understatement of the plan’s total pension liability. Based on follow-up with the System, the discrepancy in the data is not clear. We recommend the System perform a comprehensive review to determine how to pull the most accurate AFC information to provide to the actuary.

Section I - Internal Control Related Matters Identified in an Audit (Continued)

- Missing census data - The actuary noted that inactive vested members for Component I have not been fully processed by the System. As a result, the actuary took members who have retired under Component II with a deferred Component I benefit to include as deferred vested under Component I (actuary identified 307 members). Due to getting the information from the active or retired files for Component II, some information was missing, and the actuary had to make assumptions (i.e., if AFC was unavailable, the actuary assumed an AFC of $36,000 for general DOT members and $42,500 for water/sewage and library members). We recommend the System identify deferred vested members under Component I and ensure all data elements needed are provided to the actuary.

- Service years - During our testing procedures, we noted changes to service years for active and deferred members in Component II. We do not expect any changes in benefit service years given this plan is frozen as of June 30, 2014. We recommend the System perform procedures in analyzing changes in service years to ensure the only changes relate to data corrections.

We acknowledge that both the System and the actuary perform certain tests and cleanup work on the data before it is utilized in the valuations. Unfortunately, the magnitude of the issues identified during our testing is still extremely significant, particularly with AFC and, if not corrected in the coming years, may cause issues with being able to conclude that the data utilized in the valuations is accurate enough not to materially misstate financial data.

Controls Over the System's Information Technology Processes (Repeat Finding)

The System has complex modifiable information technology that integrates with the City of Detroit, Michigan's various payroll databases. The System's IT department is independent of the City and the System's other departments. The security provided by the IT system is important to the validity and the accuracy of the data maintained, including the census information provided to the actuary.

Although the System is currently in the process of modifying the information technology system, we offer the following, which the System should keep in mind as it continues to fully implement the new ERP system:

- Use of automated logs - The System uses customized software for a majority of the System's needs, which includes maintaining the census data and benefits calculation application, which are managed internally by the System's IT personnel and can be modified by the IT department. For all changes to that software, there should be an automated log maintained listing those changes, and no single individual should be able to effect a change without proper authorization. Currently, the System has a process to review, authorize, and track changes, but it is not automated; therefore, it is subject to human error and possible circumvention.

- Master file changes - Additionally, it is recommended that the System implement processes to ensure that master file changes are documented, authorized, and reviewed. The lack of this documentation could result in unauthorized and undocumented changes that go undetected by the System.

- Segregation of duties - Segregation of duty controls provide a separation of users with access to program source code and users with the ability to make or implement changes into the production environment. The ability to make or implement program source code changes should be limited to individuals who cannot access and edit source code. The lack of this control could result in inaccurate or unauthorized changes.

Section I - Internal Control Related Matters Identified in an Audit (Continued)

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. We consider the following deficiency in the System's internal control to be a significant deficiency:

Controls Over Year-end Investment Valuation

The System has approximately $914 million in investments that do not have a readily determinable market value. For approximately $865 million of this amount, management's estimate of the investments' fair value is based on capital statements provided by investment managers and general partners. The System's process is to accumulate the capital statements for all these investments to record fair value as of June 30, 2021. For investments for which the June 30, 2021 capital statements are not available timely, the System uses March 31, 2021 (or later) capital statements and adjusts for any cash flow activity during the gap period (generally April 1, 2021 through June 30, 2021) to approximate fair value as of June 30, 2021. The System maintains an Excel workpaper to track adjustments to these investments. This process is designed to ensure investment valuation is accurately estimated at June 30, 2021; however, during our audit, we noted one error related to this process:

- An investment was overstated by approximately $6,500,000. The System incorrectly used the March 31, 2020 capital statement instead of March 31, 2021 to initially value the investment (prior to accounting for cash flows for the gap period). The investment value recorded by the System was approximately $39 million but should have been $32.5 million. After we identified this error, the System subsequently recorded this change, and it is reflected in the June 30, 2021 financial statements.

We recommend the System implement additional controls over the System's valuation of investments to ensure investments continue to be recorded in compliance with generally accepted accounting principles. This would include adding another layer of review by obtaining and reviewing capital statements included in the tracker and ensuring formulas are correct in the Excel tracker.

Section II - Required Communications with Those Charged with Governance

Our Responsibility Under U.S. Generally Accepted Auditing Standards

As stated in our engagement letters dated June 18, 2021 and September 21, 2021, our responsibility, as described by professional standards, is to express an opinion about whether the financial statements prepared by management with your oversight are fairly presented, in all material respects, in conformity with U.S. generally accepted accounting principles. Our audit of the financial statements does not relieve you or management of your responsibilities. Our responsibility is to plan and perform the audit to obtain reasonable, but not absolute, assurance that the financial statements are free of material misstatement.

As part of our audit, we considered the internal control of the System. Such considerations were solely for the purpose of determining our audit procedures and not to provide any assurance concerning such internal control.

We are responsible for communicating significant matters related to the audit that are, in our professional judgment, relevant to your responsibilities in overseeing the financial reporting process. However, we are not required to design procedures specifically to identify such matters.

Planned Scope and Timing of the Audit

We performed the audit according to the planned scope and timing previously communicated to you in our meeting about planning matters on August 23, 2021.

Significant Audit Findings

Qualitative Aspects of Accounting Practices

Management is responsible for the selection and use of appropriate accounting policies. In accordance with the terms of our engagement letter, we will advise management about the appropriateness of accounting policies and their application. The significant accounting policies used by the System are described in Note 1 to the financial statements. There were several new accounting standards effective for the System this year, including GASB Statement No. 84 on fiduciary activities, which the System analyzed and determined had no impact. As a result, no new accounting policies were adopted, and the application of existing policies was not changed during year.

We noted no transactions entered into by the System during the year for which there is a lack of authoritative guidance or consensus.

There are no significant transactions that have been recognized in the financial statements in a different period than when the transaction occurred.

Accounting estimates are an integral part of the financial statements prepared by management and are based on management's knowledge and experience about past and current events and assumptions about future events. Certain accounting estimates are particularly sensitive because of their significance to the financial statements and because of the possibility that future events affecting them may differ significantly from those expected.

The following are the significant estimates affecting the financial statements:

<u>Investment valuations:</u>

The financial statements include investments valued at approximately $49 million (2 percent of net position) at June 30, 2021 whose fair values have been estimated by management in the absence of readily determinable market values.

Section II - Required Communications with Those Charged with Governance (Continued)

The valuation of alternative investments constitutes a very sensitive and significant estimate affecting the financial statements. Management uses various means to value the investments, including utilizing a third-party valuation firm, confirmations from the investment managers, periodic appraisals, guidance from real estate advisors, etc. These estimates are very subjective and highly sensitive to change. We believe management's estimates are in accordance with GAAP.

Estimates inherent in the development of the total pension liability:

The financial statement disclosures and required supplemental information schedules contain information about the System's total pension liability. In order to determine the total pension liability, the actuary must apply certain assumptions that are highly sensitive to estimation. The most sensitive estimates used in the valuation were as follows:

- Assumed long-term rate of return - For the purpose of GASB Statement No. 67, as of June 30, 2021, the System is currently using 6.50 percent for the assumed long-term expected rate of return based on information provided by the System's investment advisor combined with calculations performed by the System. This assumed rate of return was also the single discount rate used at the end of the year. Nationally, this long-term rate of return assumption has garnered significant public attention, with many being critical of the average return assumption used by plans across the United States, which, according to a February 2021 National Association of State Retirement Administrators (NASRA) study, was 7.18 percent. Nationally, the trend continues to show a continued decline in this assumption, and we believe that trend will continue. We commend the System on continuing to be critical of this significant assumption, watching the trends nationally, and reevaluating the return assumption annually with a critical eye. Please note that this assumption related to the long-term assumed rate of return is for financial reporting purposes only; the Plan of Adjustment requires that the projected rate of return for funding purposes be 6.75 percent.

- Single discount rate calculation - The calculation of the single discount rate under GASB Statement No. 67, which is calculated using the long-term assumed rate of return as one of many assumptions, is highly sensitive to estimates the actuary makes about future contributions and future benefit payments. Inherent in those assumptions is some subjectivity surrounding the projection of future contributions, since the System does not have a fully approved and agreed upon funding policy dictating contributions after 2023, although we do understand that the board of trustees has adopted a funding policy, but it has not yet been approved by the investment committee, nor has that funding policy been put in place. The assumption made in the GASB 67 valuation is that the actuarially assumed contributions will be made at rates sufficient to fund the benefits by amortizing the unfunded liability over a closed 30-year period. The adoption of a shorter amortization period, if that were the route taken, would not alter the current assumption that no depletion date exists.

- Mortality assumptions - The assumptions about mortality were estimated by the actuary based on the results of an experience study issued in February 2015. Generally, the actuary used the RP-2014 Blue Collar Annuitant Table for males and females, projected on a fully generational basis. In early 2019, the Society of Actuaries published new mortality tables called the Pub-2010 tables. These were the first mortality tables issued based solely on United States public sector employees (public safety, teachers, and general employment categories). Given the applicability of these tables to the public sector, it will be likely the System will need to consider these tables. We understand that the System is currently undergoing a new experience study but that no results are yet available and no new assumptions have yet been adopted as a result of that study, which is ongoing.

- Other assumptions - All other assumptions in the actuarial valuation are based on an experience study for the period from 2002-2007. In order to avoid any results that could be skewed due to the City's bankruptcy, we understand that the System has waited to perform an updated experience study, which is currently in process. It is possible that the results of this next experience study for the period from July 1, 2015 through June 30, 2020 could impact the total pension liability.

We evaluated the key factors and assumptions used to develop the estimates above and determined that they are reasonable in relation to the financial statements taken as a whole.

Section II - Required Communications with Those Charged with Governance (Continued)

The disclosure of these assumptions and resultant sensitivity of the discount rate can be found in Notes 7 and 8 to the financial statements.

The disclosures in the financial statements are neutral, consistent, and clear. Certain financial statement disclosures are particularly sensitive because of their significance to financial statement and schedule users. The most sensitive disclosures affecting the financial statements and the schedules are the disclosures related to GASB Statement No. 67, including the actuarial valuation results.

Difficulties Encountered in Performing the Audit

We are required to inform those charged with governance of any difficulties encountered related to the performance of the audit. While we had no difficulties in dealing with management related to the performance of the audit, we did encounter significant difficulties due to the magnitude of the census data errors we found during our audit test work.

Disagreements with Management

For the purpose of this letter, professional standards define a disagreement with management as a financial accounting, reporting, or auditing matter, whether or not resolved to our satisfaction, that could be significant to the financial statements or the auditor’s report. We are pleased to report that no such disagreements arose during the course of our audit.

Corrected and Uncorrected Misstatements

Professional standards require us to accumulate all known and likely misstatements identified during the audit, other than those that are trivial, and communicate them to the appropriate level of management. None of the misstatements detected as a result of audit procedures and corrected by management were material, either individually or in the aggregate, to the financial statements taken as a whole. The following summarizes uncorrected misstatements of the financial statements:

- The total pension liability, as calculated by the actuary, is based on census information that is either incomplete or inaccurate. The total pension liability would be different had accurate and complete information been provided to the actuary.
- In the schedule of changes in the city's net pension liability and related ratios (Legacy Plan), covered payroll is required to be presented. This information was unavailable and has been noted as not available.
- The money-weighted rate of return, net of investment expenses for the pension plans calculated return is 28.31 percent. We are unable to audit this rate of return.

Management has determined that their effects are immaterial, both individually and in the aggregate, to the financial statements taken as a whole.

Significant Findings or Issues

We generally discuss a variety of matters, including the application of accounting principles and auditing standards, business conditions affecting the System, and business plans and strategies that may affect the risks of material misstatement, with management each year prior to our retention as the System’s auditors. However, these discussions occurred in the normal course of our professional relationship, and our responses were not a condition of our retention.

Management Representations

We have requested certain representations from management that are included in the management representation letter dated November 30, 2021.

Section II - Required Communications with Those Charged with Governance (Continued)

Management Consultations with Other Independent Accountants

In some cases, management may decide to consult with other accountants about auditing and accounting matters, similar to obtaining a second opinion on certain situations. If a consultation involves application of an accounting principle to the System's financial statements or a determination of the type of auditor's opinion that may be expressed on those statements, our professional standards require the consulting accountant to check with us to determine that the consultant has all the relevant facts. To our knowledge, there were no such consultations with other accountants.

Section III - Other Recommendations and Related Information

During our audit, we noted areas where we believe there are opportunities for the System to further strengthen internal control or to increase operating efficiencies. Our observations on those areas are presented below for your consideration:

Investment Distributions

- The System receives investment cash distributions for interest, dividends, return of capital, and other investment-type income. While the majority of the distributions are received by the System's custodian, Bank of New York, there are distributions that also run through the passive investments. The controls over these distributions are critical to ensuring that all distributions that should go to the System ultimately are received.

  When the System sets up a new alternative investment, such as private equity and hedge funds, subscription agreements are signed by authorized individuals of the System (i.e., trustees and executive director). The agreements may also assign the chief investment officer (CIO) to be the authorized agent on behalf of the System, include a list of individuals that the investment fund should include in some of its correspondences, and indicate the Bank of New York banking information where future distributions are to be sent.

  As an authorized agent, the CIO is able to change the wire instructions after they are initially established. As a detective control to ensure inappropriate changes are not made, when a distribution is sent, in most cases the investment funds send distribution letters simultaneously to the accounting staff at the System in addition to the CIO, which can then be reconciled to the receipt. This control is imperative to ensure distribution wire instructions are correct and funds are being properly received by the designated Bank of New York account.

  As there are some investments initially funded many years ago, the correspondence list and contact information may need to be updated given personnel changes at the System. This is to ensure all distribution notices are received by the accounting department and follow the System's controls - reviewing distribution notices to verify the banking information and follow-up procedures to verify that all current distributions are ultimately received.

- The System's components of investment income are separated in the general ledger and in the financial statements between (a) interest income, dividend income, and other income and (b) net increase (decrease) in fair value of investments (which includes realized and unrealized gains and losses). The plan's current processes and controls do not always result in an accurate allocation between these two components of investment income, although in total investment income would not be affected.

  For investments where Bank of New York is the custodian of the System's investments, the accounting department records the activity using the individual investment reports as the source document. The System appropriately performs a reconciliation of these amounts monthly.

  For investments for which Bank of New York is not the custodian, the accounting department uses information obtained on each distribution notice to determine the income statement classification of the funds received. While the System's processes and controls have improved significantly in this reporting from prior years, during the audit we identified certain adjustments between the classification of investment income. To be clear, this does not have an effect on the System's end of year net position but is merely a misclassification between these two types of income accounts; however, proper accounting is critical to ensure the plan's accounting supports the underlying transactions that are occurring and supports the accuracy of the System's external financial reporting.

  As distribution notices and capital statement formats differ between investment funds, we recommend the System's accounting department continue to work with the chief investment officer on any uncertain distributions to properly classify the distribution within the System's general ledger.

Section III - Other Recommendations and Related Information (Continued)

Benefit Payment Classification

The System processes monthly benefit payments for each retiree that are summarized and journalized in a monthly entry. These monthly payroll entries are based on the plan to which each retiree is coded (Component II or I). During testing, it was identified that some individuals' pensions are incorrectly classified between Component I and Component II. While the number of individuals incorrectly classified was insignificant, we recommend the System implement a control to ensure proper classification of members in the IT system. This will become more important as the longevity of Component I grows.

Information Technology Processes

- Currently, there is no formal process to fill out a production release form. Usually a member of the IT department will inform Ray Tchou to review a production change. Ray is the only individual with the ability to release a production change. We recommend the System have a formal policy for individuals to submit a production release form to document change requests and maintain proper support of approval of any changes.

- It was noted there are administrative user profiles that remained in the System for users no longer employed at the System. These profiles have remained active, as staff need to access old files. In addition, we noted duplicate administrative user profiles for current employees. We recommend the System perform a user profile review and only allow one user profile for each current employee and that user profiles for former employees be immediately deleted upon ceasing employment.

Benefit Payment Calculations

Pension factors are used in calculating an individual's pension payment based on age and option selected. Currently, the pension factor used in the calculation of benefit payments is using an old mortality table (1984 table) and a 7.5 percent rate of return. Pension factors should be updated with a newer mortality table (RP-2014 Mortality Table is currently being used in the actuarial valuations) and rate of return of 6.75 percent (current rate of return used for funding purposes, as stipulated by the Plan of Adjustment). Our understanding is the System will update these amounts once the benefit calculation software is implemented.

Informational Items

Income Stabilization Fund

As you are aware, based on the Plan of Adjustment, the investment committee may recommend to the board of trustees that a portion or all of the assets that exceed the income stabilization benefits to be paid in the future be used to fund regular pension payments (up to $35 million). This is allowed beginning in 2022 and requires agreement from at least 75 percent of the independent members of the investment committee on the recommendation. As of June 30, 2021, the Income Stabilization Fund's net position was $14,210,563. The investment committee may want to utilize this option; if so, it will need to utilize an actuary to assist in making this determination.

Upcoming Accounting and Auditing Standards - Fiscal Year Ending June 30, 2022

AICPA State and Local Government Client Affiliates

The AICPA has adopted a revised auditor independence interpretation, which impacts entities reporting under the GASB framework. The new rules define four types of affiliates (entities affiliated with your financial statements) that may expand the scope of required auditor independence as it relates to your audit. Under these revised standards, one type of affiliate includes certain investments held by the audit client. For the System, it is possible that you hold several investments that meet the definition of an affiliate and, therefore, require independence.

Section III - Other Recommendations and Related Information
(Continued)

Because auditor independence is a shared responsibility between your organization and Plante & Moran, PLLC, you should be aware of and understand these changes. In addition, we will need your help to perform an initial evaluation under these revised standards and will also likely need your continuing assistance to comply with these rules in the future. The changes are effective for years beginning after December 15, 2021, which means we must be independent of your affiliates as of the first day of the year of required adoption, or July 1, 2022. For more information on these changes, please view our on-demand webinar here.

Auditor Reporting Standards

The AICPA Auditing Standards Board (ASB) issued several new standards which are coming effective shortly, that will significantly change the independent auditor's report and make some changes to certain required audit procedures. The standards discussed below are both first effective for your fiscal year ending June 30, 2022.

Statement on Auditing Standards No. 137 addresses auditors' responsibilities relating to "other information included in annual reports." This new standard may increase the scope of audit procedures and may result in some audit work being performed outside of the normal timing. To the extent that the System issues a document meeting the AICPA's definition of an annual report under the standard, additional audit procedures will need to be performed on these separate documents before issuance.

Statement on Auditing Standards No.134 requires changes in the form and content of the auditor's report issued as a result of an audit of financial statements in order to provide financial statement users with more meaningful information about the audit process and meaning of auditor opinions. This is the first significant change to auditor's reports in years.

Significant elements of the new standard include the following:

- Revised order for elements of the opinion letter, including moving the auditor's opinion to the top of the letter
- Expansion of information to be included within a basis of opinion section and notification to the user that the auditor is required to be independent of the entity and to meet other ethical responsibilities
- Explanation of how misstatements to financial statements are determined to be material
- Addition of definition of "reasonable assurance" and identifying that the risk of material misstatement due to fraud is greater than the risk due to error
- Enhanced reporting related to going concern, including a description of management's responsibilities when required by the applicable reporting framework
- Description of the auditor's responsibilities, including responsibilities relating to professional judgment and professional skepticism, internal controls, identification of risks of material misstatement to the financial statements, evaluation of accounting policies used, conclusion on the entity's ability to continue as a going concern, and the auditor's communications with those charged with governance

We are happy to discuss these changes with you so that you are well prepared.

GASB Statement No. 87 - Leases

This new accounting pronouncement will be effective for reporting periods beginning after June 15, 2021. This statement requires recognition of certain lease assets and liabilities for leases that previously were classified as operating leases and recognized as inflows of resources or outflows of resources based on the payment provisions of the contract. It establishes a single model for lease accounting based on the foundational principle that leases are financings of the right to use an underlying asset. Under this statement, a lessee is required to recognize a lease liability and an intangible right-to-use lease asset, and a lessor is required to recognize a lease receivable and a deferred inflow of resources.

Section III - Other Recommendations and Related Information
(Continued)

We recommend beginning to accumulate information now related to all significant lease agreements in order to more efficiently implement this new standard once it becomes effective.

Plante & Moran, PLLC has already provided several trainings on this new standard, which are all available on demand if you missed the original sessions or want a refresher. We also have a workaid available to help you implement the new standard. Please reach out to us for assistance in getting started; we are happy to help.

General Retirement System of the City of Detroit

Financial Report
with Supplemental Information
June 30, 2021

General Retirement System of the City of Detroit

Contents

Plante & Moran, PLLC
P.O. Box 307
3000 Town Center, Suite 100
Southfield, MI 48075
Tel: 248.352.2500
Fax: 248.352.0018
plantemoran.com

Independent Auditor's Report

To the Board of Trustees
General Retirement System of the City of Detroit

Report on the Financial Statements

We have audited the accompanying financial statements of the General Retirement System of the City of Detroit (the "System") as of and for the year ended June 30, 2021 and the related notes to the financial statements, which collectively comprise the General Retirement System of the City of Detroit's basic financial statements, as listed in the table of contents.

Management's Responsibility for the Financial Statements

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

Auditor's Responsibility

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

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

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

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the fiduciary net position of the General Retirement System of the City of Detroit as of June 30, 2021 and the changes in its fiduciary net position for the year then ended in accordance with accounting principles generally accepted in the United States of America.

To the Board of Trustees
General Retirement System of the City of Detroit

Other Matters

Required Supplemental Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis and other required supplemental information, as identified in the table of contents, be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, which 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 supplemental 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 Supplemental Information

Our audit was conducted for the purpose of forming an opinion on the financial statements that collectively comprise the General Retirement System of the City of Detroit's basic financial statements. The other supplemental information, as identified in the table of contents, is presented for the purpose of additional analysis and is not a required part of the basic financial statements.

The other supplemental 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. Such 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 other supplemental information is fairly stated in all material respects in relation to the basic financial statements as a whole.

Plante & Moran, PLLC

November 30, 2021

General Retirement System of the City of Detroit

Management's Discussion and Analysis

As management of the General Retirement System of the City of Detroit (DGRS or the “System”), we offer readers this narrative overview and analysis of the financial activities for the year ended June 30, 2021.

Using This Annual Report

This annual report consists of three parts: (1) management's discussion and analysis (this section), (2) the basic financial statements, and (3) the required supplemental information. The financial statements also include notes that explain some of the information in the financial statements and provide more detailed data. The financial statements are followed by sections of required supplemental information that further explain and support the information in the financial statements.

Financial Highlights

There have been great strides in tackling the coronavirus pandemic. Although the virus has not been eradicated, we are now in a better economic position than we were last year at this same point in time. Businesses are open, many at normal capacity. The federal stimulus provided to businesses and citizens has had mixed results. It has put more money in the hands of those who really needed it, while also allowing for excess cash for others to be invested in the U.S. financial markets. The excess money in the economy has brought on some challenges. Businesses are having a tough time finding employees to staff their operations, limiting some organizations' ability to maximize profits, and inflation is on the rise. Home prices are up nearly 20 percent, and inflation is up nearly 4 percent. Overall, the financial markets have been strong this year, allowing for double-digit returns benefiting the System and its membership.

Here at the System, we have returned to the office. While still adhering to COVID-19 safety recommendations, most employees are working in the office three days per week and working remotely two days per week.

Maximizing the use of technology remains a priority for the System. Through the use of technology, we will continue work to improve our members' experience dealing with the System and to streamline our internal processes. With that thought in mind, various components of the new ERP system have been brought online and made available to our members. The current features available relate to payroll and annuity. These two areas represent just a small portion of the ERP system's capabilities. We look forward to more features coming online as the year progresses.

This year, the City of Detroit, Michigan (the "City") adopted the provisions of GASB Statement No. 84. As part of that implementation, it was determined that the Death Benefit Fund was no longer a fiduciary activity of the City and would be excluded from the City's financial statements. As a result, the System's board of trustees, wanting to ensure the Death Benefit Fund continued to get reported and audited, concluded to change the reporting focus on the system financial statements from just reporting on the pension plans to a full reporting on the System by now including the Death Benefit Fund in the system financial statements.

Condensed Financial Information

The tables below compare key financial information in a condensed format between the current year and the prior year:

	2021	2020
Assets	$ 2,170,799,791	$ 1,865,118,309
Liabilities	93,946,613	80,261,165
Fiduciary Net Position		
Restricted:		
Pension	2,046,753,718	1,760,362,269
Postemployment benefits other than pension	30,099,460	24,494,875
Total fiduciary net position	**$ 2,076,853,178**	**$ 1,784,857,144**

General Retirement System of the City of Detroit

Management's Discussion and Analysis (Continued)

	2021	2020
Additions		
Net investment income (loss):		
Interest, dividends, and other income	$ 37,998,415	$ 65,120,608
Net increase in fair value of investments	429,689,222	(73,621,461)
Investment-related expenses	(9,999,193)	(8,077,985)
Net investment income	457,688,444	(16,578,838)
Securities lending income	523,749	322,235
Contributions:		
Employer	59,705,774	60,529,703
Employee	14,634,129	16,028,824
Foundation	375,000	375,000
Total contributions	74,714,903	76,933,527
ASF recoupment interest	6,739,858	6,214,543
Transfer from Component II to Component I	-	1,178,130
Other income	870,543	1,889,540
Total additions	540,537,497	69,959,137
Deductions		
Benefit payments	228,564,857	233,118,633
Member refunds and withdrawals	15,465,278	12,242,608
Transfer to Component I from Component II	-	1,178,130
General and administrative expenses	3,339,815	3,893,024
ASF recoupment write-off	1,171,513	1,710,757
Total deductions	248,541,463	252,143,152
Net Increase (Decrease) in Net Position Held in Trust	**$ 291,996,034**	**$ (182,184,015)**

Fund Overview, Membership, and Governance

The pension plans of the General Retirement System of the City of Detroit consist of defined benefit pension plans and defined contribution plans for the nonuniformed employees of the City of Detroit, Michigan, composed of Component I and Component II, which are memorialized in a document titled the Combined Plan for the General Retirement System of the City of Detroit, Michigan, made effective July 1, 2014, as amended and restated December 8, 2014 (the “Combined Plan”). The System also manages open and closed death benefit funds (collectively, the "Death Benefit Plans"). The Death Benefit Plans are held in a separate trust; the board of the Death Benefit Plans is substantially the same as the board of the pension plans. This discussion and its accompanying financial statements are concerned primarily with Component I, a new pension plan created by the City effective July 1, 2014 for active nonuniformed employees of the City to earn pension benefits on and after that date (also referred to as the “Hybrid Plan”), and Component II, the legacy pension plan where benefits were earned through June 30, 2014 (the "Legacy Plan").

As discussed in greater detail below, at the conclusion of the 2014 fiscal year, the City froze Component II. The freeze of Component II, which was the pension plan that existed as of June 30, 2014, means that no further benefit accruals occurred after that date, and no new employees are allowed to participate as members.

General Retirement System of the City of Detroit

Management's Discussion and Analysis (Continued)

DGRS exists to pay benefits to its members. Members of the System include active nonuniformed city employees, retirees, and their beneficiaries. Active members still employed with the City on and after July 1, 2014 earn service credit that entitles them to receive benefits in the future in Component I but not in Component II, which, as noted above, has been frozen. Both the employer and municipal plan sponsor for the System, the City, and actively employed members have historically contributed to the System (the employee contributions were voluntary prior to July 1, 2014). Retirees, their beneficiaries, and disabled members are those currently receiving benefits, though the City elected in fiscal year 2015 to transition new disability claims from the benefit program administered by the System to one administered by a third-party insurance carrier.

Component I of DGRS is a newly created plan (effective July 1, 2014), with more active members earning service credit than members eligible to receive or receiving benefits. As of June 30, 2020, there were 5,106 active members, with 508 retirees and 880 terminated plan members entitled to but not yet receiving benefits.

Component II of DGRS is a relatively mature plan in that there are more members receiving current benefits than active members. As of June 30, 2020, in Component II there were 2,403 active members, with 11,220 members receiving benefits and 2,728 terminated plan members entitled to but not yet receiving benefits. On June 30, 2014, the emergency manager of the City of Detroit, Michigan issued Order No. 30, which froze Component II. After that date, no new employees were allowed to participate in Component II, and benefit accruals for members with respect to service rendered prior to July 1, 2014 were frozen based on the member's years of service, average final compensation, and the pension multiplier formula as of the freeze date. Employees working after July 1, 2014 are now earning service credit in the Hybrid Plan, or Component I.

By way of background, a brief review of the City's migration from the Legacy Plan to the Hybrid Plan is appropriate. On June 30, 2014, the emergency manager of the City of Detroit, Michigan issued Order No. 30, which froze Component II. After that date, no new employees were allowed to participate in Component II, and benefit accruals for members with respect to service rendered prior to July 1, 2014 were frozen based on the member's years of service, average final compensation, and the pension multiplier formula as of the freeze date. Employees working after July 1, 2014 are now earning service credit in the Hybrid Plan, or Component I. On July 1, 2014, the City first published the Combined Plan with the city clerk. By August 1, 2014, the City completed the payroll information systems project transitions required to allow the now mandatory employee contributions to be contributed to Component I.

On October 19, 2014, the emergency manager issued Order No. 43, which amended and restated the Combined Plan. On December 8, 2014, before leaving office, the emergency manager issued Order No. 44, which again amended and restated the Combined Plan. According to Order No. 44, the latest amendments and restatements to the Combined Plan conformed the combined plan terms to the requirements of the City's bankruptcy plan and made clarifying modifications. The Combined Plan is available at DGRS' website, www.rscd.org.

In December 2014, DGRS governance was modified as part of the City's bankruptcy plan. DGRS is governed by a board of trustees (the “Board”). Although DGRS' investment management is now the ultimate responsibility of a seven-member investment committee (the “Investment Committee”), the Board maintains its role as the governing board vested with responsibility for the general administration, management, and operation of the System, with which the Investment Committee assists, pursuant to Michigan law.

The Board is composed of 10 members. Five members are elected by the active membership to serve six-year terms. A sixth member is elected by the retiree membership to serve a two-year term. A seventh member is appointed by the mayor of the City of Detroit, Michigan from the citizens of the City to serve a six-year term. The three remaining members serve ex officio, these members being the mayor of the City (or designee), the city treasurer, and one representative from the Detroit City Council. Expirations of terms of elected trustees are staggered, while the remaining trustees serve in accordance with their office or as a designee of an office.

The Investment Committee has five independent members appointed to initial terms with staggered expirations, which terms will all eventually become six years. Two additional members, one active and one retired, serve on the Investment Committee based on appointment by the Board. The Investment Committee will be in place through at least December 2034.

Contributions to the System

Historically, both the City and active employees have made regular contributions to the System, with employee contributions being optional in Component II, essentially before July 1, 2014, though there was a period of transition due to the City's aging information technology infrastructure, which meant that voluntary employee contributions to Component II continued through July 2014, and mandatory employee contributions to Component I from active payroll were implemented as of August 1, 2014.

Basic pension and disability benefits in Component II had been funded through employer contributions plus investment earnings on those contributions, but employee contributions are mandatory in Component I. The required employer contributions had been determined by the System's actuaries using the entry age normal cost method, which is still the case. Assumptions used by the actuaries are subject to experience testing every five years, which is also still the case. Effective December 10, 2014, as part of the resolution of the Chapter 9 case, the investment return assumption and discount rate used by the System's actuary for the purpose of determining the System's assets and liabilities for funding purposes was fixed at 6.75 percent through the period ending June 30, 2023. This applies to both Component I and Component II.

The obligations for contributions to support Component II of the System through 2023 are determined as fixed amounts by the provisions in the Plan of Adjustment. Pursuant to the Plan of Adjustment, the System is expected to receive contributions totaling $718.6 million through fiscal year 2023. The Plan of Adjustment calls for the System to receive $98.8 million from the State of Michigan; $428.5 million from the Detroit Water and Sewer Department (DWSD); $31.7 million from UTGO settlement proceeds; the present value equivalent or actual contribution of $50 million from the Detroit Institute of Arts (DIA) and its foundation donors during a 10-year period ending in 2024; the present value equivalent or actual contribution of $18.3 million per year from 2025 through 2034 from certain foundations; and $114.6 million from the other city-related employer contribution sources, such as the General Fund, Detroit Library Commission, and COBO Authority, over a 10-year period covering fiscal year 2014 through fiscal year 2023. After 2023, the City and various other employer constituents, such as the library, DWSD, and COBO Authority, will retain responsibility for the full funding obligations of Component II of the System, consistent with Michigan law.

The Plan of Adjustment allows for certain of the Legacy Plan's funding obligations to DGRS through 2034 to be met by prepayment of the present value equivalent using a discount rate of 6.75 percent. In the fiscal year ended June 30, 2016, a portion of the DIA obligation to make annual $5 million contributions over 10 years ending in 2034 was prepaid. This present value prepayment resulted in DGRS receiving $32,511,827 on June 30, 2016 from the DIA, which represents the present value, using a 6.75 percent discount rate, of $4,625,000 per year for the 9 years remaining on that annual $5,000,000 commitment ending in 2024. Pursuant to the Plan of Adjustment, DGRS still expects to receive the equivalent or actual remaining $375,000 per year from the DIA for that 10-year period ending in 2024 and also received, on June 30, 2016, the amount of $375,000 in satisfaction of the fiscal year 2016 obligation from the DIA that was not prepaid.

In addition, the City was to remit payments on the UTGO Stub Bonds to the Combined Plan through 2028. In fiscal year 2017, the City of Detroit, Michigan refunded all of its outstanding UTGO Stub Bonds. Upon refunding, the payments to the Combined Plan were accelerated, with a majority of the outstanding balance paid to the Combined Plan in fiscal year 2017; as a result, the Combined Plan received approximately $7.7 million in the ISP and $18.3 million in Component II related to this transaction.

With respect to Component I, the Hybrid Plan, nonuniformed employees who are members of DGRS are now required to make mandatory contributions of 4 percent of pay toward their defined benefit pensions earned with the City, and the City contributes an additional 5 percent of pay. The City no longer counts overtime in the calculation of its employer contribution.

The City is also setting aside an additional 0.75 percent of payroll to meet the premium payments required for the disability insurance established with a third-party carrier. DGRS is not administering those disability benefits managed by the third-party carrier.

On June 30, 2021, the City met its obligation for Component I employer contributions by contributing $11,690,984 to DGRS.

General Retirement System of the City of Detroit

Management's Discussion and Analysis (Continued)

Impact of City of Detroit, Michigan Collective Bargaining and Bankruptcy Pension Adjustments

Pursuant to Emergency Manager Order No. 30, the existing Component II defined contribution plan and defined benefit plan were frozen, preventing any future accruals or new members in Component II effective June 30, 2014.

The following changes became effective July 1, 2014, with the advent of Component I:

- The Hybrid Plan's defined benefit plan commenced with mandatory contributions of 4 percent of base pay. The City contributes 5 percent of employee base pay, not including overtime.
- A new Hybrid Plan defined contribution plan commenced for the annuity savings fund. Employees may make voluntary annuity savings fund contributions of up to 7 percent of total after-tax pay. Interest will be credited at the actual net investment rate of return of DGRS, but in no event will it be lower than 0 percent or higher than 5.25 percent.
- The Hybrid Plan provides that future duty disability and nonduty disability retirement allowances for members who become disabled after July 1, 2014 move to a commercial insurance program through the City.

Benefit Payments

The System exists to pay the benefits that its members have earned pursuant to benefits promised by the City, subject to the Chapter 9 case benefit adjustments going forward in the Legacy Plan and the new promises in the Hybrid Plan. Benefits are paid monthly. In fiscal year 2021, DGRS paid out $242,800,000 in benefits, consisting of $227,300,000 in benefits to retirees and beneficiaries plus $15,500,000 in refunds of annuity savings fund balances and mandatory contributions. The benefits and refunds represent approximately 12 percent of the net position of the System as of June 30, 2021. Employer, foundation, and employee contributions were $74,500,000, or 4 percent of the net position of the System. The excess of benefits over contributions of $168.3 million is funded through investment income. The public capital markets represent the primary source of opportunities to earn investment income.

Asset Allocation

The Board and the Investment Committee of DGRS believe that the principal determinant of total fund investment performance over long periods of time is asset allocation. DGRS' asset allocation is built upon the foundation that the obligations of the System to pay the benefits promised to its members are very long-term obligations. Accordingly, the Board and the Investment Committee must make investment decisions that they believe will be the most beneficial to the System over many years, not just one or two years.

DGRS has established asset allocation policies that are expected to deliver investment income over a very long period of time to satisfy the obligations to pay the benefits promised to the members of the System. The following is a summary of the DGRS asset allocation policy as of June 30, 2021:

Asset Class	Target Allocation
Global equity	46.00 %
Global fixed income	33.00
Real estate/Real assets	13.00
Diversifying strategies	8.00

DGRS' asset allocation policies comply with Michigan law.

Investment Results

DGRS calculates investment results on a time-weighted Global Investment Performance Standard (GIPS) basis unless explicitly stated otherwise. All returns for periods of one year or greater have been annualized.

Total Fund Composite

DGRS' total fund composite return for the year was 28.3 percent, net of fees and expenses using a time-weighted methodology. The fund returned 9.9 percent, 10.2 percent, and 8.3 percent for its 3-, 5-, and 10-year annualized returns, respectively, net of fees and expenses.

Financial markets wrapped up the fiscal year ended June 2021 at record highs, yielding strong returns for the DGRS portfolio, with investors defying pessimistic projections of a broader pullback and pushing past concerns of rising inflation and potential rate hikes.

Outweighing these concerns, the dramatic changes brought on by successful COVID-19 vaccination efforts helped fuel an economic comeback. Financial markets have also been bolstered by significant spending from Congress and an aggressive monetary policy from the Federal Reserve, as well as improving corporate earnings.

As part of the resolution of the City of Detroit, Michigan's Chapter 9 bankruptcy case, the discount rate assumption used to meet current and future benefit obligations was set at 6.75 percent through the period ending June 30, 2023. This discount rate assumption provided in the Chapter 9 case does not purport to establish an investment return assumption or discount rate for purposes of, or in accordance with, generally accepted accounting principles. Although the fund's return for this year fell below this assumption, the fund's longer-term return expectation, which this assumption is intended to characterize, still exceeds this assumption.

Total plan returns, net of fees and expenses, for the recent prior fiscal years ended June 30 are shown below:

2020	(0.96)%
2019	3.40
2018	6.50
2017	14.10
2016	1.40
2015	2.60
2014	14.50
2013	11.70
2012	0.10

Money-weighted Rate of Return

GASB Statement No. 67 requires the disclosure of the annual money-weighted rate of return. A money-weighted rate of return (as opposed to the time-weighted rate of return discussed in the previous section) considers both the size and timing of cash flows over the course of the year to determine an internal rate of return (sometimes referred to as IRR). This return is calculated net of expenses and uses cash flows determined on a monthly basis. The DGRS money-weighted rate of return for the year using month-end cash flows was 28.31 percent.

Requests for Further Information

This financial report is intended to provide a general overview of the System's finances and investment results in relation to actuarial projections. It shows the System's accountability for the money it receives from employer and employee contributions. If you have questions about this report or need additional information, we welcome you to contact the System's office or visit its website at www.rscd.org.

General Retirement System of the City of Detroit

Statement of Fiduciary Net Position

June 30, 2021

	Component II Plan (Legacy)		Component I Plan (Hybrid)		
	Defined Benefit Fund	Income Stabilization Fund	Defined Benefit Fund	Death Benefit Plans	Total
Assets					
Cash and cash equivalents (Note 3)	$ 18,515,365	$ 257,274	$ 4,203,304	$ 1,866,631	$ 24,842,574
Investments: (Notes 3 and 4)					
Global equities	860,095,029	6,755,683	98,246,942	17,528,704	982,626,358
Global fixed income	315,709,740	3,090,359	46,988,043	2,360,426	368,148,568
Real estate	211,477,802	1,661,069	24,821,447	2,067,511	240,027,829
Private equity	113,487,179	891,397	12,963,415	233,318	127,575,309
Diversifying strategies	193,992,595	1,523,730	22,159,387	6,063,736	223,739,448
Receivables:					
Investment income	1,761,023	13,832	201,155	-	1,976,010
Contributions (Note 1)	-	-	2,814,486	-	2,814,486
Other receivables	2,442,416	17,919	-	-	2,460,335
ASF recoupment receivable (Note 1)	97,994,122	-	-	-	97,994,122
Notes receivable from participants	2,972,014	-	510,483	-	3,482,497
Receivables from investment sales	3,179,136	24,971	363,146	-	3,567,253
Cash and investments held as collateral for securities lending: (Note 3)					
Asset-backed securities	4,067,132	31,946	464,580	-	4,563,658
Certificate of deposit	9,247,183	72,633	1,056,287	-	10,376,103
Repurchase agreements	14,863,156	116,744	1,697,789	-	16,677,689
U.S. corporate floating rate	42,611,354	334,694	4,867,410	-	47,813,458
Commercial paper	2,450,394	19,247	279,904	-	2,749,545
Money market funds	4,417,678	34,699	504,623	-	4,957,000
Capital assets - Net (Note 1)	2,647,165	-	1,760,384	-	4,407,549
Total assets	1,901,930,483	14,846,197	223,902,785	30,120,326	2,170,799,791
Liabilities					
Accrued expenses	2,765,946	6,007	852,348	20,866	3,645,167
Payables for investment purchases	3,571,443	28,052	407,959	-	4,007,454
Due to the City of Detroit, Michigan	354,690	-	-	-	354,690
Amounts due to broker under securities lending agreements (Note 3)	76,589,106	601,575	8,748,621	-	85,939,302
Total liabilities	83,281,185	635,634	10,008,928	20,866	93,946,613
Net Position - Restricted for					
Pension	1,818,649,298	14,210,563	213,893,857	-	2,046,753,718
Postemployment benefits other than pension	-	-	-	30,099,460	30,099,460
Total net position	**$ 1,818,649,298**	**$14,210,563**	**$ 213,893,857**	**$30,099,460**	**$ 2,076,853,178**

See notes to financial statements.

General Retirement System of the City of Detroit

Statement of Changes in Fiduciary Net Position

Year Ended June 30, 2021

	Component II Plan (Legacy)		Component I Plan (Hybrid)		
	Defined Benefit Fund	Income Stabilization Fund	Defined Benefit Fund	Death Benefit Plans	Total
Additions					
Investment income (loss):					
Interest, dividends, and other income	$ 34,154,617	$ 255,386	$ 3,408,358	$ 180,054	$ 37,998,415
Net increase in fair value of investments	381,308,190	2,848,035	38,971,158	6,561,839	429,689,222
Investment-related expenses	(8,937,713)	(67,403)	(919,077)	(75,000)	(9,999,193)
Net investment income	406,525,094	3,036,018	41,460,439	6,666,893	457,688,444
Securities lending income:					
Interest and dividends	189,807	1,411	18,556	-	209,774
Net gain on collateralized securities	263,015	2,463	48,497	-	313,975
Total securities lending income	452,822	3,874	67,053	-	523,749
Contributions:					
Employer	47,900,000	-	11,690,984	114,790	59,705,774
Employee	-	-	14,517,266	116,863	14,634,129
Foundation	375,000	-	-	-	375,000
Total contributions	48,275,000	-	26,208,250	231,653	74,714,903
ASF recoupment interest (Note 1)	6,739,858	-	-	-	6,739,858
Other income	837,019	1,280	32,244	-	870,543
Total additions - Net	462,829,793	3,041,172	67,767,986	6,898,546	540,537,497
Deductions					
Benefit payments	225,790,173	530,184	986,730	1,257,770	228,564,857
Member refunds and withdrawals	11,333,604	-	4,131,674	-	15,465,278
General and administrative expenses	1,987,194	-	1,316,430	36,191	3,339,815
ASF recoupment write-off	1,171,513	-	-	-	1,171,513
Total deductions	240,282,484	530,184	6,434,834	1,293,961	248,541,463
Net Increase in Fiduciary Net Position	222,547,309	2,510,988	61,333,152	5,604,585	291,996,034
Net Position Restricted for Pension/OPEB - Beginning of year	1,596,101,989	11,699,575	152,560,705	24,494,875	1,784,857,144
Net Position Restricted for Pension/OPEB - End of year	**$ 1,818,649,298**	**$14,210,563**	**$ 213,893,857**	**$30,099,460**	**$ 2,076,853,178**

See notes to financial statements.

Note 1 - Significant Accounting Policies

Reporting Entity

The pension plans of the General Retirement System of the City of Detroit (the "System" or DGRS) and the Death Benefit Funds are managed by the Retirement System of the City of Detroit. The City of Detroit, Michigan (the "City") sponsors these plans, which consist of four single-employer retirement plans - two pension plans (the "Combined Plan") and two other postemployment benefit plans (the "Death Benefit Plans"), as described below.

In previous years, the pension plans and Death Benefit Funds were reported as fiduciary funds of the City of Detroit, Michigan. In the current year, due to the City's implementation of GASB Statement 84, *Fiduciary Activities*, the pension plans and Death Benefit Funds are no longer reported in the City's financial statements. This is the first year that the Death Benefit Funds are included in these separately issued financial statements for the System.

Pension Plans

Component II

This is the legacy plan (the "Legacy Plan") that is the original defined benefit plan, which includes a defined benefit component and a defined contribution component. Component II generally applies to benefits accrued by members prior to July 1, 2014. On June 30, 2014, as a result of negotiations between the City and the public employee unions, the existing plan benefit formulas were frozen, and no employees were allowed to earn benefits under the existing plan. The emergency manager issued Order No. 30 (General Retirement System of the City of Detroit) on June 30, 2014, which put these changes into effect. Except as specifically provided in the Combined Plan, benefits provided under Component II are frozen effective June 30, 2014.

Component II also includes the Income Stabilization Fund. The fund, which is part of Component II only and established as a special plan of adjustment provision, was established for the sole purpose of paying the Income Stabilization Benefits and Income Stabilization Benefits Plus to eligible pensioners. A portion of the funds received by the Combined Plan from UTGO Stub Bonds tax proceeds is credited to the Income Stabilization Fund. The allocation is based on the aggregate payments to plan assignees included in the Eighth Amended Plan for the Adjustment of Debts of the City of Detroit (the "Plan of Adjustment" or the "POA"). After 2022, the Investment Committee may recommend to the board that a portion or all of the assets that exceed income stabilization benefits (including Income Stabilization Benefits Plus) to be paid in the future be used to fund regular pension payments.

Nonemployer Contributing Entity within Component II

On September 9, 2014, a memorandum of understanding (the "MOU") was entered into by the emergency manager and mayor of the City of Detroit, Michigan; the county executive of each of the charter counties of Wayne and Macomb, Michigan; the County of Oakland, Michigan; and the governor of the State of Michigan. The purpose of the MOU was to establish a framework for the creation of a regional authority (known as Great Lakes Water Authority or GLWA) pursuant to Act 233 of 1955 to operate, control, and improve the regional assets of the water supply system and the sewage disposal system owned by the City.

Pursuant to the MOU, the City of Detroit, Michigan and GLWA entered into two lease agreements: the Regional Water Supply System Lease dated June 12, 2015 and the Regional Sewage Supply System Lease dated June 12, 2015. Under the provisions of the lease agreements, GLWA leases the regional assets of the City for a period of at least 40 years.

Note 1 - Significant Accounting Policies (Continued)

Pursuant to the lease agreements, on December 1, 2015, a triparty agreement between the City of Detroit, Michigan; the General Retirement System of the City of Detroit (DGRS); and GLWA was signed (referred to as the pension reporting agreement). Per the POA and Section 4.3 of the lease agreements, GLWA is required to pay a portion of the pension obligation that will be allocable to the Detroit Water and Sewer Department (DWSD). The purpose of the pension reporting agreement is to set forth determining the funding status for the DWSD pension pool and for DGRS to agree to provide GLWA with certain actuarial and other reports to enable GLWA to properly manage and pay its portion of the pension obligation that is allocable to DWSD.

Effective January 1, 2016, GLWA was launched. Accordingly, the prior DWSD division was split into two - one representing the ongoing DWSD department, now referenced as DWSD-Retail (DWSD-R), and another to represent Great Lakes Water Authority. In accordance with the pension reporting agreement, the net position and liabilities of DWSD were allocated to DWSD-R and GLWA in accordance with written directions received from DWSD-R and GLWA. Per written directions, GLWA is to be allocated 70.3 percent of the net position and liabilities of DWSD. Because GLWA has no employees or retirees in the Combined Plan, GLWA is considered a nonemployer contributing entity in accordance with GASB Statement No. 67.

The financial statements of the Combined Plan reflect the net position and pension liabilities of the plan as a whole, which includes the portion allocable to GLWA. GLWA's portion of the total Component II net pension liability of $885,460,935 at June 30, 2021 was $65,221,328, with the remainder allocable to the City of Detroit, Michigan and related entities.

Component I

As of July 1, 2014, all current and future employees participate in the new hybrid pension plan (the "Hybrid Plan"), or Component I. Active city employees who participated in the Legacy Plan will receive the benefits they have earned under the plan through June 30, 2014 plus an additional benefit under the new hybrid plan formula, assuming all vesting requirements are met.

Other Postemployment Benefit Plans

<u>Death Benefit Plans</u>

Death benefits are provided to certain employees and retirees of the City of Detroit, Michigan through an employee benefit trust. The following are the benefit plans paid through the trust, both of which are defined benefit plans under GAAP:

- Closed Death Benefit Plan (Closed Plan) - This plan covers those retirees who retired on or before December 10, 2014
- Death Benefit Plan (Open Plan) - This plan is open to all employees providing services after December 10, 2014

<u>System Reporting</u>

The Combined Plan and the Death Benefit Plan are separate and independent trusts qualified under applicable provisions of the Internal Revenue Code; they are independent entities (separate and distinct from the employer/plan sponsor) as required by (1) state law and (2) Internal Revenue Code provisions setting forth qualified plan status. The trustees of the Combined Plan and the Death Benefit Plan have a fiduciary obligation and legal liability for any violations of fiduciary duties as independent trustees. The Combined Plan provides retirement, disability, and survivor benefits to plan members and beneficiaries. The Death Benefit Plan provides death benefits for plan members.

The assets of the System include no securities of or loans to the City or other related parties.

Note 1 - Significant Accounting Policies (Continued)

Plan Sponsor Financial Condition - Impact on the System

In the past, the City of Detroit, Michigan (the "plan sponsor") has experienced significant financial difficulty and liquidity concerns. As of June 2013, the City had defaulted on approximately $36 million of pension contributions due to the Combined Plan. During fiscal year 2014, the City did not pay any employer contributions into the Combined Plan, despite the fact that there were actuarially required contributions.

In February 2013, the governor appointed a financial review team, which determined that a local government financial emergency existed in the City. This culminated in bankruptcy proceedings, which the City initiated in July 2013. Part of the federal court's ruling in December 2013 indicated that the bankruptcy status usurped whatever protections may be offered to governmental pensions under the Michigan Constitution. On December 10, 2014, the City exited from bankruptcy through confirmation of the Eighth Amended Plan for the Adjustment of Debts of the City of Detroit. The POA specifies certain provisions pertinent to the legacy and hybrid plans, including contributions and benefits.

In fiscal year 2021, the contributions received by the Combined Plan were made in accordance with the provisions of the POA. See Note 11 for significant changes that were implemented by the Combined Plan under the POA.

The POA also resulted in the City closing the existing supplemental death benefit plan to new members effective December 10, 2014. Benefits to be paid to individuals retiring prior to that date are limited to the assets allocated to that closed plan. There are no further contribution requirements for the City for plan members who were retired as of that date.

Summary of Significant Accounting Policies

The following is a summary of the significant accounting policies used by the General Retirement System of the City of Detroit.

Accounting and Reporting Principles

The System follows accounting principles generally accepted in the United States of America (GAAP), as applicable to governmental units. Accounting and financial reporting pronouncements are promulgated by the Governmental Accounting Standards Board.

Basis of Accounting

The System uses the economic resources measurement focus and the full accrual basis of accounting. Revenue is recorded when earned, and expenses are recorded when a liability is incurred, regardless of the timing of related cash flows. Plan member contributions are recognized in the period in which the contributions are due. Employer contributions are recognized when due pursuant to legal requirements. Benefits and refunds are recognized when due and payable in accordance with the terms of the plan.

Specific Balances and Transactions

Cash and Cash Equivalents

The System considers cash on hand, demand deposits, and short-term investments with an original maturity of three months or less when purchased to be cash equivalents.

Investments

Investments are reported at fair value or estimated fair value. Short-term investments are reported at cost, which approximates fair value. Securities traded on a national or international exchange are valued at the last reported sale price at current exchange rates. Mortgages are valued on the basis of future principal and interest payments. The fair value of real estate investments is based on periodic appraisals, as well as the judgment of independent real estate advisors and management. Investments that do not have an established market value are reported at estimated fair value determined by the System's management.

Note 1 - Significant Accounting Policies (Continued)

Approximately $914,300,000, or 44 percent, of the System's net position as of June 30, 2021 does not have a readily determinable market value. Of this balance, approximately $49,500,000 has been estimated by management. The remaining $864,800,000 is valued based on valuations performed by the investee company management, which is subject to annual audits (generally as of December 31).

Investments for which market quotations are readily available are generally priced by the custodian using nationally recognized pricing services and practices. For investments that do not have readily observable market prices, including but not limited to private equity, public and private real estate, alternatives, and direct loans, management's estimate of their fair value is based on information provided by investment managers, general partners, real estate advisors, and other means. These sources are held to a standard of reasonable care in verifying that the valuations presented reasonably reflect the underlying fair value of the investments. A variety of factors is considered in the valuation process, including the nature of the investment, local market conditions, trading values on public exchanges for comparable investments, and current and projected operating performance. However, due to the inherent uncertainty and the degree of judgment involved in determining fair value for such investments, the values reflected in the financial statements may differ significantly from values that would have been used had a readily determinable market value for the investments existed, and the difference could be material.

Contributions Receivable

At June 30, 2021, there was $2,814,486 in employer contributions receivable. This amount relates to fiscal year 2021 Component I contributions and was paid in July 2021.

ASF Recoupment Receivable - Component II (Legacy)

For members who elected to make employee contributions into the defined contributions-style program, referred to as the annuity savings fund (ASF), between July 1, 2003 and June 30, 2013, the POA called for recoupment of amounts that the City calculated were excess interest credited to individual ASF accounts. In 2011, the City Council adopted an ordinance that limited ASF interest credits to the plan's actual net investment return, with a cap of 7.9 percent and a floor of 0 percent. The POA calculation of excess interest applies the interest formula in the 2011 ordinance to the July 1, 2003 - June 30, 2013 recoupment period, recouping all interest paid in excess of the lower of 7.9 percent or the plan's actual return for that year, with a cap on the recoupment amount of 20 percent of the highest ASF balance in this period. The recoupment amount is also capped at 15.5 percent of the retiree's monthly pension check. The City offered a limited lump sum or a monthly payment option. Repayment of these excess interest amounts is not optional. As of June 30, 2021, the System has approximately $98,000,000 to be collected. The receivable will be collected, with 6.75 percent interest, as a reduction to monthly pension benefits for those with recoupment balances outstanding.

Receivable/Payable from Investment Sales/Purchases

The System liquidated investments prior to year end and reported a receivable from investment sales at June 30, 2021 in the amount of $3,567,253. The proceeds from the sales were received subsequent to year end. In addition, the System purchased investments prior to year end and reported a payable from investment purchases at June 30, 2021 in the amount of $4,007,454. This amount was paid subsequent to year end.

Note 1 - Significant Accounting Policies (Continued)

Notes Receivable from Participants

In Component II (Legacy) and Component I (Hybrid), any active general employee who is or has been a participant in the 1973 defined contribution plan (annuity savings fund) may be eligible for the employee loan program. The minimum amount of the loan was established at $1,000. The maximum loan is the lesser of 50 percent of the member's account balance in the annuity savings fund or $10,000. Members can borrow as either a general purpose loan payable in 1 to 5 years or a residential loan payable in 1 to 15 years. A member can have only two outstanding loans. The balance of these loans for the year ended June 30, 2021 was $2,972,014 and $510,483 for Legacy and Hybrid, respectively. The balance is measured at the unpaid principal balance plus any accrued but unpaid interest. Participant notes receivable are written off when deemed uncollectible.

Capital Assets

Capital assets for the System include software, office equipment, and furniture. Depreciation expense is calculated by allocating the net cost of the assets over their estimated useful lives.

Use of Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the Unites States of America 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 additions and deductions during the reporting period. Actual results could differ from those estimates.

Note 2 - Pension Plan Description

Component II (Legacy Plan) and Component I (Hybrid Plan)

Plan Administration

The Combined Plan's governance was modified in December 2014 as part of the City's bankruptcy plan. The Combined Plan's board of trustees and the Investment Committee administer the General Retirement System of the City of Detroit Pension Plan - a single-employer defined benefit and defined contribution plan that provides retirement benefits, as well as survivor and disability benefits, for plan members and beneficiaries. Plan members include active employees, retirees, and beneficiaries from various departments within the City of Detroit, Michigan. Benefit terms have been established by contractual agreements between the City and the employees' collective bargaining unit, as modified by the POA. Future amendments are subject to the same process. However, pursuant to the POA, pension benefit terms presently expressed in the Combined Plan are not subject to amendment before June 30, 2023, unless an amendment is required to maintain the tax-qualified status of the plans. The obligation to contribute to and maintain the Combined Plan was established by the city charter and negotiations with the employees' collective bargaining units.

The board is composed of 10 members. Five members of the board are elected by the active membership to serve six-year terms. One retiree member is elected by the retiree membership to serve a two-year term. One member is appointed by the mayor of the City of Detroit, Michigan from the citizens of the City to serve a six-year term. Three members serve ex officio, these members being the mayor of the City (or designee), the city treasurer, and one representative from the Detroit City Council. Expirations of terms of elected trustees are staggered.

The Investment Committee has five independent members appointed to initial terms with staggered expirations, which terms will all eventually become six years. Two additional members, one active and one retired, serve on the Investment Committee based on appointment by the board. The Investment Committee will be in place through at least December 2034.

Note 2 - Pension Plan Description (Continued)

Benefits Provided

The Combined Plan provides retirement and disability benefits. Benefit terms had been established by negotiations between the City Council and the employees' collective bargaining unit and subject to amendment by the City Council. Further changes to benefits were provided for under the POA.

Employees Covered by Benefit Terms

The following members were covered by the benefit terms:

	Component II (Legacy Plan)	Component I (Hybrid Plan)
Date of member count	June 30, 2020	June 30, 2020
Inactive plan members or beneficiaries currently receiving benefits	11,220	508
Inactive plan members entitled to but not yet receiving benefits	2,728	880
Active plan members	2,403	5,106
Total employees covered by the plan	16,351	6,494

As of June 30, 2014, Component II has been frozen. As of that date, no new participants were allowed to enter the plan, and no new benefit accruals were allowed for existing participants.

After July 1, 2014, active members will retain existing service credit in the Legacy Plan but will only earn existing service credit in the new Hybrid Plan.

Contributions

Article 9, Section 24 of the State of Michigan Constitution requires that financial benefits arising on account of employee service rendered in each year be funded during that year. Accordingly, in the past, the Combined Plan had retained an independent actuary to determine the annual contribution. The actuarially determined rate was the estimated amount necessary to finance the costs of benefits earned by plan members during the year, with an additional amount to finance any unfunded accrued liability. However, until 2024, contributions are based on specific provisions in accordance with the Plan of Adjustment.

Employer and Nonemployer Contributing Entity Contributions

Component II

For Component II, during fiscal year 2021, employer contributions are not actuarially determined but rather are determined by the provisions of the POA detailed under Exhibit II.B.3.r.ii.A of the POA. Included within contributions for fiscal year 2021 in Component II are contributions from the Foundation for Detroit's Future (the "Foundation") in the amount of $375,000 and $47.9 million of contributions from the city-related entities and GLWA.

Note 2 - Pension Plan Description (Continued)

Component I

For Component I, during fiscal year 2021, employer contributions are not actuarially determined but rather are determined by the provisions of the Combined Plan detailed under Section 9.3 of Component I. Per Section 9.3, commencing on July 1, 2014 and ending on June 30, 2023, the City is required to contribute 5 percent of compensation of active members. A portion of the employer's annual contribution for each plan year, as determined by the City, shall be credited to the rate stabilization fund reserve, with the remainder allocated to the pension accumulation fund reserve. During fiscal year 2021, the City and related entities contributed $11,690,984 into the Hybrid Plan. Beginning in 2024, the employer contributions will be actuarially determined based on the amount necessary to fund the plan on an actuarial basis.

Because there were no actuarially determined contributions for Component I, there is no required schedule of city contributions included within these financial statements.

Employee Contributions

Component II

Contribution requirements of plan members historically were established and amended by the board of trustees in accordance with the city charter, union contracts, and plan provisions. For the year ended June 30, 2021, there were no employee contributions into Component II, as the plan was frozen as of June 30, 2014.

Component I

Contribution requirements of plan members are established in Sections 9.3 and 10.1 of Component I of the Combined Plan. For the year ended June 30, 2021, the required active member contribution rate for employees was 4.0 percent of annual pay. Additionally, employees can make voluntary contributions of 3 percent, 5 percent, or 7 percent of annual pay. During fiscal year 2021, the plan received mandatory and voluntary employee contributions of $14,517,266.

Fiscal Responsibility Provision

To safeguard the long-term actuarial and financial integrity of the Combined Plan, in the event the funding level of Component I projected over a five-year period falls below 100 percent, certain remedial actions are required, as set forth in Section 9.5 of Component I of the Combined Plan, including elimination of COLA, transfers from the rate stabilization fund reserve to the pension accumulation fund reserve, and increases in mandatory employee contributions from 4 percent to 5 percent.

In the event the funding level of Component I is projected to fall below 80 percent, additional remedial actions are required, including further increasing the mandatory employee contributions to 6 percent and the potential for reducing the retirement allowance.

As of June 30, 2021, the enactment of the remedial actions has not been required based on actuarial projections of the funding levels.

Note 3 - Deposits and Investments

The System is authorized by Michigan Public Act 314 of 1965, as amended, to invest, within the pension and Death Benefit Funds, in certain reverse repurchase agreements, stocks, diversified investment companies, annuity investment contracts, real estate leased to public entities, mortgages, real estate, debt or equity of certain small businesses, certain state and local government obligations, and certain other specified investment vehicles.

The investment policy adopted by the board is in accordance with Public Act 196 of 1997 and has authorized investments according to Michigan Public Act 314 of 1965, as amended. The System's deposits and investment policies are in accordance with statutory authority.

Note 3 - Deposits and Investments (Continued)

The System invests in various investment securities. Investment securities are exposed to various risks, such as interest rate, market, credit risks, and overall market volatility. Due to the level of risk associated with certain investment securities, it is at least reasonably possible that changes in the values of investment securities will occur in the near term and that such changes could materially affect the amounts reported on the statement of changes in fiduciary net position.

The System's cash and investments are subject to several types of risk, which are examined in more detail below:

Custodial Credit Risk of Bank Deposits

Custodial credit risk is the risk that, in the event of a bank failure, the System's deposits may not be returned to it. The System does not have a deposit policy for custodial credit risk. Approximately $4.4 million of the System's checking account balances was uninsured and uncollateralized at June 30, 2021. The System believes that, due to the dollar amounts of cash deposits and the limits of FDIC insurance, it is impractical to insure all deposits. As a result, the System evaluates each financial institution with which it deposits funds and assesses the level of risk of each institution; only those institutions with an acceptable estimated risk level are used as depositories.

Interest Rate Risk

Interest rate risk is the risk that the value of investments will decrease as a result of a rise in interest rates. The System's investment policy does not restrict investment maturities.

At year end, the System had the following investments and maturities:

Investment (in Thousands)	Fair Value	Less Than 1 Year	1-5 Years	6-10 Years	More Than 10 Years
Corporate bonds	$ 170,218	$ 7,556	$ 116,700	$ 33,507	$ 12,455
U.S. government mortgage-backed securities	29,073	256	11,569	1,431	15,817
Mutual fund	36,619	-	34,259	2,360	-
Government securities	560	-	-	246	314
U.S. government securities	74,894	7,116	55,589	9,500	2,689
Asset backed	368	-	-	368	-

Not all fixed-income securities are subject to interest rate risk.

Credit Risk

State law limits investments in commercial paper to the top two ratings issued by nationally recognized statistical rating organizations. The System has no investment policy that would further limit its investment choices.

At June 30, 2021, the credit quality ratings of debt securities (other than those guaranteed by the U.S. government), as rated by Standard & Poor's, are as follows:

Investment (in Thousands)	AAA	AA	A	BBB	BB	B or lower	NR
Corporate bonds	$ 1,610	$ 1,881	$ 12,595	$ 18,051	$ 34,981	$ 26,053	$ 75,048
U.S. government mortgage-backed securities	-	15,551	-	-	-	-	-
Mutual funds	-	-	-	-	-	-	36,619
Government securities	-	686	-	-	-	-	130
Asset backed	368	-	-	-	-	-	-
Total	$ 1,978	$ 18,118	$ 12,595	$ 18,051	$ 34,981	$ 26,053	$ 111,797

Note 3 - Deposits and Investments (Continued)

Foreign Currency Risk

Foreign currency risk is the risk that an investment denominated in the currency of a foreign country could reduce its U.S. dollar value as a result of changes in foreign currency exchange rates. The System does not restrict the amount of investments in foreign currency.

The following securities are subject to foreign currency risk:

Currency (in Thousands)	Equity	Net Investment (Payable) Receivable
Brazil real	$ 1,492	$ -
British pound sterling	4,615	-
Canadian dollar	4,580	104
Chinese yuan renminbi	-	22
Eurocurrency unit	22,777	282
Hong Kong dollar	3,198	1
Japanese yen	7,972	96
Mexican peso	1,136	-
New Taiwan dollar	3,158	6
Norwegian krone	3,189	45
Singapore dollar	1,222	-
South Korean won	1,387	5
Swiss franc	1,428	108
Ukraine hryvana	1	-
Total	$ 56,155	$ 669

Securities Lending

As permitted by state statutes and under the provisions of a securities lending authorization agreement, the System, through the Combined Plan, lends securities to broker-dealers and banks for collateral that will be returned for the same securities in the future. The System's custodial bank manages the securities lending program and receives cash, government securities, or irrevocable bank letters of credit as collateral. The custodial bank does not have the ability to pledge or sell collateral securities unless the borrower defaults. Borrowers are required to deliver collateral for each loan equal to no less than 102 percent of the market value of the loaned securities.

As of June 30, 2021, the collateral provided was 102.63 percent of the market value of the loaned securities, which is more than the required 102 percent.

The System did not impose any restrictions during the fiscal year on the amount of loans made on its behalf by the custodial bank. There were no failures by any borrowers to return loaned securities or pay distributions thereon during the fiscal year. Moreover, there were no losses during the fiscal year resulting from a default of the borrowers or custodial bank.

The System and the borrower maintain the right to terminate all securities lending transactions on demand. The cash collateral received on each loan was invested, together with the cash collateral of other lenders, in an investment pool. The average duration of such investment pool as of June 30, 2021 was 27.05 days. Because the loans are terminable on demand, their duration did not generally match the duration of the investments made with cash collateral. On June 30, 2021, the System had no credit risk exposure to borrowers. The collateral held (at cost) and the fair market value of the underlying securities on loans for the System as of June 30, 2021 were $85,939,302 and $83,733,905, respectively.

Note 3 - Deposits and Investments (Continued)

The following represents the balances relating to the securities lending transactions as of June 30, 2021; investments are reported at fair value:

Securities Lent	Underlying Securities
U.S. corporate fixed income	$ 21,313,210
U.S. equities	57,262,637
Non-U.S. equities	1,828,710
U.S. governments	3,329,348
Total	$ 83,733,905

The fair market value of the collateral pool related to securities lending at June 30, 2021 was $87,137,453. The investments were in asset-backed securities, floating-rate notes, commercial paper, certificates of deposit, money funds, and repurchase agreements. Approximately 95 percent of these securities had a duration of less than 1 year, 2 percent had a duration between 1 and 3 years, and 3 percent had a duration over 15 years.

The credit ratings of the securities lending collateral pool held at June 30, 2021, as rated by S&P, are as follows:

Ratings	Amount
AAA	$ 1,780,789
AA	15,678,393
A	32,135,066
A-1	13,125,647
CC	1,825,278
D	951,228
NR	21,641,052
Total	$ 87,137,453

Note 4 - Fair Value Measurements

In accordance with GASB Statement No. 72, *Fair Value Measurement and Application*, the notes to the financial statements now include enhanced disclosures about fair value measurement, the level of fair value hierarchy, and valuation techniques.

The System categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles. The hierarchy is based on the valuation inputs used to measure the fair value of the asset. Level 1 inputs are quoted prices in active markets for identical assets, Level 2 inputs are significant other observable inputs, and Level 3 inputs are significant unobservable inputs. Investments that are measured at fair value using net asset value per share (NAV) (or its equivalent) as a practical expedient are not classified in the fair value hierarchy below.

In instances where inputs used to measure fair value fall into different levels in the fair value hierarchy, fair value measurements in their entirety are categorized based on the lowest level input that is significant to the valuation. The System's assessment of the significance of particular inputs to these fair value measurements requires judgment and considers factors specific to each asset.

Note 4 - Fair Value Measurements (Continued)

The System has the following recurring fair value measurements as of June 30, 2021:

	Assets Measured at Fair Value on a Recurring Basis at June 30, 2021			
	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Balance at June 30, 2021
Fixed income:				
Government securities (U.S. and other)	$ 74,894,089	$ 13,501,332	$ -	$ 88,395,421
Corporate bonds	-	169,415,736	-	169,415,736
U.S. government mortgage-backed	-	16,132,047	-	16,132,047
Asset-backed securities	-	4,931,972	-	4,931,972
Corporate floating rate notes	-	47,813,458	-	47,813,458
Certificate of deposit (negotiable)	-	10,376,103	-	10,376,103
Commercial paper	-	2,749,545	-	2,749,545
Mutual funds	36,619,345	-	-	36,619,345
Privately negotiated debt	-	803,771	-	803,771
Total fixed income	111,513,434	265,723,964	-	377,237,398
Equity:				
Common stock	698,767,728	-	-	698,767,728
Preferred stock	6,502,630	4,733,605	-	11,236,235
Total equity	705,270,358	4,733,605	-	710,003,963
Multiasset mutual fund	6,063,736	-	-	6,063,736
Private equity funds	-	-	2,800,000	2,800,000
Partnership investments	-	-	2,530,000	2,530,000
Real estate private equity funds	-	-	6,000,000	6,000,000
Real estate-related investments	-	-	38,154,643	38,154,643
Total	$ 822,847,528	$ 270,457,569	$ 49,484,643	1,142,789,740
Investments measured at NAV:				
International equity funds				303,186,126
Fixed-income funds				45,513,708
Hedge funds				217,675,712
Real estate funds				176,204,686
Private equity funds				122,250,304
Total investments measured at NAV				864,830,536
Total investments measured at fair value				$ 2,007,620,276

A total of $21,634,689 of money market funds and repurchase agreements recorded at amortized cost is not included in the fair value table above.

Equity securities, U.S. government securities, and mutual funds classified in Level 1 are valued using prices quoted in active markets for those securities.

Note 4 - Fair Value Measurements (Continued)

The fair value of preferred stock and fixed-income securities at June 30, 2021 was determined primarily based on Level 2 inputs. The System estimates the fair value of these investments using other inputs, such as interest rates and yield curves, that are observable at commonly quoted intervals for identical or similar assets.

The fair value of the remaining investments at June 30, 2021 was determined primarily based on Level 3 inputs. The System estimates the fair value of these investments using the System's own pricing estimate methodology, pricing models, discounted cash flow methodologies, or similar techniques taking into account the characteristics of the asset.

The valuation method for investments measured at net asset value per share (or its equivalent) is presented in the table below.

Investments in Entities that Calculate Net Asset Value per Share

The System holds shares or interests in investment companies where the fair value of the investments is measured on a recurring basis using net asset value per share (or its equivalent) of the investment companies as a practical expedient.

As of June 30, 2021, the fair value, unfunded commitments, and redemption rules of those investments are as follows:

	Fair Value	Unfunded Commitments	Redemption Frequency, if Eligible	Redemption Notice Period
International equity funds	$ 303,186,126	$ -	Monthly	Up to 30 days
Fixed-income funds	45,513,708	-	Daily	10 business days
Hedge funds	217,675,712	-	Quarterly	100 days
Real estate funds	176,204,686	8,220,175	Quarterly	90 days
Private equity funds	122,250,304	41,193,420	N/A	N/A
Total investments measured at NAV	$ 864,830,536	$ 49,413,595		

Multiple funds are held in each category. For reporting purposes, the redemption frequency and redemption notice period provided are the most restrictive of any of the funds in the category.

The international equity funds class includes investments in funds that invest in predominantly equity securities of non-U.S. companies. The funds invest in developed and emerging market countries and utilize investments across the capitalization spectrum from large to small companies. The fair values of the investments in this class have been estimated using net asset value per share of the investments.

The fixed-income funds class includes investments in funds that invest in predominantly fixed-income instruments in the U.S. and developed and emerging market countries. The funds invest across a diverse group of security types, including government, corporate, and mortgage-backed debt, and across the credit quality spectrum of investment grade and high yield. The fair values of the investments in this class have been estimated using net asset value per share of the investments.

Note 4 - Fair Value Measurements (Continued)

The hedge funds class includes investments in funds that achieve capital appreciation through multimanager and/or multistrategy investments. Within this group of funds, there is exposure to investment strategies, including, but not limited to, credit, event-driven, equity, and relative value. The funds have the ability to invest across all markets and across all asset classes to implement their various strategies. The fair values of the investments in this class have been estimated using net asset value per share of the investments. Approximately 1 percent of the value of the investments in the hedge fund class above is in the process of being liquidated by the fund manager. Distributions from each fund will be received as the underlying investments of the fund are liquidated. It is estimated that the underlying investments of the fund will be liquidated over the next 12 to 18 months.

The real estate funds class includes investments in funds whose objective is to operate a core portfolio of real estate investments predominantly located in the U.S. The funds acquire ownership in underlying investments either through direct real estate ownership or ownership in real estate companies or the equity of real estate investment trusts. The funds predominantly target purchases in office, industrial, retail, or multifamily real estate classes. The fair values of the investments in this class have been estimated using net asset value per share of the investments (or its equivalent).

The private equity funds class is an alternative investment class and consists of investments in companies that are not listed on a public exchange. The General Retirement System of the City of Detroit maintains a diversified portfolio of private equity investments by both style (buyout, turnaround, venture capital, etc.) and vintage year exposure. With its private equity allocation, the General Retirement System of the City of Detroit seeks to take advantage of the illiquidity premium associated with these private equity investments. The fair values of the investments in this class have been estimated using net asset value per share of the investments (or its equivalent).

Note 5 - Pension Plan Investments - Policy and Rate of Return

Component II (Legacy Plan) and Component I (Hybrid Plan)

Investment Policy

The assets of Components II and I are commingled and invested together, as allowed by the POA. The Combined Plan's policy in regard to the allocation of invested assets is established and may be amended by governance by a majority vote of its members. It is the policy of the governance to pursue an investment strategy that manages risk through the prudent diversification of the portfolio across a broad selection of distinct asset classes. The Combined Plan's investment policy discourages the use of cash equivalents, except for liquidity purposes, and aims to refrain from dramatically shifting asset class allocations over short time spans. The following was the governance's adopted asset allocation policy as of June 30, 2021:

Asset Class	Target Allocation
Global equity	46.00 %
Global fixed income	33.00
Real estate/Real assets	13.00
Diversifying strategies	8.00
Total	100.00 %

Rate of Return

For the year ended June 30, 2021, the annual money-weighted rate of return on pension plan investments, net of pension plan investment expense, was 28.31 percent. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for the changing amounts actually invested.

Note 6 - Pension Plan Reserves

Component II (Legacy Plan)

In accordance with the Combined Plan for the General Retirement System of the City of Detroit and state law, the following reserves are required to be set aside within the Component II (Legacy) pension plan:

The annuity reserve fund is an accumulation of transfers that is made from the annuity savings fund when an employee retires or becomes disabled or if a surviving spouse elects an annuity rather than a lump-sum payout of accumulated employee contributions.

The pension reserve fund represents funded pension benefits available for retired members and is funded by actuarially determined transfers from the pension accumulation fund. The transfers from the pension accumulation fund to the pension reserve fund for fiscal year 2021 retirements have not yet been determined.

The employee reserve (annuity savings fund or ASF) is credited as employee contributions are received throughout the year; the ASF maintains a record of the amount contributed by each employee and credits interest annually at a rate approved by the board. During fiscal year 2021, the board approved the interest rate at 5.25 percent. Eligible active members may elect to withdraw their accumulated (annuity) contributions plus investment earnings. Upon retirement, members can elect to annuitize or receive a lump sum of their accumulated contribution and interest earnings. When an employee retires or becomes disabled or if a surviving spouse elects an annuity rather than a lump-sum payout of accumulated employee contributions, the balance is transferred to the annuity reserve fund. See Note 11 for disclosure of significant changes to the ASF going forward.

The pension accumulation fund is the fund that will accumulate reserves for the pensions and other benefits payable from the contributions made by the City, including various departments thereof, and certain third parties pursuant to the POA and from which pensions and other benefits will be paid on account of members with prior service credit and transfers, as provided in Section E-18. Contributions to the pension accumulation fund from the effective date of the POA through fiscal year 2023 shall be made only in the amounts and from the sources identified in the POA.

The expense fund is the fund that will be credited with all money provided by the City to pay the administrative expenses of the Combined Plan and from which all the expenses necessary in connection with the administration and operation of the Combined Plan will be paid. At year end, this reserve balance is zero, as all employer contributions were credited to the pension accumulation fund.

The income fund shall be the fund to which all interest, dividends, and other income derived from the investments of Component II of the Combined Plan will be credited. Transfers from the income fund will be made to credit earnings and losses to various reserves of the Combined Plan in accordance with the provisions of Component II of the combined plan document. Amounts credited to the income fund in excess of amounts needed to credit earnings and losses of the Combined Plan, as provided in Component II, for any plan year shall be transferred to the pension accumulation fund and used to pay retirement allowances and other benefits on account of members. During fiscal year 2021, the income fund reserve was not utilized, and all investment income was credited to the pension accumulation fund.

The balances of the reserve accounts for Component II (excluding the Income Stabilization Fund) as of June 30, 2021 are included in the table below. The reserve balances as of June 30, 2021 shown below do not include the current year transfer amount related to fiscal year 2021 retirements for amounts that are transferred from the pension accumulation fund to the pension reserve fund.

Note 6 - Pension Plan Reserves (Continued)

The balances of the reserve accounts at June 30, 2021 are as follows:

	Required Reserve	Amount Funded
Annuity savings fund	$ 104,783,035	$ 104,783,035
Pension reserve fund	2,022,510,702	1,713,866,263
Annuity reserve fund	-	-
Pension accumulation fund	N/A	-

Component I (Hybrid Plan)

In accordance with the Combined Plan for the General Retirement System of the City of Detroit and state law, the following reserves are required to be set aside within the Component I (Hybrid) pension plan:

The accumulated mandatory employee contribution fund shall be the fund in which shall be accumulated the contributions of members to provide their retirement allowances. Upon the retirement, termination, or death of a member with a vested retirement allowance, the member's accumulated mandatory employee contributions shall be deemed to be part of the pension reserve that shall be used to pay the member's retirement allowance.

The accumulated voluntary employee contribution fund shall be the fund in which shall be accumulated the voluntary after-tax contributions of members together with earnings thereon.

The pension accumulation fund shall be the fund in which shall be accumulated reserves for the retirement allowances and other benefits payable from that portion of the employer's annual contribution that is not credited to the rate stabilization fund and amounts transferred to Component I and from which shall be paid retirement allowances and other benefits on account of members. During fiscal year 2021, all employer contributions were directed by the City into the pension accumulation fund, and no amounts were credited to the rate stabilization fund.

The rate stabilization fund shall be the fund that shall be credited with the employer's annual contributions in excess of the amount of the employer's contribution that is credited to the pension accumulation fund and amounts transferred to Component I, as provided in Section E-16(C) of Component II. See Note 10 for details on the transfer provisions related to transfers between Component II and Component I. During fiscal year 2021, no amounts were credited to the rate stabilization fund. Therefore, this reserve balance is zero.

The medical benefit fund shall be the fund that will be credited with contributions made for the purpose of funding medical benefits. During the year, no such contributions were made, and, therefore, this reserve balance is zero.

The expense fund shall be the fund to which will be credited any money provided by the employers to pay the administrative expenses of the Combined Plan and from which certain expenses incurred in connection with the administration and operation of the Combined Plan will be paid. At year end, this reserve balance is zero, as all employer contributions were credited to the pension accumulation fund.

The income fund shall be the fund to which all interest, dividends, and other income derived from the investments of Component I of the Combined Plan will be credited. Transfers from the income fund will be made to credit earnings and losses to various reserves of the Combined Plan in accordance with the provisions of Component I of the combined plan document. Amounts credited to the income fund in excess of amounts needed to credit earnings and losses of the Combined Plan, as provided in Component I, for any plan year shall be transferred to the pension accumulation fund. During fiscal year 2021, investment income was transferred to other reserve funds, and, therefore, this reserve balance at June 30, 2021 remains unfunded.

Note 6 - Pension Plan Reserves (Continued)

The balances of the reserve accounts for Component I as of June 30, 2021 are included in the table below. As of June 30, 2021, not all transfers from the accumulated mandatory employee contribution fund to the pension accumulation fund for retirements have occurred.

The balances of the above reserves for Component I that were funded as of June 30, 2021 are as follows:

	Required Reserve	Amount Funded
Accumulated mandatory employee contribution fund	$ 53,155,011	$ 53,155,011
Accumulated voluntary employee contribution fund	33,233,074	33,233,074
Pension accumulation fund	-	127,505,772

Note 7 - Net Pension Liability for Component II (Legacy Plan)

The net pension liability has been measured as of June 30, 2021 and is composed of the following:

Total pension liability	$ 2,704,110,233
Plan fiduciary net position	1,818,649,298
City's pension liability	$ 885,460,935
Plan fiduciary net position as a percentage of the total pension liability	67.25 %

Actuarial Assumptions

The total pension liability was determined by an actuarial valuation as of June 30, 2020, which used update procedures to roll forward the estimated liability to June 30, 2021. The valuation used the following actuarial assumptions applied to all periods included in the measurement:

Inflation	N/A	
Salary increases	N/A	No inflation assumption or salary increases due to plan freeze as of June 30, 2014
Investment rate of return	6.50%	Net of pension plan investment expense, including inflation

Note that the long-term assumed rate of return used for the purpose of the GASB Statement No. 67 valuations was determined in accordance with generally accepted accounting principles. This should not be confused with the provisions in the Plan of Adjustment, which established a 6.75 percent assumed rate of return for the purpose of the various provisions within the plan; the Plan of Adjustment did not attempt to dictate the long-term rate of return to be used for accounting purposes.

Based on an experience study from 2008-2013 issued in February 2015, the mortality table assumption was based on the RP-2014 Blue Collar Annuitant Table for males and females. The tables are projected to be fully generational based on the two-dimensional sex-distinct mortality scale MP-2014.

The actuarial assumptions, other than mortality and the investment rate of return, used in the June 30, 2020 valuation to calculate the total pension liability as of June 30, 2021 were based on the results of an actuarial experience study for the period from 2002-2007. While the System routinely has an experience study performed by an actuary every five years, the last experience study for the period from July 1, 2007 through June 30, 2012 was started but not completed due to the City's bankruptcy. To avoid any distortions from the bankruptcy period, the System has chosen to have the next experience study performed for the period from July 1, 2015 through June 30, 2020. The experience study is currently in progress.

Note 7 - Net Pension Liability for Component II (Legacy Plan) (Continued)

Attribution Period

As addressed more fully in Note 11, as of June 30, 2014, the plan was frozen such that no new benefit accruals were allowed, and no new members could join. Starting on July 1, 2014, the participants in the Legacy Plan (Component II) will now be earning benefits under a newly created defined benefit plan (Component I). GASB Statement No. 67 requires that the service costs of all pensions be attributed through all assumed exit ages through retirement. Neither GASB Statement No. 67 nor any other GASB standard has set forth guidance specifically related to frozen plans with successor plans in place. Absent any guidance to the contrary, due to the status as a frozen plan combined with the fact that individuals are now earning service in a new defined benefit pension plan, the retirement date for the purpose of attribution was assumed to be June 30, 2014 for all members. Therefore, the total pension liability at June 30, 2021 is equal to the present value of projected benefit payments.

Discount Rate

The discount rate used to measure the total pension liability as of June 30, 2021 was 6.50 percent; however, the single discount rate used at the beginning of the year was 7.06 percent. 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 city contributions will be made at rates equal to the difference between actuarially determined contribution rates and the employee rate.

Projected Cash Flows

Based on the above assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current active and inactive employees at both the beginning of the year and the end of the year. 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. The projection of cash flows used to determine the discount rate assumed that employee contributions will be made at the current contribution rate. Contributions to the Combined Plan are projected to be at the minimum amounts required by the Plan of Adjustment through 2023, followed by actuarially determined contributions beginning in 2024. While no funding policy has been adopted by the City of Detroit, Michigan, the projection of cash flows assumes full funding of contributions such that the plan's net position will be sufficient to make all benefit payments. The System believes that the funding practice adopted by the City will be consistent with the underlying objective used in the projection to develop the single discount rate.

The long-term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic real rates of return as of June 30, 2021 for each major asset class included in the pension plan's target asset allocation, as disclosed in the investment footnote, are summarized in the following table:

Asset Class	Long-term Expected Real Rate of Return
Global equity	5.80 %
Global fixed income	3.28
Real estate/Real assets	5.94
Diversifying strategies	3.22

Note 7 - Net Pension Liability for Component II (Legacy Plan) (Continued)

Sensitivity of the Net Pension Liability to Changes in the Discount Rate

The following presents the net pension liability, calculated using the discount rate of 6.50 percent, as well as what the net pension liability would be if it were calculated using a discount rate that is 1 percentage point lower (5.50 percent) or 1 percentage point higher (7.50 percent) than the current rate:

	1 Percentage Point Decrease (5.50%)	Current Discount Rate (6.50%)	1 Percentage Point Increase (7.50%)
Net pension liability	$ 1,128,013,810	$ 885,460,935	$ 678,357,195

Note 8 - Net Pension Asset of the City for Component I (Hybrid Plan)

The net pension asset of the City has been measured as of June 30, 2021 based on benefits in force as of that date and is composed of the following:

Total pension liability	$ 210,116,172
Plan fiduciary net position	213,893,857
City's net pension asset	$ (3,777,685)
Plan fiduciary net position as a percentage of the total pension liability	101.80 %

Actuarial Assumptions

The total pension liability was determined by an actuarial valuation as of June 30, 2020, which used update procedures to roll forward the estimated liability to June 30, 2021. The following are the significant assumptions:

Wage inflation assumption was 2 percent for five years, 2.5 percent for the next five years, and 3 percent thereafter.

The investment rate of return (net of pension plan investment expense, including inflation) applied to the beginning of year total pension liability was 7.06 percent as compared to 6.50 percent, which was the assumed long-term rate of return as of the end of year. The rates were determined in accordance with generally accepted accounting principles. This should not be confused with the provisions in the Plan of Adjustment, which established a 6.75 percent assumed rate of return for the purpose of the various provisions within the plan; the Plan of Adjustment did not attempt to dictate the long-term rate of return to be used for accounting purposes.

Based on an experience study from 2008-2013 issued in February 2015, the mortality table assumption was based on the RP-2014 Blue Collar Annuitant Table for males and females. The tables are projected to be fully generational based on the two-dimensional sex-distinct mortality scale MP-2014. Other than mortality and the investment rate of return, the actuarial assumptions used in the June 30, 2020 valuation to calculate the total pension liability as of June 30, 2021 were based on the results of an actuarial experience study for the period from 2002-2007, modified as necessary to account for the difference in eligibility of this new plan. While the System routinely has an experience study performed by an actuary every five years, to avoid any distortions from the bankruptcy period, the System has chosen to have the next experience study performed for the period from July 1, 2015 through June 30, 2020. That experience study is currently in progress.

Note 8 - Net Pension Asset of the City for Component I (Hybrid Plan) (Continued)

Cost of living adjustments (COLA): This plan has a postretirement COLA feature known as the Variable Pension Improvement Factor (VPIF) of a 2 percent simple COLA. It can be granted beginning on July 1, 2018 only if the five-year projection shows the plan's funded status at 100 percent based upon 6.75 percent future investment return. For the purpose of the total pension liability, the actuary assumed a 0.50 percent simple COLA beginning in fiscal year 2020 to model the potential average COLA over time. Had no COLA been assumed, the net pension asset would have been $11,154,971. Had the full 2 percent COLA been assumed, the net pension liability would have been $18,467,339.

There were no changes in benefit provisions during the year affecting the total pension liability.

Discount Rate

The discount rate used to measure the total pension liability as of June 30, 2021 was 6.50 percent; however, the single discount rate used at the beginning of the year was 7.06 percent. 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 city contributions will be made at rates equal to the difference between actuarially determined contribution rates and the employee rate.

Projected Cash Flows

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 active and inactive employees at both the beginning of the year and the end of the year. 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. The projection of cash flows used to determine the discount rate assumed that employee contributions will be made at the current contribution rate. Contributions to the Combined Plan are projected to be at the minimum amounts required by the Plan of Adjustment through 2023, followed by actuarially determined contributions beginning in 2024. While no funding policy has been adopted by the City of Detroit, Michigan, the projection of cash flows assumes full funding of contributions such that the plan's net position will be sufficient to make all benefit payments. The System believes that the funding practice adopted by the City will be consistent with the underlying objective used in the projection to develop the single discount rate.

The long-term expected rate of return on future pension plan investments is the same as Component II given that the assets are commingled (see Note 7).

Sensitivity of the Net Pension Asset to Changes in the Discount Rate

The following presents the net pension asset of the City, calculated using the discount rate of 6.50 percent, as well as what the City's net pension liability (asset) would be if it were calculated using a discount rate that is 1 percentage point lower (5.50 percent) or 1 percentage point higher (7.50 percent) than the current rate:

	1 Percentage Point Decrease (5.50%)	Current Discount Rate (6.50%)	1 Percentage Point Increase (7.50%)
Net pension liability (asset) of the City	$ 26,903,450	$ (3,777,685)	$ (28,485,188)

Note 9 - Other Postemployment Benefit Plan

Closed Death Benefit Plan (Closed Plan) and Death Benefit Plan (Open Plan)

Plan Description

The City of Detroit Employees Death Benefit Board of Trustees administers the Death Benefit Plans, which are single-employer defined benefit OPEB plans used to provide death benefits to employees and retirees. The Death Benefit Board of Trustees is the same as the board of trustees of the General Retirement System of the City of Detroit, with the exception of the civilian member. Also, the one representative from the Detroit City Council is the City Council president.

Benefits Provided

In accordance with Section 13, Article 8 of the City of Detroit, Michigan Code of Ordinances, effective July 1, 1999 and prior to the member's retirement from the City, a death benefit of $10,000 will be paid. After retirement of the member from the City, the amount of death benefits paid is based upon the retiree's years of city service ranging from $1,860 (for 8 to 10 years of service) to $3,720 (for 30 years of service). For years of service beyond 30 years, $93 will be added per year for each additional year of service.

Employees Covered by Benefit Terms

In accordance with the City of Detroit, Michigan's plan of adjustment, the Death Benefit Plan was split into two parts: an Open Plan and a Closed Plan. Members retired on or before December 10, 2014 are in the Closed Plan. Members who retire after December 10, 2014 (provided they were active on or after December 10, 2014) are in the Open Plan. The City has no further obligations to Closed Plan members. Closed Plan members will receive benefits only if the Closed Plan assets are sufficient. As of June 30, 2020, 9,623 retirees are covered by the benefit terms in the Closed Plan.

The following members were covered by the benefit terms in the Open Plan:

Date of member count	June 30, 2020
Retirees and beneficiaries	2,694
Active plan members	7,665
Total employees covered by the plan	10,359

Contributions

Open Plan

The City of Detroit Employee Benefit Plan board establishes contribution rates for the Death Benefit Plan; however, the City of Detroit, Michigan is under no legal obligation to prefund the plan benefits. The board's policy is to develop an employer contribution that is the greater of (1) the per active person rate in the City of Detroit, Michigan Ordinance or (2) normal cost plus a 29-year closed (30-year closed period beginning with the June 30, 2019 valuation) amortization of unfunded actuarial accrued liability on a per active person basis. Currently, the per person contributions provided in the ordinance are greater than the normal cost plus amortization of unfunded actuarial accrued liability. For the year ended June 30, 2021, the employer contribution rate for each active member was $13.30 a year, except for police lieutenants and sergeants and fire equivalents. For police lieutenants and sergeants and fire equivalents, the employer contribution rate for each member was $20.70 a year. For retirees, no employer contribution is required. Active plan members are required to contribute $10.40 a year, except for police lieutenants and sergeants and fire equivalents, who contribute $13.00 a year. For retired plan members, required contributions are $1.08 a year. During the year ended June 30, 2021, the Open Plan received employer contributions of $114,790 and employee contributions of $96,996.

Note 9 - Other Postemployment Benefit Plan (Continued)

Closed Plan

The City of Detroit, Michigan allocated $30,423,997 to the Closed Death Benefit Plan as of December 31, 2014 to fully fund the plan. There are no required additional employer contributions. For retired plan members, required employee contributions are $1.08 a year.

Net OPEB Liability

Closed Plan

The Closed Death Benefit Plan will provide future benefits only to the extent that plan assets are available to pay them. After the contribution in 2014, no further employer contributions will be made to the Plan. As such, the total OPEB liability as of June 30, 2021 is equal to the plan net position of $24,966,569.

Open Plan

The net OPEB liability has been measured as of June 30, 2021 and is composed of the following:

Total OPEB liability	$ 5,521,109
Plan fiduciary net position	5,132,891
Net OPEB liability of the City	$ 388,218
Plan fiduciary net position as a percentage of the total OPEB liability	92.97 %

Actuarial Assumptions

The total OPEB liability was determined by an actuarial valuation as of June 30, 2020, which used update procedures to roll forward the estimated liability to June 30, 2021. The valuation used the following actuarial assumptions, applied to all periods included in the measurement, unless otherwise specified:

Inflation assumption was 2.5 percent. The investment rate of return (net of pension plan investment expense, including inflation) applied to the beginning of year total OPEB liability was 7.00 percent as compared to 5.99 percent, which was the assumed long-term rate of return as of the end of year. The rates were determined in accordance with generally accepted accounting principles.

Based on an experience study from 2008-2013 issued in February 2015, the mortality table assumption for general, EMS, and D.O.T. was 100 percent of the RP-2014 Blue Collar Annuitant Table set forward one year for males and 100 percent of the RP-2014 Blue Collar Annuitant Table set forward one year for females. For police and fire, the mortality tables used in evaluating death benefits to be paid to retired members was 100 percent of the RP-2014 Blue Collar Annuitant Table with no set-forward for males or females. Tables were extended below age 50 with a cubic spline to the published juvenile rates.

Discount Rate

The discount rate used to measure the total OPEB liability was 5.99 percent. The projection of cash flows used to determine the discount rate assumed that employer contributions will be made at the current contribution rate.

Based on those assumptions, the OPEB plan's fiduciary net position was projected to be available to make all projected future benefit payments of current active and inactive employees. 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 OPEB liability.

Note 9 - Other Postemployment Benefit Plan (Continued)

Investment Rate of Return

The long-term expected rate of return on OPEB plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. The board has not adopted a formal investment policy; however, the pension board approved a formal investment allocation in August 2014. The target allocation and best estimates of geometric real rates of return for each major asset class are summarized in the following table:

Asset Class	Target Allocation	Long-term Expected Real Rate of Return
Domestic equity	26.00 %	4.24 %
International equities	25.00	4.88
Bonds	25.00	1.38
REITs	4.00	3.71
Global multisector fixed income	20.00	1.29
Total	100.00 %	

Sensitivity of the City's Net OPEB Liability to Changes in the Discount Rate

The following presents the net OPEB liability of the City, calculated using the discount rate of 5.99 percent, as well as what the City's net OPEB liability would be if it were calculated using a discount rate that is 1 percentage point lower (4.99 percent) or 1 percentage point higher (6.99 percent) than the current rate:

	1 Percentage Point Decrease (4.99%)	Current Discount Rate (5.99%)	1 Percentage Point Increase (6.99%)
Net OPEB liability (asset) of the City	$ 1,404,966	$ 388,128	$ (410,987)

Since the OPEB benefits in this plan are life insurance only, there is no health care trend assumption. The sensitivity of net OPEB liability using +/-1 percent health care trend is not applicable to this plan.

Rate of Return

For the year ended June 30, 2021, the annual money-weighted rate of return on OPEB plan investments, net of OPEB plan investment expense, was 24.52 percent. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for the changing amounts actually invested.

Note 10 - Commitments

When the System enters into various investments, it may not completely fund the entire investment at the beginning. Rather, it enters into commitments to fund remaining capital amounts at certain points in time. At June 30, 2021, the remaining capital funding commitment for the Combined Plan is approximately $49 million.

Note 10 - Commitments (Continued)

In addition, the Combined Plan document setting forth the Legacy Plan (Component II) contains a provision for the transfer of certain excess investment returns to the new Hybrid Plan (Component I). In any plan year during the period beginning on or after July 1, 2014 and ending on June 30, 2023, if the annual rate of return credited to member annuity savings fund accounts is less than the actual rate of return net of expenses of the plan's invested assets for the second plan year preceding the plan year in which the annual rate of return is credited, the excess earned shall be transferred to the pension accumulation fund maintained under Component I of the Combined Plan and will be used to fund transition costs related to Component I. The transition cost is a measure of the liability that Component I of the Combined Plan has at its inception due to the fact that members in Component I receive vesting and eligibility credit under Component I for service that was earned prior to July 1, 2014 and is otherwise credited to members under Component II. Such transition costs have been calculated by the plan's actuary. Yearly transfers to fund these costs are required in the second year following the year in which the return is earned based on a two-year look-back; therefore, as an example, any transfers based on the plan year ended June 30, 2019 will be calculated and transferred during the plan year ended June 30, 2021.

Based on these provisions, $0, $1,178,130, and $9,015,677 was transferred from Component II to Component I toward the transition costs in the fiscal years ended June 30, 2021, 2020, and 2019, respectively.

Note 11 - City of Detroit's Chapter 9 Bankruptcy Plan of Adjustment and Continuing Impact on the Plan

In March 2013, after enduring years of financial difficulty, the City of Detroit, Michigan filed for bankruptcy protection. The Eighth Amended Plan for Adjustment of Debts of the City of Detroit was filed with the Bankruptcy Court on October 22, 2014. In November 2014, after a confirmation hearing lasting several weeks, the Bankruptcy Court confirmed the Plan of Adjustment, which became effective December 10, 2014.

Legacy Plan (Component II)

The pension settlement, as part of the Plan of Adjustment, compromised pension claims and provided funding support for legacy pension benefit obligations under the General Retirement System of the City of Detroit Component II from the State of Michigan, the Detroit Institute of Arts, and certain foundation donors. The Plan of Adjustment also required certain governance changes for DGRS. Those governance changes included establishment of the Investment Committee effective December 10, 2014, which officially marked the beginning of implementation of the Plan of Adjustment, although DGRS had for months already undertaken contingency planning for all of the pension adjustments. In addition to governance changes, the POA requires of the System, through its board of trustees and the Investment Committee, certain periodic and interim reporting obligations to the City, the Foundation for Detroit's Future, and the State of Michigan. Although there were some delays in meeting certain obligations because of new actuarial reporting requirements for governmental systems, which in turn impacted the preparation of the System's audited financial statements, the System believes it has ultimately met its special reporting obligations in fiscal year 2016 and continued to do so in fiscal years 2017, 2018, 2019, and 2020.

For DGRS, with respect to Component II benefit adjustments, the pension settlement (for which benefit levels were and are contingent on other factors, including receipt of outside contributions) is provided for the following:

- A loss of cost of living adjustments, or escalators, paid after July 1, 2014
- A 4.5 percent cut to the remaining accrued pension benefit after the COLA loss

Note 11 - City of Detroit's Chapter 9 Bankruptcy Plan of Adjustment and Continuing Impact on the Plan (Continued)

- For DGRS members who participated in the annuity savings fund plan between 2003 and 2013, subject to certain caps, recoupment of certain amounts of interest deemed by the City to be in excess of that which should have been credited to individual ASF accounts, referred to as "ASF Recoupment." ASF Recoupment, like other provisions of the pension settlement, was not optional. Most members will pay their ASF Recoupment by a monthly deduction from their future pension benefits for a set term of months, including interest calculated at 6.75 percent. All members were offered a lump-sum cash option, which was limited in the aggregate to $30 million in member recoupment. In fiscal year 2016, the Bankruptcy Court approved certain additional members whose application submissions were not timely received to participate in the lump-sum cash option.

- The possibility of restoration of certain pension benefit cuts, based on a program for the most financially vulnerable pensioners and beneficiaries through the State of Michigan Treasury Department, as well as a new feature of Component II allowing restoration depending on the System's funding level over time

- An Income Stabilization Program (the "ISF Program") was established as part of the State Contribution Agreement, another facet of the pension settlement. The ISF Program, supported by city funds arising from an unlimited tax general obligation bonds settlement, is intended to ensure that the most financially vulnerable retirees and beneficiaries do not fall below the poverty line as a result of bankruptcy-related pension changes. Beginning on March 1, 2015, certain DGRS members also received benefit pension cut restoration under the ISF Program administered by DGRS, pursuant to the State Contribution Agreement, based on eligibility and benefit payments calculated by the State of Michigan. Following the close of the fiscal year ended June 30, 2016 and pursuant to Component II of the Combined Plan and the State Contribution Agreement, the System implemented the first annual ISF Program benefit adjustments effective July 1, 2016.

- The POA also discusses a restoration plan. Terms of the pension restoration are contained in Exhibit II.B.3.r.ii.C of the POA, and the terms govern how accrued pensions, including COLA benefits that were reduced as a part of the POA, may be restored over the 30-year period following the confirmation order. The Investment Committee will supervise the restoration process in accordance with the restoration plan. The restoration plan shall be deemed a part of Component II. The funding levels have not been attained as of June 30, 2021 for the restoration process to initiate.

Going forward, the obligations for contributions to support Component II of the System through 2023 are determined as fixed amounts by the provisions in the Plan of Adjustment. Pursuant to the Plan of Adjustment, the System is expected to receive contributions totaling $718.6 million through fiscal year 2023. The Plan of Adjustment calls for the System to receive $98.8 million from the State of Michigan; $428.5 million from DWSD; $31.7 million from UTGO settlement proceeds; the actual or present value equivalent of $50 million from the DIA and its foundation donors; and $114.6 million from the other city-related employer contribution sources, such as the General Fund, Detroit Library Commission, and COBO Authority, over a 10-year period covering fiscal year 2014 through fiscal year 2023. Between 2025 and 2034, DGRS will receive $18.3 million per year from certain foundation donors. After 2023, the City, and various other employer constituents, such as the Library, DWSD, and COBO Authority, will retain responsibility for the full funding obligations of Component I of the System, consistent with Michigan law.

Note 11 - City of Detroit's Chapter 9 Bankruptcy Plan of Adjustment and Continuing Impact on the Plan (Continued)

In fiscal year 2017, DGRS received from the City, its employer-related contribution sources, and the DIA and its foundation donors all contributions required by the Plan of Adjustment. The City was to remit payments on the UTGO Stub Bonds to the Combined Plan through 2028. In fiscal year 2017, the City of Detroit, Michigan refunded all of its outstanding UTGO Stub Bonds. Upon refunding, the payments to the Combined Plan were accelerated, with a majority of the outstanding balance paid to the Combined Plan in fiscal year 2017; as a result, the Combined Plan received approximately $9.4 million in the ISF and $18.3 million in the Component II Defined Benefit Fund related to this transaction.

DGRS continues to implement the POA, which includes ongoing compliance and additional reporting requirements by the board and the Investment Committee, annual review of benefit levels, and essentially provides for a 40-year plan to close the DGRS Legacy Component II underfunded liability. ASF Recoupment, in particular, is a notable facet of the Plan of Adjustment that will continue to be implemented as members apply for Component II pension benefits over time.

Note 12 - City of Detroit Commitment to Future Funding

In anticipation of significant actuarially required contributions commencing in fiscal year 2024, the City, independent of the System, has established a Retiree Protection Trust Fund (the "Trust"). The Trust, a permanent irrevocable trust under Sections 115 and 414(d) of the Internal Revenue Code, is to receive, maintain, and invest city funds restricted for future deposits to the General Retirement System Plan and the Police and Fire Retirement System Plan as part of an effort to manage and stabilize future required city contributions to the plans. The City has set aside approximately $235 million for this Trust as of June 30, 2021 for future contributions to the General Retirement System Plan and the Police and Fire Retirement System Plan. Contributions to the System will be recognized as the City makes distributions from this independent trust to the System.

Required Supplemental Information

General Retirement System of the City of Detroit

Required Supplemental Information
Schedule of Changes in the Net Pension Liability and Related Ratios
Legacy Plan

Last Eight Fiscal Years

	2021	2020	2019	2018	2017	2016	2015	2014
Total Pension Liability								
Service cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 32,736,019
Interest	182,140,105	192,888,245	195,489,643	192,359,745	201,919,236	214,011,164	263,007,329	242,611,073
Changes in benefit terms	-	-	-	-	-	-	(731,824,895)	(113,311,571)
Differences between expected and actual experience	(59,232,849)	(55,836,749)	13,596,902	34,154,327	(27,508,380)	(43,719,112)	24,644,530	-
Changes in assumptions	119,876,694	67,677,535	-	(110,274,515)	76,925,957	90,034,927	(101,559,893)	(271,190,194)
Benefit payments, including refunds	(237,123,777)	(239,881,652)	(248,790,017)	(253,442,630)	(267,249,539)	(292,282,179)	(297,538,990)	(397,733,807)
Net Change in Total Pension Liability	5,660,173	(35,152,621)	(39,703,472)	(137,203,073)	(15,912,726)	(31,955,200)	(843,271,919)	(506,888,480)
Total Pension Liability - Beginning of year	2,698,450,060	2,733,602,681	2,773,306,153	2,910,509,226	2,926,421,952	2,958,377,152	3,801,649,071	4,308,537,551
Total Pension Liability - End of year	**$ 2,704,110,233**	**$ 2,698,450,060**	**$ 2,733,602,681**	**$ 2,773,306,153**	**$ 2,910,509,226**	**$ 2,926,421,952**	**$ 2,958,377,152**	**$ 3,801,649,071**
Plan Fiduciary Net Position								
Contributions - Employer, state, and foundation	$ 48,275,000	$ 48,275,000	$ 68,275,000	$ 68,275,000	$ 91,238,402	$ 104,792,657	$ 189,282,094	$ 25,126,131
Contributions - Employee	-	-	-	-	-	-	609,073	10,241,761
Net investment income (loss)	406,977,916	(14,002,111)	47,170,004	155,423,193	206,896,568	(12,450,547)	93,054,981	289,789,607
Administrative expenses	(1,987,194)	(2,351,273)	(3,023,939)	(3,313,418)	(6,021,837)	(3,742,618)	(4,617,194)	(11,237,767)
Benefit payments, including refunds	(237,123,777)	(239,881,652)	(248,790,017)	(253,442,630)	(267,249,539)	(292,282,179)	(297,538,991)	(397,733,807)
Other (includes ASF recoupment)	6,405,364	5,155,198	(5,347,863)	6,952,522	8,324,074	5,945,783	135,280,369	-
Net Change in Plan Fiduciary Net Position	222,547,309	(202,804,838)	(141,716,815)	(26,105,333)	33,187,668	(197,736,904)	116,070,332	(83,814,075)
Plan Fiduciary Net Position - Beginning of year	1,596,101,989	1,798,906,827	1,940,623,642	1,966,728,975	1,933,541,307	2,131,278,211	2,015,207,879	2,099,021,954
Plan Fiduciary Net Position - End of year	**$ 1,818,649,298**	**$ 1,596,101,989**	**$ 1,798,906,827**	**$ 1,940,623,642**	**$ 1,966,728,975**	**$ 1,933,541,307**	**$ 2,131,278,211**	**$ 2,015,207,879**
Net Pension Liability - Ending	**$ 885,460,935**	**$ 1,102,348,071**	**$ 934,695,854**	**$ 832,682,511**	**$ 943,780,251**	**$ 992,880,645**	**$ 827,098,941**	**$ 1,786,441,192**
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	67.25 %	59.15 %	65.81 %	69.98 %	67.57 %	66.07 %	72.04 %	53.01 %
Covered Payroll	$ -	$ 149,373,313	$ 141,646,750	$ 246,173,916	$ 199,307,986	$ 185,147,364	$ 188,210,536	$ 238,669,871
Net Pension Liability as a Percentage of Covered Payroll	- %	737.98 %	659.88 %	338.25 %	473.70 %	536.27 %	439.45 %	748.50 %

GASB Statement No. 67 was implemented on June 30, 2014 and does not require retroactive implementation. Data will be added as information is available until 10 years of such information is available.

GASB Statement No. 67, as amended, requires covered payroll to be presented, as well as the net pension liability as a percentage of covered payroll. Covered payroll for 2021 is not available.

See notes to required supplemental information schedules.

General Retirement System of the City of Detroit

Required Supplemental Information
Schedule of Investment Returns
Legacy and Hybrid Plans

Last Eight Fiscal Years

Years Ended June 30

	2021	2020	2019	2018	2017	2016	2015	2014*
Annual money-weighted rate of return - Net of investment expense	28.31 %	(0.78)%	3.28 %	6.70 %	12.60 %	1.10 %	2.40 %	16.30 %

*GASB Statement No. 67 was implemented on June 30, 2014 and does not require retroactive implementation. Data will be added as information is available until 10 years of such information is available.

Fiscal years 2014 and 2015 do not include information related to the Hybrid Plan. The Hybrid Plan was effective July 1, 2014, and for the first year (fiscal year 2015) it did not invest in anything other than cash and cash equivalents.

See notes to required supplemental information schedules.

General Retirement System of the City of Detroit

Required Supplemental Information
Schedule of Pension Contributions
Legacy Plan

Last Ten Fiscal Years

Years Ended June 30

	2021*	2020*	2019*	2018*	2017*	2016*	2015*	2014	2013	2012
Actuarially determined contribution	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 72,643,307	$ 62,297,432	$ 64,065,214
Contributions in relation to the actuarially determined contribution	-	-	-	-	-	-	-	25,126,131	26,515,782	64,065,214
Contribution Deficiency	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (47,517,176)**	**$ (35,781,650)**	**$ -**
Covered Payroll	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 238,669,871	$ 213,291,089	$ 257,992,240
Contributions as a Percentage of Covered Payroll	- %	- %	- %	- %	- %	- %	- %	10.53 %	12.43 %	24.83 %

*The contributions starting with fiscal year 2015 were determined by the provisions of the POA; the contributions were not actuarially determined and, therefore, not subject to disclosure within this schedule in accordance with GASB Statement No. 67.

Notes to Schedule of Pension Contributions (Legacy Plan)

Actuarial valuation information relative to the determination of contributions:

N/A - Starting in fiscal year 2015, contributions are not actuarially determined.

See notes to required supplemental information schedules.

General Retirement System of the City of Detroit

Required Supplemental Information
Schedule of Changes in the City's Net Pension (Asset) Liability and Related Ratios
Hybrid Plan

Last Seven Fiscal Years

	2021	2020	2019	2018	2017	2016	2015
Total Pension Liability							
Service cost	$ 25,208,118	$ 22,532,002	$ 20,171,596	$ 17,056,732	$ 18,417,036	$ 18,302,706	$ 19,318,576
Interest	12,218,430	10,270,622	7,531,400	5,438,061	4,084,390	2,495,896	695,469
Differences between expected and actual experience	(10,183,406)	(7,464,424)	7,556,858	4,546,865	(4,667,487)	(1,263,760)	(1,202,108)
Changes in assumptions	14,453,739	6,518,200	-	(5,758,189)	2,780,462	2,111,451	-
Voluntary employee contributions	5,183,291	5,723,982	5,804,274	5,302,650	5,043,347	5,213,744	5,775,885
Benefit payments, including refunds	(5,118,404)	(3,629,833)	(3,539,384)	(2,390,592)	(2,134,809)	(2,287,214)	-
Net Change in Total Pension Liability	41,761,768	33,950,549	37,524,744	24,195,527	23,522,939	24,572,823	24,587,822
Total Pension Liability - Beginning of year	168,354,404	134,403,855	96,879,111	72,683,584	49,160,645	24,587,822	-
Total Pension Liability - End of year	**$ 210,116,172**	**$ 168,354,404**	**$ 134,403,855**	**$ 96,879,111**	**$ 72,683,584**	**$ 49,160,645**	**$ 24,587,822**
Plan Fiduciary Net Position							
Contributions - Employer	$ 11,690,984	$ 12,515,861	$ 12,205,699	$ 14,673,644	$ 9,484,992	$ 9,048,831	$ 8,811,369
Mandatory employee contributions	9,333,975	10,205,770	9,765,911	8,837,967	7,752,058	7,345,515	6,970,544
Net investment income (loss)	41,527,492	(2,216,167)	3,270,862	8,445,590	9,109,732	(76,608)	20,690
Administrative expenses	(1,316,430)	(1,540,433)	(1,942,064)	(2,171,693)	(2,648,385)	(3,094,197)	(1,481,590)
Voluntary employee contributions	5,183,291	5,723,982	5,804,274	5,302,650	5,043,347	5,213,744	5,786,488
Benefit payments, including refunds of mandatory contributions	(2,743,760)	(2,048,198)	(1,920,550)	(1,308,550)	(1,021,847)	(1,031,060)	(10,603)
Refunds based on voluntary contributions	(2,374,644)	(1,581,635)	(1,618,834)	(1,082,042)	(1,112,962)	(1,256,154)	-
Other	32,244	1,237,613	9,066,288	12,436	61,834	6,586	-
Net Change in Plan Fiduciary Net Position	61,333,152	22,296,793	34,631,586	32,710,002	26,668,769	16,156,657	20,096,898
Plan Fiduciary Net Position - Beginning of year	152,560,705	130,263,912	95,632,326	62,922,324	36,253,555	20,096,898	-
Plan Fiduciary Net Position - End of year	**$ 213,893,857**	**$ 152,560,705**	**$ 130,263,912**	**$ 95,632,326**	**$ 62,922,324**	**$ 36,253,555**	**$ 20,096,898**
City's Net Pension (Asset) Liability - Ending	**$ (3,777,685)**	**$ 15,793,699**	**$ 4,139,943**	**$ 1,246,785**	**$ 9,761,260**	**$ 12,907,090**	**$ 4,490,924**
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	101.80 %	90.62 %	96.92 %	98.71 %	86.57 %	73.75 %	81.74 %
Covered Payroll	$ 233,681,019	$ 245,732,111	$ 224,726,503	$ 246,173,916	$ 199,307,987	$ 185,147,364	$ 180,069,852
City's Net Pension (Asset) Liability as a Percentage of Covered Payroll	(1.62)%	6.43 %	1.84 %	0.51 %	4.90 %	6.97 %	2.49 %

See notes to required supplemental information schedules.

General Retirement System of the City of Detroit

Required Supplemental Information
Schedule of Changes in the City's Net OPEB Liability and Related Ratios
Open Death Benefit Plan

Last Five Fiscal Years

	2021	2020	2019	2018	2017
Total OPEB Liability					
Service cost	$ 129,692	$ 142,198	$ 129,558	$ 114,919	$ 103,457
Interest	311,172	281,348	255,501	223,231	215,053
Differences between expected and actual experience	2,304	215,945	197,652	325,148	-
Changes in assumptions	806,689	-	-	-	-
Benefit payments, including refunds	(213,821)	(205,148)	(234,422)	(184,826)	(230,000)
Net Change in Total OPEB Liability	1,036,036	434,343	348,289	478,472	88,510
Total OPEB Liability - Beginning of year	4,485,073	4,050,730	3,702,441	3,223,969	3,135,459
Total OPEB Liability - End of year	**$ 5,521,109**	**$ 4,485,073**	**$ 4,050,730**	**$ 3,702,441**	**$ 3,223,969**
Plan Fiduciary Net Position					
Contributions - Employer	$ 114,790	$ 113,842	$ 92,990	$ 107,627	$ 88,709
Contributions - Employee	96,996	86,147	73,457	96,337	80,151
Net investment income	1,128,321	11,617	246,685	296,957	315,310
Administrative expenses	(18,094)	(55,108)	(61,160)	(32,001)	(61,755)
Benefit payments, including refunds	(213,821)	(205,148)	(234,422)	(184,826)	(230,000)
Other	-	-	-	(221,948)	-
Net Change in Plan Fiduciary Net Position	1,108,192	(48,650)	117,550	62,146	192,415
Plan Fiduciary Net Position - Beginning of year	4,024,699	4,073,349	3,955,799	3,893,653	3,701,238
Plan Fiduciary Net Position - End of year	**$ 5,132,891**	**$ 4,024,699**	**$ 4,073,349**	**$ 3,955,799**	**$ 3,893,653**
City's Net OPEB Liability (Asset) - Ending	**$ 388,218**	**$ 460,374**	**$ (22,619)**	**$ (253,358)**	**$ (669,684)**
Plan Fiduciary Net Position as a Percentage of Total OPEB Liability	92.97 %	89.74 %	100.56 %	106.84 %	120.77 %

Contributions to the OPEB plan are not based on a measure of pay; therefore, no covered payroll is presented.

GASB Statement No. 74 was implemented on June 30, 2017 and does not require retroactive implementation. Data will be added as information is available until 10 years of such information is available.

See notes to required supplemental information schedules.

General Retirement System of the City of Detroit

Required Supplemental Information
Schedule of OPEB Contributions
Open Death Benefit Plan

Last Five Fiscal Years

Year Ended June 30

	2021	2020	2019	2018	2017
Actuarially determined contribution	$ 114,790	$ 113,842	$ 92,990	$ 93,797	$ 104,659
Contributions in relation to the actuarially determined contribution	114,790	113,842	92,990	107,627	88,709
Contribution Excess (Deficiency)	**$ -**	**$ -**	**$ -**	**$ 13,830**	**$ (15,950)**

GASB Statement No. 74 was implemented for the fiscal year ended June 30, 2017 and does not require retrospective implementation. Data will be added as information is available until 10 years of such information is reported.

Notes to Schedule of Contributions

Actuarial valuation information relative to the determination of contributions:

Valuation date	Actuarially determined contribution rates are calculated as of June 30, two years prior to the end of the fiscal year in which the contributions are reported.

Methods and assumptions used to determine contribution rates:

Actuarial cost method	Level dollar entry age normal
Amortization method	Level dollar, closed
Remaining amortization period	30 years, board policy
Asset valuation method	3-year smoothed market, no corridor
Inflation	N/A
Investment rate of return	7.00 percent, net of OPEB plan expenses, including price inflation at 2.50 percent
Retirement age	Experience-based table of rates that are specific to the type of eligibility condition.
Mortality	General, EMS, and DDOT - 100 percent of the RP-2014 Blue Collar Annuitant Table set forward one year for males and females Police and Fire -100 percent of the RP-2014 Blue Collar Annuitant Table with no set forward
Other information	There were no benefit changes during the year.

See notes to required supplemental information schedules.

General Retirement System of the City of Detroit

Required Supplemental Information
Schedule of OPEB Investment Returns
Open and Closed Death Benefit Plans

Last Five Fiscal Years

Year Ended June 30

	2021	2020	2019	2018	2017
Annual money-weighted rate of return, net of investment expense	24.52 %	0.30 %	2.97 %	5.93 %	7.23 %

GASB Statement No. 74 was implemented for the fiscal year ended June 30, 2017 and does not require retrospective implementation. Data will be added as information is available until 10 years of such information is reported.

See notes to required supplemental information schedules.

General Retirement System of the City of Detroit

Required Supplemental Information
Schedule of Changes in the City's Net OPEB Liability and Related Ratios
Closed Death Benefit Plan

Last Five Fiscal Years

	2021	2020	2019	2018	2017
Total OPEB Liability -					
(Decrease) increase in total OPEB liability due to availability of assets	$ 4,496,393	$ (944,616)	$ 12,295	$ 38,822	$ (15,035)
Total OPEB Liability - Beginning of year	20,470,176	21,414,792	21,402,497	21,363,675	21,378,710
Total OPEB Liability - End of year	**$ 24,966,569**	**$ 20,470,176**	**$ 21,414,792**	**$ 21,402,497**	**$ 21,363,675**
Plan Fiduciary Net Position					
Retiree contribution	$ 19,867	$ 12,925	$ 9,080	$ 9,528	$ -
Net investment income	5,538,571	63,605	1,295,090	1,416,686	1,996,352
Administrative expenses	(18,096)	-	-	-	-
Benefit payments, including refunds	(1,043,949)	(1,074,935)	(1,230,715)	(1,355,391)	(1,949,612)
Other	-	53,789	(61,160)	(32,001)	(61,775)
Net Change in Plan Fiduciary Net Position	4,496,393	(944,616)	12,295	38,822	(15,035)
Plan Fiduciary Net Position - Beginning of year	20,470,176	21,414,792	21,402,497	21,363,675	21,378,710
Plan Fiduciary Net Position - End of year	**$ 24,966,569**	**$ 20,470,176**	**$ 21,414,792**	**$ 21,402,497**	**$ 21,363,675**
City's Net OPEB Liability - Ending	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Plan Fiduciary Net Position as a Percentage of Total OPEB Liability	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %

GASB Statement No. 74 was implemented for the fiscal year ended June 30, 2017 and does not require retrospective implementation. Data will be added as information is available until 10 years of such information is reported.

As the plan will provide future benefits only to the extent that plan assets are available to pay them, the total OPEB liability is equal to the plan's ending net position.

Contributions to the OPEB plan are not based on a measure of pay nor is there applicable payroll; therefore, no covered payroll is presented.

See notes to required supplemental information schedules.

General Retirement System of the City of Detroit

Notes to Required Supplemental Information Schedules

June 30, 2021

Pension Information

Benefit Changes

Legacy Plan

In 2014, the pension plan was frozen. No new employees are allowed to participate in the plan. All benefits for actives were frozen as of June 30, 2014 based on service and average final compensation accrued as of that date.

In 2015, benefits were reduced by 4.5 percent, and the cost of living adjustments were eliminated.

Changes in Assumptions

Legacy Plan

In 2014, amounts reported as changes of assumptions resulted from adjustment of the discount rate from 5.88 percent to 7.2 percent and updating the mortality tables from RP-2000 Combined Table to RP-2014 Blue Collar Mortality Table, and adjustments for longevity and unused sick leave were eliminated.

Legacy and Hybrid Plan

In 2015, amounts reported as changes of assumptions resulted from adjustment of the discount rate from 7.2 to 7.61 percent.

In 2016, amounts reported as changes of assumptions resulted from adjustment of the discount rate from 7.61 to 7.23 percent.

In 2017, amounts reported as changes of assumptions resulted from adjustment of the discount rate from 7.23 to 6.91 percent.

In 2018, amounts reported as changes of assumptions resulted from adjustment of the discount rate from 6.91 to 7.38 percent.

In 2020, amounts reported as changes of assumptions resulted from adjustment of the discount rate from 7.38 to 7.06 percent.

In 2021, amounts reported as changes of assumptions resulted from adjustment of the discount rate from 7.06 to 6.50 percent.

OPEB Information

Changes in Assumptions

In 2021, the discount rate changed from 7.00 to 5.99 percent.

Other Supplemental Information

Combined Plan for the General Retirement System of the City of Detroit

Statement of Changes in Fiduciary Net Position by Division - Legacy Defined Benefit Plan

For the Year Ended June 30, 2021

	DWSD Subdivisions		General Retirement System - Divisions				
	GLWA	DWSD-R	DWSD - Division Total (all DWSD Subdivisions)	General Division	DOT	Library	Total - General Retirement System (all Divisions)
Beginning Net Position - July 1, 2020	$ 363,922,133	$ 153,748,047	$ 517,670,180	$ 862,162,401	$ 140,266,264	$ 76,003,144	$ 1,596,101,989
Additions:							
Investment income:							
Interest and dividends	7,725,429	3,263,801	10,989,230	18,464,632	3,218,894	1,671,668	34,344,424
Net increase in fair value of investments	90,314,459	38,155,612	128,470,071	206,398,388	29,085,100	17,354,631	381,308,190
Net unrealized gain on collateralized securities	62,296	26,319	88,615	142,367	20,062	11,971	263,015
Investment related expenses	(2,116,935)	(894,353)	(3,011,288)	(4,837,896)	(681,743)	(406,786)	(8,937,713)
Net investment income	95,985,249	40,551,379	136,536,628	220,167,491	31,642,313	18,631,484	406,977,916
Contributions:							
Employer contributions:							
Originating from DWSD:							
Regular pension contribution	30,158,700	12,741,300	42,900,000	-	-	-	42,900,000
Contribution for administrative expenses	1,757,500	742,500	2,500,000	-	-	-	2,500,000
DWSD transfer to General Division for administrative expenses	(1,757,500)	(742,500)	(2,500,000)	2,500,000	-	-	-
Total contributions originating from DWSD	30,158,700	12,741,300	42,900,000	2,500,000	-	-	45,400,000
Contributions from other divisions	-	-	-	-	-	2,500,000	2,500,000
Total employer contributions	30,158,700	12,741,300	42,900,000	2,500,000	-	2,500,000	47,900,000
Foundation for Detroit's Future	-	-	-	265,012	109,988	-	375,000
Total contributions	30,158,700	12,741,300	42,900,000	2,765,012	109,988	2,500,000	48,275,000
ASF recoupment interest	1,297,270	548,064	1,845,334	3,604,194	1,136,912	153,418	6,739,858
Other income	203,320	85,898	289,218	454,041	57,070	36,690	837,019
Total additions - net	127,644,539	53,926,641	181,571,180	226,990,738	32,946,283	21,321,592	462,829,793
Deductions:							
Member refunds and withdrawals	1,040,916	439,761	1,480,677	4,066,345	4,875,528	911,054	11,333,604
Retirees' pension and annuity benefits	43,395,620	18,333,569	61,729,189	125,848,697	31,517,775	6,694,512	225,790,173
General and administrative expenses	453,093	191,421	644,514	1,073,418	174,636	94,626	1,987,194
ASF Recoupment Write-off	182,521	77,111	259,632	595,269	264,375	52,237	1,171,513
Transfer of general and administrative expenses to General Divisior	(453,093)	(191,421)	(644,514)	644,514	-	-	-
Total deductions	44,619,057	18,850,441	63,469,498	132,228,243	36,832,314	7,752,429	240,282,484
Net Increase (Decrease) in Net Position	83,025,482	35,076,200	118,101,682	94,762,495	(3,886,031)	13,569,163	222,547,309
End of Year Net Position Restricted for Pensions - June 30, 2021	**$ 446,947,615**	**$ 188,824,247**	**$ 635,771,862**	**$ 956,924,896**	**$ 136,380,233**	**$ 89,572,307**	**$ 1,818,649,298**

Combined Plan for the General Retirement System of the City of Detroit

Schedule of DWSD/GLWA Contributions Toward Administrative Expenses as Compared to Actual DWSD/GLWA Allocable Administrative Expenses

For the Year Ended June 30, 2021

	DWSD Division Total	
	GLWA	DWSD-R
Amount Paid in Excess of Administrative Expenses Otherwise Allocable - June 30, 2020	$ 5,630,243	$ 2,378,641
DWSD/GLWA contribution for administrative expenses in accordance with plan of adjustment and bankruptcy order	1,757,500	742,500
Administrative expenses otherwise allocable to DWSD/GLWA	(453,093)	(191,421)
Cumulative Amount Paid in Excess of Administrative Expenses Otherwise Allocable - June 30, 2021	**$ 6,934,650**	**$ 2,929,720**

Allocation Between Divisions

The Combined Plan's allocation methodology to allocate fiscal year 2021 activity between the four main divisions (General Division, DOT, DWSD, and Library) is dependent upon each revenue or expense type. Below is a description of the allocation methodology used by the Combined Plan. Where applicable, the allocation methodology outlined in the pension reporting agreement was utilized.

Investment Income - Investment income (including income from securities lending activity) and investment expenses were allocated to the divisions, with the exception of the allocation between DWSD-R and GLWA, based on the net position of each division compared to total net position (excluding the Annuity Savings Fund) as of fiscal year ended June 30, 2020. The investment income and expenses allocated were after adjusting for interest credited to the Annuity Savings Fund.

Administrative Expenses - In accordance with Section 2.3 of the pension reporting agreement, DWSD-R and GLWA's collective allocable share of administrative expenses of approximately $645,000 has been allocated to the general division. Correspondingly, the expenses transferred to the general division are offset by a $2.5 million contribution made by DWSD-R and GLWA, collectively, for administrative expenses, which was credited to the general division. This will occur until 2023, at which point the City and GLWA will mutually determine and resolve whether any aggregate over- or underpayment will impact the obligation of DWSD-R and GLWA to make payments to GRS under the pension reporting agreement.

Contributions - In fiscal year 2021, the Plan received contributions from the divisions and the Foundation for Detroit's Future. The employer contributions were allocated between the divisions according to which division the contribution was received from, with the exception of DWSD-R and GLWA's collective payments of $45,400,00, which were allocated as outlined in the POA and/or the pension reporting agreement (see below). Of the total payment of $45,400,000, $2,500,000 reflects DWSD-R and GLWA's agreed-upon share of administrative expenses which, per the pension reporting agreement, is to be transferred to the credit of the general division. The payment from the Foundation was allocated based on a common understanding from the bankruptcy proceedings, which was ultimately determined by the City of Detroit and agreed to by the other divisions. The Foundation proceeds were allocated solely to the general division and DOT in proportion to their respective net pension liability as determined by the City's actuary as of June 30, 2020.

ASF Recoupment - Revenue from the ASF recoupment was allocated between the divisions, other than between DWSD-R and GLWA, according to the division under which the individual's ASF earnings were originally accumulated and paid out.

Member Refunds, Withdrawals, Retirees' Pension, and Annuity Benefits - These deductions were allocated, other than the allocation between DWSD-R and GLWA, based on the original division from which benefits were being provided and withdrawals were being made.

Allocation between DWSD-R and GLWA - Once the above activity was allocated to the divisions, the DWSD division was further subdivided between DWSD-R and GLWA in accordance with the pension reporting agreement, which stipulated such allocation would be dictated to the Plan by DWSD-R and GLWA. Per those instructions, the Plan allocated the DWSD activity between GLWA (70.3 percent) and DWSD-R (29.7 percent).

Plante & Moran, PLLC
P.O. Box 307
3000 Town Center, Suite 100
Southfield, MI 48075
Tel: 248.352.2500
Fax: 248.352.0018
plantemoran.com

November 30, 2021

To the Board of Trustees and the
Investment Committee
General Retirement System
of the City of Detroit

We have audited the financial statements of the General Retirement System of the City of Detroit (the "System") as of and for the year ended June 30, 2021 and have issued our report thereon dated November 30, 2021. Professional standards require that we provide you with the following information related to our audit, which is divided into the following sections:

Section I - Internal Control Related Matters Identified in an Audit - This includes any deficiencies we observed in the System's accounting principles and internal control that we believe are significant. Current auditing standards require us to formally communicate on an annual basis matters we note about the System's accounting policies and internal control. The System has been diligent in its efforts to remedy many of the previously identified internal control deficiencies. Due to its efforts, the condition of the accounting records at the start of the audit and supporting documentation continues to improve.

Section II - Required Communications with Those Charged with Governance - This includes information that current auditing standards require independent auditors to communicate to those individuals charged with governance. We will report this information annually to the board of trustees and the investment committee of the System.

Section III - Other Recommendations and Related Information - This presents recommendations related to internal control, procedures, and other matters noted during our current year audit. These comments are offered in the interest of helping the System in its efforts toward continuous improvement, not just in the areas of internal control and accounting procedures, but also in operational or administrative efficiency and effectiveness.

We would like to take this opportunity to thank the System's staff for the cooperation and courtesy extended to us during our audit. The assistance and professionalism of the System's staff are invaluable and greatly appreciated.

This report is intended solely for the use of the board of trustees, the investment committee, and management of the General Retirement System of the City of Detroit and is not intended to be and should not be used by anyone other than these specified parties.

We welcome any questions you may have regarding the following communications, and we would be willing to discuss these or any other questions that you might have at your convenience.

Very truly yours,

Plante & Moran, PLLC

Michelle Watterworth

Michelle M. Watterworth, CPA

Spencer Tawa

Spencer Tawa, CPA

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Section I - Internal Control Related Matters Identified in an Audit

In planning and performing our audit of the financial statements of the System as of and for the year ended June 30, 2021, in accordance with auditing standards generally accepted in the United States of America, we considered the System's internal control over financial reporting (internal control) as a basis for designing audit procedures that are appropriate in the circumstances for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the System's internal control. Accordingly, we do not express an opinion on the effectiveness of the System's internal control.

Our consideration of internal control was for the limited purpose described in the preceding paragraph and was not designed to identify all deficiencies in internal control that might be significant deficiencies or material weaknesses, and, therefore, material weaknesses or significant deficiencies may exist that were not identified. However, as discussed below, we identified certain deficiencies in internal control that we consider to be material weaknesses and another deficiency that we consider to be a significant deficiency.

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 entity’s financial statements will not be prevented, or detected and corrected, on a timely basis.

We consider the following deficiencies in the System’s internal control to be material weaknesses:

Controls Over the System’s Census Data and Actuarial Valuation Process (Repeat Finding)

Background: The System has to accumulate and transmit voluminous member data to the actuary. The System accumulates member data based on information from the City of Detroit, Michigan (the “City”), as well as data the System independently obtains. The System relies on data it extracts from the City of Detroit, Michigan’s databases primarily for active and deferred members. The System is responsible for data on retirees, as it will obtain additional information when a member commences retirement.

The actuary then uses this information to prepare the actuarial valuation, which impacts the calculation of the actuarially determined contribution (ADC) and the actuarial accrued liability (AAL) for funding purposes and, under GASB Statement No. 67, impacts the total pension liability disclosed in the System’s financial statements.

It is key that the information provided to the actuary is complete and accurate in order to ensure that the funding levels, AAL, and disclosures under GASB Statement No. 67, including the total pension liability, also are accurate.

Issues and recommendations: The System has had issues with the accuracy of the member data for many years. While some data appears to have improved (i.e., active payroll for Component I members), we continued to identify a number of errors with the census data. The more significant errors are as follows:

- Inaccuracies with the average final compensation (AFC) and service years being used in the calculation of frozen accrued benefits (Component II only). Based on our procedures, it was noted that the majority of our sample’s actual AFC was higher than reported in the census data. The majority of the discrepancies ranged from 3 to 8 percent of AFC. Reporting lower AFC than actual leads to a potential understatement of the plan’s total pension liability. Based on follow-up with the System, the discrepancy in the data is not clear. We recommend the System perform a comprehensive review to determine how to pull the most accurate AFC information to provide to the actuary.

Section I - Internal Control Related Matters Identified in an Audit (Continued)

- Missing census data - The actuary noted that inactive vested members for Component I have not been fully processed by the System. As a result, the actuary took members who have retired under Component II with a deferred Component I benefit to include as deferred vested under Component I (actuary identified 307 members). Due to getting the information from the active or retired files for Component II, some information was missing, and the actuary had to make assumptions (i.e., if AFC was unavailable, the actuary assumed an AFC of $36,000 for general DOT members and $42,500 for water/sewage and library members). We recommend the System identify deferred vested members under Component I and ensure all data elements needed are provided to the actuary.

- Service years - During our testing procedures, we noted changes to service years for active and deferred members in Component II. We do not expect any changes in benefit service years given this plan is frozen as of June 30, 2014. We recommend the System perform procedures in analyzing changes in service years to ensure the only changes relate to data corrections.

We acknowledge that both the System and the actuary perform certain tests and cleanup work on the data before it is utilized in the valuations. Unfortunately, the magnitude of the issues identified during our testing is still extremely significant, particularly with AFC and, if not corrected in the coming years, may cause issues with being able to conclude that the data utilized in the valuations is accurate enough not to materially misstate financial data.

Controls Over the System's Information Technology Processes (Repeat Finding)

The System has complex modifiable information technology that integrates with the City of Detroit, Michigan's various payroll databases. The System's IT department is independent of the City and the System's other departments. The security provided by the IT system is important to the validity and the accuracy of the data maintained, including the census information provided to the actuary.

Although the System is currently in the process of modifying the information technology system, we offer the following, which the System should keep in mind as it continues to fully implement the new ERP system:

- Use of automated logs - The System uses customized software for a majority of the System's needs, which includes maintaining the census data and benefits calculation application, which are managed internally by the System's IT personnel and can be modified by the IT department. For all changes to that software, there should be an automated log maintained listing those changes, and no single individual should be able to effect a change without proper authorization. Currently, the System has a process to review, authorize, and track changes, but it is not automated; therefore, it is subject to human error and possible circumvention.

- Master file changes - Additionally, it is recommended that the System implement processes to ensure that master file changes are documented, authorized, and reviewed. The lack of this documentation could result in unauthorized and undocumented changes that go undetected by the System.

- Segregation of duties - Segregation of duty controls provide a separation of users with access to program source code and users with the ability to make or implement changes into the production environment. The ability to make or implement program source code changes should be limited to individuals who cannot access and edit source code. The lack of this control could result in inaccurate or unauthorized changes.

Section I - Internal Control Related Matters Identified in an Audit (Continued)

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. We consider the following deficiency in the System's internal control to be a significant deficiency:

Controls Over Year-end Investment Valuation

The System has approximately $914 million in investments that do not have a readily determinable market value. For approximately $865 million of this amount, management's estimate of the investments' fair value is based on capital statements provided by investment managers and general partners. The System's process is to accumulate the capital statements for all these investments to record fair value as of June 30, 2021. For investments for which the June 30, 2021 capital statements are not available timely, the System uses March 31, 2021 (or later) capital statements and adjusts for any cash flow activity during the gap period (generally April 1, 2021 through June 30, 2021) to approximate fair value as of June 30, 2021. The System maintains an Excel workpaper to track adjustments to these investments. This process is designed to ensure investment valuation is accurately estimated at June 30, 2021; however, during our audit, we noted one error related to this process:

- An investment was overstated by approximately $6,500,000. The System incorrectly used the March 31, 2020 capital statement instead of March 31, 2021 to initially value the investment (prior to accounting for cash flows for the gap period). The investment value recorded by the System was approximately $39 million but should have been $32.5 million. After we identified this error, the System subsequently recorded this change, and it is reflected in the June 30, 2021 financial statements.

We recommend the System implement additional controls over the System's valuation of investments to ensure investments continue to be recorded in compliance with generally accepted accounting principles. This would include adding another layer of review by obtaining and reviewing capital statements included in the tracker and ensuring formulas are correct in the Excel tracker.

Section II - Required Communications with Those Charged with Governance

Our Responsibility Under U.S. Generally Accepted Auditing Standards

As stated in our engagement letters dated June 18, 2021 and September 21, 2021, our responsibility, as described by professional standards, is to express an opinion about whether the financial statements prepared by management with your oversight are fairly presented, in all material respects, in conformity with U.S. generally accepted accounting principles. Our audit of the financial statements does not relieve you or management of your responsibilities. Our responsibility is to plan and perform the audit to obtain reasonable, but not absolute, assurance that the financial statements are free of material misstatement.

As part of our audit, we considered the internal control of the System. Such considerations were solely for the purpose of determining our audit procedures and not to provide any assurance concerning such internal control.

We are responsible for communicating significant matters related to the audit that are, in our professional judgment, relevant to your responsibilities in overseeing the financial reporting process. However, we are not required to design procedures specifically to identify such matters.

Planned Scope and Timing of the Audit

We performed the audit according to the planned scope and timing previously communicated to you in our meeting about planning matters on August 23, 2021.

Significant Audit Findings

Qualitative Aspects of Accounting Practices

Management is responsible for the selection and use of appropriate accounting policies. In accordance with the terms of our engagement letter, we will advise management about the appropriateness of accounting policies and their application. The significant accounting policies used by the System are described in Note 1 to the financial statements. There were several new accounting standards effective for the System this year, including GASB Statement No. 84 on fiduciary activities, which the System analyzed and determined had no impact. As a result, no new accounting policies were adopted, and the application of existing policies was not changed during year.

We noted no transactions entered into by the System during the year for which there is a lack of authoritative guidance or consensus.

There are no significant transactions that have been recognized in the financial statements in a different period than when the transaction occurred.

Accounting estimates are an integral part of the financial statements prepared by management and are based on management's knowledge and experience about past and current events and assumptions about future events. Certain accounting estimates are particularly sensitive because of their significance to the financial statements and because of the possibility that future events affecting them may differ significantly from those expected.

The following are the significant estimates affecting the financial statements:

<u>Investment valuations:</u>

The financial statements include investments valued at approximately $49 million (2 percent of net position) at June 30, 2021 whose fair values have been estimated by management in the absence of readily determinable market values.

Section II - Required Communications with Those Charged with Governance (Continued)

The valuation of alternative investments constitutes a very sensitive and significant estimate affecting the financial statements. Management uses various means to value the investments, including utilizing a third-party valuation firm, confirmations from the investment managers, periodic appraisals, guidance from real estate advisors, etc. These estimates are very subjective and highly sensitive to change. We believe management's estimates are in accordance with GAAP.

Estimates inherent in the development of the total pension liability:

The financial statement disclosures and required supplemental information schedules contain information about the System's total pension liability. In order to determine the total pension liability, the actuary must apply certain assumptions that are highly sensitive to estimation. The most sensitive estimates used in the valuation were as follows:

- Assumed long-term rate of return - For the purpose of GASB Statement No. 67, as of June 30, 2021, the System is currently using 6.50 percent for the assumed long-term expected rate of return based on information provided by the System's investment advisor combined with calculations performed by the System. This assumed rate of return was also the single discount rate used at the end of the year. Nationally, this long-term rate of return assumption has garnered significant public attention, with many being critical of the average return assumption used by plans across the United States, which, according to a February 2021 National Association of State Retirement Administrators (NASRA) study, was 7.18 percent. Nationally, the trend continues to show a continued decline in this assumption, and we believe that trend will continue. We commend the System on continuing to be critical of this significant assumption, watching the trends nationally, and reevaluating the return assumption annually with a critical eye. Please note that this assumption related to the long-term assumed rate of return is for financial reporting purposes only; the Plan of Adjustment requires that the projected rate of return for funding purposes be 6.75 percent.

- Single discount rate calculation - The calculation of the single discount rate under GASB Statement No. 67, which is calculated using the long-term assumed rate of return as one of many assumptions, is highly sensitive to estimates the actuary makes about future contributions and future benefit payments. Inherent in those assumptions is some subjectivity surrounding the projection of future contributions, since the System does not have a fully approved and agreed upon funding policy dictating contributions after 2023, although we do understand that the board of trustees has adopted a funding policy, but it has not yet been approved by the investment committee, nor has that funding policy been put in place. The assumption made in the GASB 67 valuation is that the actuarially assumed contributions will be made at rates sufficient to fund the benefits by amortizing the unfunded liability over a closed 30-year period. The adoption of a shorter amortization period, if that were the route taken, would not alter the current assumption that no depletion date exists.

- Mortality assumptions - The assumptions about mortality were estimated by the actuary based on the results of an experience study issued in February 2015. Generally, the actuary used the RP-2014 Blue Collar Annuitant Table for males and females, projected on a fully generational basis. In early 2019, the Society of Actuaries published new mortality tables called the Pub-2010 tables. These were the first mortality tables issued based solely on United States public sector employees (public safety, teachers, and general employment categories). Given the applicability of these tables to the public sector, it will be likely the System will need to consider these tables. We understand that the System is currently undergoing a new experience study but that no results are yet available and no new assumptions have yet been adopted as a result of that study, which is ongoing.

- Other assumptions - All other assumptions in the actuarial valuation are based on an experience study for the period from 2002-2007. In order to avoid any results that could be skewed due to the City's bankruptcy, we understand that the System has waited to perform an updated experience study, which is currently in process. It is possible that the results of this next experience study for the period from July 1, 2015 through June 30, 2020 could impact the total pension liability.

We evaluated the key factors and assumptions used to develop the estimates above and determined that they are reasonable in relation to the financial statements taken as a whole.

Section II - Required Communications with Those Charged with Governance (Continued)

The disclosure of these assumptions and resultant sensitivity of the discount rate can be found in Notes 7 and 8 to the financial statements.

The disclosures in the financial statements are neutral, consistent, and clear. Certain financial statement disclosures are particularly sensitive because of their significance to financial statement and schedule users. The most sensitive disclosures affecting the financial statements and the schedules are the disclosures related to GASB Statement No. 67, including the actuarial valuation results.

Difficulties Encountered in Performing the Audit

We are required to inform those charged with governance of any difficulties encountered related to the performance of the audit. While we had no difficulties in dealing with management related to the performance of the audit, we did encounter significant difficulties due to the magnitude of the census data errors we found during our audit test work.

Disagreements with Management

For the purpose of this letter, professional standards define a disagreement with management as a financial accounting, reporting, or auditing matter, whether or not resolved to our satisfaction, that could be significant to the financial statements or the auditor’s report. We are pleased to report that no such disagreements arose during the course of our audit.

Corrected and Uncorrected Misstatements

Professional standards require us to accumulate all known and likely misstatements identified during the audit, other than those that are trivial, and communicate them to the appropriate level of management. None of the misstatements detected as a result of audit procedures and corrected by management were material, either individually or in the aggregate, to the financial statements taken as a whole. The following summarizes uncorrected misstatements of the financial statements:

- The total pension liability, as calculated by the actuary, is based on census information that is either incomplete or inaccurate. The total pension liability would be different had accurate and complete information been provided to the actuary.

- In the schedule of changes in the city's net pension liability and related ratios (Legacy Plan), covered payroll is required to be presented. This information was unavailable and has been noted as not available.

- The money-weighted rate of return, net of investment expenses for the pension plans calculated return is 28.31 percent. We are unable to audit this rate of return.

Management has determined that their effects are immaterial, both individually and in the aggregate, to the financial statements taken as a whole.

Significant Findings or Issues

We generally discuss a variety of matters, including the application of accounting principles and auditing standards, business conditions affecting the System, and business plans and strategies that may affect the risks of material misstatement, with management each year prior to our retention as the System’s auditors. However, these discussions occurred in the normal course of our professional relationship, and our responses were not a condition of our retention.

Management Representations

We have requested certain representations from management that are included in the management representation letter dated November 30, 2021.

Section II - Required Communications with Those Charged with Governance (Continued)

Management Consultations with Other Independent Accountants

In some cases, management may decide to consult with other accountants about auditing and accounting matters, similar to obtaining a second opinion on certain situations. If a consultation involves application of an accounting principle to the System's financial statements or a determination of the type of auditor's opinion that may be expressed on those statements, our professional standards require the consulting accountant to check with us to determine that the consultant has all the relevant facts. To our knowledge, there were no such consultations with other accountants.

Section III - Other Recommendations and Related Information

During our audit, we noted areas where we believe there are opportunities for the System to further strengthen internal control or to increase operating efficiencies. Our observations on those areas are presented below for your consideration:

Investment Distributions

- The System receives investment cash distributions for interest, dividends, return of capital, and other investment-type income. While the majority of the distributions are received by the System's custodian, Bank of New York, there are distributions that also run through the passive investments. The controls over these distributions are critical to ensuring that all distributions that should go to the System ultimately are received.

  When the System sets up a new alternative investment, such as private equity and hedge funds, subscription agreements are signed by authorized individuals of the System (i.e., trustees and executive director). The agreements may also assign the chief investment officer (CIO) to be the authorized agent on behalf of the System, include a list of individuals that the investment fund should include in some of its correspondences, and indicate the Bank of New York banking information where future distributions are to be sent.

  As an authorized agent, the CIO is able to change the wire instructions after they are initially established. As a detective control to ensure inappropriate changes are not made, when a distribution is sent, in most cases the investment funds send distribution letters simultaneously to the accounting staff at the System in addition to the CIO, which can then be reconciled to the receipt. This control is imperative to ensure distribution wire instructions are correct and funds are being properly received by the designated Bank of New York account.

  As there are some investments initially funded many years ago, the correspondence list and contact information may need to be updated given personnel changes at the System. This is to ensure all distribution notices are received by the accounting department and follow the System's controls - reviewing distribution notices to verify the banking information and follow-up procedures to verify that all current distributions are ultimately received.

- The System's components of investment income are separated in the general ledger and in the financial statements between (a) interest income, dividend income, and other income and (b) net increase (decrease) in fair value of investments (which includes realized and unrealized gains and losses). The plan's current processes and controls do not always result in an accurate allocation between these two components of investment income, although in total investment income would not be affected.

  For investments where Bank of New York is the custodian of the System's investments, the accounting department records the activity using the individual investment reports as the source document. The System appropriately performs a reconciliation of these amounts monthly.

  For investments for which Bank of New York is not the custodian, the accounting department uses information obtained on each distribution notice to determine the income statement classification of the funds received. While the System's processes and controls have improved significantly in this reporting from prior years, during the audit we identified certain adjustments between the classification of investment income. To be clear, this does not have an effect on the System's end of year net position but is merely a misclassification between these two types of income accounts; however, proper accounting is critical to ensure the plan's accounting supports the underlying transactions that are occurring and supports the accuracy of the System's external financial reporting.

  As distribution notices and capital statement formats differ between investment funds, we recommend the System's accounting department continue to work with the chief investment officer on any uncertain distributions to properly classify the distribution within the System's general ledger.

Section III - Other Recommendations and Related Information (Continued)

Benefit Payment Classification

The System processes monthly benefit payments for each retiree that are summarized and journalized in a monthly entry. These monthly payroll entries are based on the plan to which each retiree is coded (Component II or I). During testing, it was identified that some individuals' pensions are incorrectly classified between Component I and Component II. While the number of individuals incorrectly classified was insignificant, we recommend the System implement a control to ensure proper classification of members in the IT system. This will become more important as the longevity of Component I grows.

Information Technology Processes

- Currently, there is no formal process to fill out a production release form. Usually a member of the IT department will inform Ray Tchou to review a production change. Ray is the only individual with the ability to release a production change. We recommend the System have a formal policy for individuals to submit a production release form to document change requests and maintain proper support of approval of any changes.
- It was noted there are administrative user profiles that remained in the System for users no longer employed at the System. These profiles have remained active, as staff need to access old files. In addition, we noted duplicate administrative user profiles for current employees. We recommend the System perform a user profile review and only allow one user profile for each current employee and that user profiles for former employees be immediately deleted upon ceasing employment.

Benefit Payment Calculations

Pension factors are used in calculating an individual's pension payment based on age and option selected. Currently, the pension factor used in the calculation of benefit payments is using an old mortality table (1984 table) and a 7.5 percent rate of return. Pension factors should be updated with a newer mortality table (RP-2014 Mortality Table is currently being used in the actuarial valuations) and rate of return of 6.75 percent (current rate of return used for funding purposes, as stipulated by the Plan of Adjustment). Our understanding is the System will update these amounts once the benefit calculation software is implemented.

Informational Items

Income Stabilization Fund

As you are aware, based on the Plan of Adjustment, the investment committee may recommend to the board of trustees that a portion or all of the assets that exceed the income stabilization benefits to be paid in the future be used to fund regular pension payments (up to $35 million). This is allowed beginning in 2022 and requires agreement from at least 75 percent of the independent members of the investment committee on the recommendation. As of June 30, 2021, the Income Stabilization Fund's net position was $14,210,563. The investment committee may want to utilize this option; if so, it will need to utilize an actuary to assist in making this determination.

Upcoming Accounting and Auditing Standards - Fiscal Year Ending June 30, 2022

AICPA State and Local Government Client Affiliates

The AICPA has adopted a revised auditor independence interpretation, which impacts entities reporting under the GASB framework. The new rules define four types of affiliates (entities affiliated with your financial statements) that may expand the scope of required auditor independence as it relates to your audit. Under these revised standards, one type of affiliate includes certain investments held by the audit client. For the System, it is possible that you hold several investments that meet the definition of an affiliate and, therefore, require independence.

Section III - Other Recommendations and Related Information (Continued)

Because auditor independence is a shared responsibility between your organization and Plante & Moran, PLLC, you should be aware of and understand these changes. In addition, we will need your help to perform an initial evaluation under these revised standards and will also likely need your continuing assistance to comply with these rules in the future. The changes are effective for years beginning after December 15, 2021, which means we must be independent of your affiliates as of the first day of the year of required adoption, or July 1, 2022. For more information on these changes, please view our on-demand webinar here.

Auditor Reporting Standards

The AICPA Auditing Standards Board (ASB) issued several new standards which are coming effective shortly, that will significantly change the independent auditor's report and make some changes to certain required audit procedures. The standards discussed below are both first effective for your fiscal year ending June 30, 2022.

Statement on Auditing Standards No. 137 addresses auditors' responsibilities relating to "other information included in annual reports." This new standard may increase the scope of audit procedures and may result in some audit work being performed outside of the normal timing. To the extent that the System issues a document meeting the AICPA's definition of an annual report under the standard, additional audit procedures will need to be performed on these separate documents before issuance.

Statement on Auditing Standards No.134 requires changes in the form and content of the auditor's report issued as a result of an audit of financial statements in order to provide financial statement users with more meaningful information about the audit process and meaning of auditor opinions. This is the first significant change to auditor's reports in years.

Significant elements of the new standard include the following:

- Revised order for elements of the opinion letter, including moving the auditor's opinion to the top of the letter
- Expansion of information to be included within a basis of opinion section and notification to the user that the auditor is required to be independent of the entity and to meet other ethical responsibilities
- Explanation of how misstatements to financial statements are determined to be material
- Addition of definition of "reasonable assurance" and identifying that the risk of material misstatement due to fraud is greater than the risk due to error
- Enhanced reporting related to going concern, including a description of management's responsibilities when required by the applicable reporting framework
- Description of the auditor's responsibilities, including responsibilities relating to professional judgment and professional skepticism, internal controls, identification of risks of material misstatement to the financial statements, evaluation of accounting policies used, conclusion on the entity's ability to continue as a going concern, and the auditor's communications with those charged with governance

We are happy to discuss these changes with you so that you are well prepared.

GASB Statement No. 87 - Leases

This new accounting pronouncement will be effective for reporting periods beginning after June 15, 2021. This statement requires recognition of certain lease assets and liabilities for leases that previously were classified as operating leases and recognized as inflows of resources or outflows of resources based on the payment provisions of the contract. It establishes a single model for lease accounting based on the foundational principle that leases are financings of the right to use an underlying asset. Under this statement, a lessee is required to recognize a lease liability and an intangible right-to-use lease asset, and a lessor is required to recognize a lease receivable and a deferred inflow of resources.

Section III - Other Recommendations and Related Information (Continued)

We recommend beginning to accumulate information now related to all significant lease agreements in order to more efficiently implement this new standard once it becomes effective.

Plante & Moran, PLLC has already provided several trainings on this new standard, which are all available on demand if you missed the original sessions or want a refresher. We also have a workaid available to help you implement the new standard. Please reach out to us for assistance in getting started; we are happy to help.

The General Retirement System of the City of Detroit

GASB Statement Nos. 67 and 68 Accounting and Financial Reporting for Pension Plans of Component II

June 30, 2021

GRS

800.521.0498 | P: 248.799.9000 | www.grsconsulting.com

October 29, 2021

Board of Trustees
The General Retirement System of the City of Detroit

Dear Board Members:

This report provides information required for the General Retirement System of the City of Detroit in connection with the Governmental Accounting Standards Board (GASB) Statement No. 67 "Financial Reporting for Pension Plans" and Statement No. 68 "Employer Reporting for Pension Plans." These calculations have been made on a basis that is consistent with our understanding of this Statement. This information is subject to a review by the System's Auditor. Please let us know if the System's Auditor recommends any changes. This report covers the General Retirement System Plan known as Component II (also known as the Legacy Plan). Since Component I is a separate plan, it is detailed in a separate report.

Our calculation of the liability associated with the benefits described in this report was performed for the purpose of satisfying the requirements of GASB Statement Nos. 67 and 68. The calculation of the plan's liability for this report is not applicable for funding purposes of the plan. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB Statement Nos. 67 and 68 may produce significantly different results. In particular, this is not a funding report and nothing in this report should be construed as a funding recommendation. This report may be provided to parties other than the System only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report.

The Appendix of this report also provides some of the information necessary to complete the reporting requirements for the State of Michigan's Local Government Retirement System Annual Report (Form No. 5572). This information is not required to be included in your financial statements. The calculations in the Appendix are based on assumptions that satisfy the Uniform Assumptions criteria published by the Michigan Treasury for Fiscal Year 2021 reporting requirements.

This report is based upon information, furnished to us by System staff, concerning retirement and ancillary benefits, active members, deferred vested members, retirees and beneficiaries, and financial data. This report is based on the valuation date of June 30, 2020. The total pension liability was rolled-forward from the valuation date to the plan year ending June 30, 2021 using generally accepted actuarial principles. The asset information as of June 30, 2021 was provided by the System. This information was checked for internal consistency, but it was not audited by Gabriel, Roeder, Smith & Company. A description of the adjustments made to the data is incorporated in this report (either directly or by reference). GRS is not responsible for the accuracy of the data provided by the Retirement System. This report is based upon estimates of frozen accrued benefits. Future measurements based on final calculation of benefit amounts will differ.

At the direction of the System and approval of the System's Auditor, the long-term expected return on assets used to determine the discount rate is 6.50%, net of investment expenses, as of June 30, 2021, down from 7.06% as of June 30, 2020. We have reviewed this assumption based on the System's asset allocation and have determined it does not significantly conflict with what, in our professional judgement, would be reasonable for purposes of the measurement.

To the best of our knowledge, the information contained within this report is accurate and fairly represents the actuarial position of the System on the measurement date for purposes of GASB Statement Nos. 67 and 68 reporting. All calculations have been made in conformity with generally accepted actuarial principles and practices as well as with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

This report was prepared using our proprietary valuation model and related software which, in our professional judgment, has the capability to provide results that are consistent with the purposes of the valuation and has no material limitations or known weaknesses. We performed tests to ensure that the model reasonably represents that which is intended to be modeled. We are relying on the GRS actuaries and Internal Software, Training, and Processes Team who developed and maintain the model.

The signing individuals are independent of the plan sponsor.

David T. Kausch, Judith A. Kermans, and Jamal Adora are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,
Gabriel, Roeder, Smith & Company

David T Kausch

David T. Kausch, FSA, EA, FCA, MAAA, PhD
Senior Consultant and Chief Actuary

Judith A. Kermans

Judith A. Kermans, EA, FCA, MAAA
Senior Consultant and President

Jamal Adora

Jamal Adora, ASA, EA, MAAA
Senior Analyst

DTK/JAK/JA:bd

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SECTION A

EXECUTIVE SUMMARY

Executive Summary
as of June 30, 2021

Actuarial Valuation Date	June 30, 2020
Measurement Date of the Net Pension Liability	June 30, 2021
Employer's Fiscal Year Ending Date (GASB No. 68 Reporting Date)	June 30, 2022
Membership	
Number of	
- Retirees and Beneficiaries	11,220
- Inactive, Nonretired Members	2,728
- Active Members	2,403
- Total	16,351
Covered Payroll	$ 111,124,304
Net Pension Liability	
Total Pension Liability	$ 2,704,110,233
Plan Fiduciary Net Position	1,818,649,298
Net Pension Liability	$ 885,460,935
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	67.25%
Net Pension Liability as a Percentage of Covered Payroll	796.82%
Development of the Single Discount Rate	
Single Discount Rate	6.50%
Long-Term Expected Rate of Investment Return	6.50%
Long-Term Municipal Bond Rate*	1.92%
Last year ending June 30 in the 2022 to 2121 projection period for which projected benefit payments are fully funded	2121
Total Pension Expense	$ 97,970,192

Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources
Difference between expected and actual experience	$ -	$ -
Changes in assumptions	-	-
Net difference between projected and actual earnings on pension plan investments	119,508,010	245,801,617
Total	$ 119,508,010	$ 245,801,617

**Source:* *Fixed-income municipal bonds with 20 years to maturity that include only federally tax-exempt municipal bonds as reported in Fidelity Index's "20-Year Municipal GO AA Index" as of June 30, 2021. In describing this index, Fidelity notes that the municipal curves are constructed using option-adjusted analytics of a diverse population of over 10,000 tax-exempt securities.*

Discussion

Changes Compared to Funding Valuation

For purposes of determining the Total Pension Liability (TPL) as of June 30, 2021, we note the following differences from the assumptions used in the June 30, 2020 funding valuation:

- At the direction of the System and approval of the System's Auditor, the long-term expected return on assets was 6.50% net of investment expenses, as of June 30, 2021. It was 6.75% net of investment and administrative expenses, in the June 30, 2020 funding valuation, as required by the Plan of Adjustment.
- Administrative expenses are assumed to be shared 60% with Component II and 40% with Component I. This was reflected in our modeling, where appropriate.

All other actuarial assumptions were the same as those used in the June 30, 2020 actuarial valuation (the funding valuation).

Changes Compared to Prior Year's GASB Report

The changes in actuarial assumptions compared to the June 30, 2019 GASB No. 68 reporting was:

- The long-term expected rate of investment return and single discount rate decreased from 7.06% to 6.50%.

This change increased the TPL by $120 million resulting in a new deferred outflow for recognition in the pension expense.

Data Approximations and Assumptions

A description of the data approximations and assumptions used in completing this report are included in the June 30, 2020 funding valuation report.

Discussion

Development of Employer Proportionate Shares

As instructed, we have developed the proportionate employer shares as follows:

- General, DOT, DWSD, and Library have contribution rates assessed on separate relationships and are, therefore, accounted for separately under Paragraph 49 of GASB Statement No. 68.
- The component units in the General Division were 1) General City; 2) Parking; and 3) Airport.
- Proportionate shares in the General Division were determined by prorating based on the Total Pension Liability.

Accounting Standard

For pension plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board (GASB) Statement No. 67 establishes standards of financial reporting for separately issued financial reports and specifies the required approach for measuring the pension liability. Similarly, GASB Statement No. 68 establishes standards for state and local government employers (as well as non-employer contributing entities) to account for and disclose the net pension liability, pension expense, and other information associated with providing retirement benefits to their employees (and former employees) on their basic financial statements.

The following discussion provides a summary of the information that is required to be disclosed under these accounting standards. A number of these disclosure items are provided in this report. However, certain information, such as notes regarding accounting policies and investments, is not included in this report and the retirement system and/or plan sponsor will be responsible for preparing and disclosing that information to comply with these accounting standards.

Financial Statements

GASB Statement No. 68 requires state or local governments to recognize the net pension liability and the pension expense on their financial statements. The net pension liability is the difference between the total pension liability and the plan's fiduciary net position. In traditional actuarial terms, this is analogous to the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

Paragraph 57 of GASB Statement No. 68 states, "Contributions to the pension plan from the employer subsequent to the measurement date of the collective net pension liability and before the end of the employer's reporting period should be reported as a deferred outflow of resources related to pensions." The information contained in this report does not incorporate any contributions made to the General Retirement System of the City of Detroit subsequent to the measurement date of June 30, 2021.

Discussion

The pension expense recognized each fiscal year is equal to the change in the net pension liability from the beginning of the year to the end of the year, adjusted for deferred recognition of the certain changes in the liability and investment experience.

Pension plans that prepare their own, stand-alone financial statements are required to present two financial statements – a statement of fiduciary net position and a statement of changes in fiduciary net position in accordance with GASB Statement No. 67. The *statement of fiduciary net position* presents the assets and liabilities of the pension plan at the end of the pension plan's reporting period. The *statement of changes in fiduciary net position* presents the additions, such as contributions and investment income, and deductions, such as benefit payments and expenses, and net increase or decrease in the fiduciary net position.

Notes to Financial Statements

GASB Statement No. 68 requires the notes of the employer's financial statements to disclose the total pension expense, the pension plan's liabilities and assets, and deferred outflows and inflows of resources related to pensions.

GASB Statement Nos. 67 and 68 require the notes of the financial statements for the employers and pension plans to include certain additional information. The list of disclosure items should include:

- A description of benefits provided by the plan;
- The type of employees and number of members covered by the pension plan;
- A description of the plan's funding policy, which includes member and employer contribution requirements;
- The pension plan's investment policies;
- The pension plan's fiduciary net position and the net pension liability;
- The net pension liability using a discount rate that is 1% higher and 1% lower than used to calculate the total pension liability and net pension liability for financial reporting purposes;
- Significant assumptions and methods used to calculate the total pension liability;
- Inputs to the discount rates; and
- Certain information about mortality assumptions and the dates of experience studies.

Retirement systems that issue stand-alone financial statements are required to disclose additional information in accordance with GASB Statement No. 67. This information includes:

- The composition of the pension plan's Board and the authority under which benefit terms may be amended;
- A description of how fair value is determined;
- Information regarding certain reserves and investments, which include concentrations of investments greater than or equal to 5%, receivables, and insurance contracts excluded from plan assets; and
- Annual money-weighted rate of return.

Discussion

Required Supplementary Information

GASB Statement No. 67 requires a 10-year fiscal history of:

- Sources of changes in the net pension liability;
- Information about the components of the net pension liability and related ratios, including the pension plan's fiduciary net position as a percentage of the total pension liability, and the net pension liability as a percent of covered-employee payroll; and
- A comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy.

Timing of the Valuation

An actuarial valuation to determine the total pension liability is required to be performed at least every two years. The net pension liability and pension expense should be measured as of the pension plan's fiscal year end (measurement date) on a date that is within the employer's prior fiscal year. If the actuarial valuation used to determine the total pension liability is not calculated as of the measurement date, the total pension liability is required to be rolled forward from the actuarial valuation date to the measurement date.

The total pension liability shown in this report is based on an actuarial valuation performed as of June 30, 2020, rolled to the plan year end of June 30, 2021.

Single Discount Rate

Projected benefit payments are required to be discounted to their actuarial present values using a Single Discount Rate that reflects (1) a long-term expected rate of return on pension plan investments (to the extent that the plan's 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 of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 6.50% the municipal bond rate is 1.92% (based on the daily rate closest to but not later than the measurement date of the Fidelity "20-Year Municipal GO AA Index"); and the resulting Single Discount Rate is 6.50%.

The expected rate of return was provided by the Retirement System and approved by the System's auditor.

Discussion

Limitation of Assets as a Percent of Total Pension Liability Measurements

This report includes a measure of the plan fiduciary net position as a percent of total pension liability (67.25% as of June 30, 2021). Unless otherwise indicated, with regard to any such measurements presented in this report:

(1) This measurement is not intended to be a funded ratio or a measure of funded progress.
(2) This measurement is inappropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligations.
(3) The measurement is inappropriate for assessing the need for or amount of future employer contributions.

Limitations of Project Scope

Actuarial Standards do not require the actuary to evaluate the ability of the plan sponsor or other contributing entities to make required contributions when due. Such an evaluation was not within the scope of this project and is not within our area of expertise. Consequently, we have not made such an evaluation.

ASF Recoupments

The reported June 30, 2021 assets included a receivable, computed by the System's auditor, that accounts for future ASF recoupments. We understand this amount was originally determined as of June 30, 2015 and updated to June 30, 2021 in accordance with GAAP.

SECTION B

FINANCIAL STATEMENTS

This information is subject to the System's Auditor's review. Please let us know if the System's Auditor recommends any changes.

Statement of Fiduciary Net Position as of June 30, 2021

Assets	
Cash and Cash Equivalents	$ 81,684,767
Receivables	108,348,712
Investments at Fair Value	1,631,592,944
Cash and Investments held as collateral for securities lending	77,656,896
Capital Assets - Net	2,647,165
Total Assets	$ 1,901,930,484
Liabilities	
Accounts Payable	$ 83,281,186
Total Liabilities	$ 83,281,186
Net Position Restricted for Pensions	$ 1,818,649,298
ASF Reserve	$ 104,783,035
Other Reserves	1,713,866,263
Plan Fiduciary Net Position	$ 1,818,649,298

Statement of Changes in Fiduciary Net Position for Year Ended June 30, 2021

Additions		
Contributions		
Employer	$	47,900,000
Employee		-
Foundation Contribution		375,000
Total Contributions	$	48,275,000
Investment Income		
Investment Income	$	406,977,917
Net Investment Income	$	406,977,917
Other Income (Including ASF Interest)^	$	7,576,875
Total Additions	$	462,829,792
Deductions		
Benefit Payments, including Refunds of Employee Contributions	$	237,123,777
Pension Plan Administrative Expense		1,987,193
Other (including ASF write-offs and transfers to Comp I)		1,171,513
Total Deductions	$	240,282,483
Net Increase in Net Position	$	222,547,309
Net Position Restricted for Pensions		
Beginning of Year	$	1,596,101,989
End of Year	$	1,818,649,298

^ *Following discussions with the auditor, we understand that for purposes of determining the Pension Expense for GASB Statement No. 68, ASF Interest should be treated as Other Changes in Plan Fiduciary Net Position and recognized immediately.*

Statement of Pension Expense Under GASB Statement No. 68
Fiscal Year Ended June 30, 2021*

A. Expense	General	DOT	DWSD	Library	Total
1. Service Cost	$ -	$ -	$ -	$ -	$ -
2. Interest on the Total Pension Liability	98,821,058	28,380,977	48,808,307	6,129,763	182,140,105
3. Current-Period Benefit Changes	-	-	-	-	-
4. Employee Contributions (made negative for addition here)	-	-	-	-	-
5. Projected Earnings on Plan Investments (made negative for addition here)	(56,441,869)	(8,648,648)	(35,896,761)	(5,187,122)	(106,174,400)
6. Pension Plan Administrative Expense	1,717,931	174,636	-	94,626	1,987,193
7. Other Changes in Plan Fiduciary Net Position	(3,462,963)	(929,607)	(1,874,921)	(137,871)	(6,405,362)
8. Recognition of Outflow (Inflow) of Resources due to Liabilities	28,271,756	8,889,512	20,008,404	3,474,173	60,643,845
9. Recognition of Outflow (Inflow) of Resources due to Assets	(19,081,501)	(2,525,029)	(11,250,854)	(1,363,805)	(34,221,189)
10. Total Pension Expense	**$ 49,824,412**	**$ 25,341,841**	**$ 19,794,175**	**$ 3,009,764**	**$ 97,970,192**

**Totals may not add due to rounding.*

Statement of Outflows and Inflows Arising from Current Reporting Period Fiscal Year Ended June 30, 2021*

A. Outflows (Inflows) of Resources due to Liabilities	General	DOT	DWSD	Library	Total
1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses	$ (35,563,723)	$ (10,172,786)	$ (13,092,918)	$ (403,422)	$ (59,232,849)
2. Assumption Changes (gains) or losses	$ 63,835,479	$ 19,062,298	$ 33,101,322	$ 3,877,595	$ 119,876,694
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}	1.0000	1.0000	1.0000	1.0000	1.0000
4. Outflow (Inflow) of Resources to be recognized in the current pension expense for the difference between expected and actual experience of the Total Pension Liability	$ (35,563,723)	$ (10,172,786)	$ (13,092,918)	$ (403,422)	$ (59,232,849)
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes	$ 63,835,479	$ 19,062,298	$ 33,101,322	$ 3,877,595	$ 119,876,694
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	$ 28,271,756	$ 8,889,512	$ 20,008,404	$ 3,474,173	$ 60,643,845
7. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for the difference between expected and actual experience of the Total Pension Liability	$ -	$ -	$ -	$ -	$ -
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes	$ -	$ -	$ -	$ -	$ -
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	$ -	$ -	$ -	$ -	$ -
B. Outflows (Inflows) of Resources due to Assets					
1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	$ (163,725,622)	$ (22,993,665)	$ (100,639,867)	$ (13,444,363)	$ (300,803,517)
2. Recognition period for Assets {in years}	5.0000	5.0000	5.0000	5.0000	5.0000
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets	$ (32,745,124)	$ (4,598,733)	$ (20,127,973)	$ (2,688,873)	$ (60,160,703)
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	$ (130,980,498)	$ (18,394,932)	$ (80,511,894)	$ (10,755,490)	$ (240,642,814)

**Totals may not add due to rounding.*

Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods
Fiscal Year Ended June 30
General

A. Outflows and Inflows of Resources Due to Liabilities and Assets to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Due to Liabilities	$ 63,835,479	$ 35,563,723	$ 28,271,756
2. Due to Assets	25,427,451	44,508,952	(19,081,501)
3. Total	$ 89,262,930	$ 80,072,675	$ 9,190,255

B. Outflows and Inflows of Resources by Source to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Differences between expected and actual experience	$ -	$ 35,563,723	$ (35,563,723)
2. Assumption Changes	63,835,479	-	63,835,479
3. Net Difference between projected and actual earnings on pension plan investments	25,427,451	44,508,952	(19,081,501)
4. Total	$ 89,262,930	$ 80,072,675	$ 9,190,255

C. Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net Deferred Outflows of Resources
1. Differences between expected and actual experience	$ -	$ -	$ -
2. Assumption Changes	-	-	-
3. Net Difference between projected and actual earnings on pension plan investments	66,289,191	134,132,407	(67,843,216)
4. Total	$ 66,289,191	$ 134,132,407	$ (67,843,216)

D. Deferred Outflows and Deferred Inflows of Resources by Year to be Recognized in Future Pension Expenses

Year Ending June 30	Net Deferred Outflows of Resources General Total
2022	$ (10,469,582)
2023	(7,317,675)
2024	(17,310,833)
2025	(32,745,126)
2026	-
Thereafter	-
Total	$ (67,843,216)

Recognition of Deferred Outflows and Inflows of Resources
Fiscal Year Ended June 30, 2021
General

Year Established	Initial Amount	Initial Recognition Period	Current Year Recognition	Remaining Recognition	Remaining Recognition Period
Deferred Outflow (Inflow) due to Differences Between Expected and Actual Experience on Liabilities					
2017	$ (23,006,975)	1.0000	$ -	$ -	0.0000
2018	3,041,504	1.0000	-	-	0.0000
2019	10,605,505	1.0000	-	-	0.0000
2020	(30,326,230)	1.0000	-	-	0.0000
2021	(35,563,723)	1.0000	(35,563,723)	-	0.0000
Total			**$ (35,563,723)**	**$ -**	
Deferred Outflow (Inflow) due to Assumption Changes					
2017	$ 41,844,061	1.0000	$ -	$ -	0.0000
2018	(59,163,587)	1.0000	-	-	0.0000
2019	-	1.0000	-	-	0.0000
2020	36,247,728	1.0000	-	-	0.0000
2021	63,835,479	1.0000	63,835,479	-	0.0000
Total			**$ 63,835,479**	**$ -**	
Deferred Outflow (Inflow) due to Differences Between Projected and Actual Earnings on Plan Investments					
2017	$ (43,059,585)	5.0000	$ (8,611,917)	$ -	0.0000
2018	(15,759,553)	5.0000	(3,151,911)	(3,151,909)	1.0000
2019	49,965,808	5.0000	9,993,162	19,986,322	2.0000
2020	77,171,447	5.0000	15,434,289	46,302,869	3.0000
2021	(163,725,622)	5.0000	(32,745,124)	(130,980,498)	4.0000
Total			**$ (19,081,501)**	**$ (67,843,216)**	

Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods
Fiscal Year Ended June 30
DOT

A. Outflows and Inflows of Resources Due to Liabilities and Assets to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Due to Liabilities	$ 19,062,298	$ 10,172,786	$ 8,889,512
2. Due to Assets	4,064,434	6,589,463	(2,525,029)
3. Total	$ 23,126,732	$ 16,762,249	$ 6,364,483

B. Outflows and Inflows of Resources by Source to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Differences between expected and actual experience	$ -	$ 10,172,786	$ (10,172,786)
2. Assumption Changes	19,062,298	-	19,062,298
3. Net Difference between projected and actual earnings on pension plan investments	4,064,434	6,589,463	(2,525,029)
4. Total	$ 23,126,732	$ 16,762,249	$ 6,364,483

C. Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net Deferred Outflows of Resources
1. Differences between expected and actual experience	$ -	$ -	$ -
2. Assumption Changes	-	-	-
3. Net Difference between projected and actual earnings on pension plan investments	10,517,052	18,811,364	(8,294,312)
4. Total	$ 10,517,052	$ 18,811,364	$ (8,294,312)

D. Deferred Outflows and Deferred Inflows of Resources by Year to be Recognized in Future Pension Expenses

Year Ending June 30	Net Deferred Outflows of Resources
2022	$ (950,731)
2023	(534,297)
2024	(2,210,551)
2025	(4,598,733)
2026	-
Thereafter	-
Total	$ (8,294,312)

Recognition of Deferred Outflows and Inflows of Resources
Fiscal Year Ended June 30, 2021
DOT

Year Established	Initial Amount	Initial Recognition Period	Current Year Recognition	Remaining Recognition	Remaining Recognition Period
Deferred Outflow (Inflow) due to Differences Between Expected and Actual Experience on Liabilities					
2017	$ (5,802,247)	1.0000	$ -	$ -	0.0000
2018	32,573,900	1.0000	-	-	0.0000
2019	(1,582,543)	1.0000	-	-	0.0000
2020	(7,081,563)	1.0000	-	-	0.0000
2021	(10,172,786)	1.0000	(10,172,786)	-	0.0000
Total			**$ (10,172,786)**	**$ -**	
Deferred Outflow (Inflow) due to Assumption Changes					
2017	$ 11,022,689	1.0000	$ -	$ -	0.0000
2018	(17,236,637)	1.0000	-	-	0.0000
2019	-	1.0000	-	-	0.0000
2020	10,660,029	1.0000	-	-	0.0000
2021	19,062,298	1.0000	19,062,298	-	0.0000
Total			**$ 19,062,298**	**$ -**	
Deferred Outflow (Inflow) due to Differences Between Projected and Actual Earnings on Plan Investments					
2017	$ (7,871,494)	5.0000	$ (1,574,298)	$ -	0.0000
2018	(2,082,160)	5.0000	(416,432)	(416,432)	1.0000
2019	8,381,262	5.0000	1,676,252	3,352,506	2.0000
2020	11,940,910	5.0000	2,388,182	7,164,546	3.0000
2021	(22,993,665)	5.0000	(4,598,733)	(18,394,932)	4.0000
Total			**$ (2,525,029)**	**$ (8,294,312)**	

Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods
Fiscal Year Ended June 30
DWSD

A. Outflows and Inflows of Resources due to Liabilities and Assets to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Due to Liabilities	$ 33,101,322	$ 13,092,918	$ 20,008,404
2. Due to Assets	14,258,921	25,509,775	(11,250,854)
3. Total	$ 47,360,243	$ 38,602,693	$ 8,757,550

B. Outflows and Inflows of Resources by Source to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Differences between expected and actual experience	$ -	$ 13,092,918	$ (13,092,918)
2. Assumption Changes	33,101,322	-	33,101,322
3. Net Difference between projected and actual earnings on pension plan investments	14,258,921	25,509,775	(11,250,854)
4. Total	$ 47,360,243	$ 38,602,693	$ 8,757,550

C. Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net Deferred Outflows of Resources
1. Differences between expected and actual experience	$ -	$ -	$ -
2. Assumption Changes	-	-	-
3. Net Difference between projected and actual earnings on pension plan investments	37,407,153	81,947,581	(44,540,428)
4. Total	$ 37,407,153	$ 81,947,581	$ (44,540,428)

D. Deferred Outflows and Deferred Inflows of Resources by Year to be Recognized in Future Pension Expenses

Year Ending June 30	Net Deferred Outflows of Resources
2022	$ (7,304,739)
2023	(5,869,050)
2024	(11,238,664)
2025	(20,127,975)
2026	-
Thereafter	-
Total	$ (44,540,428)

Recognition of Deferred Outflows and Inflows of Resources
Fiscal Year Ended June 30, 2021
DWSD

Year Established	Initial Amount	Initial Recognition Period	Current Year Recognition	Remaining Recognition	Remaining Recognition Period
Deferred Outflow (Inflow) due to Differences Between Expected and Actual Experience on Liabilities					
2017	$ 3,370,105	1.0000	$ -	$ -	0.0000
2018	(456,059)	1.0000	-	-	0.0000
2019	4,924,609	1.0000	-	-	0.0000
2020	(14,601,904)	1.0000	-	-	0.0000
2021	(13,092,918)	1.0000	(13,092,918)	-	0.0000
Total			**$ (13,092,918)**	**$ -**	
Deferred Outflow (Inflow) due to Assumption Changes					
2017	$ 21,554,914	1.0000	$ -	$ -	0.0000
2018	(30,363,241)	1.0000	-	-	0.0000
2019	-	1.0000	-	-	0.0000
2020	18,638,831	1.0000	-	-	0.0000
2021	33,101,322	1.0000	33,101,322	-	0.0000
Total			**$ 33,101,322**	**$ -**	
Deferred Outflow (Inflow) due to Differences Between Projected and Actual Earnings on Plan Investments					
2017	$ (19,730,574)	5.0000	$ (3,946,114)	$ -	0.0000
2018	(7,178,439)	5.0000	(1,435,688)	(1,435,687)	1.0000
2019	26,848,067	5.0000	5,369,613	10,739,228	2.0000
2020	44,446,541	5.0000	8,889,308	26,667,925	3.0000
2021	(100,639,867)	5.0000	(20,127,973)	(80,511,894)	4.0000
Total			**$ (11,250,854)**	**$ (44,540,428)**	

Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods
Fiscal Year Ended June 30
Library

A. Outflows and Inflows of Resources Due to Liabilities and Assets to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Due to Liabilities	$ 3,877,595	$ 403,422	$ 3,474,173
2. Due to Assets	2,023,734	3,387,539	(1,363,805)
3. Total	$ 5,901,329	$ 3,790,961	$ 2,110,368

B. Outflows and Inflows of Resources by Source to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Differences between expected and actual experience	$ -	$ 403,422	$ (403,422)
2. Assumption Changes	3,877,595	-	3,877,595
3. Net Difference between projected and actual earnings on pension plan investments	2,023,734	3,387,539	(1,363,805)
4. Total	$ 5,901,329	$ 3,790,961	$ 2,110,368

C. Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net Deferred Outflows of Resources
1. Differences between expected and actual experience	$ -	$ -	$ -
2. Assumption Changes	-	-	-
3. Net Difference between projected and actual earnings on pension plan investments	5,294,614	10,910,265	(5,615,651)
4. Total	$ 5,294,614	$ 10,910,265	$ (5,615,651)

D. Deferred Outflows and Deferred Inflows of Resources by Year to be Recognized in Future Pension Expenses

Year Ending June 30	Net Deferred Outflows of Resources
2022	$ (819,914)
2023	(665,137)
2024	(1,441,729)
2025	(2,688,871)
2026	-
Thereafter	-
Total	$ (5,615,651)

Recognition of Deferred Outflows and Inflows of Resources
Fiscal Year Ended June 30, 2021
Library

Year Established	Initial Amount	Initial Recognition Period	Current Year Recognition	Remaining Recognition	Remaining Recognition Period
Deferred Outflow (Inflow) due to Differences Between Expected and Actual Experience on Liabilities					
2017	$ (2,069,263)	1.0000	$ -	$ -	0.0000
2018	(1,005,018)	1.0000	-	-	0.0000
2019	(350,671)	1.0000	-	-	0.0000
2020	(3,827,052)	1.0000	-	-	0.0000
2021	(403,422)	1.0000	(403,422)	-	0.0000
Total			**$ (403,422)**	**$ -**	
Deferred Outflow (Inflow) due to Assumption Changes					
2017	$ 2,504,293	1.0000	$ -	$ -	0.0000
2018	(3,511,050)	1.0000	-	-	0.0000
2019	-	1.0000	-	-	0.0000
2020	2,130,947	1.0000	-	-	0.0000
2021	3,877,595	1.0000	3,877,595	-	0.0000
Total			**$ 3,877,595**	**$ -**	
Deferred Outflow (Inflow) due to Differences Between Projected and Actual Earnings on Plan Investments					
2017	$ (2,719,454)	5.0000	$ (543,890)	$ -	0.0000
2018	(773,879)	5.0000	(154,776)	(154,775)	1.0000
2019	3,882,957	5.0000	776,591	1,553,184	2.0000
2020	6,235,716	5.0000	1,247,143	3,741,430	3.0000
2021	(13,444,363)	5.0000	(2,688,873)	(10,755,490)	4.0000
Total			**$ (1,363,805)**	**$ (5,615,651)**	

Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods
Fiscal Year Ended June 30
Total

A. Outflows and Inflows of Resources Due to Liabilities and Assets to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Due to Liabilities	$ 119,876,694	$ 59,232,849	$ 60,643,845
2. Due to Assets	45,774,540	79,995,729	(34,221,189)
3. Total	$ 165,651,234	$ 139,228,578	$ 26,422,656

B. Outflows and Inflows of Resources by Source to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Differences between expected and actual experience	$ -	$ 59,232,849	$ (59,232,849)
2. Assumption Changes	119,876,694	-	119,876,694
3. Net Difference between projected and actual earnings on pension plan investments	45,774,540	79,995,729	(34,221,189)
4. Total	$ 165,651,234	$ 139,228,578	$ 26,422,656

C. Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net Deferred Outflows of Resources
1. Differences between expected and actual experience	$ -	$ -	$ -
2. Assumption Changes	-	-	-
3. Net Difference between projected and actual earnings on pension plan investments	119,508,010	245,801,617	(126,293,607)
4. Total	$ 119,508,010	$ 245,801,617	$ (126,293,607)

D. Deferred Outflows and Deferred Inflows of Resources by Year to be Recognized in Future Pension Expenses

Year Ending June 30	Net Deferred Outflows of Resources
2022	$ (19,544,966)
2023	(14,386,159)
2024	(32,201,777)
2025	(60,160,705)
2026	-
Thereafter	-
Total	$ (126,293,607)

Schedule of Proportionate Employer Share for Year Ended June 30, 2021 General Subgroup*

TPL	Employer	Prop. Share	Net Pension Liability	Deferred Outflows of Resources: Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments	Changes of Assum.	Changes in Proportion and Differences Between Employer Cont. and Share of Cont.	Total Deferred Outflows of Resources
$ 1,437,453,800	General City	98.33%	$ 496,509,550	$ -	$ 65,182,162	$ -	$ -	$ 65,182,162
21,489,445	Parking	1.47%	7,422,649	-	974,451	-	-	974,451
2,923,734	Airport	0.20%	1,009,884	-	132,578	-	-	132,578
$ 1,461,866,979	***Total for All Employers***	**100.00%**	**$ 504,942,083**	**$ -**	**$ 66,289,191**	**$ -**	**$ -**	**$ 66,289,191**

Employer	Deferred Inflows of Resources: Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments	Changes of Assum.	Changes in Proportion and Differences Between Employer Cont. and Share of Cont.	Total Deferred Inflows of Resources	Pension Expense: Prop. Share of Plan Pension Expense	Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributins and Proportionate	Total Employer Pension Expense
General City	$ -	$ 131,892,396	$ -	$ -	$ 131,892,396	$ 48,992,344	$ 481,157	$ 49,473,501
Parking	-	1,971,746	-	-	1,971,746	732,419	(183,219)	549,200
Airport	-	268,265	-	-	268,265	99,649	(297,938)	(198,289)
Total for All Employers	**$ -**	**$ 134,132,407**	**$ -**	**$ -**	**$ 134,132,407**	**$ 49,824,412**	**$ -**	**$ 49,824,412**

** Totals may not add due to rounding.*

Schedule of Proportionate Employer Share
for Year Ended June 30, 2021
General Subgroup*

Employer	Employer Allocation Percentage	2022	2023	2024	2025	2026	Thereafter	Total
		Schedule of Deferred Inflows and Outflows						
General City	98.33%	$ (10,294,740)	$ (7,195,470)	$ (17,021,742)	$ (32,198,282)	$ -	$ -	$ (66,710,234)
Parking	1.47%	(153,903)	(107,570)	(254,469)	(481,353)	-	-	(997,295)
Airport	0.20%	(20,939)	(14,635)	(34,622)	(65,490)	-	-	(135,686)
TOTAL	100.00%	$ (10,469,582)	$ (7,317,675)	$ (17,310,833)	$ (32,745,125)	$ -	$ -	$ (67,843,215)

** Totals may not add due to rounding.*

Determination of Employer Contribution Allocation
for Year Ended June 30, 2021

Employer	General City	Parking	Airport	General Total	DOT	DWSD	Library	Total
Contributions Before General Breakdown				$ 2,765,012	$ 109,988	$ 42,900,000	$ 2,500,000	$ 48,275,000
General Employer Allocation Percent	100.00%	0.00%	0.00%	100.00%	N/A	N/A	N/A	N/A
Times General Total	2,765,012	2,765,012	2,765,012	2,765,012	N/A	N/A	N/A	N/A
Contribution Allocation Dollar	$ 2,765,012	$ -	$ -	$ 2,765,012	$ 109,988	$ 42,900,000	$ 2,500,000	$ 48,275,000

We understand that the General contributions should be split between the General component units (General City, Parking, and Airport) according to the above schedule. Please let us know if a different allocation should be used.

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Schedule of Changes in Net Pension Liability and Related Ratios Current Period
Fiscal Year Ended June 30, 2021*

A. Total Pension Liability	General	DOT	DWSD	Library	Total
1. Service Cost	$ -	$ -	$ -	$ -	$ -
2. Interest on the Total Pension Liability	98,821,058	28,380,977	48,808,307	6,129,763	182,140,105
3. Changes of benefit terms	-	-	-	-	-
4. Difference between expected and actual experience of the Total Pension Liability	(35,563,723)	(10,172,786)	(13,092,918)	(403,422)	(59,232,849)
5. Changes of assumptions	63,835,479	19,062,298	33,101,322	3,877,595	119,876,694
6. Benefit payments, including refunds of employee contributions	(129,915,040)	(36,393,303)	(63,209,867)	(7,605,567)	(237,123,777)
7. Net change in Total Pension Liability	$ (2,822,226)	$ 877,186	$ 5,606,844	$ 1,998,369	$ 5,660,173
8. Total Pension Liability – Beginning	1,464,689,205	420,193,498	722,940,733	90,626,624	2,698,450,060
9. Total Pension Liability – Ending	**$ 1,461,866,979**	**$ 421,070,684**	**$ 728,547,577**	**$ 92,624,993**	**$ 2,704,110,233**
B. Plan Fiduciary Net Position					
1. Contributions – employer	$ 2,765,012	$ 109,988	$ 42,900,000	$ 2,500,000	$ 48,275,000
2. Contributions – employee	-	-	-	-	-
3. Net investment income	220,167,491	31,642,313	136,536,628	18,631,485	406,977,917
4. Benefit payments, including refunds of employee contributions	(129,915,040)	(36,393,303)	(63,209,867)	(7,605,567)	(237,123,777)
5. Pension Plan Administrative Expense	(1,717,931)	(174,636)	-	(94,626)	(1,987,193)
6. Other	3,462,963	929,607	1,874,921	137,871	6,405,362
7. Net change in Plan Fiduciary Net Position	$ 94,762,495	$ (3,886,031)	$ 118,101,682	$ 13,569,163	$ 222,547,309
8. Plan Fiduciary Net Position – Beginning	862,162,401	140,266,264	517,670,180	76,003,144	1,596,101,989
9. Plan Fiduciary Net Position – Ending	**$ 956,924,896**	**$ 136,380,233**	**$ 635,771,862**	**$ 89,572,307**	**$ 1,818,649,298**
C. Net Pension Liability	**$ 504,942,083**	**$ 284,690,451**	**$ 92,775,715**	**$ 3,052,686**	**$ 885,460,935**
D. Plan Fiduciary Net Position as a percentage of the Total Pension Liability	**65.46%**	**32.39%**	**87.27%**	**96.70%**	**67.25%**
E. Covered-employee payroll	**$ 72,060,511**	**$ 15,783,013**	**$ 14,485,553**	**$ 8,795,227**	**$ 111,124,304**
F. Net Pension Liability as a percentage of covered-employee payroll	**700.72%**	**1803.78%**	**640.47%**	**34.71%**	**796.82%**

**Totals may not add due to rounding.*

A Special Funding Situation may occur if a non-city entity has a legal obligation to contribute directly to the Retirement System. The Net Pension Liability shown here has not been adjusted for any potential special funding situation.

Schedules of Required Supplementary Information
Schedule of Changes in Net Pension Liability and Related Ratios Multiyear

Ultimately 10 Fiscal Years will be Displayed

Fiscal year ending June 30,	2021	2020	2019	2018	2017	2016	2015	2014
Total Pension Liability								
Service Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 32,736,019
Interest on the Total Pension Liability	182,140,105	192,888,245	195,489,643	192,359,745	201,919,236	214,011,164	263,007,329	242,611,073
Benefit Changes	-	-	-	-	-	-	(731,824,895)	(113,311,571)
Difference between Expected and Actual Experience	(59,232,849)	(55,836,749)	13,596,900	34,154,327	(27,508,380)	(43,719,112)	24,644,530	-
Assumption Changes	119,876,694	67,677,535	-	(110,274,515)	76,925,957	90,034,927	(101,559,893)	(271,190,194)
Benefit Payments	(225,790,173)	(230,537,598)	(235,153,732)	(239,301,938)	(242,938,006)	(242,470,451)	(253,217,949)	(253,683,194)
Refunds*	(11,333,604)	(9,344,054)	(13,636,283)	(14,140,692)	(24,311,533)	(49,811,728)	(44,321,041)	(144,050,613)
Net Change in Total Pension Liability	5,660,173	(35,152,621)	(39,703,472)	(137,203,073)	(15,912,726)	(31,955,200)	(843,271,919)	(506,888,480)
Total Pension Liability - Beginning	2,698,450,060	2,733,602,681	2,773,306,153	2,910,509,226	2,926,421,952	2,958,377,152	3,801,649,071	4,308,537,551
Total Pension Liability - Ending (a)	$ 2,704,110,233	$ 2,698,450,060	$ 2,733,602,681	$ 2,773,306,153	$ 2,910,509,226	$ 2,926,421,952	$ 2,958,377,152	$ 3,801,649,071
Plan Fiduciary Net Position								
Employer Contributions	$ 48,275,000	$ 47,900,000	$ 67,900,000	$ 68,275,000	$ 91,238,402	$ 104,792,657	$ 189,282,095	$ 25,126,131
Employee Contributions	-	-	-	-	-	-	609,073	10,241,761
Pension Plan Net Investment Income	406,977,917	(14,002,111)	47,170,007	155,423,193	206,896,567	(7,865,094)	93,054,978	289,789,607
Benefit Payments	(225,790,173)	(230,537,598)	(235,153,732)	(239,301,938)	(242,938,006)	(242,470,451)	(253,217,949)	(253,683,194)
Refunds*	(11,333,604)	(9,344,054)	(13,636,283)	(14,140,692)	(24,311,533)	(49,811,728)	(44,321,041)	(144,050,613)
Pension Plan Administrative Expense	(1,987,193)	(2,351,273)	(3,023,943)	(3,313,418)	(6,021,837)	(3,742,618)	(7,556,822)	(11,237,767)
Other	6,405,362	5,530,198	(4,972,864)	6,952,522	8,324,075	1,360,330	138,219,998	-
Net Change in Plan Fiduciary Net Position	222,547,309	(202,804,838)	(141,716,815)	(26,105,333)	33,187,668	(197,736,904)	116,070,332	(83,814,075)
Plan Fiduciary Net Position - Beginning	1,596,101,989	1,798,906,827	1,940,623,642	1,966,728,975	1,933,541,307	2,131,278,211	2,015,207,879	2,099,021,954
Plan Fiduciary Net Position - Ending (b)	$ 1,818,649,298	$ 1,596,101,989	$ 1,798,906,827	$ 1,940,623,642	$ 1,966,728,975	$ 1,933,541,307	$ 2,131,278,211	$ 2,015,207,879
Net Pension Liability - Ending (a) - (b)	$ 885,460,935	$ 1,102,348,071	$ 934,695,854	$ 832,682,511	$ 943,780,251	$ 992,880,645	$ 827,098,941	$ 1,786,441,192
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	67.25 %	59.15 %	65.81 %	69.98 %	67.57 %	66.07 %	72.04 %	53.01 %
Covered-Employee Payroll	$ 111,124,304	$ 142,215,060	$ 149,373,313	$ 141,454,717	$ 143,882,722	$ 200,722,197	$ 203,507,079	$ 213,291,083
Net Pension Liability as a Percentage of Covered-Employee Payroll	796.82 %	775.13 %	625.74 %	588.66 %	655.94 %	494.65 %	406.42 %	837.56 %
Notes to Schedule:	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

** For FY 2017, includes approximately $2.9 million of adjusted loan balances that were treated as refunds of ASF contributions.*

A Special Funding Situation may occur if a non-city entity has a legal obligation to contribute directly to the Retirement System. The Net Pension Liability shown here has not been adjusted for any potential funding situation. Our understanding is that the City makes all the employer contributions into the fund, even though the City may receive monies from other entities as a result of the POA.

Schedules of Required Supplementary Information
Schedule of the Net Pension Liability Multiyear

Ultimately 10 Fiscal Years will be Displayed

FY Ending June 30,	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a % of Total Pension Liability	Covered Payroll*	Net Pension Liability as a % of Covered Payroll
2014	$ 3,801,649,071	$ 2,015,207,879	$ 1,786,441,192	53.01%	$ 213,291,083	837.56%
2015	2,958,377,152	2,131,278,211	827,098,941	72.04%	203,507,079	406.42%
2016	2,926,421,952	1,933,541,307	992,880,645	66.07%	200,722,197	494.65%
2017	2,910,509,226	1,966,728,975	943,780,251	67.57%	143,882,722	655.94%
2018	2,773,306,153	1,940,623,642	832,682,511	69.98%	141,454,717	588.66%
2019	2,733,602,681	1,798,906,827	934,695,854	65.81%	149,373,313	625.74%
2020	2,698,450,060	1,596,101,989	1,102,348,071	59.15%	142,215,060	775.13%
2021	2,704,110,233	1,818,649,298	885,460,935	67.25%	111,124,304	796.82%

** Covered payroll shown is the reported payroll on the actuarial valuation date (census date). Actual covered payroll paid during the year was unavailable.*

Schedule of Contributions Multiyear

Ultimately 10 Fiscal Years will be Displayed

FY Ending June 30,	Actuarially Determined Contribution	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll*	Actual Contribution as a % of Covered Payroll
2014	$80,627,791	$ 25,126,131	$55,501,660	$213,291,083	11.78%
2015	N/A	189,282,095	N/A	203,507,079	93.01%
2016	N/A	104,792,657	N/A	200,722,197	52.21%
2017	N/A	91,238,402	N/A	143,882,722	63.41%
2018	N/A	68,275,000	N/A	141,454,717	48.27%
2019	N/A	68,275,000	N/A	149,373,313	45.71%
2020	N/A	48,275,000	N/A	142,215,060	33.95%
2021	N/A	48,275,000	N/A	111,124,304	43.44%

** Covered payroll shown is the reported payroll from the actuarial valuation date (census date). Actual covered payroll paid during the year was unavailable.*

Notes to Schedule of Contributions

Contribution Requirement: Required contributions to the Plan through FY 2023 are provided in the POA. Certain agreements (as allowed for in the POA) have resulted in some of the contributions being accelerated. The schedule below details our understanding of the remaining contributions required by the POA.

Contribution Source

	For DWSD		For Other Liabilities					
Fiscal Year	DWSD	Transfers	UTGO	State	DIA	Other	Transfers from DWSD	Total
2022	45.4	(2.5)	-	-	0.4	2.5	2.5	48.3
2023	45.4	(2.5)	-	-	0.4	2.5	2.5	48.3

We have assumed the contributions outlined above as called for in the POA (with adjustments) will not change. An estimate of the probability of those payments being made was outside the scope of this project, not required by Actuarial Standards, and was not made.

Beginning with Fiscal Year 2024, employer contributions will be actuarially determined.

Schedule of Investment Returns

This information should be provided by the plan's investment consultant.

SECTION D

NOTES TO FINANCIAL STATEMENTS

Single Discount Rate

A Single Discount Rate of 6.50%, net of investment expenses, was used to measure the total pension liability as of June 30, 2021. This Single Discount Rate was based on the expected rate of return on pension plan investments of 6.50% as directed by the System and approved by the System's Auditor. The projection of cash flows used to determine this Single Discount Rate assumed that plan member contributions ceased as of June 30, 2014, and that employer contributions will be made at rates equal to those set by the final Plan of Adjustment through June 30, 2023 and contributions consistent with PERSIA and the intention to fully fund the System by 2053 as determined in the bankruptcy (POA). Based on these 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.

Regarding the sensitivity of the net pension liability to changes in the Single Discount Rate, the following presents the plan's net pension liability, calculated using a Single Discount Rate of 6.50%, as well as what the plan's net pension liability would be if it were calculated using a Single Discount Rate that is one percent lower or one percent higher.

Sensitivity of Net Pension Liability to the Single Discount Rate Assumption

	1% Decrease 5.50%	Current Single Discount Rate Assumption 6.50%	1% Increase 7.50%
Total Pension Liability (TPL)	$2,946,663,108	$2,704,110,233	$2,497,006,493
Net Position Restricted for Pensions	1,818,649,298	1,818,649,298	1,818,649,298
Net Pension Liability (NPL)	$1,128,013,810	$ 885,460,935	$ 678,357,195

Users of this report should be aware that, in the actuary's judgement, a discount rate of 7.50% would not be a reasonable assumption for funding purposes.

Summary of Population Statistics

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	11,220
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	2,728
Active Plan Members	2,403
Total Plan Members	16,351

Additional information regarding the plan population may be found in the June 30, 2020 actuarial valuation of the System.

Additional Note

Potential future asset transfers from this Plan to Component I for payment of Transition Costs were not included in this calculation.

SECTION E

SUMMARY OF BENEFITS

Summary of Benefit Provisions Evaluated

Component II Frozen Benefits

All Component II benefits are frozen as of June 30, 2014 based on service and average final compensation accrued as of that date and the provisions of the Detroit General Retirement System as it existed on June 30, 2014. Frozen benefits are further reduced by 4.5% and all future Cost-of-Living Adjustments ("COLAs") were eliminated. Benefits resulting from the Annuity Savings Fund and benefits paid from the Annuity Reserve Fund were subject to a separate reduction described as a "Claw-back." Details of the claw-back provision are complicated and can be found in the Eighth Amended Plan of Adjustment. The benefits evaluated in this report are the frozen reduced benefits after the claw-back. Component II benefits are payable after separation from service, upon meeting the eligibility conditions of the plan as it existed on June 30, 2014, regardless of whether the individual is eligible to receive a Component I benefit at that time.

Our understanding of the June 30, 2014 plan provisions is provided below for completeness. The material below does not have legal standing and is not intended to cover all potential situations that could occur. If there are discrepancies between the description below, and appropriate legal documents, the latter necessarily govern.

Age and Service Pension

Eligibility - Any age (minimum age 55 for non-EMS members hired after 1995) with 30 years of service (25 for EMS members), or age 60 with 10 years of service, or age 65 with 8 years of service.

Annual Amount - **EMS Members:** Sum of a) a basic pension of $12 for each of the first 10 years of service, plus b) a pension equal to 2.0% of AFC multiplied by years of service. Maximum benefit is 90% of AFC.

Other Members: Sum of a) a basic pension of $12 for each of the first 10 years of service, plus b) a pension equal to the first 10 years of service multiplied by 1.6% of AFC, plus 1.8% of AFC for each year of service greater than 10 years up to 20 years, plus 2.0% of AFC for each year of service greater than 20 years up to 25 years, plus 2.2% of AFC for each year of service greater than 25 years. Future benefit accruals for certain active members (depending on bargaining unit) were reduced to 1.5% of final average compensation per year of service.

Type of Average Final Compensation (AFC) - Highest 3 consecutive years out of the last 10. Pension benefits will not be diminished if compensation is reduced because of a fiscal emergency. Effective July 1, 1999, in computing the AFC, a member shall have the option of adding the value of 25% of unused accrued sick leave to the earnings used in computing the AFC. Longevity is added to AFC in accordance with the following schedule: $150 after 5 years, $300 after 10 years, $450 after 15 years, $600 after 20 years, and $750 after 25 years.

Early Retirement

Eligibility - Any age with 25 or more years of service (min. age 55 for members hired after 1995).

Annual Amount - Same as regular retirement but actuarially reduced.

Summary of Benefit Provisions Evaluated (Continued)

Deferred Retirement (Vested Benefit)

Eligibility - Hired prior to 7-1-80: Age 40 with 8 years of service. Hired on or after 7-1-80: Any age with 10 years of service.

Benefit Commencement - APTE hired prior to July 1, 1988: Benefit begins at the age the member would have become eligible for regular retirement if service had continued. ***SAAA, Non-Union and lawyers hired prior to June 30, 1986:*** Benefit begins at the age the member would have become eligible for regular retirement. ***Others:*** Benefits based on service rendered by June 30, 1986 begin at the age the member would have become eligible for regular retirement. Benefits based on service rendered after July 1, 1986 begin at age 62.

Annual Amount - Same as regular retirement but based on average final compensation and service at the time of termination.

Duty Disability Retirement

Eligibility - Service related disability before eligibility for service retirement prior to July 1, 2014. No service requirement.

Annual Amount - An annuity which is the actuarial equivalent of the accumulated contributions at date of disability plus a pension of two-thirds of average final compensation at time of disability. The maximum annual pension is $5,700 ($9,000 for EMS). At the earliest of when the member would have accrued 30 years of service credit (25 for EMS) or age 60, the annuity is recomputed assuming contributions would have continued at a salary level equal to final compensation. The pension is recomputed with additional service credit granted from the date of disability to age 60 (or 30 years of service credit) or June 30, 2014, whichever is earlier. Benefits payable prior to conversion/re-computation, if any, were assumed to be paid outside the trust.

Non-Duty Disability Retirement

Eligibility - Disability from any cause before age 60 with 10 or more years of service prior to July 1, 2014.

Annual Amount - Computed in the same manner as a regular retirement benefit. Maximum annual pension to age 60 is $6,000. Benefit is recomputed at age 60 with no maximum. Benefits payable prior to age 60, if any, were assumed to be paid from outside the trust.

Duty Death Before Retirement

Eligibility - Death from service related causes. No age or service requirements.

Annual Amount - One-third of final compensation as of June 30, 2014 to the surviving spouse for life or until remarriage, plus an equal share of 1/4 of final compensation to each unmarried child under age 18. If there is no eligible spouse, eligible children each receive 1/4 of final compensation; if there are more than 2 such children, each child shares an equal part of 1/2 of final compensation. Maximum total amount for spouse and children is $9,000 annually. If there is no eligible spouse or children, dependent parents each receive 1/6 of deceased's final compensation, to a total maximum of $600 annually.

Summary of Benefit Provisions Evaluated (Concluded)

Non-Duty Death Before Retirement

Eligibility - Death-in-service at any age with 15 years of service; or after age 60 with 10 years of service; or after age 65 with 8 years of service.

Annual Amount - To Surviving Spouse: Computed as a regular retirement benefit but reduced in accordance with a 100% joint and survivor election for members with 20 or more years of service. For members with 15 years of service but less than 20, benefit is reduced in accordance with a 50% joint and survivor election. To Dependent Children if no Surviving Spouse: $9,000 payable to age 19 of the youngest child or for life if child is physically or mentally impaired for members with 20 or more years of service ($6,000 if less than 20 years of service).

Post-Retirement Cost-of-Living Adjustments

Benefit is increased annually by 2.25% of the **original** pension amount at retirement. Post-retirement cost-of-living increases were eliminated on future accruals for certain active members (depending on bargaining unit).

Member Contributions

Members had the option of choosing one of four contribution amounts: (1) 0%; (2) 3.0% of compensation up to the Social Security wage base, plus 5.0% of compensation in excess of the Social Security wage base; (3) 5.0% of total compensation; or (4) 7.0% of total compensation. Member contributions can be paid as a lump sum or annuitized at retirement to provide an annuity in addition to the pension (which is not affected by the level of member contributions).

SECTION F

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

Summary of Assumptions and Methods Used for GASB Actuarial Valuations Adopted by Board of Trustees

All assumptions are estimates of future experience except as noted. The rationale for the assumptions is based on experience studies where noted.

Economic Assumptions

The investment return rate is 6.50% per year, compounded annually (net after investment expenses) as of June 30, 2021. This assumption was provided by the Retirement System.

Price inflation is not directly used in the valuation. For purposes of assessing the reasonability of the investment return assumptions, we assumed price inflation of 2.25% per year.

Non-Economic Assumptions

The mortality table used to measure retired life mortality was 100% of the RP-2014 Blue Collar Annuitant Table set-forward 1 year for males and 100% of the RP-2014 Blue Collar Annuitant Table set-forward 1 year for females. Tables were extended below age 50 with a cubic spline to the published Juvenile rates. Pre-retirement mortality is based on the corresponding Employee tables with corresponding set-forward. The tables are projected to be fully generational, based on the 2-dimensional, sex distinct mortality improvement scale MP-2014 (which was published and intended to be used with RP-2014). 75% of all deaths-in-service are assumed to be non-duty related. This table was first used as of June 30, 2014. For disabled members, the same tables are used. The rationale for the mortality assumption is based on the 2008-2013 Mortality Experience Study issued February 4, 2015.

The probabilities of retirement for members eligible to retire are shown on pages 34 and 35. These probabilities were revised for the June 30, 2008 valuation. The rationale is based on the 2002-2007 Experience Study.

The probabilities of separation from service (including *disability)* are shown for sample ages on page 36. These probabilities were revised for the June 30, 2008 valuation. The rationale is based on the 2002-2007 Experience Study.

Single Life Retirement Values
Based on RP-2014 Blue Collar
100% of Male Rates Set-Forward 1 Year
100% of Female Rates Set-Forward 1 Year

Sample Attained Ages in 2020	Future Life Expectancy (years)	
	Men	Women
45	38.83	42.17
50	33.87	37.11
55	29.10	32.20
60	24.54	27.44
65	20.23	22.86
70	16.23	18.54
75	12.59	14.57
80	9.39	11.05

Rationale for assumption is based upon a 2008 to 2013 study of mortality experience dated February 4, 2015.

Probabilities of Age/Service Retirement for Members Eligible to Retire

Retirement Ages	Percent of Eligible Active Members Retiring Within Next Year With Unreduced Benefits EMS	D.O.T.	Others
45	25%		
46	25%		
47	25%		
48	22%		
49	20%		
50	18%	55%	50%
51	15%	50%	50%
52	15%	50%	45%
53	15%	50%	45%
54	15%	55%	40%
55	15%	50%	30%
56	15%	50%	30%
57	15%	50%	30%
58	15%	50%	30%
59	15%	55%	40%
60	40%	40%	25%
61	30%	30%	25%
62	30%	30%	25%
63	30%	30%	25%
64	30%	30%	25%
65	30%	30%	35%
66	30%	30%	30%
67	30%	30%	25%
68	30%	50%	25%
69	30%	50%	25%
70	100%	100%	20%
71			20%
72			20%
73			20%
74			20%
75			20%
76			20%
77			20%
78			20%
79			20%
80			100%
Ref	537	1648	1647

Rationale for assumption is 2002 to 2007 Experience Study. Additional retirement rates for Component I (Hybrid Plan) eligibility are not reflected in this valuation due to materiality.

Probabilities of Early Retirement for Members Eligible for Early Retirement

Retirement Ages	Percent of Eligible Active Members Retiring Within Next Year With Reduced Benefits
55	7%
56	8%
57	9%
58	10%
59	12%
60	12%
61	12%
62	12%
63	12%
64	12%
Ref	1649

Rationale for assumption is based upon a 2002 to 2007 Experience Study.

Sample Rates of Separation from Active Employment Before Retirement

Sample Ages	Years of Service	% of Active Members Separating Within Next Year			
		Withdrawal			
				Others	
		EMS	D.O.T.	Men	Women
ALL	0	11.00%	18.00%	18.00%	20.00%
	1	10.00%	16.00%	15.00%	16.00%
	2	8.00%	14.00%	13.00%	14.00%
	3	8.00%	11.00%	11.00%	12.00%
	4	7.00%	9.00%	10.00%	10.00%
25	5 & Over	6.70%	8.00%	7.60%	7.60%
30		5.90%	7.60%	7.22%	7.22%
35		5.20%	5.56%	5.28%	5.28%
40		4.40%	4.26%	4.05%	4.05%
45		3.40%	3.69%	3.51%	3.51%
50		2.40%	3.50%	3.33%	3.33%
55		2.00%	3.50%	3.33%	3.33%
60		0.00%	3.50%	3.33%	3.33%
Ref		338 1068	143 212	584 212 x 0.95	188 212 x 0.95

Sample Ages	% of Active Members Becoming Disabled Within Next Year			
	D.O.T.		Others	
	Ordinary	Duty	Ordinary	Duty
25	0.02%	0.03%	0.01%	0.25%
30	0.05%	0.08%	0.04%	0.29%
35	0.14%	0.21%	0.11%	0.34%
40	0.27%	0.42%	0.21%	0.39%
45	0.51%	0.79%	0.40%	0.45%
50	0.66%	1.03%	0.51%	0.52%
55	0.76%	1.18%	0.59%	0.60%
60	0.86%	1.34%	0.67%	0.70%
Ref	23 x 0.45	23 x 0.70	23 x 0.35	423 x 0.90

Rationale for assumption is based upon a 2002 to 2007 Experience Study.

Miscellaneous and Technical Assumptions

Benefit Service	Exact Fractional service is used to determine the amount of benefit payable.
Decrement Operation	Disability and mortality decrements do not operate during the first 5 years of service. Disability and withdrawal also do not operate during retirement eligibility.
Decrement Timing	Decrements of all types are assumed to occur mid-year.
Eligibility Testing	Eligibility for benefits is determined based upon the age nearest birthday and rounded service on the date the decrement is assumed to occur.
Forfeitures	None.
Marriage Assumption	100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses for active member valuation purposes.
Normal Form of Benefit	Straight life is the normal form of benefit. The Board adopted assumptions for Actuarial Equivalence to be an 80%/20% unisex blend of RP-2014 mortality (Male/Female) with Blue Collar Adjustment, set ahead 1 year for males and females, projected 11 years with MP-2014, an interest rate of 6.75, and no COLA for optional forms of payment and early retirement reduction. Assumptions for annuitizing member contributions are the same except for using a 60%/40% unisex blend and a 5.25% assumed interest rate of interest. Prior to that, actuarial equivalent factors were based on 7.5% interest and 1984 Group Annuity Mortality table.
Service Credit Accruals	Service accruals stop as of June 30, 2014 for measurement of Component II liabilities. However, future service in Component I may be used to satisfy benefit eligibility requirement in Component II. Members who became duty disabled prior to June 30, 2014 are assumed to get projected service from date of disability to conversion date. Members who become disabled after June 30, 2014 are assumed to get their frozen accrued benefit as of June 30, 2014 at date of conversion.
Administrative Expenses	3.00% of Component I payroll. 60% was allocated to Component II and 40% to Component I.
Sick Leave	Sick leave banks as of June 30, 2014 were included in the 2014 data file provided by the System.
Member Contributions	Member contributions to this Component II plan are assumed to have ceased with the bankruptcy.
Pop-Up Benefits	For current retirees with a pop-up benefit, the value of the pop-up was estimated by valuing a non-pop-up option and increasing the associated liabilities by 2%.

Rationale for assumption is based upon a 2002 to 2007 Experience Study, modified as necessary for changes in data or administration.

SECTION G

CALCULATION OF THE SINGLE DISCOUNT RATE

Calculation of the Single Discount Rate at End of Year

GASB Statement No. 67 includes a specific requirement for the discount rate that is used for the purpose of the measurement of the Total Pension Liability. This rate considers the ability of the fund to meet benefit obligations in the future. To make this determination, employer contributions, employee contributions, benefit payments, expenses and investment returns are projected into the future. The Plan Net Position (assets) in future years can then be determined and compared to its obligation to make benefit payments in those years. As long as assets are projected to be on hand in a future year, the assumed valuation discount rate is used. In years where assets are not projected to be sufficient to meet benefit payments, the use of a municipal bond rate is required, as described in the following paragraph.

The Single Discount Rate (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the 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 of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 6.50%; the municipal bond rate is 1.92%; and the resulting Single Discount Rate is 6.50% as of June 30, 2021.

The tables in this section provide background for the development of the Single Discount Rate.

The **Projection of Contributions** table shows the development of expected contributions in future years. Normal Cost contributions for future hires are not included (nor are their liabilities). For purposes of determining the discount rate as of June 30, 2021, the employer contributions for the 10-year period ending June 30, 2023 were set by the 8th Amended Plan of Adjustment (POA), as adjusted by subsequent agreements. Subsequent employer contributions were determined by a closed 30-year level principle amortization of any unfunded actuarial accrued liability (as required by State law) using 6.50% interest, net of investment expenses, consistent with the 100% funded target by 2053 in the POA.

Rates of Return: Note that these projections are specifically used to determine the SDR and should not be interpreted as a funding recommendation. The 6.50% rate of return was before administrative expenses. Therefore, the projections assumed that any administrative expenses incurred by the plan will directly increase employer contributions beginning with FY 2024. The rate is net of investment expenses.

Administrative Expenses: For purposes of the projection using a 6.50% rate of return, administrative expenses were assumed to be related to payroll. Payroll was increased by an assumed wage inflation as of June 30, 2014 of 2.00% for 5 years, 2.50% for the next 5 years and 3.00% thereafter. Since benefits are frozen, the wage inflation assumption does not affect anything other than the administrative expenses.

The **Projection of Plan Fiduciary Net Position** table shows the development of expected asset levels in future years.

Unfunded Actuarial Accrued Liabilities. Actual employer contributions through June 30, 2023 are set by the POA. The amortization period and method after 2023 has not yet been established by the Board.

Calculation of the Single Discount Rate at End of Year

The **Present Values of Projected Benefit Payments** table shows the development of the SDR. It breaks down the benefit payments into present values for funded and unfunded portions (if any) and shows the equivalent total at the SDR. For purposes of determining the discount rate as of June 30, 2021, the benefit payments reflect the plan provisions in force as of June 30, 2021.

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Single Discount Rate Development
Projection of Contributions
End of Year

Fiscal Year Ending June 30,	Projected Contributions from Current Employees	Projected Service Cost	Administrative Expense Contributions	Projected UAL Contributions	Projected Total Contributions
2022	$ -	$ -	$ 4,176,397	$ 44,098,603	$ 48,275,000
2023	-	-	3,882,715	44,392,285	48,275,000
2024	-	-	3,659,350	86,712,707	90,372,057
2025	-	-	3,476,712	84,802,088	88,278,800
2026	-	-	3,323,625	82,891,469	86,215,094
2027	-	-	3,165,379	80,980,850	84,146,229
2028	-	-	3,000,204	79,070,231	82,070,435
2029	-	-	2,834,697	77,159,612	79,994,309
2030	-	-	2,667,903	75,248,993	77,916,896
2031	-	-	2,504,881	73,338,374	75,843,255
2032	-	-	2,353,332	71,427,755	73,781,087
2033	-	-	2,209,042	69,517,137	71,726,179
2034	-	-	2,073,504	67,606,518	69,680,022
2035	-	-	1,947,524	65,695,899	67,643,423
2036	-	-	1,828,248	63,785,280	65,613,528
2037	-	-	1,713,822	61,874,661	63,588,483
2038	-	-	1,606,611	59,964,042	61,570,653
2039	-	-	1,506,746	58,053,423	59,560,169
2040	-	-	1,411,440	56,142,804	57,554,244
2041	-	-	1,321,064	54,232,185	55,553,249
2042	-	-	1,234,735	52,321,566	53,556,301
2043	-	-	1,153,312	50,410,947	51,564,259
2044	-	-	1,074,259	48,500,328	49,574,587
2045	-	-	995,058	46,589,709	47,584,767
2046	-	-	917,092	44,679,090	45,596,182
2047	-	-	838,925	42,768,471	43,607,396
2048	-	-	758,501	40,857,852	41,616,353
2049	-	-	675,222	38,947,233	39,622,455
2050	-	-	589,105	37,036,614	37,625,719
2051	-	-	503,258	35,125,995	35,629,253
2052	-	-	422,553	33,215,376	33,637,929
2053	-	-	349,523	31,304,757	31,654,280
2054	-	-	285,410	-	285,410
2055	-	-	229,852	-	229,852
2056	-	-	182,474	-	182,474
2057	-	-	143,163	-	143,163
2058	-	-	110,639	-	110,639
2059	-	-	83,235	-	83,235
2060	-	-	60,828	-	60,828
2061	-	-	43,687	-	43,687
2062	-	-	30,912	-	30,912
2063	-	-	21,617	-	21,617
2064	-	-	14,985	-	14,985
2065	-	-	10,343	-	10,343
2066	-	-	7,125	-	7,125
2067	-	-	4,852	-	4,852
2068	-	-	3,269	-	3,269
2069	-	-	2,195	-	2,195
2070	-	-	1,458	-	1,458
2071	-	-	959	-	959

Employer contributions as shown may differ substantially from those determined by a funding valuation.

Single Discount Rate Development
Projection of Plan Fiduciary Net Position
End of Year

Fiscal Year Ending June 30,	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected ASF Refund	Projected Administrative Expenses	Projected Investment Earnings at 6.50% (5.25% for ASF)	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)	(g)=(a)+(b)-(c)-(d)-(e)+(f)
2022	$ 1,818,649,298	$ 48,275,000	$ 233,194,114	$ 13,388,175	$ 4,176,397	$ 110,506,615	$ 1,726,672,226
2023	1,726,672,226	48,275,000	231,632,170	13,388,175	3,882,715	104,690,389	1,630,734,554
2024	1,630,734,554	90,372,057	229,678,354	13,388,175	3,659,350	99,979,029	1,574,359,761
2025	1,574,359,761	88,278,800	227,304,484	13,388,175	3,476,712	96,443,502	1,514,912,693
2026	1,514,912,693	86,215,094	224,685,515	13,388,175	3,323,625	92,722,104	1,452,452,576
2027	1,452,452,576	84,146,229	221,397,592	13,388,175	3,165,379	88,832,556	1,387,480,215
2028	1,387,480,215	82,070,435	217,509,671	13,388,175	3,000,204	84,805,536	1,320,458,135
2029	1,320,458,135	79,994,309	213,077,133	13,388,175	2,834,697	80,669,684	1,251,822,123
2030	1,251,822,123	77,916,896	208,419,369	13,388,175	2,667,903	76,443,477	1,181,707,050
2031	1,181,707,050	75,843,255	203,389,387	13,388,175	2,504,881	72,140,769	1,110,408,631
2032	1,110,408,631	73,781,087	198,138,917	-	2,353,332	68,123,277	1,051,820,747
2033	1,051,820,747	71,726,179	192,584,977	-	2,209,042	64,431,609	993,184,515
2034	993,184,515	69,680,022	186,651,092	-	2,073,504	60,748,951	934,888,892
2035	934,888,892	67,643,423	180,244,810	-	1,947,524	57,103,545	877,443,525
2036	877,443,525	65,613,528	173,567,870	-	1,828,248	53,522,063	821,182,998
2037	821,182,998	63,588,483	166,644,813	-	1,713,822	50,025,468	766,438,313
2038	766,438,313	61,570,653	159,629,229	-	1,606,611	46,630,363	713,403,489
2039	713,403,489	59,560,169	152,339,671	-	1,506,746	43,355,163	662,472,404
2040	662,472,404	57,554,244	144,880,268	-	1,411,440	40,222,139	613,957,079
2041	613,957,079	55,553,249	137,333,560	-	1,321,064	37,248,932	568,104,636
2042	568,104,636	53,556,301	129,720,807	-	1,234,735	34,450,926	525,156,320
2043	525,156,320	51,564,259	122,124,781	-	1,153,312	31,841,152	485,283,637
2044	485,283,637	49,574,587	114,559,511	-	1,074,259	29,430,311	448,654,765
2045	448,654,765	47,584,767	107,016,987	-	995,058	27,229,589	415,457,076
2046	415,457,076	45,596,182	99,582,406	-	917,092	25,248,442	385,802,201
2047	385,802,201	43,607,396	92,317,166	-	838,925	23,492,161	359,745,668
2048	359,745,668	41,616,353	85,247,151	-	758,501	21,963,527	337,319,896
2049	337,319,896	39,622,455	78,417,540	-	675,222	20,663,202	318,512,791
2050	318,512,791	37,625,719	71,854,495	-	589,105	19,589,564	303,284,474
2051	303,284,474	35,629,253	65,587,238	-	503,258	18,739,085	291,562,316
2052	291,562,316	33,637,929	59,635,025	-	422,553	18,106,429	283,249,095
2053	283,249,095	31,654,280	54,015,782	-	349,523	17,684,702	278,222,773
2054	278,222,773	285,410	48,740,916	-	285,410	16,525,338	246,007,195
2055	246,007,195	229,852	43,807,028	-	229,852	14,589,152	216,789,320
2056	216,789,320	182,474	39,221,860	-	182,474	12,836,662	190,404,122
2057	190,404,122	143,163	34,983,031	-	143,163	11,257,218	166,678,308
2058	166,678,308	110,639	31,084,807	-	110,639	9,839,738	145,433,239
2059	145,433,239	83,235	27,518,405	-	83,235	8,572,892	126,487,726
2060	126,487,726	60,828	24,272,131	-	60,828	7,445,276	109,660,871
2061	109,660,871	43,687	21,331,784	-	43,687	6,445,588	94,774,674
2062	94,774,674	30,912	18,681,379	-	30,912	5,562,767	81,656,062
2063	81,656,062	21,617	16,303,628	-	21,617	4,786,118	70,138,552
2064	70,138,552	14,985	14,180,323	-	14,985	4,105,400	60,063,630
2065	60,063,630	10,343	12,292,667	-	10,343	3,510,914	51,281,876
2066	51,281,876	7,125	10,621,566	-	7,125	2,993,555	43,653,866
2067	43,653,866	4,852	9,148,084	-	4,852	2,544,869	37,050,650
2068	37,050,650	3,269	7,853,870	-	3,269	2,157,060	31,353,840
2069	31,353,840	2,195	6,721,398	-	2,195	1,822,993	26,455,435
2070	26,455,435	1,458	5,734,171	-	1,458	1,536,177	22,257,441
2071	22,257,441	959	4,876,741	-	959	1,290,735	18,671,435

Employer contributions as shown may differ substantially from those determined by a funding valuation.

Single Discount Rate Development
Projection of Plan Fiduciary Net Position
End of Year (Concluded)

Fiscal Year Ending June 30,	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected ASF Refund	Projected Administrative Expenses	Projected Investment Earnings at 6.50% (5.25% for ASF)	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)	(g)=(a)+(b)-(c)-(d)-(e)+(f)
2072	$ 18,671,435	$ 624	$ 4,134,710	$ -	$ 624	$ 1,081,381	$ 15,618,105
2073	15,618,105	399	3,494,810	-	399	903,384	13,026,679
2074	13,026,679	251	2,944,909	-	251	752,531	10,834,301
2075	10,834,301	155	2,473,956	-	155	625,092	8,985,437
2076	8,985,437	89	2,071,951	-	89	517,775	7,431,261
2077	7,431,261	47	1,729,905	-	47	427,695	6,129,051
2078	6,129,051	24	1,439,774	-	24	352,332	5,041,609
2079	5,041,609	11	1,194,454	-	11	289,496	4,136,651
2080	4,136,651	5	987,706	-	5	237,287	3,386,233
2081	3,386,233	2	814,082	-	2	194,064	2,766,214
2082	2,766,214	-	668,842	-	-	158,409	2,255,781
2083	2,255,781	-	547,869	-	-	129,100	1,837,012
2084	1,837,012	-	447,562	-	-	105,089	1,494,539
2085	1,494,539	-	364,753	-	-	85,477	1,215,263
2086	1,215,263	-	296,673	-	-	69,502	988,093
2087	988,093	-	240,911	-	-	56,520	803,701
2088	803,701	-	195,393	-	-	45,990	654,299
2089	654,299	-	158,352	-	-	37,464	533,410
2090	533,410	-	128,300	-	-	30,568	435,678
2091	435,678	-	103,986	-	-	24,993	356,684
2092	356,684	-	84,371	-	-	20,486	292,799
2093	292,799	-	68,585	-	-	16,838	241,051
2094	241,051	-	55,904	-	-	13,880	199,028
2095	199,028	-	45,730	-	-	11,474	164,772
2096	164,772	-	37,577	-	-	9,508	136,703
2097	136,703	-	31,036	-	-	7,893	113,559
2098	113,559	-	25,761	-	-	6,557	94,356
2099	94,356	-	21,479	-	-	5,446	78,322
2100	78,322	-	17,980	-	-	4,516	64,858
2101	64,858	-	15,093	-	-	3,733	53,499
2102	53,499	-	12,686	-	-	3,072	43,884
2103	43,884	-	10,660	-	-	2,511	35,736
2104	35,736	-	8,934	-	-	2,037	28,839
2105	28,839	-	7,451	-	-	1,636	23,024
2106	23,024	-	6,169	-	-	1,299	18,153
2107	18,153	-	5,059	-	-	1,018	14,113
2108	14,113	-	4,100	-	-	786	10,799
2109	10,799	-	3,277	-	-	597	8,119
2110	8,119	-	2,579	-	-	445	5,985
2111	5,985	-	1,992	-	-	325	4,319
2112	4,319	-	1,509	-	-	232	3,042
2113	3,042	-	1,119	-	-	162	2,084
2114	2,084	-	810	-	-	110	1,384
2115	1,384	-	571	-	-	72	885
2116	885	-	390	-	-	45	539
2117	539	-	259	-	-	27	307
2118	307	-	166	-	-	15	156
2119	156	-	103	-	-	7	60
2120	60	-	62	-	-	2	-
2121	-	-	-	-	-	0	0

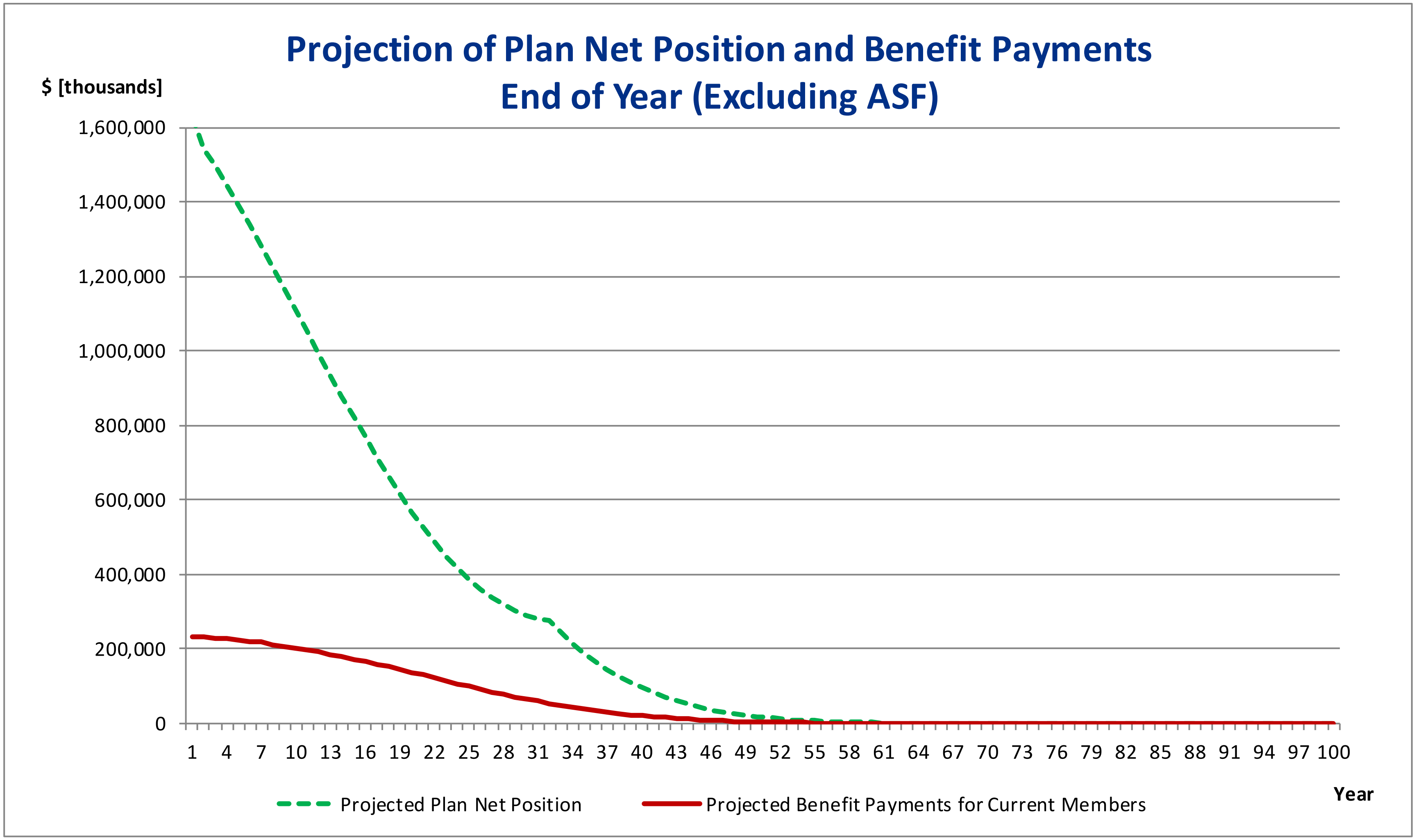
Employer contributions as shown may differ substantially from those determined by a funding valuation.

Single Discount Rate Development
Present Values of Projected Benefits
End of Year
(Excluding ASF)

Fiscal Year Ending June 30,	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=(c)/(1+sdr)^(a-.5)
2022	$ 1,713,866,263	$ 233,194,114	$ 233,194,114	$ -	$ 225,965,835	$ -	$ 225,965,835
2023	1,630,123,201	231,632,170	231,632,170	-	210,753,339	-	210,753,339
2024	1,542,851,825	229,678,354	229,678,354	-	196,221,255	-	196,221,255
2025	1,495,598,308	227,304,484	227,304,484	-	182,341,018	-	182,341,018
2026	1,445,751,383	224,685,515	224,685,515	-	169,239,541	-	169,239,541
2027	1,393,395,417	221,397,592	221,397,592	-	156,584,962	-	156,584,962
2028	1,339,057,674	217,509,671	217,509,671	-	144,446,200	-	144,446,200
2029	1,283,228,531	213,077,133	213,077,133	-	132,866,283	-	132,866,283
2030	1,226,373,084	208,419,369	208,419,369	-	122,029,944	-	122,029,944
2031	1,168,657,055	203,389,387	203,389,387	-	111,816,788	-	111,816,788
2032	1,110,408,631	198,138,917	198,138,917	-	102,281,928	-	102,281,928
2033	1,051,820,747	192,584,977	192,584,977	-	93,347,333	-	93,347,333
2034	993,184,515	186,651,092	186,651,092	-	84,949,424	-	84,949,424
2035	934,888,892	180,244,810	180,244,810	-	77,027,014	-	77,027,014
2036	877,443,525	173,567,870	173,567,870	-	69,646,616	-	69,646,616
2037	821,182,998	166,644,813	166,644,813	-	62,787,455	-	62,787,455
2038	766,438,313	159,629,229	159,629,229	-	56,473,394	-	56,473,394
2039	713,403,489	152,339,671	152,339,671	-	50,605,169	-	50,605,169
2040	662,472,404	144,880,268	144,880,268	-	45,189,912	-	45,189,912
2041	613,957,079	137,333,560	137,333,560	-	40,221,599	-	40,221,599
2042	568,104,636	129,720,807	129,720,807	-	35,673,250	-	35,673,250
2043	525,156,320	122,124,781	122,124,781	-	31,534,593	-	31,534,593
2044	485,283,637	114,559,511	114,559,511	-	27,775,698	-	27,775,698
2045	448,654,765	107,016,987	107,016,987	-	24,363,346	-	24,363,346
2046	415,457,076	99,582,406	99,582,406	-	21,287,136	-	21,287,136
2047	385,802,201	92,317,166	92,317,166	-	18,529,661	-	18,529,661
2048	359,745,668	85,247,151	85,247,151	-	16,066,278	-	16,066,278
2049	337,319,896	78,417,540	78,417,540	-	13,877,109	-	13,877,109
2050	318,512,791	71,854,495	71,854,495	-	11,939,609	-	11,939,609
2051	303,284,474	65,587,238	65,587,238	-	10,233,069	-	10,233,069
2052	291,562,316	59,635,025	59,635,025	-	8,736,518	-	8,736,518
2053	283,249,095	54,015,782	54,015,782	-	7,430,329	-	7,430,329
2054	278,222,773	48,740,916	48,740,916	-	6,295,517	-	6,295,517
2055	246,007,195	43,807,028	43,807,028	-	5,312,903	-	5,312,903
2056	216,789,320	39,221,860	39,221,860	-	4,466,494	-	4,466,494
2057	190,404,122	34,983,031	34,983,031	-	3,740,644	-	3,740,644
2058	166,678,308	31,084,807	31,084,807	-	3,120,955	-	3,120,955
2059	145,433,239	27,518,405	27,518,405	-	2,594,257	-	2,594,257
2060	126,487,726	24,272,131	24,272,131	-	2,148,563	-	2,148,563
2061	109,660,871	21,331,784	21,331,784	-	1,773,036	-	1,773,036
2062	94,774,674	18,681,379	18,681,379	-	1,457,974	-	1,457,974
2063	81,656,062	16,303,628	16,303,628	-	1,194,746	-	1,194,746
2064	70,138,552	14,180,323	14,180,323	-	975,726	-	975,726
2065	60,063,630	12,292,667	12,292,667	-	794,215	-	794,215
2066	51,281,876	10,621,566	10,621,566	-	644,364	-	644,364
2067	43,653,866	9,148,084	9,148,084	-	521,102	-	521,102
2068	37,050,650	7,853,870	7,853,870	-	420,075	-	420,075
2069	31,353,840	6,721,398	6,721,398	-	337,562	-	337,562
2070	26,455,435	5,734,171	5,734,171	-	270,405	-	270,405
2071	22,257,441	4,876,741	4,876,741	-	215,936	-	215,936

Single Discount Rate Development
Present Values of Projected Benefits
End of Year
(Excluding ASF) (Concluded)

Fiscal Year Ending June 30,	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=(c)/(1+sdr)^(a-.5)
2072	$ 18,671,435	$ 4,134,710	$ 4,134,710	$ -	$ 171,906	$ -	$ 171,906
2073	15,618,105	3,494,810	3,494,810	-	136,433	-	136,433
2074	13,026,679	2,944,909	2,944,909	-	107,949	-	107,949
2075	10,834,301	2,473,956	2,473,956	-	85,151	-	85,151
2076	8,985,437	2,071,951	2,071,951	-	66,962	-	66,962
2077	7,431,261	1,729,905	1,729,905	-	52,495	-	52,495
2078	6,129,051	1,439,774	1,439,774	-	41,024	-	41,024
2079	5,041,609	1,194,454	1,194,454	-	31,957	-	31,957
2080	4,136,651	987,706	987,706	-	24,813	-	24,813
2081	3,386,233	814,082	814,082	-	19,203	-	19,203
2082	2,766,214	668,842	668,842	-	14,814	-	14,814
2083	2,255,781	547,869	547,869	-	11,394	-	11,394
2084	1,837,012	447,562	447,562	-	8,740	-	8,740
2085	1,494,539	364,753	364,753	-	6,688	-	6,688
2086	1,215,263	296,673	296,673	-	5,108	-	5,108
2087	988,093	240,911	240,911	-	3,895	-	3,895
2088	803,701	195,393	195,393	-	2,966	-	2,966
2089	654,299	158,352	158,352	-	2,257	-	2,257
2090	533,410	128,300	128,300	-	1,717	-	1,717
2091	435,678	103,986	103,986	-	1,307	-	1,307
2092	356,684	84,371	84,371	-	996	-	996
2093	292,799	68,585	68,585	-	760	-	760
2094	241,051	55,904	55,904	-	582	-	582
2095	199,028	45,730	45,730	-	447	-	447
2096	164,772	37,577	37,577	-	345	-	345
2097	136,703	31,036	31,036	-	267	-	267
2098	113,559	25,761	25,761	-	208	-	208
2099	94,356	21,479	21,479	-	163	-	163
2100	78,322	17,980	17,980	-	128	-	128
2101	64,858	15,093	15,093	-	101	-	101
2102	53,499	12,686	12,686	-	80	-	80
2103	43,884	10,660	10,660	-	63	-	63
2104	35,736	8,934	8,934	-	50	-	50
2105	28,839	7,451	7,451	-	39	-	39
2106	23,024	6,169	6,169	-	30	-	30
2107	18,153	5,059	5,059	-	23	-	23
2108	14,113	4,100	4,100	-	18	-	18
2109	10,799	3,277	3,277	-	13	-	13
2110	8,119	2,579	2,579	-	10	-	10
2111	5,985	1,992	1,992	-	7	-	7
2112	4,319	1,509	1,509	-	5	-	5
2113	3,042	1,119	1,119	-	4	-	4
2114	2,084	810	810	-	2	-	2
2115	1,384	571	571	-	2	-	2
2116	885	390	390	-	1	-	1
2117	539	259	259	-	1	-	1
2118	307	166	166	-	0	-	0
2119	156	103	103	-	0	-	0
2120	60	62	62	-	0	-	0
2121	0	-	-	-	-	-	-
				Totals	$ 2,599,327,198	$ -	$ 2,599,327,198


Projection of Plan Net Position and Benefit Payments
End of Year (Excluding ASF)
$ [thousands]
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70 73 76 79 82 85 88 91 94 97 100
Year
Projected Plan Net Position
Projected Benefit Payments for Current Members

SECTION H

GLOSSARY OF TERMS

Glossary of Terms

Actuarial Accrued Liability (AAL)	The AAL is the difference between the actuarial present value of all benefits and the actuarial value of future normal costs. The definition comes from the fundamental equation of funding which states that the present value of all benefits is the sum of the Actuarial Accrued Liability and the present value of future normal costs. The AAL may also be referred to as "accrued liability" or "actuarial liability."
Actuarial Assumptions	These assumptions are estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and compensation increases. Actuarial assumptions are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (compensation increases, payroll growth, inflation and investment return) consist of an underlying real rate of return plus an assumption for a long-term average rate of inflation.
Accrued Service	Service credited under the system which was rendered before the date of the actuarial valuation.
Actuarial Equivalent	A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate actuarial assumptions.
Actuarial Cost Method	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of the pension trust benefits between future normal cost and actuarial accrued liability. The actuarial cost method may also be referred to as the actuarial funding method.
Actuarial Gain (Loss)	The difference in liabilities between actual experience and expected experience during the period between two actuarial valuations is the gain (loss) on the accrued liabilities.
Actuarial Present Value (APV)	The amount of funds currently required to provide a payment or series of payments in the future. The present value is determined by discounting future payments at predetermined rates of interest and probabilities of payment.
Actuarial Valuation	The actuarial valuation report determines, as of the actuarial valuation date, the service cost, total pension liability, and related actuarial present value of projected benefit payments for pensions.
Actuarial Valuation Date	The date as of which an actuarial valuation is performed.
Actuarially Determined Contribution (ADC) or Annual Required Contribution (ARC)	A calculated contribution into a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically, the Actuarially Determined Contribution has a normal cost payment and an amortization payment.

Glossary of Terms

AFC	Average Final Compensation.
Amortization Payment	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
Amortization Method	The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be "open" (meaning, reset each year) or "closed" (the number of years remaining will decline each year).
APTE	Association of Professional and Technical Employees.
ASF	Annuity Savings Fund.
Cost-of-Living Adjustments	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)	A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.
Covered-Employee Payroll	The payroll of covered employees, which is typically only the pensionable pay and does not include pay above any pay cap.
Deferred Inflows and Outflows	The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources.
DIA	Detroit Institute of Art.
Discount Rate	For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically: 1. The benefit payments to be made while the pension plans' fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period; and 2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.

Glossary of Terms

D.O.T.	Department of Transportation.
DWSD	Detroit Water and Sewerage Department.
EMS	Emergency Medical Service.
Entry Age Actuarial Cost Method (EAN)	The EAN is a funding method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit age(s). The portion of the actuarial present value allocated to a valuation year is the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is the actuarial accrued liability. The sum of the accrued liability plus the present value of all future normal costs is the present value of all benefits.
GASB	The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.
GLWA	Great Lakes Water Authority.
Fiduciary Net Position	The fiduciary net position is the value of the assets of the trust.
Long-Term Expected Rate of Return	The long-term rate of return is the expected return to be earned over the entire trust portfolio based on the asset allocation of the portfolio.
Money-Weighted Rate of Return	The money-weighted rate of return is a method of calculating the returns that adjusts for the changing amounts actually invested. For purposes of GASB Statement No. 67, money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.
Multiple-Employer Defined Benefit Pension Plan	A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.
Municipal Bond Rate	The Municipal Bond Rate is the discount rate to be used for those benefit payments that occur after the assets of the trust have been depleted.
Net Pension Liability (NPL)	The NPL is the liability of employers and non-employer contribution entities to plan members for benefits provided through a defined benefit pension plan.

Glossary of Terms

Non-Employer Contribution Entities	Non-employer contribution entities are entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of the GASB Accounting statement plan members are not considered non-employer contribution entities.
Normal Cost	The actuarial present value of the pension trust benefits allocated to the current year by the actuarial cost method. Also known as service cost.
POA	The 8th Amended Plan for the Adjustment of the Debt of the City of Detroit.
SAAA	Senior Accountants, Analysts, and Appraisers Association.
UTGO	Unlimited Tax General Obligation.

APPENDIX

MICHIGAN PUBLIC ACT 202

State Reporting Assumptions for Fiscal Year 2021 Calculations as of June 30, 2020

The Protecting Local Government Retirement and Benefits Act, Public Act 202 of 2017, was put into law effective December 20, 2017. One outcome of the law is the requirement for the local unit of government to provide select reporting disclosures to the State. Sec. 5(1) of the Act provides the State treasurer with the authority to annually establish uniform actuarial assumptions for purposes of developing the requisite disclosures. Below you will find information which may be used to assist the local unit of government with required reporting.

Uniform Assumptions, as applicable to the measurement and the required disclosures under uniform assumptions, are denoted below. Additional discussion of PA 202 and uniform assumptions may be found on the State website in the *Public Act 202: Selection of the Uniform Assumptions for Fiscal Year 2021* memo dated October 22, 2020.

	PA 202	Assumptions used for GASB	Uniform Assumptions used for Fiscal Year 2020
Investment Rate of Return Discount Rate	**Maximum of 7.00%^**	7.06%	**7.00%^**
Salary Increase	Minimum of 3.00% or based on experience study within last 5 years	**N/A**	**N/A**
Mortality	**Version of Pub-2010 with future mortality improvement projected generationally using Scale MP-2019 or based on experience study within last 5 years**	A version of RP-2014. First used for the September 30, 2014 valuation.	**Pub-2010, Amount Weighted, General tables with fully generational projection using Scale MP-2019. The corresponding Disabled Retiree and Employee tables are used for disability and pre-retirement mortality, respectively.**
Amortization of the Unfunded Accrued Actuarial Liability: Period	Maximum Period of 18 Years	N/A	**18**
Method	**Closed Plans: Level Dollar Open Plans: Level Percent of Payroll or Level Dollar**	Other	**Level Dollar**

^ *A blended rate calculated using GASB Statement No. 68 methodology. For periods in which projected plan assets are sufficient to make projected benefit payments – maximum of 7.00%; for periods in which projected plan assets are NOT sufficient to make projected benefit payments – 2.20%.*

The calculations for PA 202 use a June 30, 2020 valuation date and a June 30, 2020 measurement date. The 7.06% Investment Rate of Return was used as the Long Term Expected Rate of Return for GASB disclosures with a measurement date of June 30, 2020. With exception of the assumptions and methods listed above, all other assumptions and methods are the same as those listed in June 30, 2021 GASB report.

State Reporting for Fiscal Year 2021
Calculations as of June 30, 2020

The following information has been prepared to provide some of the information necessary to complete the pension reporting requirements for the State of Michigan's Local Government Retirement System Annual Report (Form 5572). The local unit of government is required to complete/develop all of the remaining reporting requirements necessary for Form 5572. Additional resources are available on the State website.

Line	Descriptive Information	
18	**Actuarial Assumptions**	
19	Actuarial assumed Rate of Investment Return	6.75%
20	Amortization method utilized for funding the system's unfunded actuarial accrued liability, if any	Other
21	Amortization period utilized for funding the system's unfunded actuarial accrued liability, if any	N/A
22	Is each division within the system closed to new employees? ~	yes
23	**Uniform Assumptions^**	
24	Enter retirement pension system's actuarial value of assets using uniform assumptions+	$ 1,596,101,989.00
25	Enter retirement pension system's actuarial accrued liabilities using uniform assumptions	$ 2,727,913,413.00
26	Funded ratio using uniform assumptions	58.5%
27	Actuarially Determined Contribution (ADC) using uniform assumptions	$ 112,516,318.00
28	All systems combined ADC/Governmental fund revenues	Auto*

^ *Information on lines 23-28 is based on the Uniform Assumptions used, listed on the prior page, as of the most recent valuation date, June 30, 2020.*

\+ *The actuarial value of assets is equal to the market value of assets as of the June 30, 2020.*

* *Automatically calculated by State of Michigan Form 5572.*

~ *This Component II plan is closed to new employees. The Component I plan is open to new employees and its PA 202 information is in the Component I GASB Statement No. 68 report.*

The General Retirement System of the City of Detroit

Annual Actuarial Valuation of Component II

June 30, 2021

GRS

800.521.0498 | P: 248.799.9000 | www.grsconsulting.com

March 11, 2022

Board of Trustees
The General Retirement System of the City of Detroit

Dear Board Members:

This report provides key results from the **Annual Actuarial Valuation** of the annuity and pension liabilities of the General Retirement System of the City of Detroit – Component II benefits. The date of the valuation was **June 30, 2021.**

The City of Detroit filed for bankruptcy on July 18, 2013. A final Plan of Adjustment ("POA") was confirmed on November 7, 2014 and the official exit from bankruptcy was on December 10, 2014. In connection with the POA, very significant changes were made to the benefits that the General Retirement System provides and to the contributions that it will receive. In particular, the benefits provided by the Retirement System were divided into two separate plans, referred to as "Component I" and "Component II." The benefits provided in each component are effective July 1, 2014 and are described in detail in Emergency Manager Order No. 44, dated December 8, 2014. In very general terms, Component I provides benefits for service rendered on and after July 1, 2014 and Component II provides benefits for services rendered prior to July 1, 2014.

The results provided herein relate solely to the Component II benefits. Component I benefits will be the subject of a separate report. The purposes of the valuation are:

1) To measure the funding progress of Component II in accordance with the terms of the POA;
2) To provide illustrative actuarially determined contribution amounts for FY 2023;
3) To compare the illustrative actuarially determined contributions to the POA mandated contributions; and
4) To estimate the FY 2024 actuarially determined contributions (the first year the employer will be required to make actuarially determined contributions adopted by the Board and Investment Committee) under possible funding policies amounts.

The results of the valuation are not applicable for other purposes. In particular, the information provided in this report is not suitable for financial reporting in connection with GASB Statement No. 67. Such information is provided in a separate report. Information regarding potential benefit restoration as allowed for in the POA will also be provided in a separate report, at the Board's request.

The contribution amounts on page 7 include POA mandated contributions plus two illustrative contribution amounts from potential alternate funding policies. Users of this report should be aware that contributions made at these amounts do not guarantee benefit security.

One Towne Square | Suite 800 | Southfield, Michigan 48076-3723

This report was prepared at the request of the Board and is intended for use by the Retirement System and those designated or approved by the Board. This report may be provided to parties other than the Retirement System only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as: plan experience differing from that anticipated by the economic and demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of the actuary's assignment, the actuary did not perform an analysis of the potential range of such future measurements.

This valuation was based upon records maintained and furnished by the Retirement System staff concerning active members, retirees and beneficiaries, and financial accounts as of the valuation date. Data was checked for year-to-year consistency, but was not audited by the actuary. We are not responsible for the completeness or accuracy of the data. Certain necessary data was not available in time to be considered in this report and, therefore, it was necessary for us to use approximations. Please see related discussion in the Comments section as well as the Data section of this report.

The assumptions used in the valuations concerning future experience are summarized in Section D of this report. Except for the assumed rate of investment return, the actuarial assumptions used for the valuation are set by the Board based upon advice of the actuary and other parties. **Other than the prescribed assumed rate of return, this report reflects the new actuarial assumptions as adopted by the Board and the Investment Committee based on the July 1, 2015 to June 30, 2020 experience study.** The assumed rate of investment return was set to 6.75% in the POA and is, therefore, a "prescribed assumption set by another party" as discussed in Actuarial Standard of Practice No. 4. In our judgement, all of the actuarial assumptions used for this valuation are reasonable for purposes of the measurement being made.

This report was prepared using our proprietary valuation model and related software which, in our professional judgment, has the capability to provide results that are consistent with the purposes of the valuation and has no material limitations or known weaknesses. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

This report has been prepared by actuaries who have substantial experience valuing public sector retirement systems. To the best of our knowledge, this report is complete and accurate and was made in accordance with Actuarial Standards of Practice promulgated by the Actuarial Standards Board.

The signing actuaries are independent of the plan sponsor.

David T. Kausch, Judith A. Kermans and Jamal Adora are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

This report does not evaluate the plan sponsor's ability or willingness to make contributions to the Retirement System.

Respectfully submitted,
Gabriel, Roeder, Smith & Company

David T. Kausch

David T. Kausch, FSA, EA, FCA, MAAA, PhD

Judith A. Kermans

Judith A. Kermans, EA, FCA, MAAA

Jamal Adora, ASA, EA, MAAA

DTK/JAK/JA:sc

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SECTION A

VALUATION RESULTS

Executive Summary

($ in Millions)

Valuation Date	June 30, 2021	June 30, 2020
Contributions For Fiscal Year Ending	June 30, 2023	June 30, 2022
POA Mandated Employer Contributions	$ 48.3	$ 48.3
Membership		
Number of:		
Active Members	2,185	2,403
Retirees and Beneficiaries	11,173	11,220
Inactive, Nonretired Members	2,645	2,728
Total	16,003	16,351
Valuation Payroll	$ 102.7	$ 111.1
Assets		
Market Value (1)	$ 1,818.6	$ 1,596.1
Return on Market Value (net of all expenses)	27.84 %	(0.60)%
Actuarial Information		
Actuarial Accrued Liability (2)	$ 2,542.6	$ 2,716.5
Unfunded Actuarial Accrued Liability: (2) - (1)	724.0	1,120.4
Funded Ratio: (1) / (2)	71.53 %	58.76 %
Risk Metrics		
Actuarial Accrued Liability Divided by Payroll	24.8	24.4
Market Value of Assets Divided by Payroll	17.7	14.4

Valuation Results

Required contributions to the Plan through FY 2023 are provided in the POA. The schedule below details our understanding of the remaining contributions required by the POA.

Contribution Source
($ Millions)

Fiscal Year	For DWSD Liabilities		For Other Liabilities					Total
	DWSD	Transfers	UTGO	State	DIA	Other	Transfers from DWSD	
2022	$ 45.4	$ (2.5)	$ -	$ -	$ 0.4	$ 2.5	$ 2.5	$ 48.3
2023	45.4	(2.5)	-	-	0.4	2.5	2.5	48.3

We have assumed the contributions outlined above as called for in the POA (with adjustments) will not change. An estimate of the probability of those payments being made was outside the scope of this project, not required by Actuarial Standards, and was not made.

In order to develop divisional valuation results in accordance with POA provisions, we allocated the above contributions to the various divisions as instructed by the Retirement System staff. This was done by allocating DWSD transfer amounts to the General City division and remaining DWSD contributions to the DWSD division; allocating $2.5 million per year to the Library; and allocating remaining contributions to DOT and General in proportion to their unfunded liabilities as of June 30, 2021.

The chart below shows this allocation.

	General	D.O.T.	Subtotal	Library	DWSD	Totals
	$ Thousands					
Unfunded Liabilities (6/30/2021)	$ 416,356	$ 257,229	$ 673,585	$ (5,905)	$ 56,301	$ 723,980
% of Subtotal	61.8%	38.2%	100.0%	N/A	N/A	
FY 2022 Contributions	$ 232	$ 143	$ 375	$ 2,500	$ 45,400	$ 48,275
Transfers	$ 2,500	$ -	$ 2,500	$ -	$ (2,500)	$ -
FY 2022 UAAL Contributions	**$ 2,732**	**$ 143**	**$ 2,875**	**$ 2,500**	**$ 42,900**	**$ 48,275**

A different allocation procedure would produce different results. If a different allocation procedure should be used, please let us know and we will revise this report.

Valuation Results (Continued)

Unfunded Actuarial Accrued Liability (UAAL)

	($ Millions)				
	General City	D.O.T.	DWSD	Library	System Total
UAAL as of June 30, 2021	$ 416.4	$ 257.2	$ 56.3	$ (5.9)	$ 724.0
Anticipated POA Contribution (EOY)	(2.7)	(0.1)	(42.9)	(2.5)	(48.3)
Anticipated Expenses[1]	1.9	0.3	-	0.1	2.3
Interest at 6.75%	28.2	17.4	3.8	(0.4)	48.9
Projected UAAL as of June 30, 2022	$ 443.7	$ 274.8	$ 17.2	$ (8.7)	$ 727.0
Anticipated POA Contributions for FY 2023	**2.7**	**0.1**	**42.9**	**2.5**	**48.3**
Estimated Employer Contributions for FY 2024[2, 3]					
Alternate 1: 30-Year Level Principal					
UAAL Contribution	$ 47.7	$ 29.6	$ (2.5)	$ (1.2)	$ 73.6
$0 Minimum UAAL Contribution	47.7	29.6	-	-	77.3
Administrative Expense Contribution[4]	1.3	0.3	0.6	0.1	2.3
Total Contribution	**$ 49.0**	**$ 29.9**	**$ 0.6**	**$ 0.1**	**$ 79.6**
Alternate 2: 30-Year Level Dollar[5]					
UAAL Contribution	$ 37.2	$ 23.1	$ (1.9)	$ (0.9)	$ 57.4
$0 Minimum UAAL Contribution	37.2	23.1	-	-	60.2
Administrative Expense Contribution[4]	1.3	0.3	0.6	0.1	2.3
Total Contribution	**$ 38.5**	**$ 23.4**	**$ 0.6**	**$ 0.1**	**$ 62.5**

Totals may not add due to rounding.

1 *Administrative expenses for DWSD are paid by General City through 2023.*

2 *Assuming the POA contributions through 2023 and a 30-year closed amortization thereafter. When determining the contributions through 2023, only the total contributions and the DWSD contributions are stipulated in the POA. The remaining amounts were allocated to the other groups as described on page 2. A different allocation would result in different results by group.*

3 *Total employer contributions, including amounts paid by the employer but funded from other sources as required by POA.*

4 *We recommend that the proposed administrative expense contribution for DWSD be reviewed in the context of the 2015 agreement between the City, the Retirement System, and the Great Lakes Water Authority.*

5 ***Contributions at this level may not be sufficient to prevent fund depletion prior to satisfaction of all benefit payments. This scenario is included at Retirement System's request (see page 4).***

The POA contributions are well below actuarially determined amounts and, as such, result in a defunding of the plan between now and June 30, 2023, which was contemplated by the POA. In fact, the anticipated POA contributions are not expected to result in benefit restoration even if all assumptions are met (including the POA mandated assumed rate of return of 6.75%).

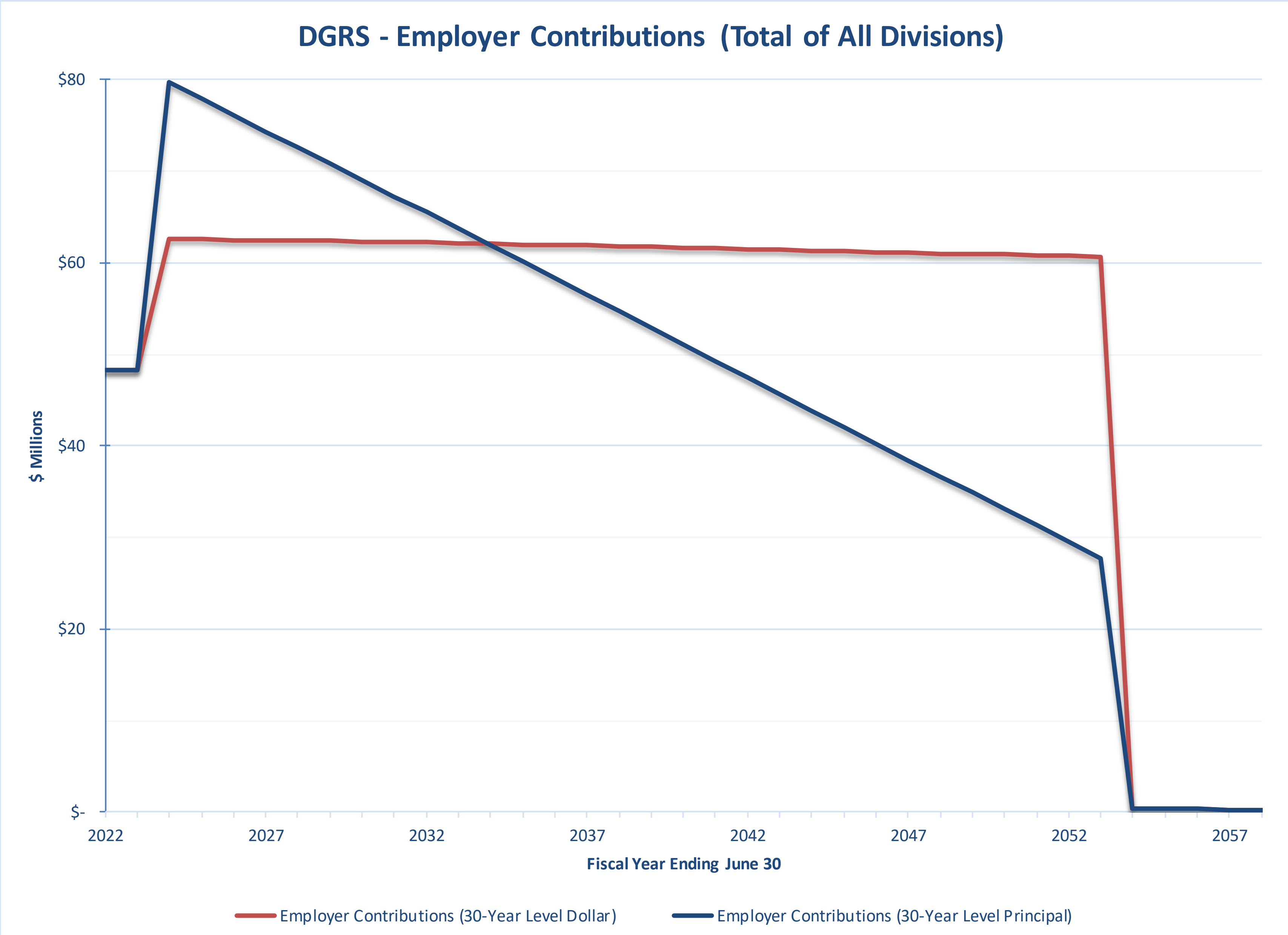
Also, the total FY 2022 to 2023 contributions are less than the amount of nominal interest that accrues on the UAAL.

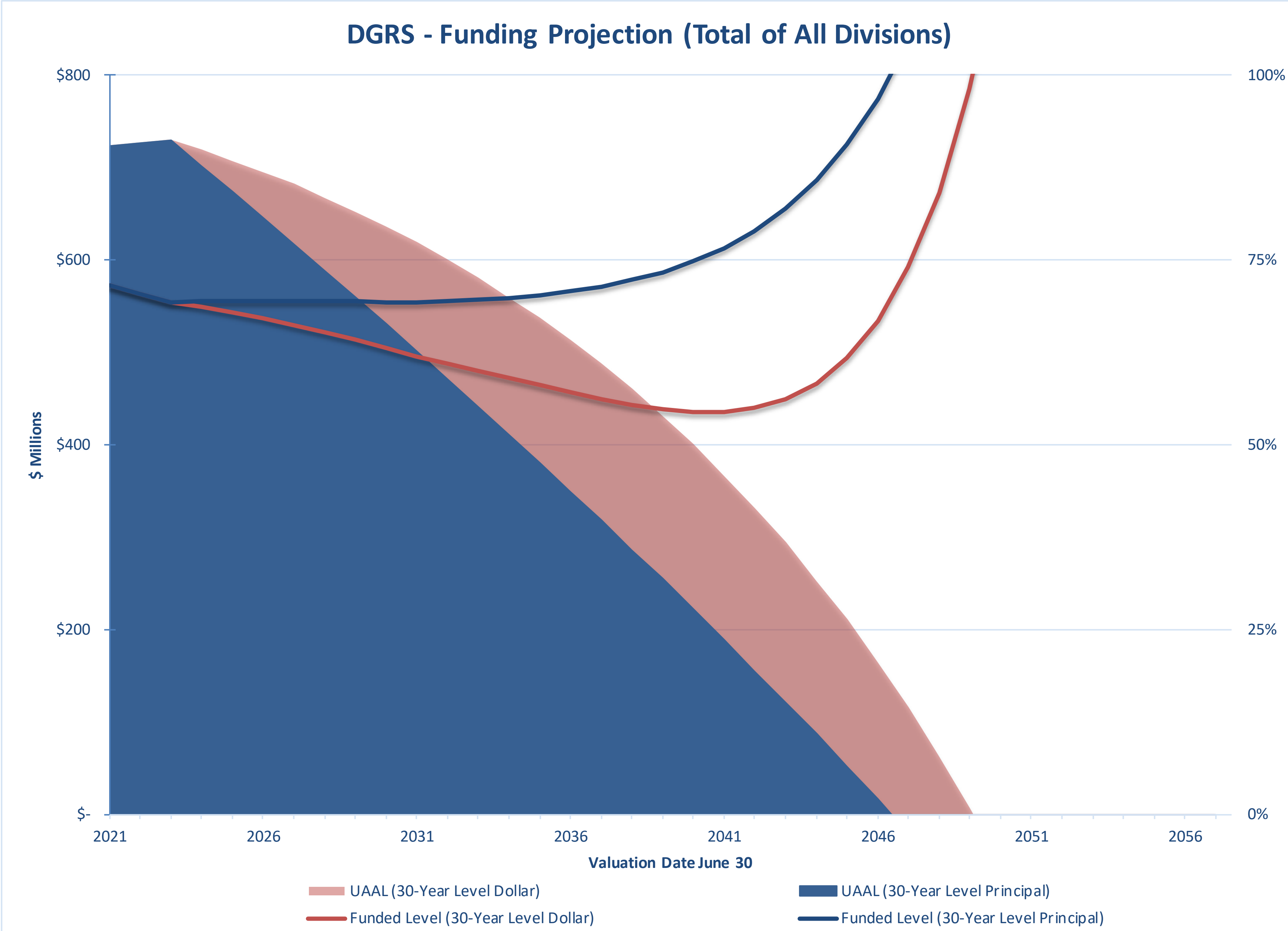
The Estimated Employer Contribution for FY 2024 is based on a projection of results assuming only the POA contributions are made and all future experience between the actuarial valuation date and FY 2024 is as assumed. Actual experience will result in changes to this estimate and the final result (from the June 30, 2022 actuarial valuation) could be materially different than shown on the previous page.

We understand that the City has set aside additional money in a side fund to be contributed to the pension plans in the future. This potential additional contribution has not been considered in this valuation.

The charts that follow show a 37-year projection of the funded status and employer contributions under a 30-year level principal and 30-year level dollar policy starting in FY 2024. For purposes of these projections, we have assumed the objective would be for each group (General City, DOT, DWSD, and Library) to separately fund their UAAL. These projections assume that if any division's assets deplete, no extra contributions will be assessed. Separately assessing extra contributions by divisions may result in a different projected total employer contribution than those shown here. We have also assumed that each group would have a $0 minimum UAL contribution. We will continue to work with the Board and Investment Committee to develop a funding policy. For the projections in this report, we note the following:

- The DWSD and Library groups are projected to be more than 100% funded on June 30, 2023. As a result, starting in FY 2024 the only contributions for those groups is for administrative expenses and the funded ratio is projected to continue growing which means that the total funded ratio is expected to exceed 100% once the other divisions achieve full funding.
- The funded ratio for DOT is projected to be 21% funded on June 30, 2023. We note the following implication of the low DOT funded status.
    - Under the 30-Year Level Principal method, the funded status for DOT is projected to fall below 15% on June 30, 2040.
    - Under the 30-Year Level Dollar method, the assets allocated for DOT are projected to be depleted by June 30, 2032. At that point, we have assumed that DOT would not be responsible for making additional contributions equal to the benefit payments.
- The projected UAL contributions for DWSD decrease to $0 beginning in FY 2024 in this valuation (there is a small contribution requirement for administrative expenses). Note that in prior post-POA valuations, the projected DWSD contribution was greater than zero. At any point in the future, plan experience may result in an unfunded actuarial accrued liability for DWSD. In addition, under a different assumption set (such as a lower assumed rate of return), the DWSD may have an unfunded actuarial accrued liability. We understand that the City, System and GLWA have a Memorandum of Understanding dated December 1, 2015 for assessing contributions, if any, to GLWA. This report does not reflect that agreement.


DGRS - Employer Contributions (Total of All Divisions)
$80
$60
$40
$20
$-
$ Millions
2022
2027
2032
2037
2042
2047
2052
2057
Fiscal Year Ending June 30
Employer Contributions (30-Year Level Dollar)
Employer Contributions (30-Year Level Principal)


DGRS - Funding Projection (Total of All Divisions)
$800
$600
$400
$200
$-
$ Millions
100%
75%
50%
25%
0%
2021
2026
2031
2036
2041
2046
2051
2056
Valuation Date June 30
UAAL (30-Year Level Dollar)
UAAL (30-Year Level Principal)
Funded Level (30-Year Level Dollar)
Funded Level (30-Year Level Principal)

Valuation Results (Continued)

We have recommended that the Board establish a funding policy for the contribution determinations on and after Fiscal Year 2024. The Board has begun the process. Once that process has been completed, we will incorporate the adopted policy into future valuation reports. Until that process is completed, we will continue to show the following two possible policies.

In the chart below, the first policy funds the UAAL over the expected remaining active service life of this group. The second policy is similar to the Board's pre-bankruptcy policy, but with accelerated principle payments of the UAAL to prevent insolvency prior to the end of the funding period. The illustrations are intended to show that there are a broad range of possible funding policies, but are not intended to provide a specific recommendation or a minimum or maximum level of contributions.

Funding Policy 1 is based on amortizing the UAAL over the average remaining service life of active members (8 years for General; 7 years for DOT; 8 years for DWSD; and 8 years for Library) using level dollar amortization.

Funding Policy 2 is based on amortizing the UAAL with level principal payments over a closed 30-year period plus interest. This method is also known as level principal declining interest amortization.

Illustrative Contribution Shortfall

	($ Millions)				
	General City	D.O.T.	DWSD	Library	System Total
(1) Illustrative Contribution for FY 2023 (Funding Policy 1)					
UAAL Contribution	**$ 73.6**	**$ 50.5**	**$ 2.9**	**$ (1.4)**	**$ 125.5**
$0 Minimum UAAL Contribution	**73.6**	**50.5**	**2.9**	**-**	**127.0**
Administrative Expense Contribution	**1.3**	**0.3**	**0.6**	**0.1**	**2.4**
Total Contribution	**74.9**	**50.9**	**3.5**	**0.1**	**129.4**
(2) Illustrative Contribution for FY 2023 (Funding Policy 2)					
UAAL Contribution	**44.7**	**27.7**	**1.7**	**(0.9)**	**73.3**
$0 Minimum UAAL Contribution	**44.7**	**27.7**	**1.7**	**-**	**74.2**
Administrative Expense Contribution	**1.3**	**0.3**	**0.6**	**0.1**	**2.4**
Total Contribution	**46.1**	**28.0**	**2.4**	**0.1**	**76.6**
(3) Actual Contributions for FY 2023 (POA)	**2.7**	**0.1**	**42.9**	**2.5**	**48.3**
Fiscal Year 2023 Shortfall - Funding Policy 1: (1) - (3)	**$ 72.2**	**$ 50.7**	**$ (39.4)**	**$ (2.4)**	**$ 81.1**
Fiscal Year 2023 Shortfall - Funding Policy 2: (2) - (3)	**$ 43.3**	**$ 27.9**	**$ (40.5)**	**$ (2.4)**	**$ 28.3**

We understand the Employer continues to set aside money in a separate side fund account to contribute to the Pension Plans in the future. Since the account is outside of the trust fund and the portion of the fund this Plan will receive (vs. the Police and Fire Plan) has not been determined, we have not taken those assets into account in our calculations. We commend the Employer for taking proactive steps to manage the estimated increase in funding requirements beginning in FY 2024 from a budgeting perspective. In the meantime, we recommend continued consideration of increasing contributions actually deposited into the trust.

Valuation Results (Concluded)

In addition, as the Board works through the funding policy, we would suggest considering a funding period less than 30 years. Given the fact that not all of the retiree liabilities are funded, a period of 15 years or less should be considered.

Present Value	June 30, 2021	June 30, 2020
Accrued Pension Liabilities (Employer Financed)		
Retirees and beneficiaries	$1,915,878,072	$2,022,510,702
Inactive members future deferred pensions	214,790,496	223,061,249
Active members	209,090,483	256,033,419
Total accrued pensions	2,339,759,051	2,501,605,370
Pension fund balances	1,741,300,968	1,500,667,694
Unfunded accrued pension liabilities	$ 598,458,083	$1,000,937,676
Accrued Annuity Liabilities (Member Financed)		
Retirees and beneficiaries		
Future annuities	$ 98,087,136	$ 100,671,026
Member annuities & future refunds	104,783,035	114,225,043
Total accrued annuity liabilities	202,870,171	214,896,069
Annuity fund balances	77,348,330	95,434,295
Unfunded accrued annuity liabilities*	$ 125,521,841	$ 119,461,774
Totals		
Actuarial Accrued Liabilities (AAL)	**$2,542,629,222**	**$2,716,501,439**
Market Value of Assets (MVA)	**1,818,649,298**	**1,596,101,989**
Unfunded Actuarial Accrued Liabilities (UAAL)	**$ 723,979,924**	**$1,120,399,450**
POA Funded Status	**71.5%**	**58.8%**

* *Liabilities are gross before accounting for ASF claw-back. Assets currently include a receivable of approximately $98.0 million related to the ASF claw-back. We believe the receivable is included in the pension fund balances.*

Historical Results ($ Millions)

	2019	2018	2017	2016	2015	2014
Total AAL	$2,866.1	$2,929.1	$2,995.8	$3,032.3	$3,139.1	$3,222.4
MVA	1,798.9	1,940.6	1,966.7	1,933.5	2,131.3	2,015.2
UAAL	1,067.2	988.4	1,029.1	1,098.8	1,007.8	1,207.1
POA Funded Status	62.8%	66.3%	65.6%	63.8%	67.9%	62.5%

Funded Ratio - POA

		Defined Benefit	ASF	Total
A	Actuarial Accrued Liability (AAL)	$2,437,846,187	$104,783,035	$2,542,629,222
B	Market Value of Assets	$1,713,866,263	$104,783,035	$1,818,649,298
C	Unfunded Actuarial Accrued Liability (A-B)	$ 723,979,924	$ 0	$ 723,979,924
D	Funded Ratio (B/A)	70.3%	100.0%	71.5%

The POA Funded Ratio measurement above is an expected return-based measurement of the pension obligation. It is based upon the mandated 6.75% interest rate assumption (assumption prescribed by the POA). It determines an amount (AAL) that will be sufficient to provide benefits if the portfolio earns the expected 6.75% return on assets and all other assumptions are met. This measure is appropriate for assessing the need for or amount of future contributions (if all assumptions are met). This measure is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligation, in other words, of transferring the obligation to a third party in a market value type transaction.

Funded Ratio - Solvency

		Defined Benefit	ASF	Total
A	Market-Based Liability (MBL)	$3,923,406,427	$104,783,035	$4,028,189,462
B	Market Value of Assets	$1,713,866,263	$104,783,035	$1,818,649,298
C	Unfunded Market-Based Liability (A-B)	$2,209,540,164	$ 0	$2,209,540,164
D	Funded Ratio (B/A)	43.7%	100.0%	45.1%

The Solvency Funded Ratio is a market-based measurement of the pension obligation. It estimates the amount (MBL) the plan would need to invest in low risk securities to provide the benefits with greater certainty. For this purpose, the MBL is computed at 1.92% interest as of June 30, 2021, based on the long-term municipal bond rate ("20-Year Municipal GO AA Index" rate from the Fidelity Index as of June 30, 2021). We are not able to assess the credit quality of the plan sponsor and, as such, no adjustment has been made for the credit quality of the plan sponsor. This measure may not be appropriate for assessing the need for or amount of future contributions. This measure may not be appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligation.

The difference between the two measures (POA and Solvency) is one illustration of the savings the sponsor anticipates by taking on the risk in a diversified portfolio.

Comments

Experience

Experience was more favorable than assumed during the year ending June 30, 2021. The chart below shows the estimated gain by division.

Development of Actuarial Gain or Loss

	($ Millions)				
	General City	D.O.T.	DWSD	Library	System Total
(1) UAAL as of June 30, 2020 (BOY)	$ 608.6	$ 282.4	$ 212.6	$ 16.7	$ 1,120.4
(2) Actual POA Contribution (EOY)	2.8	0.1	42.9	2.5	48.3
(3) Interest at 6.75%	41.1	19.1	14.4	1.1	75.6
(4) Benefit Changes	-	-	-	-	-
(5) Assumption Changes	(71.4)	(18.7)	(24.6)	(6.2)	(120.8)
(6) Projected UAAL* as of June 30, 2021	$ 575.5	$ 282.7	$ 159.5	$ 9.2	$ 1,027.0
(7) Actual UAAL* as of June 30, 2021	416.4	257.2	56.3	(5.9)	724.0
Gain or Loss: (6) - (7)	$ 159.2	$ 25.5	$ 103.2	$ 15.1	$ 303.0
Gain or Loss from Investments	$ 168.1	$ 24.2	$ 105.6	$ 13.8	$ 311.7
Gain or Loss from Excess Interest Transfers (Inc. FY 2021)	$ (11.1)	$ (4.4)	$ (3.4)	$ (1.5)	$ (20.4)
Gain or Loss from Liabilities	$ 2.2	$ 5.8	$ 1.0	$ 2.9	$ 11.8

* *Unfunded actuarial accrued liability.*

Source of Actuarial Gain or Loss

	Gain (Loss) in Period	
Type of Risk Area	Totals ($ in Millions)	Percent of Liabilities
Data Improvements	$ 5.6	0.2 %
ASF Transfers	0.0	0.0 %
Excess Interest Transfers (Inc. FY 2021)	(20.4)	(0.8)%
Risks Related to Experience		
Economic Risk Areas:		
Investment Return	311.7	11.5 %
Demographic Risk Areas:		
Full and Reduced Service Retirements	7.6	0.3 %
Death Benefits	0.1	0.0 %
Disability Benefits	(0.1)	0.0 %
Other Terminations	2.0	0.1 %
Post-Retirement Mortality	(3.5)	(0.1)%
Total Gain or Loss Related to Experience	317.8	11.7 %
Total Gain or Loss During Period	303.0	11.2 %
Beginning of Year Accrued Liabilities	2,716.5	100.0 %

Comments (Continued)

Experience (Continued)

The estimated FY 2024 contributions are very sensitive to changes in year-to-year experience. The chart below reconciles our estimate from the June 30, 2020 valuation to our estimate from this valuation (June 30, 2021).

The June 30, 2021 gain, primarily due to investments, improved the funded status of the plan.

Reconciliation of Projected June 30, 2024 UAAL Contributions – Level Principal

	($ Millions)				
	General City	D.O.T.	DWSD	Library	System Total*
Estimated FY 2024 UAAL Contribution from 2020 Valuation	$ 73.8	$ 34.6	$ 12.2	$ 1.2	$ 121.8
Gain or Loss from Investments	(19.3)	(2.8)	(12.1)	(1.6)	(35.8)
Gain or Loss from Excess Interest Transfers (Inc. FY 2021)	1.3	0.5	0.4	0.2	2.3
Gain or Loss from Liabilities	(0.2)	(0.7)	(0.1)	(0.3)	(1.4)
Modified Contributions (see below)	-	-	-	-	-
Actual FY 2021 Contribution above/(below) Expected	-	-	-	-	-
Benefit Changes	-	-	-	-	-
Assumption Changes	(7.8)	(2.1)	(2.8)	(0.7)	(13.4)
Adjustment for $0 minimum	-	-	2.5	1.2	3.7
Estimated FY 2024 UAAL Contribution from 2021 Valuation	$ 47.7	$ 29.6	$ -	$ -	$ 77.3

* *Totals may not add due to rounding.*

Reconciliation of Projected June 30, 2024 UAAL Contributions – Level Dollar

	($ Millions)				
	General City	D.O.T.	DWSD	Library	System Total*
Estimated FY 2024 UAAL Contribution from 2020 Valuation	$ 57.5	$ 27.0	$ 9.5	$ 1.0	$ 94.9
Gain or Loss from Investments	(15.1)	(2.2)	(9.5)	(1.2)	(27.9)
Gain or Loss from Excess Interest Transfers (Inc. FY 2021)	1.0	0.4	0.3	0.1	1.8
Gain or Loss from Liabilities	(0.2)	(0.5)	(0.1)	(0.3)	(1.1)
Modified Contributions (see below)	-	-	-	-	-
Actual FY 2021 Contribution above/(below) Expected	-	-	-	-	-
Benefit Changes	-	-	-	-	-
Assumption Changes	(6.1)	(1.6)	(2.2)	(0.5)	(10.4)
Adjustment for $0 minimum	-	-	1.9	0.9	2.9
Estimated FY 2024 UAAL Contribution from 2021 Valuation	$ 37.2	$ 23.1	$ -	$ -	$ 60.2

* *Totals may not add due to rounding.*

Comments (Continued)

Experience (Continued)

Demographic Experience

	Number Count		
	Actual	Expected	
	A	E	A/E%
Retirement (including early)	126	261	48%
Disability	0	15	0%
Vested Terminations	112	40	277%
Other Terminations (including pre-retirement death)	58	24	237%
Post-Retirement Death	397	414	96%

Expected counts are based on the assumptions used in the prior valuation.

Member Experience Additional Comments

Retirements were less than one-half the number expected.

Vested Terminations were nearly three times the number expected.

Other Termination were over double expected.

Active member experience this year was very different from expectations. We believe this is partly due to the pandemic and resulting economic uncertainties as well as the City's response, which was to implement furloughs and a workshare program. Based on some number counts that the System's Staff provided, we suspect that a lot of the terminations are actually temporary. The System provided information on members participating in the work share program and we have confirmed that the vast majority of those members are included as active members on June 30, 2020. If the furloughed members return to full time active status in the future, this could result in a liability loss in that future year. We have considered setting up a liability reserve for this potential future loss and decided not to include such a reserve for the following reasons:

1) It is unknown how many of the furloughed members will return to active service; and
2) The liability loss in this plan related to those members returning to active status would likely be small, since it would only affect future eligibility service and not the frozen accrued benefit.

New Members

We continue to see active members added to the Legacy data. We have assumed these were either data corrections or re-hires. We have observed this every year since 2014. The change this year is included in the "Data Improvements" source of gains/losses on page 10. This year 78 members were added as active to this plan. This resulted in an increase in accrued liabilities of approximately $1.6 million, after accounting for those members that were known to come from the deferred and retiree rolls.

Actuarial Assumptions

As a result of the recent experience study there were many assumption changes related to administrative expenses, mortality rates, withdrawal rates, disability rates, normal and early retirement rates, and merit and longevity pay increases. A full description of current assumptions can be in Section D of this report, and justification for these assumptions can be found in our Experience Study dated February 4, 2022. These changes decreased the AAL by approximately $121 million.

In the Experience Study, we noted the continuing decrease in capital market expectations which suggests that the assumed rate of return may need to be lowered in the near future. We understand that the Board may continue to explore changes in the assumed rate of return. However, per legal counsel, we also understand that for the annual actuarial valuation the 6.75% assumed rate of return cannot be changed until the June 30, 2024 report, including for purposes of calculating the actuarially determined contribution.

We anticipate the next comprehensive review of experience to cover the period from July 1, 2020 to June 30, 2025.

Annuity Savings Fund (ASF) Claw-Back Data

For the June 30, 2015 valuation, the System's auditors determined a receivable in accordance with GAAP accounting that was included in the reported June 30, 2015 assets. The reported assets for the June 30, 2021 status valuation also included a receivable for the remaining claw-back payments. We have assumed this information, received by the System's auditors, was reasonable. This assumption is in compliance with the Actuarial Standards of Practice.

Annuity Reserve Fund (ARF)

Typically, we would compare the Annuity Reserve Fund (ARF) to the ARF liabilities and recommend a transfer if liabilities exceed assets. However, the annuity claw-back receivable created by the Bankruptcy (which relates to the ARF and the ASF) makes this analysis much more complicated. If the System would like us to perform this calculation, we will need additional information not routinely provided for the valuation. Please let us know if this is needed.

In general, assets were reviewed for reasonableness. During that review, we discovered that the ARF does not appear to have been credited any interest. As a result, we recommend that all the reserve amounts be reviewed.

Plan Provisions

Section B-1 (b) of the plan provides that members who terminate employment and are subsequently rehired before incurring a six-year break in service are eligible to earn additional vesting and eligibility service under the plan. For purposes of this valuation, we have assumed no terminated members will be rehired in the future. Rehires will, therefore, cause a loss when they occur.

Based on our discussions with System staff, we understand that current EMT members may elect to enter the Police and Fire Retirement System and that future EMT will go into in the Police and Fire Retirement System. Our understanding is that it is unlikely that a current EMT member would elect to transfer to the Police and Fire Retirement System and have assumed that no current EMT members would elect to do so.

Comments (Continued)

Allocation of Contributions Between General and DOT

Our understanding of the allocation of contributions between General and DOT is discussed on page 2 of this report. Based on the reported assets, a different allocation method appears to have been used in FY 2020 and FY 2021. If the System supplies us with this asset allocation method actually used, we can incorporate that method in future valuations.

Annuity Savings Fund (ASF) Interest Credits

The ASF fund is credited with the lesser of 5.25% interest and the total fund earnings. We understand that any earnings in excess of 5.25% (that otherwise would have been credited to the ASF fund if not for the 5.25% cap) will be transferred to Component I assets, to the extent needed, for funding of transition liability. Since ASF liabilities are equal to ASF balances, we did not model any such future excess earnings as part of this valuation. However, since the fund earned 28% during FY 2021, we expect that there will be a transfer of excess ASF interest in FY 2023 related to this year's performance. Approximately $20.4 million was added to the liabilities in this report to account for anticipated excess earnings expected to occur as a result of return on assts in the 2021 fiscal year. No additional liabilities were included in this report to account for anticipated excess earnings expected to occur as a result of return on assets. We have discussed the potential for additional liability with the Plan's accountants and have been instructed that the excess earnings should not be included as a liability in the GASB Statement Nos. 67 and 68 reports.

We understand that the System has adopted a procedure for computing the ASF interest credits lagging the actual experience of the assets. We have not reviewed or audited this procedure. If the Retirement System can provide the methodology for determining the transfer, we may be able to more accurately reflect it in advance.

As of June 30, 2021, it appears that Component I may be fully funded under a 0.0% assumed VPIF. There does not currently exist a policy that allocates that unfunded amount between Transition Costs and non-Transition Costs. Since future excess interest transfers are affected by whether or not the Transition Costs are fully funded, we recommend that the Board adopt a method of allocating any unfunded amounts (after exclusion of the RSF) between Transition Costs and other liabilities. If the Board wishes, we can work with legal counsel and suggest a few methods for consideration and discuss the advantages and disadvantages with the Board.

For purposes of this valuation we have assumed the Component I Transition Cost is fully funded as of June 30, 2021. For Component II, this assumption only affects ASF Return Excess transfers calculated starting with the June 30, 2022 valuation.

Comments (Continued)

Estimated Excess Interest Transfers

Fiscal Year Transfer is Expected (A)	ASF Balance BOY (B)	Assumed ASF Payment (C)	ASF Balance EOY (D)	FY 2 Years Prior to Transfer: Year (E)	FY 2 Years Prior to Transfer: Estimated Return (F)	Investment Return Excess Percent (G) = (F) - 5.25%	ASF Return Excess (H) = (G) x (B)	Estimated Component I Funded Transition Cost Status (I)	Resulting Percent Transfer (J)	Assets to be Transferred Out (BOY) (K) = (H) x (J)
2022	$ 104,783,035	$ 13,388,175	$ 96,549,025	2020	-0.60%	0.00%	$ -	<100%	100%	$ -
2023	96,549,025	13,388,175	87,882,729	2021	27.84%	22.59%	21,810,425	<100%	100%	21,810,425
2024	87,882,729	13,388,175	78,761,453					**>=100%**		

We understand this calculation will be performed by staff and may be different than shown above. The estimates above are used to approximate the effect on UAAL.

Section E-16(c) of the Combined General Plan is shown below:

In any Plan Year during the period beginning on or after July 1, 2014 and ending June 30, 2023 in which the annual rate of return credited to the accounts of members investing in the Annuity Savings Fund as provided in paragraph (b) is less than the actual rate of return net of expenses of the Retirement System's invested assets for the second Plan Year immediately preceding the Plan Year in which the annual rate of return is credited ("ASF Return Excess"), an amount equal to the value of the ASF Return Excess shall be transferred to the Pension Accumulation Fund maintained under Component I of the Combined Plan and shall be used to fund the Transition Cost relating to Component I. The Transition Cost is a measure of the liability that Component I of the Retirement System has at its inception; due to the fact that at its inception, members in Component I of the Retirement System receive vesting and eligibility credit under Component I for service that was earned prior to July 1, 2014 and is otherwise credited to members under Component II of the Retirement System. Transition Cost is calculated by the Plan Actuary. In the event there is an ASF return excess for a Plan Year following the Plan Year in which such transfers have fully funded the Transition Costs relating to Component I, fifty percent (50%) of such ASF Return Excess shall be transferred to the Pension Accumulation Fund maintained under Component II and the remaining fifty percent (50%) of such ASF Return Excess shall be transferred to Component I and credited to the Rate Stabilization Fund maintained under Component I. "Transition Cost" shall be determined by the Plan Actuary.

Comments (Continued)

Risks Associated with Measuring the Accrued Liability and Actuarially Determined Contribution

The determination of the accrued liability and the actuarially determined contribution requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and the actuarially determined contribution that result from the differences between actual experience and the actuarial assumptions.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions due to changing conditions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period, or additional cost or contribution requirements based on the Plan's funded status); and changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

1. **Investment Risk** – actual investment returns may differ from the expected returns;
2. **Asset/Liability Mismatch** – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
3. **Contribution Risk** – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
4. **Salary and Payroll Risk** – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
5. **Longevity Risk** – members may live longer or shorter than expected and receive pensions for a period of time other than assumed; and
6. **Other Demographic Risks** – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

The effects of certain trends in experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise, if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

The timely receipt of the actuarially determined contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made at the actuarially determined rate do not necessarily guarantee benefit security.

Comments (Continued)

Plan Maturity Measures

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Generally accepted plan maturity measures include the following:

	2021	2020
Ratio of the market value of assets to total payroll*	6.8	5.9
Ratio of actuarial accrued liability to payroll*	9.5	10.0
Ratio of actives to retirees and beneficiaries	0.2	0.2
Ratio of net cash flow to market value of assets	-10.4%	-12.1%
Duration of the actuarial accrued liability	8.2	8.6

* *Payroll for this purpose is Component I payroll of $267.0 million for 2021 and $271.4 million for 2020.*

Ratio of Market Value of Assets to Payroll

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the market value of assets is 2.0 times the payroll, a return on assets 5% different than assumed would equal 10% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in plan sponsor contributions as a percentage of payroll.

Ratio of Actuarial Accrued Liability to Payroll

The relationship between actuarial accrued liability and payroll is a useful indicator of the potential volatility of contributions for a fully funded plan. A funding policy that targets a funded ratio of 100% is expected to result in the ratio of assets to payroll and the ratio of liability to payroll converging over time.

The ratio of liability to payroll may also be used as a measure of sensitivity of the liability itself. For example, if the actuarial accrued liability is 2.5 times the payroll, a change in liability 2% other than assumed would equal 5% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in liability (and also plan sponsor contributions) as a percentage of payroll.

Comments (Continued)

Ratio of Actives to Retirees and Beneficiaries

A young plan with many active members and few retirees will have a high ratio of actives to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

Ratio of Net Cash Flow to Market Value of Assets

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means existing funds are being used to make benefits payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

Duration of Actuarial Accrued Liability

The duration of the actuarial accrued liability may be used to approximate the sensitivity to a 1% change in the assumed rate of return. For example, a duration of 10 indicates that the liability would increase approximately 10% if the assumed rate of return were lowered 1%.

Additional Risk Assessment

The Solvency Liability shown on page 9 may be considered as a risk assessment. Additional risk assessment is outside the scope of the annual actuarial valuation. Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, and stress tests. We included additional risk assessments in the funding policy discussions based on the 2017 actuarial valuation. We can update those at the Board's request.

Census Data and Approximations

Data was reported separately for Component I and Component II. Additional time was needed to reconcile these two data sets as they came from different source data. Processing time for the valuation could be shortened if data for future valuations is reconciled before being provided to GRS. We would be happy to work with the Retirement System staff to help them provide the information that is needed for the valuation. Additional information about the data approximations and assumptions may be found on page 27.

Option Factors

The Board adopted new option factors for the Plan based on the mortality study completed in 2015. We have not been provided with a specific effective date for the new factors. However, we understand the intent is to implement the new factors with the new data system. For the sake of simplicity, we have assumed the new factors apply to all retirements after the valuation date. We will continue to work with the System in the calculation of optional forms of payment. In particular, the Board may want to consider updating the assumptions used in optional forms of payment in order to recognize recent changes to the assumptions used in the annual actuarial valuations.

Comments (Continued)

Restoration

This valuation assumes no future restoration of Component II benefits (consistent with the expectation of the POA). Any future restoration will be reflected beginning in the next valuation after being granted.

DWSD (Water/Sewer) Projections

As a result of gains in this valuation year, the DWSD (Water/Sewer) division is now expected to be fully funded by 2024. As a result, no additional contributions are expected to be needed in FY 2024 to fund DWSD liabilities.

The DWSD contributions and liabilities determined in this report do not consider the separation of DWSD-R and GLWA from the DWSD. For the illustrative employer contributions in this report, we have assumed that contributions would be assessed to the City based on the total unfunded liability for DWSD and without regard to any contribution agreement with GLWA. Our understanding is that the split of DWSD liabilities between DWSD-R and GLWA will be determined by the System's staff under previously established procedures.

DWSD Members

For the June 30, 2017 valuation we received a separate file indicating the June 30, 2014 DWSD status of members. Any members that were indicated as being DWSD division members on that file were valued under the DWSD for this valuation, regardless of the division reported on the main valuation data (which we understand to be the division as of June 30, 2021 in the Component I plan).

New Data System

We understand that the Retirement System is in the process of moving to a new data system and that future valuation data will be provided from that system beginning with the 2022 or 2023 valuation. We also understand that data may have gone through additional cleaning/auditing as it has been entered into the new system. We anticipate that data will be more precise for valuation purposes once the new system is providing that data. Please note that changes in data may impact future valuation results and generate gains or losses.

Recommendation

We recommend the Board consider updating the assumptions used in optional forms of payment in order to recognize recent changes to the assumptions used in the annual actuarial valuations.

We recommend that every potential action be taken to increase contributions to the Retirement System. Benefit payments to retirees in the Plan were almost $236 million compared to the FY 2021 contribution of $48.3 million. See benefit projections on page 32.

We strongly recommend that the Board and Investment Committee adopt a funding policy in the next few months so that the funding policy can be incorporated in the June 30, 2022 valuation.

Comments (Concluded)

Divisional Results

Divisional results are shown on page 21. One result that stands out is the funded status of the DOT division at 35%. This is much lower than the other divisions. We expect that all of the assets back all of the liabilities. Therefore, if this division runs out of money before all of its benefits are paid, the plan will pay DOT benefits from other divisional assets. In that case, the total plan funded status is a better measure than individual division funded ratios. However, the manner in which divisional contributions have historically been determined treats each division as a standalone plan for the purpose of determining the actuarially determined contribution. Assuming the Board continues this method for Fiscal Year 2024 (the first year actuarially determined contributions are assessed to the employer), this low funded status for the DOT (relative to the other divisions) could result in a higher DOT employer contribution (relative to the other divisions). The Board may also want to consider a more aggressive funding policy for the DOT division if they want to avoid using other divisional assets to pay DOT benefits. Please let us know if the Board would like us to do any special projects related to this situation, such as divisional cash flow projections or divisional funding policy suggestions.

Conclusion

It is likely that the funded status will decline and the unfunded actuarial accrued liability will increase between now and June 30, 2023. On a market value basis, the funded status is projected to decline to approximately 69% as of June 30, 2023 if the market rate of return equals 6.75% and all other assumptions are met.

Liability by Division - POA

($ Thousands)

	General	D.O.T.	DWSD	Library	Totals
Accrued Pension Liabilities					
Retirees and beneficiaries	$1,031,632	$285,129	$549,107	$ 50,010	$1,915,878
Inactive members future deferred pensions	111,145	31,013	67,979	4,653	214,790
Active members	119,774	44,402	26,921	17,994	209,091
Total accrued pension liabilities	1,262,551	360,544	644,007	72,657	2,339,759
Pension fund balance#	916,566	114,498	626,926	83,312	1,741,302
Unfunded accrued pension liabilities	345,985	246,046	17,081	(10,655)	598,457
Accrued Annuity Liabilities					
Retirees and beneficiaries#	53,896	10,282	30,800	3,109	98,087
Members annuities & future refunds	56,834	22,783	17,265	7,900	104,782
Total accrued annuity liabilities	110,730	33,065	48,065	11,009	202,869
Annuity fund balances	40,359	21,883	8,846	6,260	77,348
Unfunded accrued annuity liabilities#	70,371	11,182	39,219	4,749	125,521
Totals					
Actuarial Accrued Liabilities	1,373,281	393,609	692,072	83,666	2,542,628
Accrued Assets	956,925	136,381	635,772	89,572	1,818,650
Funded Ratio	69.7%	34.6%	91.9%	107.1%	71.5%
Unfunded Actuarial Accrued Liabilities	**$ 416,356**	**$257,228**	**$56,300**	**$ (5,906)**	**$723,978**

Totals may be off slightly due to rounding.

 # The pension fund balance includes a receivable of approximately $98.0 million for future claw-back payments. Liabilities are shown gross, before the annuity savings claw-back.

SECTION B

FUND ASSETS

Statement of Plan Assets
(Reported Assets at Market Value)

Market Value - June 30, 2021	
Cash and Cash Equivalents	$ 81,684,767
Investments at Fair Value	1,631,592,944
Receivables	108,348,712
Cash and Investments held as collateral for securities lending	77,656,896
Capital Assets - Net	2,647,165
Accounts Payable	(83,281,186)
Total Current Assets	**$ 1,818,649,298**

Market Value of Assets

Reserve Accounts

Funds	Fund Balances June 30, 2021	Fund Balances June 30, 2020
Annuity Savings	$ 104,783,035	$ 114,225,043
Annuity Reserve	(27,434,705)	(18,790,748)
Pension Accumulation	(65,451,896)	(370,423,727)
Pension Reserve	1,806,752,864	1,871,091,421
Total Fund Balances	**$ 1,818,649,298**	**$1,596,101,989**

Revenues and Expenditures

	Pension Funds	Annuity Funds	Total Funds
Balance, July 1, 2020	$1,500,667,694	$95,434,295	$1,596,101,989
Prior valuation audit adjustment	0	0	0
Market Value July 1, 2020	$1,500,667,694	$95,434,295	$1,596,101,989
Revenues			
Employer Contributions	47,900,000	0	47,900,000
Employee Contributions	0	0	0
Foundation Contributions	375,000	0	375,000
ASF Recoupment Interest	6,739,857	0	6,739,857
Investment Income (Net of Investment Expenses)	403,573,894	3,404,023	406,977,917
Other Income	961,366	(124,348)	837,018
Total	$ 459,550,117	$ 3,279,675	$ 462,829,792
Expenditures			
Benefit Payments	215,758,136	10,032,037	225,790,173
Refund of Member Contributions	0	11,333,604	11,333,604
ASF Recoupment Write Off	1,171,513	0	1,171,513
Transfer to Component I (Transition Cost)	0	0	0
Administrative Expenses	1,987,193	0	1,987,193
Total	$ 218,916,842	$ 21,365,641	$ 240,282,483
Market Value June 30, 2021	$1,741,300,969	$ 77,348,329	$1,818,649,298
Market Value Rate of Return (Net of all expenses)	29.3%	3.9%	27.8%
Net Cash Flow as Percent of Assets	(11.2)%	(22.4)%	(11.8)%

Rates of return are dollar-weighted estimates assuming contributions occur at the end of the year and remaining items are mid-year cash flows. “ASF Recoupment Interest” and “Other” items are treated as investment cash flows.

Note that interest credits to the ASF (and other reserves) are determined by Plan provisions and Board policy (including any timing issues) as calculated by the Retirement System’s staff.

Allocation of Assets Used for Valuation by Reserve Account and Division

	June 30, 2020	Adjustments	Contributions	Benefit Payments	Other	Investment Return (Net of All Expenses)	June 30, 2021
Annuity Savings Fund							
General	$ 60,036,933	$ 0	$ 0	$ (4,066,345)	$ (853,307)	$ 1,716,897	$ 56,834,178
D.O.T.	27,232,918	0	0	(4,875,528)	(432,865)	858,849	22,783,374
DWSD	18,397,307	0	0	(1,480,677)	(216,400)	564,813	17,265,043
Library	8,557,885	0	0	(911,054)	(9,856)	263,465	7,900,440
Totals	114,225,043	0	0	(11,333,604)	(1,512,428)	3,404,024	104,783,035
Annuity Reserve Fund							
General	(11,671,540)	0	0	(5,591,350)	788,048	0	(16,474,842)
D.O.T.	(399,737)	0	0	(906,471)	405,450	0	(900,758)
DWSD	(5,504,800)	0	0	(3,107,999)	193,814	0	(8,418,985)
Library	(1,214,671)	0	0	(426,217)	768	0	(1,640,120)
Totals	(18,790,748)	0	0	(10,032,037)	1,388,080	0	(27,434,705)
Pension Accumulation Fund							
General	(199,690,877)	(84,956,115)	2,765,012	0	3,528,222	216,732,663	(61,621,095)
D.O.T.	(155,570,180)	(23,189,737)	109,988	0	957,022	30,608,828	(147,084,079)
DWSD	(34,893,810)	(37,598,517)	42,900,000	0	1,897,507	135,971,815	108,276,995
Library	19,731,140	(5,675,210)	2,500,000	0	146,959	18,273,394	34,976,283
Totals	(370,423,727)	(151,419,579)	48,275,000	0	6,529,710	401,586,700	(65,451,896)
Pension Reserve Fund							
General	1,013,487,885	84,956,115	0	(120,257,345)	0	0	978,186,655
D.O.T.	269,003,263	23,189,737	0	(30,611,304)	0	0	261,581,696
DWSD	539,671,483	37,598,517	0	(58,621,191)	0	0	518,648,809
Library	48,928,790	5,675,210	0	(6,268,296)	0	0	48,335,704
Totals	1,871,091,421	151,419,579	0	(215,758,136)	0	0	1,806,752,864
Retirement System Totals	$1,596,101,989	$ 0	$48,275,000	$ (237,123,777)	$ 6,405,362	$ 404,990,724	$1,818,649,298

SECTION C

PARTICIPANT DATA

Reconciliation of Raw Data

Active Members

A) Count reported in Legacy file	2,518
B) In Legacy file but not in Hybrid file	(41)
C) Hired after plan closed	(101)
D) Non-active Status	(166)
E) Agency "88"	(17)
F) Non-eligible class code & bargaining unit	(2)
G) No hire date in Hybrid file	-
H) Zero salary in Hybrid file	(6)
I) Number of records to value	2,185

Inactive Vested Members

A) Number of records reported on data file	2,669
B) In Legacy active file but not otherwise in database and not in Hybrid active file	1
C) Valued as inactive in prior year and would not have otherwise been valued in Legacy this year	49
D) Valued as a vested active member in prior year but not in this year's active file and would not have otherwise been valued in Legacy this year	100
E) Deceased	-
F) Less than 8 years of vesting service	(174)
G) Number of records to value	2,645

Retired Members and Beneficiaries

A) Number of records reported on data file	45,058
B) Number of records in P/F plan	(16,857)
C) Records not currently in receipt of benefits based on reported status codes	(16,549)
D) Component I (Hybrid) Records	(479)
E) Number of records valued	11,173

Notes:

Active Row B: There were 41 records that appeared in the Legacy active file but did not appear in the Hybrid active file. It was assumed that these members were no longer active in the General plan.

Active Row D: The Active data file contains a field titled “Stat.” Active members were only valued if the record for this field had a value of “1.” In 2021, members were also valued if this field had a status of “71” (LOA).

Active Row E: Agency “88” is the 36th District Court. We understand that members in that agency are not eligible to receive benefits.

Active Row F: We have received a separate list of Class Codes and Bargaining Units that are not eligible to receive benefits.

Inactive Vested Row B: See the note for Row B of the active member reconciliation (of the 41 members removed from the active file, only 1 appeared to be vested and added to the deferred file).

Inactive Vested Row C: Only includes records that appear in the raw database last year.

Retired Row C: The Retired Life file has a field named “STATUS.” We understand that if this field is populated with a number that is one or greater, the member is no longer receiving a benefit and should not be valued.

Reconciliation of Year-to-Year Data as of June 30, 2021

	Active		Term. Vested	Retirees		Totals
	Count	Pay#	Count	Count	Monthly Benefits	Count
2020	**2,403**	**$111,124,304**	**2,728**	**11,220**	**$17,863,859**	**16,351**
Change in Pay/Pensions	N/A	1,359,046	N/A	N/A	(84,737)	
Rehired (Not Vested)	47	1,601,690				47
Rehired (Vested)	31	1,079,240	(31)	-	-	-
New Beneficiary				99	109,859	99
Retired	(126)	(5,375,835)	(113)	243	334,012	4
Non-Duty Disabled				-	-	-
Duty Disabled				-	-	-
Assumed Death/Removals			(59)	(397)	(510,683)	(456)
Vested Term	(112)	(4,478,728)	112			-
Non-Vested Terminated	(58)	(2,656,081)				(58)
Data Adjustment	-	-	8	8	13,847	16
2021	**2,185**	**$102,653,636**	**2,645**	**11,173**	**$17,726,157**	**16,003**

 # This represents current pay and is not used for the Component II (Legacy) valuation.

Notable Data Changes:

4 new Retirees came from nowhere. We believe most of these are a result of EDRO's.

59 Terminated Vested members were valued last year but will not be valued this year. We have assumed these members refunded and forfeited their defined benefit.

The data adjustments relate to records where we could not specifically identify the activity during the year. This could be the result of duplicate Social Security numbers or corrected Social Security numbers.

Data Approximations and Assumptions

As part of our review of the data received from the System, we discussed questionable or missing data with System staff and developed approximations and assumptions in order to perform the valuation. We provided System staff with a letter dated December 17, 2021 with additional information regarding data reconciliation, processing instructions, and assumptions regarding unresolved issues. Note, that letter disclosed our remaining data processing procedures and assumptions and details our reconciliation and final valuation data. System staff has approved the detail and final data disclosed in that letter.

The purpose of this section in this report is to summarize any unresolved concerns about questionable data that are relevant and could have a significant effect on the valuation as disclosed in that letter. This summary also discusses any significant steps we have taken to improve the data due to identifying questionable data values or relationships, significant judgments, or assumptions we have applied to the data.

Active

For active members, frozen AFC amounts and frozen service as of June 30, 2014 was reported. For purposes of this valuation, we matched the June 30, 2021 actives to the active data reported for the June 30, 2014 valuation to check against AFC as of June 30, 2014. In cases where the frozen AFC as reported in the 2021 data file was less than 75% of the AFC as reported on the 2014 data file, the AFC as reported on the 2014 data file was used. This boundary was determined after an analysis of the raw AFC data showed that the AFC for several members was unreasonably low. In cases where AFC was reported in to be $0 in both the current data file and the 2014 data file, the current salary was used in place of the AFC.

Deferred Vested

Data provided for deferred vested members was incomplete. As part of the processing of deferred member data, in cases where AFC was incomplete, we used $30,000 to estimate the AFC. Component II benefit service is not directly provided on the file. The Component II (Legacy) file includes total vesting service and the Component I (Hybrid) file includes Component I benefit service. Since Component II benefit service was frozen as of June 30, 2014 for members that terminated after June 30, 2014, Component II (Legacy) benefit service was determined by subtracting service in the Component I (Hybrid) inactive file from total vesting service in the corresponding Component II (Legacy) inactive file. Members with vesting service of less than 8 years were assumed to be non-vested and were not valued. We estimated the commencement date with the following rules:

- Age 55 if 30 or more years of service and hired before July 1986;
- Age 60 if less than 30 years of service, but more than 10 years of service and hired before 1986; and
- Age 62 for all others.

The entire amount of the deferred benefit was assumed to commence at the same time regardless of the date of hire.

Retired and Beneficiary

It is our understanding that the current pension amount provided in the retiree data includes the 4.5% reduction as mandated in the POA. However, for members that retired prior to July 1, 2015, the other pension amounts provided in the data (original pension amount, equated pension amount, and prior year's pension amount) did not reflect the 4.5% reduction and, as such, were reduced by 4.5% when valuing any related liability. Other adjustments/assumptions include:

- In cases where the benefit is identified to be a joint and survivor benefit and a beneficiary is not listed in the data, it was assumed that male spouses were 3 years older than females;
- Benefits for dependent children are assumed to cease at age 21; and
- For non-converted disabled members, converted benefits are:
  - assumed to commence at age 60; and
  - estimated, based on reported service and projected service from the date of disability to age 60.

Summary of Member Data
June 30, 2021

Active Members

	General	D.O.T.	DWSD	Library	Totals^
Number	1,327	368	293	197	2,185
% Change in active members	(7.0)%	(14.4)%	(12.8)%	(6.2)%	(9.1)%
Annual payroll ($ millions)	$ 68.0	$ 13.5	$ 12.8	$ 8.3	$ 102.7
Average pay	$51,265	$36,814	$43,610	$42,128	$46,981
% Change in average pay	1.5 %	0.3 %	1.2 %	0.6 %	1.6 %

^ *May not add due to rounding.*

Retired Members and Survivor Beneficiaries

	General	D.O.T.	DWSD	Library	Totals
Number	6,541	1,609	2,707	316	11,173
Annual benefits ($ millions) #	$ 123.9	$ 31.2	$ 61.1	$ 6.5	$ 222.8
Average benefits #	$18,949	$19,378	$22,588	$20,558	$19,938
% Change in reported average benefit	(0.1)%	0.3 %	(0.7)%	(2.0)%	(0.3)%

Includes annuities. Does not include reductions resulting from the annuity claw-backs.

Inactive Vested Members

	General	D.O.T.	DWSD	Library	Totals
Number	1,429	354	779	83	2,645
Average AFC	$39,902	$45,252	$49,269	$33,245	$43,168
Average years of service	15.2	15.1	15.1	13.6	15.1
Annual benefits ($ millions)	$ 14.2	$ 4.0	$ 9.5	$ 0.6	$ 28.3
Average benefits	$9,918	$11,169	$12,227	$ 7,524	$10,690
% Change in average years of service	(1.1)%	(0.5)%	(0.8)%	(1.6)%	(0.9)%
% Change in average AFC	(0.4)%	(0.4)%	(0.5)%	(2.2)%	(0.4)%

Active Members as of June 30, 2021
by Attained Age and Years of Service
Retirement System Totals

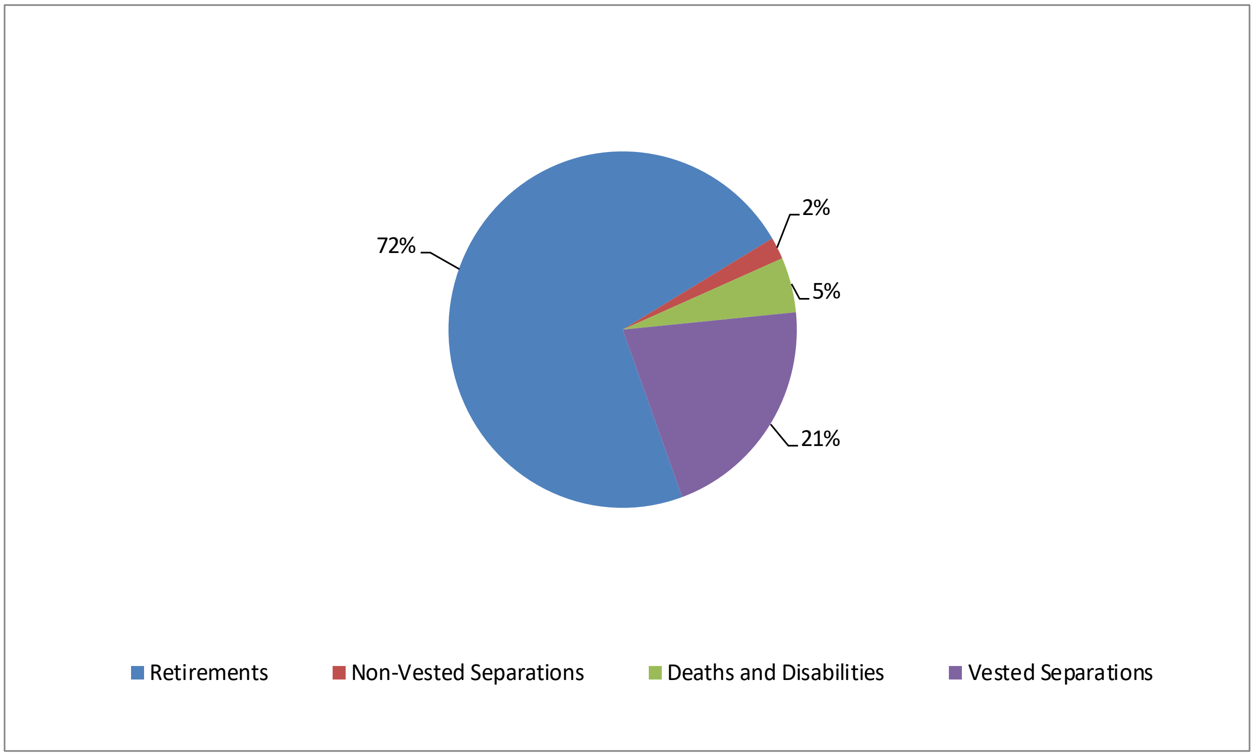
Attained Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
Under 20	0							0	$ 0
20-24	0	0						0	0
25-29	0	1	0					1	39,398
30-34	4	32	9	0				45	1,652,774
35-39	3	20	27	10	4			64	2,488,489
40-44	6	28	43	51	37	2		167	7,152,916
45-49	4	54	38	63	93	24	0	276	12,649,367
50-54	6	30	50	106	162	81	36	471	22,562,792
55-59	4	39	41	72	176	96	115	543	25,725,762
60-64	2	29	36	58	89	77	147	438	20,878,415
65-69	0	20	17	9	30	12	41	129	6,893,194
70-74	0	4	5	8	11	3	6	37	1,886,883
75-79	0	2	2	2	3	1	4	14	723,646
Totals	**29**	**259**	**268**	**379**	**605**	**296**	**349**	**2,185**	**$102,653,636**

Group Averages:

Age: 54.4 years
Benefit Service: 14.9 years
Eligibility Service: 20.9 years
Annual Pay: $46,981

Service shown in this schedule is Legacy Benefit service plus Hybrid Benefit service.

Expected Terminations from Active Employment for Current Active Members



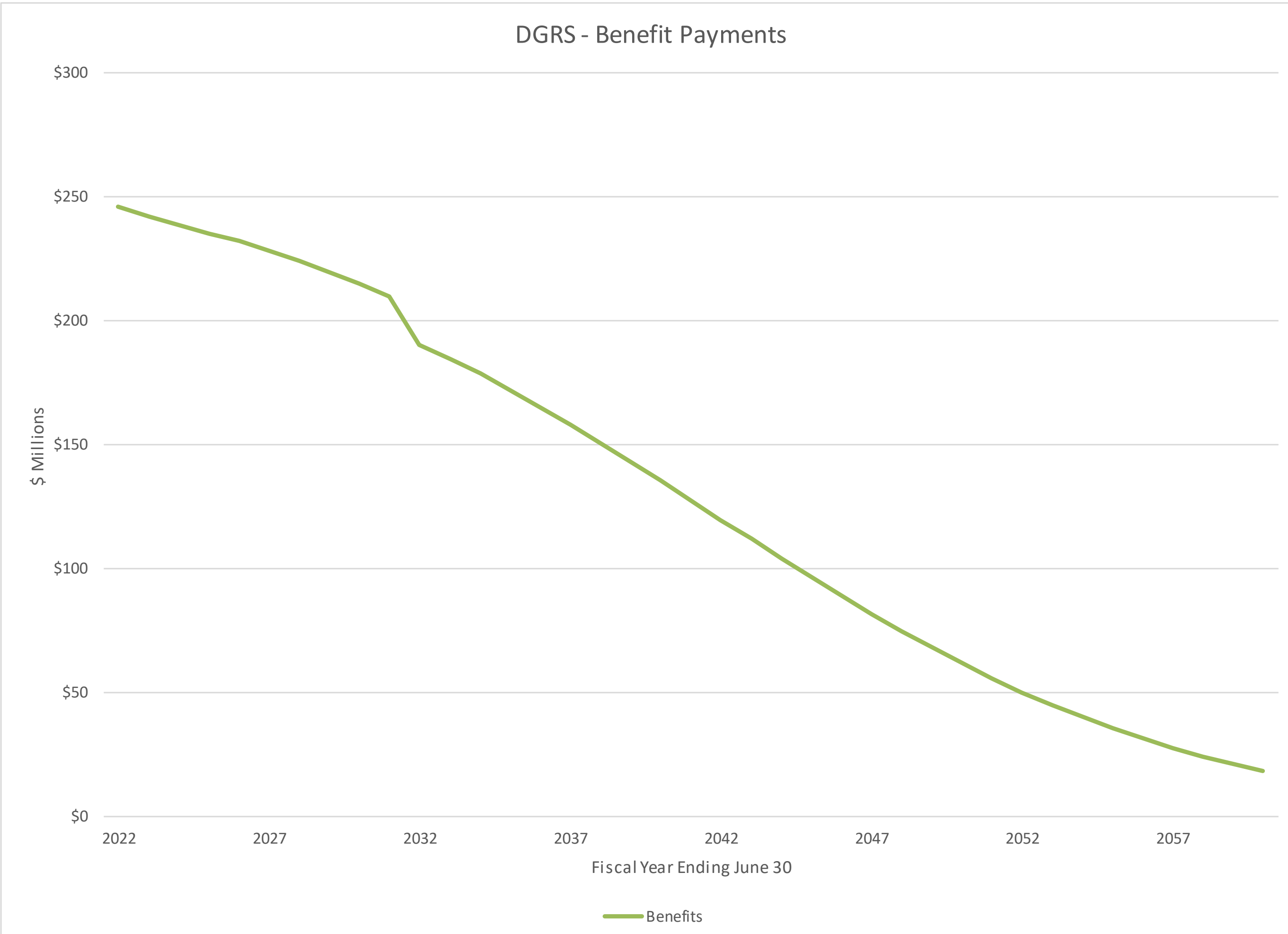
The chart shows the expected future development of the present population in simplified terms. The Retirement System presently covers 2,185 active members. Eventually, 43 people are expected to terminate covered employment prior to retirement and forfeit eligibility for an employer provided benefit. 2,029 people are expected to receive monthly retirement benefits either by retiring directly from active service, or by retiring from vested deferred status. 113 people are expected to become eligible for benefits as a result of death-in-service or disability. Vested Separations may include members eligible to retire in this Component II (Legacy) plan but not yet eligible to retire in the Component I (Hybrid) plan. A detailed discussion on how members eligible to retire in Component II (Legacy) but not eligible to retire in Component I (Hybrid) are treated is included in Section D of this report.

Actual versus expected retirements for the 2021 fiscal year is shown below:

Year Ended June 30,	Expected	Actual
2021	261	126

Expected Benefit Payments

Shown below is a graph of projected benefit payments remaining in the Retirement System.



The graph above shows the projection of future expected benefit payments (solid green line) derived from the June 30, 2021 actuarial valuation data.

Retirees and Beneficiaries as of June 30, 2021
Tabulated by Attained Ages
Retirement System Totals

Attained Ages	Age & Years of Service# No.	Age & Years of Service# Monthly Allowances	Disability No.	Disability Monthly Allowances	Death-in-Service No.	Death-in-Service Monthly Allowances	Totals No.	Totals Monthly Allowances
Under 20*	31	$ 36,589	0	$ 0	1	$ 478	32	$ 37,067
20-24	7	8,401					7	8,401
25-29	4	4,671					4	4,671
30-34	17	11,973	0	0			17	11,973
35-39	14	7,330	0	0	1	2,311	15	9,641
40-44	18	11,884	4	1,681	1	500	23	14,065
45-49	41	34,813	17	11,637	4	2,205	62	48,655
50-54	130	183,264	37	25,695	8	7,360	175	216,319
55-59	483	861,923	89	81,027	14	17,097	586	960,047
60-64	1,349	2,404,877	188	249,060	40	48,172	1,577	2,702,109
65-69	2,046	3,493,434	208	243,698	32	37,296	2,286	3,774,428
70-74	2,150	3,900,796	160	176,872	44	77,026	2,354	4,154,694
75-79	1,452	2,512,890	91	98,277	34	45,899	1,577	2,657,066
80-84	919	1,359,772	48	45,620	24	26,654	991	1,432,046
85-89	657	835,852	19	14,990	21	21,258	697	872,100
90-94	453	530,712	13	8,241	27	20,590	493	559,543
95 and Over	242	235,321	11	9,245	24	18,766	277	263,332
Totals	**10,013**	**$16,434,502**	**885**	**$966,043**	**275**	**$325,612**	**11,173**	**$17,726,157**

** May include records with defective birth dates.*
 # Includes survivor beneficiaries of deceased retirees.

Retirees and Beneficiaries as of June 30, 2021
Tabulated by Year of Retirement

Year of Retirement	No.	Monthly Allowances Total	Monthly Allowances Average
1950 & before	3	$ 5,931	$1,977
1951-1955	3	5,323	1,774
1956-1960	0	0	0
1961-1965	6	2,314	386
1966-1970	16	7,053	441
1971-1975	57	35,080	615
1976-1980	173	125,533	726
1981-1985	359	351,736	980
1986-1990	547	570,932	1,044
1991-1995	1,049	1,285,104	1,225
1996-2000	1,306	1,953,004	1,495
2001-2005	1,813	3,405,188	1,878
2006-2010	2,011	3,745,914	1,863
2011-2015	2,405	4,145,307	1,724
2016	398	684,389	1,720
2017	248	336,603	1,357
2018	234	308,558	1,319
2019	232	306,624	1,322
2020	212	310,897	1,466
2021	101	140,667	1,393
Totals	**11,173**	**$17,726,157**	**$1,587**

SECTION D

METHODS AND ASSUMPTIONS

Summary of Assumptions and Methods Used for Actuarial Valuations Adopted by the Board of Trustees

All assumptions are estimates of future experience except as noted. The rationale for the assumptions is based on experience studies where noted.

Economic Assumptions

The investment return rate used in making the valuation was 6.75% per year, compounded annually (net after investment expenses). This assumption is prescribed by the Eighth Amended Plan for the Adjustment of Debts of the City of Detroit (POA).

Price inflation is not directly used in the valuation. For purposes of assessing the reasonability of the investment return assumptions, we assumed price inflation of 2.50% per year.

Future ***administrative expenses*** are assumed to be 1.01% of benefit payments and refunds.

Non-Economic Assumptions

For healthy post-retirement mortality, the PubG-2010(B) Below-Median General Retiree table was used for mortality assumptions going forward, decreased by 3% for males and increased by 26% for females.

For disabled post-retirement mortality, PubNS-2010 Non-Safety Disabled Retiree mortality table was used, increased 4% for males and decreased 2% for females.

For pre-retirement mortality rates, the PubG-2010(B) Below-Median General Employee mortality table was used for both males and females.

The tables are projected to be fully generational, based on the 2-dimensional, sex distinct mortality improvement scale MP-2021 (which was intended to be used with the Pub-2010). 75% of all deaths-in-service are assumed to be non-duty related. This table was first used as of June 30, 2021. The rationale for the mortality assumption is based on the 2015-2020 Mortality Experience Study issued February 4, 2022.

The probabilities of retirement for members eligible to retire are shown on pages 38 and 39. These probabilities were revised for the June 30, 2021 valuation. The rationale is based on the 2015-2020 Experience Study.

The probabilities of separation from service (including *death-in-service* and *disability*) are shown for sample ages on page 40. These probabilities were revised for the June 30, 2021 valuation. The rationale is based on the 2015-2020 Experience Study.

Summary of Assumptions and Methods Used for Actuarial Valuations Adopted by the Board of Trustees (Concluded)

Funding Methods

The unit credit cost method was used in determining age & service pension liabilities, vesting liabilities, and casualty pension liabilities. Under this method, there is no normal cost since benefits are frozen and there are no future accruals and actuarial accrued liability is the present value of each individual's accrued benefit.

Unfunded Actuarial Accrued Liabilities. Actual employer contributions through June 30, 2023 are set by the POA. The amortization period and method after 2023 has not yet been established by the Board.

Employer contribution dollars were assumed to be paid at the end of the employer fiscal year.

Present assets are set equal to the Market Value.

The data about persons now covered and about present assets was furnished by the System's administrative staff. Although examined for general reasonableness, the data was not audited by the Actuary.

Single Life Retirement Values

Based on PubG-2010(B)
97% of Male Rates/126% of Female Rates
Using Projection Scale MP-2021

Sample Attained Ages in 2021	Future Life Expectancy (Years)	
	Men	Women
45	37.47	39.95
50	32.54	34.89
55	28.16	30.31
60	23.94	25.80
65	19.86	21.37
70	15.90	17.05
75	12.26	13.04
80	9.07	9.51

Probabilities of Age/Service Retirement for Members Eligible to Retire

Retirement Ages	Percent of Eligible Active Members Retiring within Next Year with Unreduced Benefits		
	EMS	D.O.T.	Others
62	40%	20%	20%
63	40%	20%	20%
64	40%	20%	20%
65	40%	20%	20%
66	40%	20%	20%
67	40%	30%	20%
68	40%	30%	20%
69	40%	30%	20%
70	100%	100%	20%
71			20%
72			20%
73			20%
74			20%
75			20%
76			20%
77			20%
78			20%
79			20%
80			100%
Ref	851	3304	3305

All members are assumed to retire while eligible for Component I (Hybrid) retirement only. The rationale is based on the 2015-2020 Experience Study.

Probabilities of Early Retirement for Members Eligible for Early Retirement

Retirement Ages	Percent of Eligible Active Members Retiring within Next Year with Reduced Benefits
55	6.5%
56	6.5%
57	6.5%
58	7.5%
59	8.5%
60	9.5%
61	9.5%
62	9.5%
Ref	3303

All members are assumed to retire while eligible for Component I (Hybrid) retirement only. The rationale is based on the 2015-2020 Experience Study.

Sample Rates of Separation from Active Employment Before Retirement

Sample Ages	Years of Service	% of Active Members Separating within Next Year — Withdrawal: EMS	Other
ALL	0	16.00%	28.00%
	1	15.00%	19.00%
	2	15.00%	15.00%
	3	11.00%	14.00%
	4	11.00%	14.00%
25	5 & Over	10.05%	13.00%
30		8.85%	11.91%
35		7.80%	9.25%
40		6.60%	7.19%
45		5.10%	5.91%
50		3.60%	5.00%
55		3.00%	5.00%
60		3.00%	5.00%
Ref		1405	1406
		1608	1609

Sample Ages	% of Active Members Becoming Disabled within Next Year — D.O.T.: Ordinary	D.O.T.: Duty	Others: Ordinary	Others: Duty
25	0.16%	0.24%	0.03%	0.03%
30	0.19%	0.28%	0.04%	0.04%
35	0.26%	0.39%	0.05%	0.05%
40	0.37%	0.56%	0.08%	0.08%
45	0.56%	0.84%	0.12%	0.12%
50	0.70%	1.05%	0.15%	0.15%
55	0.82%	1.23%	0.17%	0.17%
60	0.94%	1.41%	0.20%	0.20%
Ref	1238 x 1.20	1238 x 1.80	1238 x 0.25	1238 x 0.25

The rationale is based on the 2015-2020 Experience Study.

Miscellaneous and Technical Assumptions

Benefit Service	Exact Fractional service is used to determine the amount of benefit payable.
Decrement Operation	Disability and mortality decrements do not operate during the first five years of service. Disability and withdrawal do not operate during retirement eligibility.
Decrement Timing	Decrements of all types are assumed to occur mid-year.
Eligibility Testing	Eligibility for benefits is determined based upon the age nearest birthday and rounded service on the date the decrement is assumed to occur.
Forfeitures	None.
Incidence of Contributions	Contributions are assumed to be received at the end of the year.
Marriage Assumption	100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses for active member valuation purposes.
Normal Form of Benefit	Straight life is the normal form of benefit. The Board adopted assumptions for Actuarial Equivalence to be an 80%/20% unisex blend of RP-2014 mortality (Male/Female) with Blue Collar Adjustment, set ahead one year for males and females, projected 11 years with MP-2014, an interest rate of 6.75%, and no COLA for optional forms of payment and early retirement reduction. Assumptions for annuitizing member contributions are the same except for using a 60%/40% unisex blend and a 5.25% assumed rate of interest. Prior to the use of these factors, actuarial equivalent factors were based on 7.5% interest and the 1984 Group Annuity Mortality table.
Service Credit Accruals	Service accruals stop as of June 30, 2014 for measurement of Component II liabilities. However, future service in Component I may be used to satisfy benefit eligibility requirement in Component II. Members who became duty disabled prior to June 30, 2014 are assumed to get projected service from date of disability to conversion date. Member who become disabled after June 30, 2014 are assumed to get their frozen accrued benefit as of June 30, 2014 at date of conversion.
Administrative Expenses	Administrative expenses are assumed to be 1.01% of benefit payments and are to be included in the employer contribution.
Sick Leave	Sick leave banks as of June 30, 2014 were included in the 2014 data file provided by the System.
Member Contributions	Member contributions to this Component II plan are assumed to have ceased with the bankruptcy.
Pop-Up Benefits	For current retirees with a pop-up benefit, the value of the pop-up was estimated by valuing a non-pop-up option and increasing the associated liabilities by 2%.

The rationale is based on the 2015-2020 Experience Study, modified as necessary for changes in data or administration.

SECTION E

PLAN PROVISIONS

Summary of Benefit Provisions Evaluated

Component II Frozen Benefits

All Component II benefits are frozen as of June 30, 2014 based on service and average final compensation accrued as of that date and the provisions of the Detroit General Retirement System as it existed on June 30, 2014. Frozen benefits are further reduced by 4.5% and all future cost-of-living adjustments ("COLAs") were eliminated. Benefits resulting from the Annuity Savings Fund and benefits paid from the Annuity Reserve Fund were subject to a separate reduction described as a "Claw-back." Details of the claw-back provision are complicated and can be found in the Eighth Amended Plan of Adjustment. The benefits evaluated in this report are the frozen reduced benefits after adjusting the assets for the claw-back. Component II benefits are payable after separation from service, upon meeting the eligibility conditions of the plan as it existed on June 30, 2014, regardless of whether the individual is eligible to receive a Component I benefit at that time.

Our understanding of the June 30, 2014 plan provisions is provided below for completeness. The material below does not have legal standing and is not intended to cover all potential situations that could occur. If there are discrepancies between the description below and appropriate legal documents, the latter necessarily govern.

Age and Service Pension

Eligibility - Any age (minimum age 55 for non-EMS members hired after 1995) with 30 years of service (25 for EMS members), or age 60 with 10 years of service, or age 65 with 8 years of service.

Annual Amount - **EMS Members:** Sum of a) a basic pension of $12 for each of the first 10 years of service, plus b) a pension equal to 2.0% of AFC multiplied by years of service. Maximum benefit is 90% of AFC.

Other Members: Sum of a) a basic pension of $12 for each of the first 10 years of service, plus b) a pension equal to the first 10 years of service multiplied by 1.6% of AFC, plus 1.8% of AFC for each year of service greater than 10 years up to 20 years, plus 2.0% of AFC for each year of service greater than 20 years up to 25 years, plus 2.2% of AFC for each year of service greater than 25 years. Future benefit accruals for certain active members (depending on bargaining unit) were reduced to 1.5% of final average compensation per year of service.

Type of Average Final Compensation (AFC) - Highest 3 consecutive years out of the last 10. Pension benefits will not be diminished if compensation is reduced because of a fiscal emergency. Effective July 1, 1999, in computing the AFC, a member shall have the option of adding the value of 25% of unused accrued sick leave to the earnings used in computing the AFC. Longevity is added to AFC in accordance with the following schedule: $150 after 5 years, $300 after 10 years, $450 after 15 years, $600 after 20 years, and $750 after 25 years.

Early Retirement

Eligibility - Any age with 25 or more years of service (min. age 55 for members hired after 1995).

Annual Amount - Same as regular retirement but actuarially reduced.

Summary of Benefit Provisions Evaluated (Continued)

Deferred Retirement (Vested Benefit)

Eligibility - Hired prior to 7-1-80: Age 40 with 8 years of service. Hired on or after 7-1-80: Any age with 10 years of service.

Benefit Commencement - APTE hired prior to July 1, 1988: Benefit begins at the age the member would have become eligible for regular retirement if service had continued. ***SAAA, Non-Union and lawyers hired prior to June 30, 1986:*** Benefit begins at the age the member would have become eligible for regular retirement. ***Others:*** Benefits based on service rendered by June 30, 1986 begin at the age the member would have become eligible for regular retirement. Benefits based on service rendered after July 1, 1986 begin at age 62.

Annual Amount - Same as regular retirement but based on average final compensation and service at the time of termination.

Duty Disability Retirement

Eligibility - Service related disability before eligibility for service retirement prior to and July 1, 2014. No service requirement.

Annual Amount - An annuity which is the actuarial equivalent of the accumulated contributions at date of disability plus a pension of two-thirds of average final compensation at time of disability. The maximum annual pension is $5,700 ($9,000 for EMS). At the earliest of when the member would have accrued 30 years of service credit (25 for EMS) or age 60, the annuity is recomputed assuming contributions would have continued at a salary level equal to final compensation. The pension is recomputed with additional service credit granted from the date of disability to age 60 (or 30 years of service credit) or June 30, 2014, whichever is earlier. **Benefits payable prior to conversion/re-computation, if any, were assumed to be paid outside the trust.**

Non-Duty Disability Retirement

Eligibility - Disability from any cause before age 60 with 10 or more years of service prior to July 1, 2014.

Annual Amount - Computed in the same manner as a regular retirement benefit. Maximum annual pension to age 60 is $6,000. Benefit is recomputed at age 60 with no maximum. **Benefits payable prior to age 60, if any, were assumed to be paid from outside the trust.**

Duty Death Before Retirement

Eligibility - Death from service related causes. No age or service requirements.

Annual Amount - One-third of final compensation as of June 30, 2014 to the surviving spouse for life or until remarriage, plus an equal share of 1/4 of final compensation to each unmarried child under age 18. If there is no eligible spouse, eligible children each receive 1/4 of final compensation; if there are more than 2 such children, each child shares an equal part of 1/2 of final compensation. Maximum total amount for spouse and children is $9,000 annually. If there is no eligible spouse or children, dependent parents each receive 1/6 of deceased's final compensation, to a total maximum of $600 annually.

Summary of Benefit Provisions Evaluated (Concluded)

Non-Duty Death Before Retirement

Eligibility - Death-in-service at any age with 15 years of service; or after age 60 with 10 years of service; or after age 65 with 8 years of service.

Annual Amount - To Surviving Spouse: Computed as a regular retirement benefit but reduced in accordance with a 100% joint and survivor election for members with 20 or more years of service. For members with 15 years of service but less than 20, benefit is reduced in accordance with a 50% joint and survivor election. To Dependent Children if no Surviving Spouse: $9,000 payable to age 19 of the youngest child or for life if child is physically or mentally impaired for members with 20 or more years of service ($6,000 if less than 20 years of service).

Post-Retirement Cost-of-Living Adjustments

Benefit is increased annually by 2.25% of the **original** pension amount at retirement. Post-retirement cost-of-living increases were eliminated on future accruals for certain active members (depending on bargaining unit).

Member Contributions

Members have the option of choosing one of four contribution amounts: (1) 0%; (2) 3.0% of compensation up to the Social Security wage base, plus 5.0% of compensation in excess of the Social Security wage base; (3) 5.0% of total compensation; or (4) 7.0% of total compensation. Member contributions can be paid as a lump sum or annuitized at retirement to provide an annuity in addition to the pension (which is not affected by the level of member contributions).

SECTION F

GLOSSARY

Glossary

Actuarial Accrued Liability. The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as “accrued liability” or “past service liability.”

Accrued Service. The service credited under the plan which was rendered before the date of the actuarial valuation.

Actuarial Assumptions. Estimates of future plan experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

Actuarial Cost Method. A mathematical budgeting procedure for allocating the dollar amount of the “actuarial present value of future plan benefits” between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the “actuarial funding method.”

Actuarial Equivalent. A single amount or series of amounts of equal value to another single amount or series of amounts, computed on the basis of the rate(s) of interest and mortality tables used by the plan.

Actuarial Present Value. The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

AFC. Average Final Compensation.

Amortization. Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.

APTE. Association of Professional and Technical Employees.

ASF. Annuity Savings Fund.

Contribution Budgeting Liability. An expected return-based measure of pension obligation.

DIA. Detroit Institute of Art.

D.O.T. Department of Transportation.

DWSD. Detroit Water and Sewerage Department.

EMS. Emergency Medical Service.

Glossary

Experience Gain (Loss). A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used.

GASB. The Governmental Accounting Standards Board.

GLWA. Great Lakes Water Authority.

Normal Cost. The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as "current service cost." Any payment toward the unfunded actuarial accrued liability is not part of the normal cost.

PAF. Pension Accumulation Fund.

Plan of Adjustment or POA. The 8th Amended Plan for the Adjustment of the Debt of the City of Detroit.

Reserve Account. An account used to indicate that funds have been set aside for a specific purpose and are not generally available for other uses.

SAAA. Senior Accountants, Analysts, and Appraisers Association.

Solvency Liability. A market-based measure of the present value of accrued benefits at a municipal bond discount rate unadjusted for the credit quality of the plan sponsor.

Unfunded Actuarial Accrued Liability. The difference between the actuarial accrued liability and valuation assets. Sometimes referred to as "unfunded accrued liability."

UTGO. Unlimited Tax General Obligation.

Valuation Assets. The value of current plan assets recognized for valuation purposes.

GLWA Great Lakes Water Authority

Procurement Pipeline

AGENDA ITEM #9A

Great Lakes Water Authority (313) 964-9157 www.glwater.org **May 2022 - Volume 38**

Welcome to the May edition of *The Procurement Pipeline*, a monthly newsletter designed to provide updates on doing business with the Great Lakes Water Authority (GLWA).

***Procurement Tip of the Month*: Reviewing the Solicitation Cover and Instructions to Vendors**

Carefully reviewing the Solicitation Cover and Instructions to Vendors is an important first step for Vendors interested in submitting a bid or proposal response to a GLWA solicitation. This document, included with every solicitation and available on the solicitation's Bonfire Project Page, outlines key information about the project and what Vendors can expect as they navigate through the GLWA procurement process. Read below to learn more about this important document.

Solicitation Cover – The Solicitation Cover provides a snapshot of the solicitation's key due dates and requirements as well as an overview of the project and its background. In addition, Vendors will find information on the following:

- ✓ Minimum qualifications;
- ✓ All required documents for the submission of a complete and responsive proposal;
- ✓ Evaluation criteria and scoring weights; and
- ✓ Appendixes summarizing additional requirements (if applicable) regarding a Vendor's technical work plan, experience and qualifications, and project team.

Instructions to Vendors – From advertisement to award, the Instructions to Vendors establishes the parameters by which Vendors must adhere in submitting a response to the GLWA solicitation. These parameters include:

- ✓ Monitoring the Bonfire Project Page for any posted addenda;
- ✓ Acquiring Security for the Solicitation (if applicable);
- ✓ Arranging Material/Equipment substitutes and "or-Equal" items;
- ✓ Securing Subcontractors for the performance of work as outlined in the solicitation documents;
- ✓ Modifying or withdrawing a solicitation response after it has been submitted; and
- ✓ Fulfilling GLWA's Conditions to Final Award.

Carefully reviewing the Solicitation Cover and Instructions to Vendors enables vendors to clearly understand what the project entails, what they are being asked to deliver, and the minimum qualifications required to deliver it. This, in turn, helps to ensure that qualified vendors can submit the best possible bid or proposal response to the GLWA solicitation. Any questions regarding the information contained within the Solicitation Cover and Instructions to Vendors must be directed to the GLWA buyer of record listed on the solicitation via the "Opportunity Q&A" tab in Bonfire.

Virtual Vendor Introduction Meetings

If you are interested in learning more about doing business with GLWA, contact us at GLWAVendorOutreach@glwater.org to schedule a virtual vendor introduction meeting. Topics include information on submitting a competitive bid or proposal to a GLWA solicitation, as well as the requirements for GLWA's Business Inclusion and Diversity (B.I.D.) Program.

Keeping up with GLWA

Our Interim Chief Executive Officer (ICEO) Monthly Report provides a wealth of information and news about important initiatives within GLWA's service territory that impact GLWA, its member partners, and the public. To read the April 2022 Monthly Report, please click here.

What's Coming Down the Pipe?

Current Solicitations: Register in GLWA's Bonfire Procurement Portal for new solicitations and contract award information.

Upcoming Procurements: Next Three to Nine Months—See newsletter page 2.

Visit GLWA online!

To see the GLWA Vendor homepage, please visit www.glwater.org or contact us via email at procurement@glwater.org.

Upcoming Solicitations May 2022

Category	CIP #	Description/Project Title	Budget Estimate
Water System (next four to nine months)			
Construction	170802	Reservoir Rehabilitation Construction Services Phase II at Waterworks Park, Northeast, and Booster Stations.	$35,972,000
Construction	112003	Northeast WTP Medium Voltage Electrical System Improvements	$20,000,000
Materials & Equipment	114002E-G	Springwells WTP Pumping Unit Procurement Package (Contracts E thru G)	$50,000,000
Materials & Equipment	114002H-J	Springwells WTP Process Valve Procurement Package (Contracts H thru J)	$14,000,000
Wastewater Systems (next four to nine months)			
Construction	260802	WRRF Roofing Improvements	$1,600,000
Design	273001	Hubbell Southfield CSO Facility Improvements	$9,500,000
Construction	232002	Freud Pump Station Improvements	$75,000,000
Construction	O&M	Plumbing Shop Rehabilitation	$1,500,000
Water System (next three months)			
Construction	114017	Springwells WTP 1958 Flocculator Replacements	$22,000,000
Wastewater (next three months)			
Design-Build	212008	Aeration Decks 1 & 2 RFP (invite to RFQ selected teams only)	$74,000,000
Construction	211006	WRRF Pump Station #1 Improvements	$73,400,000
Construction	260903	WRRF Front Entrance Rehabilitation	$3,300,000
Construction	O&M	Incinerator #11 Rehabilitation	$1,200,000
Projects moved to Procurement Team (Preparing for solicitation on Bonfire)			
Design Build	270006	CSO Facility Control Improvements #2	$3,305,000
Professional Services	O&M	SCADA System Professional Services	$5,500,000
Engineering Services	260210	Rehabilitation of GLWA Sewers; Ashland Relief, Linwood, Lonyo, Second Avenue, and Shiawassee	$6,900,000
Construction	114002B	Springwell's WTP Medium Voltage Electrical System Replacement	$52,000,000
Construction	211006	Pump Station #1 Screenings Building HVAC Improvements	$60,000,000

Vendors should continue to monitor Bonfire for solicitation updates.

Acronyms		
WRRF: Water Resource Recovery Facility	**CSO:** Combined Sewer Overflow	**WTP:** Water Treatment Plant