Great Lakes Water Authority
Board Workshop
February 14, 2018

Update: FY 2019 & 2020 Biennial Budget and Five Year Plan (FY 2019 – FY 2023)

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Key Decisions to Achieve Final Budget

Updates since last presentations to Board

- Charges (1.24.2018) and Budget (1.10.2018)

New! Capital Improvement Program (CIP) and Related Financial Plan

- Presented last week to customer members, CIP Committee, and Audit Committee

Charges

- Water System: Units of Service Phasing
- Sewer System: New Concept – Equity Allocation for Customer Specific Cost Pools

Budget

- Revenue requirement adjustment – overall presently proposed at 2%
- CSO costs under review with largest shareholder in that cost pool
- Memorandum of Understanding to clarify/resolve lease implementation matters
- Other analysis as requested

Key Excerpts from Committee Documents

Capital Improvement Planning Committee

- February 6, 2018
- http://www.glwater.org/about-us/capital-improvement-planning-committee/

Audit Committee

- January 5, 2018 and January 19, 2018
- http://www.glwater.org/finances/audit-committee-documents/

Key excerpts attached for today's discussion and reference

Next Steps

Audit Committee Special Meeting, February 23, 2018 at 8 am

GLWA Board Meeting, February 28, 2018 at 2 pm

Discussion Outline

- Proposed Charges Review Process Summary
- Executive Summary of Study Results – Key Issue Impacts
  - ✓*Water Units of Service (UoS) Study*
  - ✓*Sewer BUDGET Allocation*
- Perspectives on Implementation of Key Issues

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Proposed Charges Have Emerged Through a Rigorous Review Process

- Audit Committee Meetings
  - ✓ ***11/17/2017***
  - ✓ ***12/15/2017***
  - ✓ ***1/5/2018***
  - ✓ ***1/19/2018***
- Full Board of Directors Meetings
  - ✓ ***12/13/2017***
  - ✓ ***12/21/2017***
  - ✓ ***1/10/2018***
  - ✓ ***1/24/2018***

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Proposed Charges Have Emerged Through a Rigorous Review Process

- Formal "Charge Rollout" Meetings
  - ✓ ***12/12/2017*** *- Preliminary Water Units of Service*
  - ✓ ***12/19/2017*** *– Capital Improvement Program*
  - ✓ ***1/11/2018*** *– Proposed FY 2019 Revenue Requirements*
  - ✓ ***1/25/2018*** *– Proposed FY 2019 Service Charges*
- One Water Partnering Meetings
  - ✓ ***9/28/17 –*** *Contract Demands Determination Process*
  - ✓ ***12/20/17 –*** *Units of Service (UoS) Study*

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FY 2019 Cost of Service Study / Charges Results: *Executive Summary*

- There are myriad elements that impact the cost of service allocations and proposed service charges for FY 2019, but there is a singular highlight for the Water Charges and another for the Sewer Charges
- **Today's discussion focuses on those highlights for each system**

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FY 2019 Cost of Service Study / Charges Results: *Executive Summary*

- The proposed Water Charges are materially impacted by implementation of the Units of Service (UoS) Study for non-master metered Customers
- The proposed Sewer Charges are materially impacted by the allocation of the BUDGET to Cost Pools, and specifically those Cost Pools that are solely or primarily allocated to specific Customers:
  - ✓ *Oakland Macomb Interceptor (OMID) – direct to OMID*
  - ✓ *Combined Sewer Overflow (CSO) – 83% to Detroit*

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Key Issue Summary and Results - Water

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FY 2019 Water Cost of Service Results: *Units of Service Study*

- Phase 1 of the UoS Study conducted by Black & Veatch establishes ***observed and estimated*** "units of service" for Detroit, Dearborn, and Highland Park, which do not have master "billing" meters
- The Phase 1 ***technical*** findings were accepted in a consensus manner by the One Water Partnering Group at its meeting on December 20, 2017
- Units of service include:
  - ✓ *Average daily demands*
  - ✓ *Maximum day demands*
  - ✓ *Peak hour demands*
  - ✓ *Distance & Elevation factors*

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FY 2019 Water Cost of Service Results: *Units of Service Study*

- The GLWA Administrative recommendation to implement the UoS technical findings for the FY 2019 Charges includes modifications to the ***observed and estimated*** max day and peak hour demands
- This approach is designed to align demand determinations for non-master metered Customers with the process applied for all master metered Customers

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FY 2019 Water Cost of Service Results: *Units of Service Study*

- The GLWA Administrative recommendation:
  - ✓*Increases max day and peak hour demands for Detroit and Highland Park by 10% - similar to the approach applied to **model** contract Customers who re-opened during 2017*
  - ✓*Increases Dearborn's max day and peak hour demands by 20% - consistent with the manner that demands for other Customers under "old" contract formats are treated*

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FY 2019 Water Cost of Service Results: *Units of Service Study*

	Existing Data Prior to UoS Study	Technical Findings B&V UoS	GLWA UoS Adminstrative Adjustment	GLWA UoS Adminstrative Recommendation *2019 Charges*
Detroit				
Average Day Demand - mgd	91.5	98.1	*NA*	98.1
Max Day Demand - mgd	114.4	118.4	*10%*	130.2
Peak Hour Demand - mgd	118.1	145.7	*10%*	160.3
Distance Factor	16.9	16.8	*NA*	16.8
Elevation	632	629	*NA*	629
Dearborn				
Average Day Demand - mgd	12.7	14.7	*NA*	14.7
Max Day Demand - mgd	25.7	27.4	*20%*	32.9
Peak Hour Demand - mgd	33.8	35.9	*20%*	43.1
Distance Factor	20.3	20.1	*NA*	20.1
Elevation	605	597	*NA*	597
Highland Park				
Average Day Demand - mgd	2.3	3.1	*NA*	3.1
Max Day Demand - mgd	2.9	4.0	*10%*	4.4
Peak Hour Demand - mgd	3.1	4.2	*10%*	4.6
Distance Factor	16.9	17.3	*NA*	17.3
Elevation	632	639	*NA*	639

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FY 2019 Water Cost of Service Results: *Units of Service Study*

- The UoS Study, and the GLWA Administrative recommendation to implement it, has the effect of:
  - ✓ *Increasing cost allocations to "non master metered" Customers (Detroit, Dearborn, Highland Park);*
  - ✓ *Decreasing cost allocations to master metered Customers*
- Impact Summary (all else being equal) - *$ millions*

		Unadjusted	Technical Recommendations			GLWA Implementation Plan		
		Revenue Req	Adjusted	Variance	% Variance	Adjusted	Variance	% Variance
	Non Master Metered Customers							
1	Detroit	36.3	39.7	3.4	*9.3%*	41.9	5.5	*15.3%*
2	Dearborn	8.8	9.3	0.5	*5.9%*	10.8	2.0	*22.2%*
3	Highland Park	1.1	1.3	0.1	*13.0%*	1.4	0.2	*20.1%*
4	Total NMM Customers	46.3	50.3	4.1	*8.8%*	54.0	7.7	*16.7%*
5	Master Metered Customers	284.6	280.5	(4.1)	*-1.4%*	276.8	(7.7)	*-2.7%*
6	Total System	330.8	330.8	(0.0)	*0.0%*	330.8	(0.0)	*0.0%*

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Key Issue Summary and Results - Sewer

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FY 2019 Sewer Cost of Service Results: *Cost Pool Allocations*

- The vast majority of the Sewer BUDGET is allocated to Customers based on their relative SHARE of the assignment of costs allocated to the "common to all" (CTA) Cost Pool
- There are two major "Customer specific" Cost Pools that are solely or primarily allocated to specific Customers:
  - ✓ *Oakland Macomb Interceptor (OMID) – direct to OMID*
  - ✓ *Combined Sewer Overflow (CSO) – 83% to Detroit*

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FY 2019 Sewer Cost of Service Results: *Cost Pool Allocations*

- Both of the "Customer specific" Cost Pools are experiencing "unique" circumstances with respect to the FY 2019 Cost of Service Study, that have the effect of increasing costs allocated to them
- The increase reflects a combination of refined budgetary awareness, new maintenance programs, and the the recognition of new information from the capital asset inventory and valuation project

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FY 2019 Sewer Cost of Service Results: *Cost Pool Allocations*

- A detailed review of the FY 2019 Sewer Operating Expense Budget indicates a variance between Common-to-All ("CTA") costs allocated based on SHAREs and Customer specific Cost Pools
  - ✓*CTA SHARE costs – **De**crease of ~ $7.1 million*
  - ✓*OMID specific costs – **In**crease of ~ $2.1 million*
  - ✓*CSO program costs – **In**crease of ~ $9.2 million*
  - ✓*IWC program costs – **De**crease of ~ $4.7 million*

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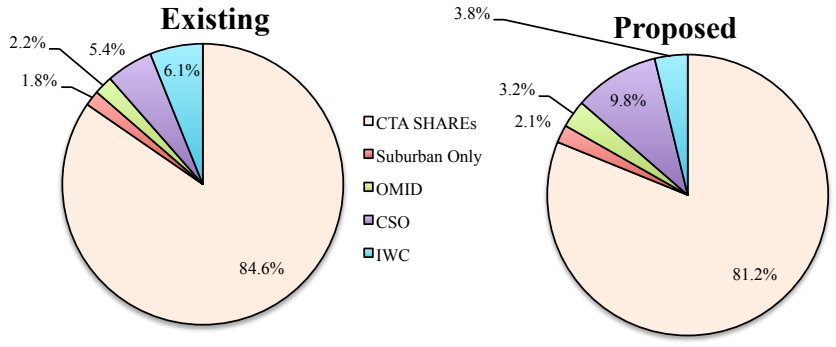
FY 2019 Sewer Cost of Service Results: *Cost Pool Allocations*



	Existing	Proposed
CTA SHAREs	84.6%	81.2%
Suburban Only	1.8%	2.1%
OMID	2.2%	3.2%
CSO	5.4%	9.8%
IWC	6.1%	3.8%

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FY 2019 Sewer Cost of Service Results: *OMID Cost Pool Allocations*

- The OMID Cost Pool is experiencing an increased allocation of the FY 2019 BUDGET due primarily to a recognition that updated review indicates that the Northeast Sewer Lift Station is a larger proportional recipient of all Lift Station costs than prior cost of service study assumptions indicated
- This new awareness also impacts other indirect cost allocations that are based on direct operating expense allocations

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FY 2019 Sewer Cost of Service Results:
OMID Cost Pool Allocations ($ millions)

	FY 2018	FY 2019	Variance	% Variance
O&M Allocation				
Direct Lift Station Costs	0.42	0.93	0.51	123%
Indirect WW Operations	0.00	0.00	0.00	0%
Centralized Services	2.86	3.85	0.99	35%
Administrative Services	0.80	1.26	0.47	58%
Subtotal O&M *(a)*	4.08	6.05	1.97	48%
Debt Service	2.32	2.82	0.50	22%
Other MBO Req'ts	1.06	1.48	0.42	40%
Regional I&E *(b)*	0.13	0.16	0.02	18%
Total Revenue Req't	7.58	10.50	2.92	39%

(a) Relative (FY 2018 / FY 2019) cost assignment: lift station (15% / 25%); interceptor (5% / 3.5%)
(b) Revenue Req't assigned based on capital asset allocation, not on intended "use of" I&E Funds.

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FY 2019 Sewer Cost of Service Results: *CSO Cost Pool Allocations*

- The CSO Cost Pool is experiencing an increased allocation of the FY 2019 BUDGET due primarily to introduction of new maintenance programs to responsibly address facilities that are entering (for some) their third decade of service
- The FY 2019 BUDGET also reflects refined awareness regarding allocation of existing GLWA operating costs
- The increased direct costs allocable to the CSO Cost Pool also results in increased indirect cost allocations

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FY 2019 Sewer Cost of Service Results: *CSO Cost Pool Allocations ($ millions)*

O&M Allocation	FY 2018	FY 2019	Variance	% Variance
Direct WW Operations	7.87	14.19	6.33	80%
Indirect WW Operations	0.31	0.66	0.35	113%
Centralized Services *(a)*	0.00	0.00	0.00	0%
Administrative Services	2.00	3.93	1.93	97%
Subtotal O&M	10.17	18.78	8.61	85%
Debt Service	29.80	33.04	3.24	11%
Other MBO Req'ts	4.34	6.13	1.79	41%
Regional I&E *(b)*	1.71	1.85	0.13	8%
Total Revenue Req't	46.02	59.80	13.78	30%
Allocable to Detroit Customers	38.20	49.64	11.44	30%
Allocable to Suburban Customers	7.82	10.17	2.34	30%

(a) No costs related to Centralized Services have been allocated to CSO cost pool in recent years.
(b) Revenue Req't assigned based on capital asset allocation, not on intended "use of" I&E Funds.

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FY 2019 Sewer Cost of Service Results: *Cost Pool Allocations*

- The nature of these two Customer specific Cost Pools are similar, and methods for assigning indirect costs to both are under review as part of the Cost Allocation Project
  - ✓ *Methods of assigning Centralized Services operating expenses, etc.*
- However there are unique circumstances for these two Cost Pools:
  - ✓ *OMID Cost Pool is related to facilities that entirely serve one GLWA Customer, and could arguably be defined as "local" facilities for that Customer;*
  - ✓ *CSO Cost Pool is related to regional facilities that (while predominantly allocated to service for one Customer) are still a "common to all" wholesale service*

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FY 2019 Sewer Cost of Service Results: *Cost Pool Allocations*

- The increased allocation of costs to the OMID Cost Pool has the effect of increasing the OMID Wholesale Service Charge by approximately 2%
  - ✓ *This figure is net of the offsetting reduction in costs allocable to the CTA Cost Pool. It is difficult to accurately isolate specific impacts of multiple changing assumptions.*
- The increased allocation of costs to the CSO Cost Pool has the effect of increasing the total Detroit allocated wholesale sewer revenue requirement by approximately 3.5%
  - ✓ *This figure is net of the offsetting reduction in costs allocable to the CTA Cost Pool. Again, it is difficult to accurately isolate specific impacts of multiple changing assumptions.*

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Key Issue Perspectives

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Key Issue Perspectives

- We have been asked to explore creative implementation options related to the two principal issues introduced in this presentation
- Our perspectives are offered in the spirit of embracing the stability and equity objectives of the GLWA Strategic Charge Methodology Initiatives
- This commentary is not intended to represent formal recommendations, nor GLWA Administrative positions, but rather to offer concepts for stakeholder consideration

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GLWA One Water Strategic Charge Methodology Initiatives – *Potential Implementation Schedule*

		FY 2019	FY 2020	FY 2021
1	**Cost Allocation Project**			
1.1	*Admin and Centralized Services Cost Allocation Study*	X	*X*	*X*
1.2	*Refined Functional Cost Structure*	X	*X*	*X*
1.3	*Fixed Asset Project*	X	*x*	*x*
2	**Wastewater Charges / Methodology Update**			
2.1	*2nd year of phase in for FY 2018 SHAREs*	X		
2.2	*SHARE Update - 3rd Fixed SHARE Period*			X
2.3	*Evaluation of Peak Wastewater Flows and Costs*			X
2.4	*Wastewater Strength of Flow Sampling Plan*			X
2.5	*Wastewater Strength of Flow Sampling*			X
2.6	*Wastewater Master Plan*			X
2.7	*West Side Modeling & Monitoring*			X
2.8	*Wet Weather Optimization Refinements*			X
2.9	*Leverage National Expertise and Benchmarks*		*x*	X
3	**Water Charges / Methodology Update**			
3.1	*Units of Service Study - Non-Master Metered Customers*	X		
3.2	*UoS Phase 2 - System Water Audit*		X	
3.3	*Water Model Contract Alignment Project*		X	
3.4	*Alternative Allocators for Pumping and Transmission*			X
3.5	*Reflection of NE WTP Repurposing*			X
3.6	*Leverage National Expertise and Benchmarks*			X

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FY 2019 Water Cost of Service Perspectives: *Units of Service Study*

- During the review of the UoS Study, the concept of a phased approach to implementing the resulting impacts was introduced by Detroit and Dearborn
- From our perspective, an implementation approach that phases in the UoS impacts over a two year period may be worthy of consideration
- We believe that such an approach recognizes that stability is a valued objective, and that further unknown cost allocation impacts will occur in the near future related to:
  - ✓ *Phase 2 of the UoS Study;*
  - ✓ *Other initiatives that emerge from the Charge Methodology Review*

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FY 2019 Water Cost of Service Perspectives: *Units of Service Study*

- The two year phased period matches that implemented last year by the Board of Directors for the Sewer SHAREs, a FY 2018 "key issue" that had (in broad terms) a directionally opposite impact on Sewer customer classes compared to the UoS impact on Water customer classes
- As part of the Charge notification process, GLWA notified Customers of two potential Scenarios of proposed Charges to Customers
  - ✓ *Scenario 1 = full implementation of UoS;*
  - ✓ *Scenario 2 = 2 year phased implementation*

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FY 2019 Sewer Cost of Service Perspectives: *Cost Pool Allocations*

- Both of the "Customer specific" Cost Pools are experiencing "unique" circumstances with respect to the FY 2019 Cost of Service Study, reflecting a combination of refined awareness, new programs, and the recognition of:
  - ✓ *A potential operating agreement between GLWA and OMID regarding the Northeast Sewer Pumping Station may change the cost dynamics;*
  - ✓ *The fact that the costs to operate and maintain the CSO facilities are "dynamic" and irregular*

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FY 2019 Sewer Cost of Service Persepectives: *Cost Pool Allocations*

- The nature of these two Customer specific Cost Pools are similar, and methods for assigning indirect costs to both are under review as part of the Cost Allocation Project
  - ✓ *Methods of assigning Centralized Services operating expenses, etc.*
- However there are unique circumstances for these two Cost Pools:
  - ✓ *OMID Cost Pool is related to facilities that entirely serve one GLWA Customer, and could arguably be defined as "local" facilities for that Customer;*
  - ✓ *CSO Cost Pool is related to regional facilities that (while costs are predominantly allocated to one Customer) are still a "common to all" wholesale service*

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FY 2019 Sewer Cost of Service Perspectives: *Cost Pool Allocations*

- We believe that both of these Customer class impacts may be well served by the concept of a potential ***"Charge Stability Adjustment"*** that embraces a notion of comparing actual Cost Pool expenditures to budgeted amounts
- Under this approach, Sewer Service Charges would be established at 100% of the BUDGET assigned to the Customer specific (OMID / CSO) Cost Pools, with the understanding that:
  - ✓ *Actual costs to these Cost Pools would be tracked and compared to original budgets;*
  - ✓ *Potentially, adjustments to future charges (for FY 2020 and/or beyond) would be made to reflect actual vs. budget performance in "Customer specific" Cost Pools*

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FY 2019 Sewer Cost of Service Perspectives: *Cost Pool Allocations*

- We believe that this ***"Charge Stability Adjustment"*** concept is consistent with the overall equity and stability strategy that is fundamental to the GLWA Strategic Charge Initiatives
- We further believe that the concept may provide a valuable tool for GLWA to address potentially volatile expenditures in these unique Cost Pools, and avoid unintended consequences to the directly impacted Customers
- We do NOT believe that the notion should be applied to budget/actual variances in revenues or "CTA SHAREs" revenue requirements

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FY 2019 Sewer Cost of Service Perspectives: *Cost Pool Allocations*

- We believe any implementation of the ***"Charge Stability Adjustment"*** concept will require further analysis and policy development, including:
  - ✓ *Understanding that the OMID "Charge Stability Adjustment" (at least as referenced in this commentary) is suggested to be limited to the potential recognition of a successfully negotiated operating agreement for the Northeast Sewer Pump Station;*
  - ✓ *Acknowledging that OMID Cost Pool adjustments are applicable to the OMID Customer only, while CSO Cost Pool adjustments are subject to the 83 / 17 allocation agreement;*
  - ✓ *Establishing material thresholds for implementing "Charge Stability Adjustments";*
  - ✓ *Understanding how I&E Funds are generated, included in charges, committed, and expended*

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Asset Management & CIP Work Group Meeting

February 8, 2018

8:00 a.m. - 10:00 a.m.

Water Works Park

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Agenda Review

Desired Outcomes:	• Ensure voice of stakeholders through stakeholder involvement in the Asset Management / CIP process.
8:00 a.m.	Welcome . . . Agenda Review . . . Introductions – Charlie Fleetham
8:05 a.m.	December 19, 2017 Meeting Summary – Charlie Fleetham • Meeting Results Form Actions
8:15 a.m.	2019 – 2023 CIP Version 2 – Jody Caldwell
8:45 a.m.	Highlighted Water Engineering Projects – Grant Gartrell
9:15 a.m.	Financial Alignment 2019-2023 CIP Version 2 – Nickie Bateson
9:35 a.m.	CIP Breakout Session – Group Discussion
9:55 a.m.	Closing Comments / Next Steps • Meeting Results Form
10:00 a.m.	Meeting Adjourns

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REVIEW 12/19/18
MEETING SUMMARY

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GLWA's FY 2019 - 2023 Capital Improvement Plan

AM/CIP Member Outreach Work Group
February 8, 2018
8:00 a.m. – 10:00 a.m.

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Revised: 2018-02-06

CIP Presentation Agenda

- **Introduction**
  - Major CIP Changes Since Version 1
  - Questions & Answers from CIP Version 1
- **Water Engineering**
  - General Strategy in Selecting Projects
  - Highlighted Projects
- **CIP Relationship to Financial Plan**
- **Next Steps & Closing Remarks**
  - Next Steps
  - Closing Remarks

What We Are Trying to Accomplish

- Increased redundancy, reliability & resiliency of water and wastewater systems
- Adherence with long-term planning document recommendations
- Provide opportunity for Board, Authority Members and stakeholders to provide input
- Best-in-class planning and execution of capital program
    - Efficient spending
    - Planning of human resource needs
    - Planning of financial resource needs

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Major CIP Changes Since V1

New To The Plan – Chapter IV: Project Location Summary

- Projects By Jurisdiction
- Once Approved – Project Information (Location & BCE) To Be Provided in the CIP Viewer
- For Access & Instructions Email:
  - WAMR@glwater.org
  - GDRSS@glwater.org

Jurisdiction	CIP Projects				
City of Detroit					
112001	122003	211004	212005	213007	216006
112002	122009	211005	212006	213008	216007
112003	122010	211006	212007	213009	222002
112004	122015	211007	212008	214001	222007
115001	132009	211008	213001	215001	232001
115002	171100	211009	213002	216001	232002
115003	171300	212001	213003	216002	232003
115004	211001	212002	213004	216003	361001
116001	211002	212003	213005	216004	361002
116002	211003	212004	213006	216005	380600
Lapeer County					
132007	132021				
Macomb County					
122001					
Oakland County					
122013	132004	132011	132014	132017	
132003	132010	132013	132016	132020	
Saint Clair County					
111001	111003	111005	111007	171000	
111002	111004	111006	111008		
Wayne County – Outside Detroit					
113001	114001	114009	122005	132001	132022
113002	114002	114010	122006	132002	171200
113003	114004	114011	122007	132006	
113004	114005	114012	122011	132012	
113005	114006	114013	122012	132015	
113006	114007	114014	122014	132018	
113007	114008	114015	122016	132019	

Jurisdiction	CIP Projects				
Multiple Counties					
114003	132024	170700	222005	260400	380500
116003	161001	170800	222006	260500	380700
116004	170100	170900	233001	260600	380800
122002	170200	171400	233002	331001	380900
122004	170300	171500	251002	331002	381000
132005	170400	222001	260100	351001	
132008	170500	222003	260200	361003	
132023	170600	222004	260300	380400	

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New To The Plan – 19 New Water Projects

- 10 Booster Pump Station Projects
- 4 Water Treatment Plant Sanitary Survey Related Improvements
- 2 Reservoir Rehabilitation
- 1 Energy Management
- 1 Roof Replacement
- 1 NE WTP Service Line Replacement

Projects Added Since Version 1			($1,000's)	
NEW CIP #	Title	Significance	5 Year CIP	Project Total
112004	NE - WTP Relocation of 12" service line at front of plant	Plant service water is currently fed off of a DWSD owned 12" water main along 8 Mile Road in front of the plant. GLWA is charged by DWSD for use of this water which represents a substantial long term cost. Project involves disconnecting from the DWSD 12"	2,460	2,460
132013	Adams Road Pumping Booster VFD & Gate Valves to Optimize Service Delivery	Provide new VFDs to meet viable system demands with respect to pressure (improve customer service) and replace gate valves with new more reliable valves.	1,558	1,558
132014	Adams Road Pumping Booster Pumping & Switch Gear Improvements	Existing pumps, motors and electrical gear for station power are beyond useful service life and requires replacement to keep station reliable.	1,051	5,676
132015	Newburgh BPS - Pumping System & Building Upgrades	Existing pumps, motors and electrical gear are beyond useful service life. Replacement will provide new equipment that is more reliable, energy efficient and optimally sized for system demands. Other improvements involve building mechanical equipment rep	7,795	12,170
132016	North Service Center BPS Improvements	Recondition line pumps L-2 through L-6, add VFD, replace existing valves and electrical gear with new due to equipment being past useful service life in order to provide more reliable equipment.	4,526	24,920
132017	North Service Center BPS - On-Site & Off-Site Yard Piping & Valve Replacement	Yard piping and valves are original to the facility and are beyond useful service life. New valves and yard piping are needed to improve reliable operation; and in order to provide reliable shutoff and water tightness during the subsequent station upgrade	5,076	5,076
132018	Schoolcraft BPS - Pumps, Yard Piping, Valves & Reservoir Pumps & Underdrain System	Existing pumps, yard piping and station valves are past their useful service life and require replacement to maintain reliable operation. Existing belt drain underdrain system protects reservoir from floating when empty so underdrain system must perform t	4,011	10,564
132019	Wick Road BPS - Switchgear, Control Valves & Hydropneumatic Tank Replacement	Existing switchgear, control valves and hydropneumatic tank at station is beyond useful service life and requires replacement to maintain station reliability	1,015	5,570
132020	Franklin BPS - Isolation Gate Valves & Electrical Actuator Improvements	Existing gate valves, pumps, motors, and valve operators are beyond useful service life and require replacement to maintain reliable station.	2,855	10,170
132021	Imlay BPS - Replace VFDs, Pumps, Motors and HVAC	Existing pumps, motors, VFDs and HVAC system need replacement in order to maintain reliability in the station's operation.	5	12,107
132022	Joy Road BPS - Replace Reservoir Pumps, Motors and Isolation Valves	Existing pumps, motors, and valves are past their useful service life and require replacement to maintain reliable station operation. Existing header has suffered corrosion and needs replacement.	6	6,109
132023	Reservoir Inspection & Rehabilitation @ Water Works Park and Northeast Water Treatment Plants; and Wick, Schoolcraft, Northwest, North Service Center, and Michigan Avenue Pumping Stations	Existing reservoirs need to be inspected and any necessary rehabilitation conducted every 5 years according to MDEQ guidelines; and in order to assure that reservoirs are protective of drinking water quality.	1,003	19,109
132024	Reservoir Inspection and Rehabilitation @ Adams, East-side, Farmington, Ford Road, Franklin, Haggerty and Joy Road	Existing reservoirs need to be inspected and any necessary rehabilitation conducted every 5 years according to MDEQ guidelines; and in order to assure that reservoirs are protective of drinking water quality.	1,003	19,109
171000	LH - WTP Sanitary Survey Improvements	Address the sanitary survey needs that are identified by the MDEQ as part of its 3-year rotation of plant sanitary surveys where regulatory needs are identified.	241	488
171100	NE - WTP Sanitary Survey Improvements	Address the sanitary survey needs that are identified by the MDEQ as part of its 3-year rotation of plant sanitary surveys where regulatory needs are identified.	391	796
171200	SW-WTP Sanitary Survey Improvements	Address the sanitary survey needs that are identified by the MDEQ as part of its 3-year rotation of plant sanitary surveys where regulatory needs are identified.	318	717
171300	WWP - WTP Sanitary Survey Improvements	Address the sanitary survey needs that are identified by the MDEQ as part of its 3-year rotation of plant sanitary surveys where regulatory needs are identified.	241	488
171400	Energy Management Program @ All Water Facilities	Existing lighting systems at most facilities are energy inefficient. Replacement with new, modern LED lighting type systems will reduce electrical usage and costs.	1,906	7,000
171500	Roof Replacement - Various Water Facilities	These existing roofs are leaking and are beyond repair. Replacement is needed to protect building interiors and most importantly sensitive electrical equipment.	2,490	27,246

GLWA Great Lakes Water Authority

Cost Estimate Classifications - WATER

	Cost Estimate Class	Project Definition	Method	5-Year CIP Amount ($1,000's)	% of Total CIP	# of Phases
Water	1	50% to 100%	Deterministic	$ 15,877	2%	19
	2	30% to 70%	Primarily deterministic	$ 3,872	1%	3
	3	10% to 40%	Combinations of detailed, unit cost, activity-based + class 4 & 5 methods	$ 116	0%	1
	4	1% to 15%	Expert opinion, trend analysis, more parametric	$ 84,415	12%	8
	5	0% to 2%	Judgement, trend analysis, parametric	$ 245,054	34%	20
			Currently Unidentified	$ 363,495	51%	128
			Total 5-Year CIP Amount	$ 712,829	100%	179

Cost Estimate Classifications - WASTEWATER

	Cost Estimate Class	Project Definition	Method	5-Year CIP Amount ($1,000's)	% of Total CIP	# of Phases
Wastewater	1	50% to 100%	Deterministic	$ 80,452	13%	14
	2	30% to 70%	Primarily deterministic	$ 82,581	13%	12
	3	10% to 40%	Combinations of detailed, unit cost, activity-based + class 4 & 5 methods	$ 51,989	8%	8
	4	1% to 15%	Expert opinion, trend analysis, more parametric	$ 234,142	37%	44
	5	0% to 2%	Judgement, trend analysis, parametric	$ 101	0%	1
			Currently Unidentified	$ 183,894	29%	39
			Total 5-Year CIP Amount	$ 633,159	100%	118

WATER Changes Between Version 1 & Version 2

WATER: 2019-2023 CIP Summary Table

$1,000's

WATER	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	2019-2023 CIP Total	Project Total
2018 Water	270,130	137,655	194,089	197,259	141,305	130,300	98,640	-		
2019 V1 Water	160,710	77,486	142,703	199,931	202,483	214,946	223,880	449,517	983,943	1,671,656
2019 V2 Water	160,918	40,043	66,038	137,583	155,734	178,300	175,174	789,815	712,829	1,703,605
V1 to V2 Change:	**208**	**(37,443)**	**(76,665)**	**(62,348)**	**(46,749)**	**(36,646)**	**(48,706)**	**340,298**	**(271,114)**	**31,949**

- Reduction of $271Million over the five-year plan from Version 1
- Realistic look at sequencing & implementation
- Evaluation of project contingencies and allowances
- Allowances decreased by $33.5 Million

GLWA Great Lakes Water Authority

WASTEWATER Changes Between Version 1 & Version 2

WASTEWATER: 2019-2023 CIP Summary Table

$1,000's

WASTEWATER	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	2019-2023 CIP Total	Project Total
2018 Wastewater	338,753	160,746	197,493	189,794	115,442	89,250	23,739	-		
2019 V1 Wastewater	234,829	102,389	191,866	183,556	158,866	144,788	105,203	77,643	784,279	1,199,140
2019 V2 Wastewater	235,026	70,632	105,183	111,155	111,952	136,411	168,458	162,428	633,159	1,101,245
V1 to V2 Change:	**197**	**(31,757)**	**(86,683)**	**(72,401)**	**(46,914)**	**(8,377)**	**63,255**	**84,785**	**(151,120)**	**(97,895)**

- Reduction of $151 Million over the five-year plan from Version 1
- Realistic look at sequencing & implementation
- Evaluation of project contingencies and allowances
- Allowances decreased by $52.4 Million

GLWA Great Lakes Water Authority

Questions & Answers From CIP Version 1

GLWA
Great Lakes Water Authority

GLWA 2019-2023 Capital Improvement Plan
Version 1.0
Comments, Questions and Answers
Date: January 31, 2018

Summary:

The 2019-2023 Capital Improvement Plan review period began with the release of Version 1.0 at the Great Lakes Water Authority Capital Improvement Planning Committee on December 15, 2017. Version 1.0 was also released at the Asset Management & Capital Improvement Planning Customer Outreach Workgroup meeting held on December 19, 2017. Comments were requested by January 5, 2018.

One written response was received from a respondent in Oakland County by the requested deadline. To date, no other comments have been received.

The over-arching general thought from the respondent was that, "Overall, I think the plan looks really good with an amazing amount of detail. It shows that a lot of thought, time and effort has been put into developing the plan."

The respondent also provided 13 comments and questions related to many areas within the CIP and in the projects that were presented. Each of these comments and questions have an associated response written after each question. Because of the limited number of questions or comments, a categorized summary of these has not been included.

Where applicable and as indicated in the response to each question or comment, modifications to the overall CIP document have been made and can be viewed within the soon to be released 2019-2023 Capital Improvement Plan Version 2.0.

We want to thank those customers and stakeholders for the time and effort that they have taken to help to improve this CIP document and the process by which it is developed and rolled out. This includes the many participants within the Asset Management / Capital

Questions & Answers From CIP Version 1

- One written response was received
  - Overarching comment:

    "Overall, I think the plan looks really good with an amazing amount of detail. It shows that a lot of thought, time and effort has been put into developing the plan."

  - Official responses to questions are available in hard copy.

Questions & Answers From CIP Version 1

- 13 Comments and Questions:
  - Prioritization Threshold
  - Ability to Execute
  - Status of Energy Management Type Projects
  - Study Type Projects (Possible Reclassification to O&M)
  - Revision of CIP Numbering System
  - Minor Variation in Projected Expenses Between Tables
  - Suggestions: Lower Project Thresholds in Chapter 1 & Remove Canceled, Closed-Out and Reclassified Projects from Summary Tables
  - Errors: Spelling of a Road Name Spelling & CIP Table Header mislabeled
  - Project Specific Questions: 114007, SPW Activated Carbon System & 132011, West Service Center – Energy Management: VFD Installation
  - Programs & Allowances with Project Roll-ups

Highlighted Water CIP Projects

Grant Gartrell

GLWA
Great Lakes Water Authority

Criteria Used to Select Highlighted Water Projects

1. Decommissioning treatment at Northeast Water Plant
2. Right-sizing system capacity vs. water demands
3. Improving water transmission system redundancy
4. Addressing water system reliability

Highlighted Water Projects

CIP #	Project	Project Driver
116002	Raw Water Tunnel Rehabilitation	System Reliability
122004	96” Water Main Relocation	Transmission Redundancy
122016	Downriver Transmission Main Loop	Transmission Redundancy
122013	14 Mile Road Transmission Loop	Transmission Redundancy
122003	Water Works Park to Northeast Transmission System	Decommissioning NE
114013	Springwells Reservoir Fill Line Construction	Decommissioning NE
114002	Springwells Low-High Pump Station Improvements	System Reliability
132010	West Service Center Division Valve & Reservoir Upgrades	Decommissioning NE
132012	Ypsilanti Booster Station Improvements	System Reliability
115003	Water Works Park Condition Assessment	System Reliability

Projects Necessary to Decommission Treatment at Northeast WTP

122003 New Water Main Water Works Park to Northeast Water Plant
114013 Springwells Reservoir Fill Line Construction
116002 Raw Water Tunnel Rehabilitation
132010 West Service Center Division Valves Replacement
115003 Water Works Park Condition Assessment
115001 Water Works Park Yard Piping Replacement

Highlighted Water Projects

GLWA
Great Lakes Water Authority

CIP 116002

CIP Number:	116002
Old CIP No.:	1327
Project Title:	**Pennsylvania, Springwells and Northeast Raw Water Supply Tunnel Improvements**
Project Status	Active
Budget:	Water
Classification Lvl 1:	Water
Classification Lvl 2:	Treatment Plants & Facilities
Classification Lvl 3:	General Purpose
Project Location:	City of Detroit

☐ Innovation
☐ Water MP Right Sizing
☐ Reliability/Redundancy

Project Score

Crown cracks are especially concerning in the Springwells Raw Water Tunnel

Project Significance:	Project critical to production at Springwells WTP during repurposing of Northeast WTP as recommended by the 2015 WMPU. Contract CS-1623 identified problem areas on the raw water supply system that compromised the system's ability to meet demands during the repurposing of Northeast WTP.
Project Engineer/Manager:	Todd King
Manager:	Grant Gartrell
Scope of Work:	The scope of work is to conduct supplemental investigations to design the repairs for the sections of tunnel identified in CS-1623 as having structural concerns. Three areas were identified with the highest concern being a portion of the Springwells Tunnel near the Springwells WTP.
Challenges:	The tunnels are approximately 80 feet below the surface of the Detroit River. This poses challenges for assessing the extent of damage to the structures, as well as repair. Dewatering the tunnels to repair them will create extensive stresses that must be considered prior to performing the work. Maintaining a supply of raw water to Springwells, Northeast and Water Works Park throughout construction to meet finished water production requirements/demands of the system. Specialized/complicated construction.

CIP 116002 Raw Water Tunnel Rehabilitation

Project Information

- Active
- Phase: construction
- Project Delivery: progressive design-build
- Contract: DB-150
- Initial Contract Amount: $10-million
- Estimated to finish at $34-million
- GLWA Project Manager: Todd King

Project Significance and Scope

Project Significance:

- Severe cracking and tunnel ovality were discovered during a recent condition assessment
- Severity of cracks raises concern of tunnel collapse

Scope of Work:

- Rehabilitate the stressed and severely cracked segments of the Northeast, Pennsylvania and Springwells raw water tunnels

CIP 116002 Raw Water Tunnel Rehabilitation

Springwells Tunnel Crack

Springwells Tunnel Cracking

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CIP 116002 Raw Water Tunnel Rehabilitation

Cracking in Northeast Tunnel

Pennsylvania Tunnel Invert Crack

GLWA
Great Lakes Water Authority

CIP 122004

CIP Number:	122004
Old CIP No.:	1321
Project Title:	96-inch Main Relocation, Isolation Valves Installations, and New Parallel Main
Project Status	Active
Budget:	Water
Classification Lvl 1:	Water
Classification Lvl 2:	Field Services
Classification Lvl 3:	Transmission System
Project Location:	Multiple Counties

- ☐ Innovation
- ☐ Water MP Right Sizing
- ☑ Reliability/Redundancy

Project Score 65.2

Map of the 96-inch main relocation away from the landfill

Project Significance:	Project critical to providing redundancy to Lake Huron WTP supply and protection of water supply from potential contamination. Project includes relocation around existing landfill and addition of a parallel main with interconnection to meters between Romeo and 24 Mile Road.
Project Engineer/Manager:	Grant Gartrell
Manager:	Grant Gartrell
Scope of Work:	Relocate 2.5 miles of 96-inch transmission main currently located in an EPA NPL landfill, a portion of which is submerged in landfill leachate. Relocation includes crossing the Clinton River, coordination with many various authorities having jurisdiction and easement acquisition. Isolation valve installation portion of the project provides the ability to isolate segments of the 96-inch main between Imlay Station and North Service Center for maintenance while maintaining customer expected level of service.
Challenges:	Shutdown, isolation and live tapping of the 96" main while maintaining the Lake Huron WTP supply and operations of Rochester Station. Routing and possible property acquisition for both the parallel main and relocation around the landfill.

CIP 122004 96” Water Main Relocation

Project Information

- Active
- Phase: study
- Project Delivery: design-bid-build
- Contract: CS-165
- Contract Amount: $139-million (est.)
- GLWA Project Manager: Grant Gartrell

Project Significance & Scope

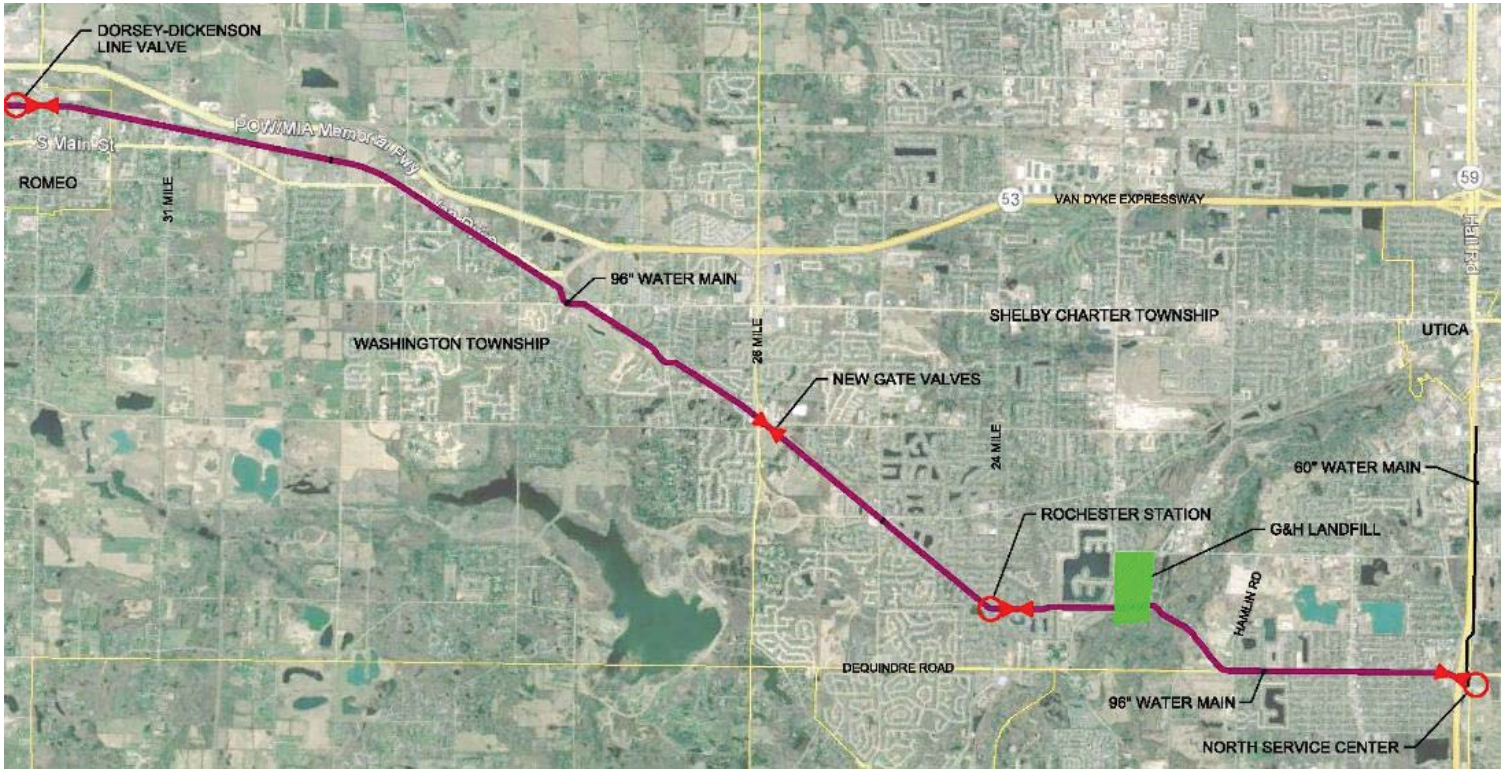
Project Significance:

- Relocate main out of closed landfill
- Provide redundancy to customers served by 96” water main

Scope:

- Install 13,500 feet of new 96” water main
- Install 4 new isolation valves with large by-passes at master meter locations and at North Service Center Pumping Station
- Upsize suction feed to Rochester Booster Pumping Station

CIP 122004 96” Water Main Relocation



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CIP 122004 96” Water Main Relocation

GLWA
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CIP 122016

CIP Number: 122016
Old CIP No.:
Project Title: Downriver Transmission Main Loop

Project Status	New
Budget:	Water
Classification Lvl 1:	Water
Classification Lvl 2:	Facilities
Classification Lvl 3:	Transmission System
Project Location:	Wayne County - Outside Detroit

- ☐ Innovation
- ☐ Water MP Right Sizing
- ☑ Reliability/Redundancy

Project Score 58.4

Example transmission main

Project Significance: The Downriver Transmission Main that currently serves Brownstown, Riverview, Woodhaven, Trenton, Flat Rock, Gibraltar, Rockwood, South Rockwood, and Berlin Township is a single feed transmission system. If a disruption to service were to occur on this transmission main, many of the users along this main would experience a complete loss of pressure and flow. This project would provide a transmission main loop to the Downriver system to increase redundancy on this branch of the system.

Project Engineer/Manager: Timothy Kuhns

Manager: Grant Gartrell

Scope of Work: Install approximately 6 Miles of 16-inch transmission main and 3 Miles of 24-inch transmission main from along the Electric Avenue corridor to parallel the existing transmission system in this branch of the system.

Challenges: Assuming ownership of the 24-inch transmission main through the City of Trenton may require condition assessment of this portion of pipeline.

CIP 122016 Downriver Transmission Main Loop

Project Information

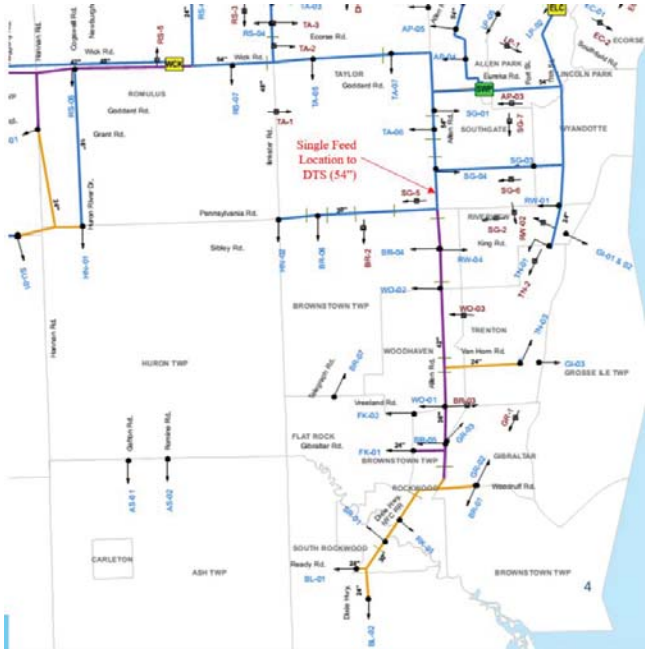
- Upcoming
- Phase: design
- Project Delivery: design-bid-build
- Contract: TBD
- Contract Amount: $34-million (est.)
- GLWA Project Manager: Tim Kuhns
- Project Significance: Downriver transmission system is single feed system with no transmission redundancy.

Scope of Work

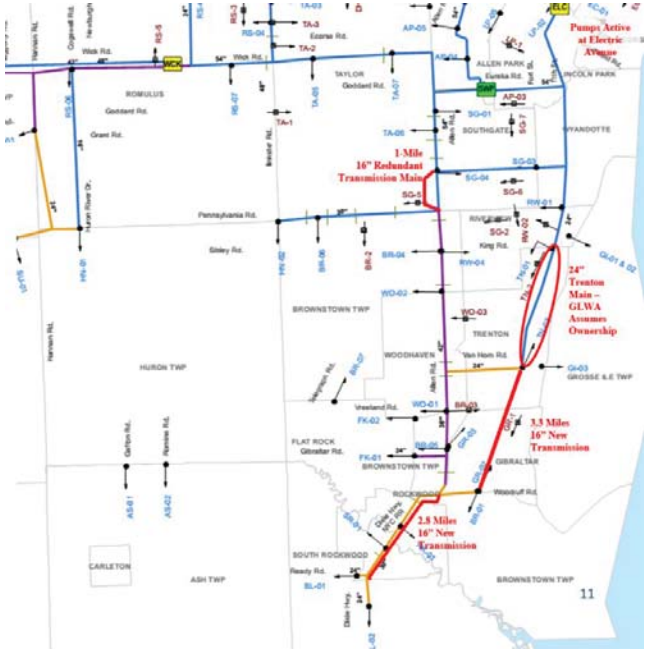
- Pump replacement at Electric Avenue
- 16-inch transmission main - Allen Road
- GLWA to inspect/rehab/assume ownership of 24-inch transmission through Trenton
- 16-inch transmission main between Van Horn and Woodruff
- 16-inch transmission between Woodruff and Ready Road

CIP 122016 Downriver Transmission Main Loop

Existing System



Proposed Loop



GLWA
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CIP 122013

CIP Number:	**122013**
Old CIP No.:	1405
Project Title:	**14 Mile Transmission Main Loop**
Project Status	Future Planned
Budget:	Water
Classification Lvl 1:	Water
Classification Lvl 2:	Facilities
Classification Lvl 3:	Transmission System
Project Location:	Oakland County

☐ Innovation

☐ Water MP Right Sizing

☑ Reliability/Redundancy

Project Score **58.4**

Project Significance:	The 14 Mile Transmission Main that currently serves West Bloomfield Township, Farmington Hills, Commerce Township, Novi, Walled Lake, and Wixom is a single feed transmission system. If a disruption to service were to occur on this transmission main, many of the users along this main would experience a complete loss of pressure and flow. This project would provide a transmission main loop to the 14 Mile system to increase redundancy on this branch of the system.
Project Engineer/Manager:	Timothy Kuhns
Manager:	Grant Gartrell
Scope of Work:	Install approximately 6 Miles of 48-inch transmission main from 8 Mile Road to 14 Mile Road along Haggerty Road. The work will also include connections to the yard piping and reservoir fill line at the Haggerty Booster Station as well as a control valve to regulate flows along the transmission main.
Challenges:	Routing and construction staging for the proposed piping in the vicinity of the Haggerty and 8 Mile Intersection appears to be a significant challenge as this intersection is one of the highest traffic volume intersections in Southeast Michigan.

CIP 122013 14 Mile Transmission Loop

Project Information

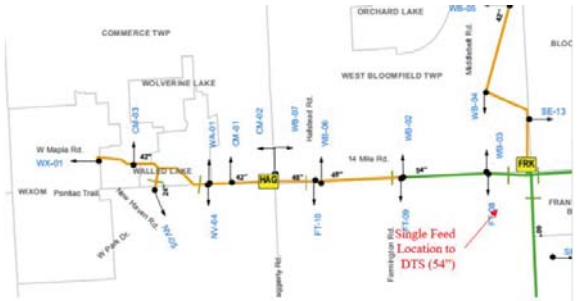
- Upcoming
- Phase: design
- Project Delivery: design-bid-build
- Contract: TBD
- Contract Amount: $49-million (est.)
- GLWA Project Manager: Tim Kuhns
- Project Significance: 14 Mile transmission system is single feed system with no transmission redundancy.

Scope of Work

- Transmission Main Loop from 8 Mile to 14 Mile along Halsted/Haggerty Corridor
- Transmission Main reinforcement from west of M-5 to Decker Road along 14 Mile.

CIP 122013 14 Mile Transmission Loop

Existing System

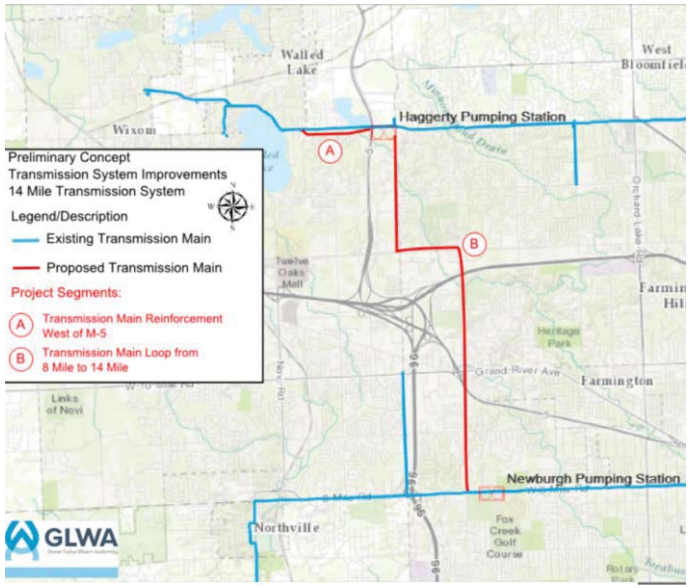


Service Management Plan • Section 7

Table 7-13: Wholesale Customers Served by Single Transmission Mains

High Priority Master Meters*	All Master Meters on the Single line	Single Main	Whole 2035 Population Served	Whole Average Day Demand 2035 (MGD)	Master Plan Conclusion
WAMR_CM02, WAMR_CM01, WAMR_WA01, WAMR_NV04, WAMR_CM03, WAMR_NV05,WAMR_WX01	WAMR_FT08, WAMR_WB03, WAMR_FT09, WAMR_WB02, WAMR_FT10, WAMR_WB06, WAMR_WB07, WAMR_CM02, WAMR_CM01, WAMR_WA01, WAMR_NV04, WAMR_CM03, WAMR_NV05,WAMR_WX01	From Haggerty Station To Wixom	150,256	18.5	Investigate the use of adjacent community water systems during an emergency along 14 Mile Road west of the Franklin Station. The emergency plan should include the Haggerty and Franklin reservoir supplies.
	WAMR_BR06,				

Proposed Loop



GLWA Great Lakes Water Authority

CIP 122013 14 Mile Transmission Loop

Project Information

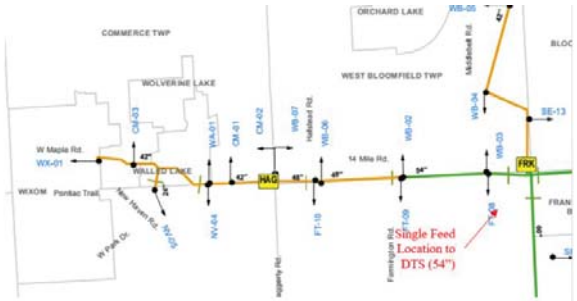
- Upcoming
- Phase: design
- Project Delivery: design-bid-build
- Contract: TBD
- Contract Amount: $49-million (est.)
- GLWA Project Manager: Tim Kuhns
- Project Significance: 14 Mile transmission system is single feed system with no transmission redundancy.

Scope of Work

- Transmission Main Loop from 8 Mile to 14 Mile along Halsted/Haggerty Corridor
- Transmission Main reinforcement from west of M-5 to Decker Road along 14 Mile.

CIP 122013 14 Mile Transmission Loop

Existing System

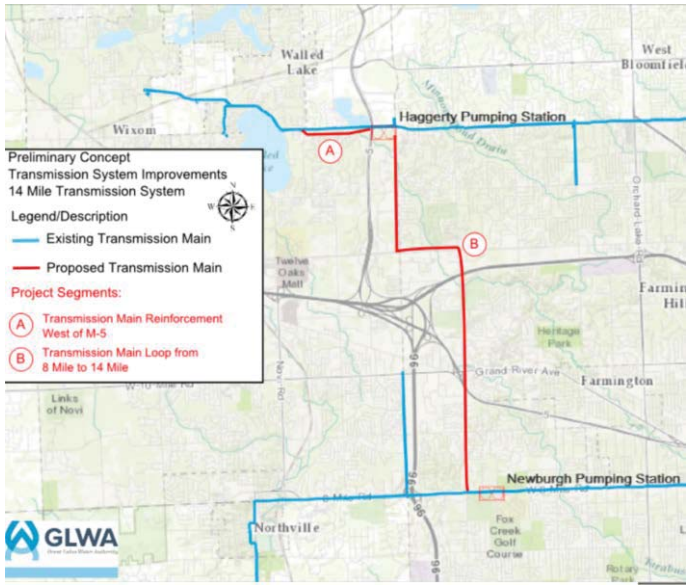


Service Management Plan • Section 7

Table 7-13: Wholesale Customers Served by Single Transmission Mains

High Priority Master Meters*	All Master Meters on the Single line	Single Main	Whole 2035 Population Served	Whole Average Day Demand 2035 (MGD)	Master Plan Conclusion
WAMR_CM02, WAMR_CM01, WAMR_WA01, WAMR_NV04, WAMR_CM03, WAMR_NV05,WAMR_WX01	WAMR_FT08, WAMR_WB03, WAMR_FT09, WAMR_WB02, WAMR_FT10, WAMR_WB06, WAMR_WB07, WAMR_CM02, WAMR_CM01, WAMR_WA01, WAMR_NV04, WAMR_CM03, WAMR_NV05,WAMR_WX01	From Haggerty Station To Wixom	150,256	18.5	Investigate the use of adjacent community water systems during an emergency along 14 Mile Road west of the Franklin Station. The emergency plan should include the Haggerty and Franklin reservoir supplies.
	WAMR_BR06,				

Proposed Loop



GLWA Great Lakes Water Authority

CIP 122003

CIP Number: 122003
Old CIP No.: 1305
Project Title: Waterworks Park WTP to Northeast WTP Transmission Main

Project Status Active
Budget: Water
Classification Lvl 1: Water
Classification Lvl 2: Field Services
Classification Lvl 3: Transmission System
Project Location: City of Detroit

- ☐ Innovation
- ☑ Water MP Right Sizing
- ☑ Reliability/Redundancy

Project Score 62.4

NONE

Project Significance: New Transmission System needed to convey finish water to re-purposed Northeast WTP.
Project Engineer/Manager: Timothy Kuhns
Manager: Grant Gartrell
Scope of Work: GLWA system has excess treatment capacity. In order to right-size system capacity and avoid future treatment upgrade, treatment is to be discontinued at the Northeast WTP. In order to discontinue treatment at Northeast, a new finish water supply from Waterworks Park to Northeast is needed.
Challenges: Route determination, utility conflicts and connections to yard piping at Northeast and Water Works Park WTPs. The large new main will cross I-94 and run through 7 miles of residential/commercial streets.

GLWA Great Lakes Water Authority

CIP 122003 Water Works Park to Northeast Transmission System

Project Information

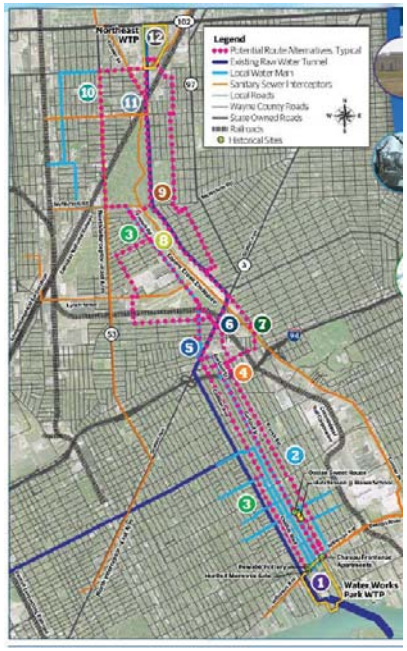
- Active
- Phase: Study
- Project Delivery: TBD
- Contract: TBD
- Contract Amount: $128-million (est.)
- GLWA Project Manager: Tim Kuhns
- Project Significance: A new finished water transmission main is needed from Water Works Park to Northeast to decommission treatment at Northeast

Scope of Work

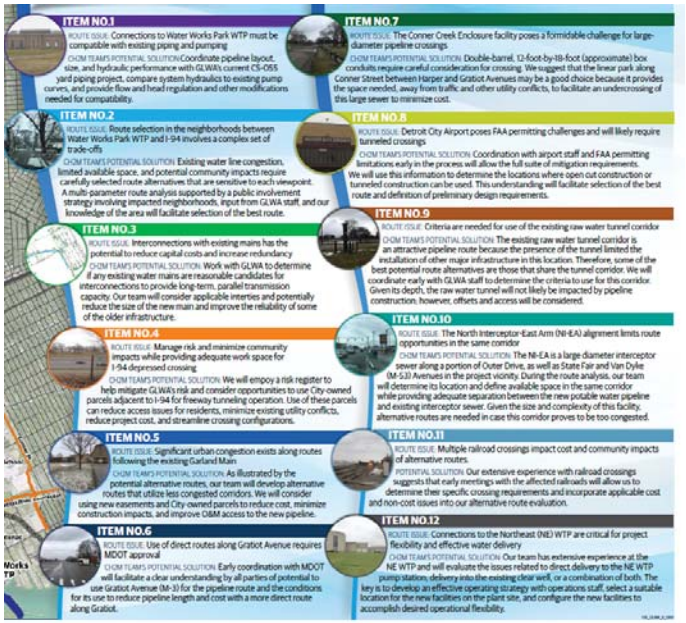
- Approximately 37,000 feet of 72-84” Transmission Main from Water Works Park to Northeast.

CIP 122003 Water Works Park to Northeast Transmission System

Route Alternatives



Route Challenges



GLWA
Great Lakes Water Authority

CIP 114013

CIP Number:	114013
Old CIP No.:	1389
Project Title:	**SPW WTP Reservoir Fill Line Improvements**
Project Status	Active
Budget:	Water
Classification Lvl 1:	Water
Classification Lvl 2:	Treatment Plants & Facilities
Classification Lvl 3:	Springwells
Project Location:	Wayne County - Outside Detroit

☐ Innovation

☑ Water MP Right Sizing

☑ Reliability/Redundancy

Project Score 77.2

Springwells WTP

Project Significance:	Reservoir fill line to Springwells is needed to provide finished water to the Springwells high service area from Southwest and Waterworks Park while the Springwells raw water tunnel is out of service for repairs and during times when the Springwells Low Lift Station is taken offline for inspections, repairs or maintenance.
Project Engineer/Manager:	Erich Klun
Manager:	Grant Gartrell
Scope of Work:	Reservoir fill line to Springwells is needed to provide finished water to the Springwells high service area from Southwest and Waterworks Park while the Springwells raw water tunnel is out of service for repairs.
Challenges:	Very complicated sequence of construction, and coordination with wholesale customers is required.

CIP 114013 Springwells Reservoir Fill Line Improvements

Project Information

- Active
- Phase: Bidding for Construction
- Project Delivery: design-bid-build
- Contract: CS-038
- Contract Amount: $298,871.00
- Percent Complete: 60%
- GLWA Project Manager: Erich Klun
- Review Committee Score:
- Project Significance: allows Springwells high pressure demands to be maintained when raw water supply or low lift pumping is out of service

Scope of Work

- Construction of valve vault housing energy dissipating valves (plunger type)
- Isolation and connection to original 1930s-era riveted steel piping in Warren Ave. right-of-way
- Isolation and connection to Reservoir No. 1
- Rigorous field acceptance/performance testing to ensure system reliability
- Finished water to be supplied from the intermediate pressure system from Southwest and Water Works Park WTPs

CIP 114013 Springwells Reservoir Fill Line Improvements

Condition of Rivets and Coating on 1930s-Era Buried Piping

Condition of Existing 1930s-Era Connecting Flange

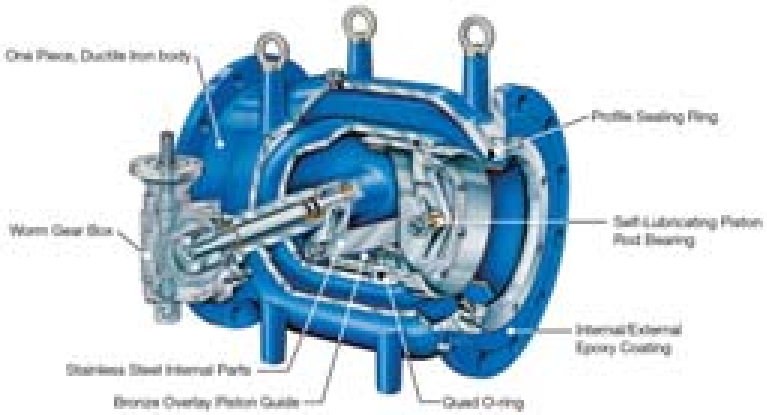
GLWA
Great Lakes Water Authority

CIP 114013 Springwells Reservoir Fill Line Improvements

Typical GLWA Reservoir Fill (Energy Dissipating) Valve

Cone Valve

Proposed Plunger Valve



Plunger Valve

GLWA Great Lakes Water Authority

CIP 114002

CIP Number:	114002
Old CIP No.:	1071
Project Title:	**SPW WTP Low Lift and High Lift Pump Station**
Project Status	Active
Budget:	Water
Classification Lvl 1:	Water
Classification Lvl 2:	Treatment Plants & Facilities
Classification Lvl 3:	Springwells
Project Location:	Wayne County - Outside Detroit

☐ Innovation

☑ Water MP Right Sizing

☐ Reliability/Redundancy

Project Score 69.2

High Lift Station viewed from Low Lift Station operating floor showing high lift pump pits and windows to be replaced.

Project Significance:	Existing low & high lift pumping system electrical is original, unsafe, not reliable, and is oversized for current & projected demands. New and/or rehabilitated pumping system equipment is needed.
Project Engineer/Manager:	Erich Klun
Manager:	Grant Gartrell
Scope of Work:	The electrical gear at the Springwells WTP high and low lift stations is old and parts are no longer available. The outdated equipment also poses safety issues. Furthermore, the pumps may be right-sized to provide more efficient pumping systems.
Challenges:	Extremely complicated sequence of construction required to replace electrical gear while maintaining system demands throughout construction. During construction, new costly equipment will be operating next to existing equipment/facilities to be demolished

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CIP 114002 Springwells Low-High Pump Improvements

Project Information

- Active
- Phase: Design
- Project Delivery: design-bid-build
- Contract: TBD
- Contract Amount: $85-million (est.)
- GLWA Project Manager: Erich Klun
- Project Significance: replacement of obsolete medium voltage electrical gear, right-sizing of pumping systems and architectural improvements

Scope of Work

- Investigate alternative pump types, arrangements and rehab options
- Replace medium voltage switchgear
- Investigate and apply variable speed pumping, if appropriate
- Replace exterior windows and doors to protect new equipment and buildings
- Improve Pump House ventilation and atmospheric conditions
- Modernize and provide most efficient pumping systems possible

CIP 114002 Springwells Low-High Pump Improvements

Interior of the Pump House Showing Eight High Lift Pump Pits

View of Low Lift Station Motor Floor Showing Floor Access to Low Lift Pumps Below

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CIP 114002 Springwells Low-High Pump Improvements

View of High Lift Pump with Top Half of Casing Removed

View of Same Pump From Above Showing Pump Internals and Possible Pump Rehabilitation

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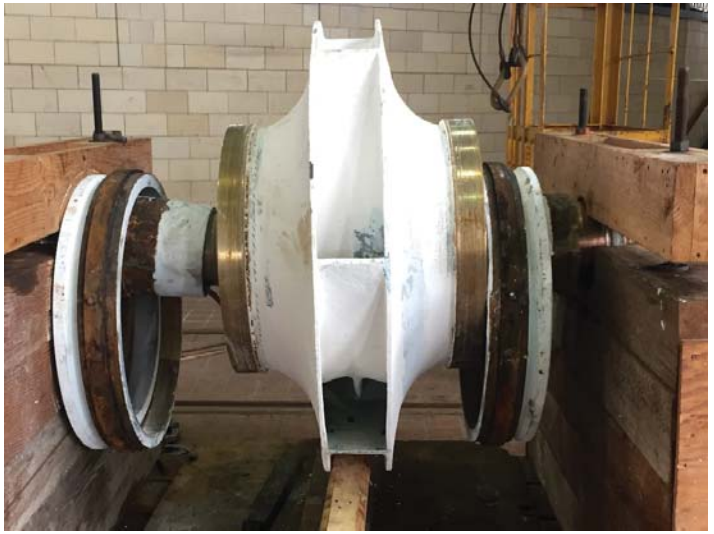
CIP 114002 Springwells Low-High Pump Improvements

View of Inside of Top Half of High Lift Pump Casing

View of Existing High Lift Pump Impeller Removed for Repairs



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CIP 132010

CIP Number:	132010
Old CIP No.:	1336
Project Title:	**West Service Center PS - Duval Rd Division Valve Upgrades**
Project Status	Future Planned
Budget:	Water
Classification Lvl 1:	Water
Classification Lvl 2:	SCC
Classification Lvl 3:	Pump Station/Reservoir
Project Location:	Oakland County

☐ Innovation

☐ Water MP Right Sizing

☐ Reliability/Redundancy

Project Score 54

Project Significance:	Construction of West Service Center Division Valves is needed to convey Lake Huron flows through the West Service Center to the Springwells high service area while the Springwells raw water tunnel is out of service for repairs. Construction of active bypass around the Newburgh Pump Station.
Project Engineer/Manager:	Timothy Kuhns
Manager:	Grant Gartrell
Scope of Work:	Lake Huron WTP needs to provide flows to the Springwells high service area while the Springwells raw water tunnel is out of service for repair.
Challenges:	Coordination with operations critical meet testing of existing valves. Isolation, shutdown and operation of Lake Huron and Springwells WTPs, North Service Center, and other facilities.

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CIP 132010 West Service Center Division Valve and Reservoir Upgrades

Project Information

- Active
- Phase: Study
- Project Delivery: TBD
- Contract: TBD
- Contract Amount: $37-million (est.)
- GLWA Project Manager: Tim Kuhns
- Project Significance: Division valve upgrades are needed to provide service to Springwells high pressure system from Lake Huron. Reservoir replacement is needed to rapidly deteriorating reservoirs.

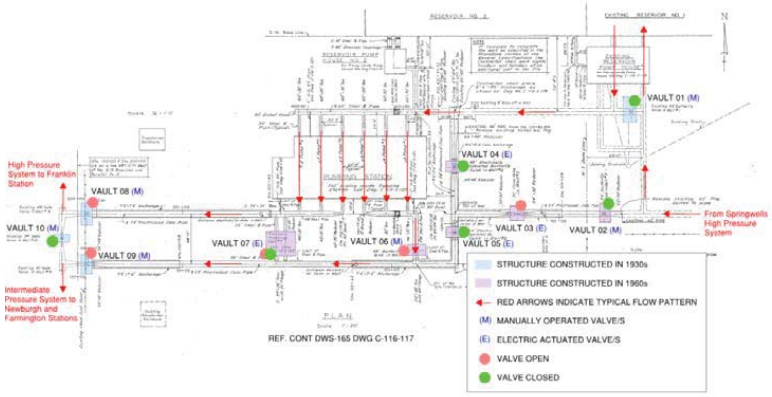
Scope of Work

- 10-million gallon reservoir
- Upgrades to all yard division valves
- Reservoir Pump House

CIP 132010 West Service Center Division Valve and Reservoir Upgrades

Existing Site

Division Valves



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CIP 132012

CIP Number:	132012
Old CIP No.:	
Project Title:	Ypsilanti PS Improvements
Project Status	New
Budget:	Water
Classification Lvl 1:	Water
Classification Lvl 2:	SCC
Classification Lvl 3:	Pump Station/Reservoir
Project Location:	Wayne County - Outside Detroit

☐ Innovation

☐ Water MP Right Sizing

☐ Reliability/Redundancy

Project Score 61.2

Ypsilanti Pump Station

Project Significance:	Ypsilanti does not have a generator and needs one in the event of a power outage in order to help maintain pressures. The pumps, motors and electrical system are original to the facility and are past their useful service life. The electrical system requires substantial maintenance to keep it in service. Replacement of the motors and electrical system will improve the reliability of the station. In addition, the station does not have a sewer discharge, which is required in order to enable any underground construction due to dewatering discharges.
Project Engineer/Manager:	Eric Kramp
Manager:	Grant Gartrell
Scope of Work:	Replace pumps, motors, drive, switchgear with new. Install a new discharge sewer, backup generator and bypass for the station.
Challenges:	Contaminated groundwater at the site. No existing sanitary, storm or combined sewer at the site. A NPDES permit will be required to discharge treated groundwater to a surface water of the state for all construction dewatering operations.

CIP 132012 Ypsilanti Pump Station Improvements

Project Information

- Not started
- Project Delivery: design-bid-build
- Contract: to be determined
- Contract Amount: $9-million (est.)
- GLWA Project Manager: Eric Kramp
- Project Significance: Existing station lacks backup power generator and its mechanical and electrical equipment are beyond their useful service life. New equipment will improve station reliability

Scope of Work

- Install new backup power generator
- Replace existing pumps, motors, valves, valve operators, and variable speed drives with variable frequency drives
- Replace existing electrical switchgear and motor control centers
- Replace existing 36-inch diameter yard valve and install 400 feet of yard piping for passive bypass
- Install new septic system

CIP 132012 Ypsilanti Pump Station Improvements

Switchgear & Pumping Units

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CIP 115003

CIP Number:	115003
Old CIP No.:	1301
Project Title:	WWP WTP Comprehensive Condition Assessment
Project Status	Active
Budget:	Water
Classification Lvl 1:	Water
Classification Lvl 2:	Treatment Plants & Facilities
Classification Lvl 3:	Water Works Park
Project Location:	City of Detroit

☐ Innovation

☐ Water MP Right Sizing

☐ Reliability/Redundancy

Project Score 35.6

Waterworks Park WTP

Project Significance:	A condition assessment of Waterworks Park Water Treatment Plant has not been completed since the 2004 reconstruction. Condition assessment is needed to identify critical assets in need of repair or replacement.
Project Engineer/Manager:	Grant Gartrell
Manager:	Grant Gartrell
Scope of Work:	A condition assessment of Waterworks Park Water Treatment Plant has not been completed since the 2004 reconstruction. Continued and periodic inspection of the Water Treatment Plant is needed to maintain a reliable production system, especially given the reliance on Waterworks Park to provide finish water to the Northeast Service Area.
Challenges:	Coordinating shutdowns required for condition assessment inspections.

CIP 115003 Water Works Park Water Plant (WWP) Condition Assessment

Project Information

- Active
- Phase: study
- Contract: CS-147
- Contract Amount: $546,482
- GLWA Project Manager: Grant Gartrell
- Project Significance: WWP has been in service for 15 years and is the most technically advanced and complicated GLWA water plant.

Scope of Work

- Project Significance – continued: Its average day demand will be nearly doubled in the coming years as treatment is decommissioned and reduced at other facilities. Therefore, this assessment will identify possible needed improvements so that it will reliably treat greater average day flows in the future.
- Scope of Work: multi-disciplinary assessment of the entire facility.

CIP 115003 Water Works Park Water Plant (WWP) Condition Assessment

Screen House

Raw Water Screens

Low-Lift Pumping Units

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CIP 115003 Water Works Park Water Plant (WWP) Condition Assessment

Electrical Switchgear for Low Lift Motors

Chemical Storage Tanks & Feed Pumps

Chemical Flash Mixing Units

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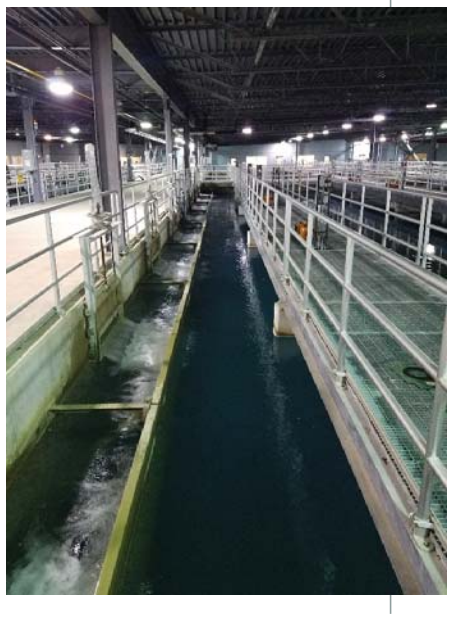
CIP 115003 Water Works Park Water Plant (WWP) Condition Assessment

Flocculation Units



Filter Gallery Piping

High-Lift Pumping Station

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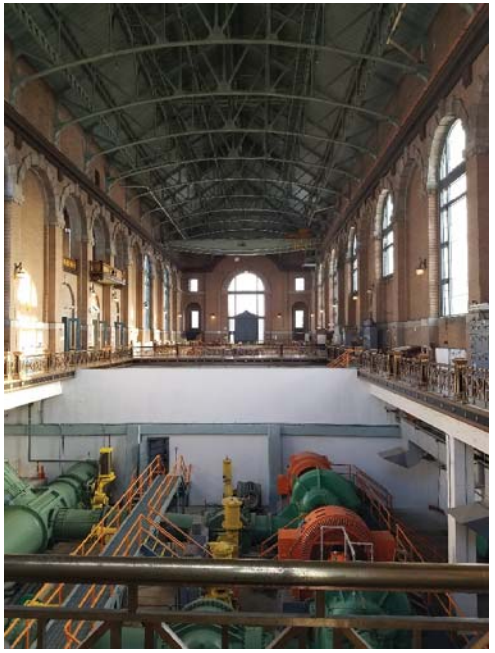
CIP 115003 Water Works Park Water Plant (WWP) Condition Assessment

High Lift Pumping Units

Interior of High Lift Pumping Station



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CIP Alignment With The Financial Plan

Cost Allocation

Cost Allocation	Projected Capital Expenditures FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Total FYs 2019-2023	Percent of Five Year Total
Water							
Common-to-all	$ 61,425	$ 133,893	$ 152,044	$ 174,303	$ 171,074	$ 692,739	97%
Suburban Only	4,613	3,690	3,690	3,997	4,100	20,090	3%
Grand Total	**$ 66,038**	**$ 137,583**	**$ 155,734**	**$ 178,300**	**$ 175,174**	**$ 712,829**	**100%**

Cost Allocation	Projected Capital Expenditures FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Total FYs 2019-2023	Percent of Five Year Total
Wastewater							
Common-to-all	$ 91,905	$ 97,173	$ 95,193	$ 109,140	$ 143,107	$ 536,518	85%
OMID	-	-	13,408	22,920	16,000	52,328	8%
CSO 83/17	9,277	6,218	2,351	4,351	9,351	31,548	5%
Industrial Waste Control	4,001	7,764	1,000	-	-	12,765	2%
Grand Total	**$ 105,183**	**$ 111,155**	**$ 111,952**	**$ 136,411**	**$ 168,458**	**$ 633,159**	**100%**

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Capital Outlay vs. Capital Improvement Plan

Category	Capital Outlay < $5,000	Capital Outlay > $5,000	Capital Outlay > $5,000 – Specific I&E	Capital Improvement Plan – Strategic I&E	Capital Improvement Plan - Bonds
Funding Source	Operations & Maintenance	Operations & Maintenance	Improvement & Extension Fund	Improvement & Extension Fund	Construction Bond Fund
Rationale	Tagged and tracked for internal asset control purposes (not capitalized)	Efficiencies in budget control and procurement	Isolate items that cause variability in the annual financial plan that do not meet the criteria for CIP	Lower the cost of capital by funding the CIP with Revenue Financed Capital versus bond financing	Constructed Assets
Frequency	Recurring in nature	Recurring in nature	Unique, nonrecurring, purchases, and/or large dollar assets on a replacement program	Project specific	Project Specific
Life	> One Year	> One Year	> One Year	> 20 years	> 20 years
Examples	Tools, Smartboards, Small Equipment	Pumps, motors, and equipment	Vehicles, large equipment, security and information technology systems	Infrastructure, plant, and facility upgrade, rehabilitation, and/or replacement	Infrastructure, plant, and facility upgrade, rehabilitation, and/or replacement
Justification	Internal review panel	Internal review panel, prioritization, replacement validation with asset records	Internal review panel, prioritization, replacement validation with asset records	Business Case Evaluation; Internal Review Panel; Customer Outreach; GLWA Board Committee	Business Case Evaluation; Internal Review Panel; Customer Outreach; GLWA Board Committee
Procurement Impact	Low – recurring in nature; shorter lead time to bid	Low – recurring in nature; shorter lead time to bid	Medium – specialized resources; additional lead time for RFx; may need evaluation panel	High - specialized resources; additional lead time for RFx; evaluation panel required	High - specialized resources; additional lead time for RFx; evaluation panel required

Life of Asset – Basis for Optimizing Resources

Asset Life Range	Projected Capital Expenditures FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Total FYs 2019-2023	Percent of Five Year Total
Water							
<20 years	$ 13,172	$ 11,209	$ 12,565	$ 11,280	$ 12,007	$ 60,233	8%
>20 years	52,866	126,374	143,169	167,020	163,167	652,596	92%
Grand Total	**$ 66,038**	**$ 137,583**	**$ 155,734**	**$ 178,300**	**$ 175,174**	**$ 712,829**	**100%**

Asset Life Range	Projected Capital Expenditures FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Total FYs 2019-2023	Percent of Five Year Total
Wastewater							
<20 years	$ 8,312	$ 10,882	$ 13,659	$ 10,852	$ 12,280	$ 55,985	8.8%
>20 years	96,871	100,273	98,293	125,559	156,178	577,174	91%
Grand Total	**$ 105,183**	**$ 111,155**	**$ 111,952**	**$ 136,411**	**$ 168,458**	**$ 633,159**	**100%**

Estimating Likelihood of Spend

Phase Status	Projected Capital Expenditures FY 2019	Status as % of Capital Expenditures FY 2019	Projected Capital Expenditures FY 2020	FY 2021	FY 2022	FY 2023	Total FYs 2019-2023
Water							
Active	$ 36,933	56%	$ 25,032	$ 14,954	$ 7,991	$ 9,215	$ 94,125
New	3,910	6%	7,667	9,444	15,744	31,786	68,551
Future Planned	25,192	38%	104,884	131,336	154,565	134,173	550,150
Pending Closeout	3	0%	-	-	-	-	3
Closed	-	0%	-	-	-	-	-
Grand Total	**$ 66,038**	**100%**	**$ 137,583**	**$ 155,734**	**$ 178,300**	**$ 175,174**	**$ 712,829**

Phase Status	Projected Capital Expenditures FY 2019	Status as % of Capital Expenditures FY 2019	Projected Capital Expenditures FY 2020	FY 2021	FY 2022	FY 2023	Total FYs 2019-2023
Wastewater							
Active	$ 61,040	58%	$ 40,386	$ 12,902	$ 2,250	$ 2,057	$ 118,635
New	-	0%	230	1,141	6,569	5,767	13,707
Future Planned	44,120	42%	70,539	97,909	127,592	160,634	500,794
Pending Closeout	23	0%	-	-	-	-	23
Grand Total	**$ 105,183**	**100%**	**$ 111,155**	**$ 111,952**	**$ 136,411**	**$ 168,458**	**$ 633,159**

GLWA Great Lakes Water Authority

Construction vs. Soft Costs (Water)

Phase Status	Projected Capital Expenditures FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Total FYs 2019-2023	Category as a Percent of Total FYs 2019-2023
Water							
C	$ 35,713	$ 93,456	$ 92,188	$ 76,011	$ 95,451	$ 392,819	55%
CA	398	110	97	10	-	615	0%
D	396	150	200	200	200	1,146	0%
D/C	1,000	1,000	3,000	3,000	3,000	11,000	2%
D/CA	5,140	6,986	5,783	7,256	4,717	29,882	4%
DB	16,012	28,871	49,770	88,673	68,527	251,853	35%
S	2,759	153	-	-	-	2,912	0%
S/D/C	-	188	229	1,064	1,682	3,163	0%
S/D/CA	4,620	6,669	4,467	2,086	1,597	19,439	3%
Grand Total	**$ 66,038**	**$ 137,583**	**$ 155,734**	**$ 178,300**	**$ 175,174**	**$ 712,829**	**100%**

Construction vs. Soft Costs (Sewer)

Phase Status	Projected Capital Expenditures FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Total FYs 2019-2023	Category as a Percent of Total FYs 2019-2023
Wastewater							
C	$ 69,322	$ 73,691	$ 78,227	$ 111,216	$ 141,659	$ 474,115	75%
CM	597	156	-	-	-	753	0%
D	137	892	2,936	1,288	908	6,161	1%
D/C	2,456	4,951	2,351	4,351	9,351	23,460	4%
D/CA	597	543	494	-	-	1,634	0%
DB	16,327	12,053	10,187	10,187	10,187	58,941	9%
S	-	-	1,110	340	90	1,540	0%
S/D/C	9,100	9,160	1,760	1,255	1,439	22,714	4%
S/D/CA	6,647	9,709	14,887	7,774	4,824	43,841	7%
Grand Total	**$ 105,183**	**$ 111,155**	**$ 111,952**	**$ 136,411**	**$ 168,458**	**$ 633,159**	**100%**

Strategic vs Specific Use of I&E Funds

- ✓ Striking the balance between bond proceeds and revenue financed capital will lower the cost of capital over the long-term.
- ✓ Revenue financed capital is budgeted for use only after it is received to minimize financial plan risk.
- ✓ When I&E funds are assigned to offset a portion of the costs of specific capital expenses, a transfer is made from the I&E Fund to the Construction Bond Fund.
- ✓ "Transfers from I&E Transfers" are labeled as specific or strategic.
  - "Specific" transfers relate to specifically identified projects (general soft costs for services at the study or design phase).
  - "Strategic" relates to outlining the potential use of Revenue Financed Capital to lower the amount of revenue bonds.
- ✓ Measuring this effort over time will inform stakeholders of the effectiveness of this approach.

Water CIP - Financial Plan

Category	FY 2018 Projected	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
	Financial Plan - Sources and Uses of Capital Spending					
Water Construction Bond Fund						
Revenue (Sources)						
Bond Proceeds	$ -	$ -	$ 145,000	$ -	$ 140,000	$ 145,000
Investment Earnings	-	743	462	408	252	500
Transfer In from I&E - Specific	10,315	13,172	11,209	12,565	11,280	12,007
Transfer In from I&E - Strategic	-	-	-	80,000	20,000	-
Total Revenue (Sources)	10,315	13,915	156,671	92,973	171,532	157,507
Expenses (Uses)						
Construction	30,231	52,431	123,229	143,924	167,582	167,665
Engineering Services	8,871	11,885	12,580	10,074	9,220	6,115
Internal Costs	941	1,722	1,774	1,736	1,498	1,394
Total Expenses (Uses)	40,043	66,038	137,583	155,734	178,300	175,174
Increase/(Decrease) in Reserves	(29,728)	(52,123)	19,088	(62,761)	(6,768)	(17,667)
Beginning Net Position	173,000	143,272	91,149	110,237	47,476	40,708
Ending Net Position	$ 143,272	$ 91,149	$ 110,237	$ 47,476	$ 40,708	$ 23,041

Sewer System – Financial Plan

Financial Plan - Sources and Uses of Capital Spending						
Category	FY 2018 Projected	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
Wastewater (Sewage Disposal) Construction Bond Fund						
Revenue (Sources)						
Bond Proceeds	$ -	$ -	$ 75,000	$ 135,000	$ -	$ 140,000
Investment Earnings	429	299	633	361	194	300
Revolving Fund and Other Loans	45,965	42,197	30,923	20,799	10,187	10,187
Transfer In from I&E - Specific	3,380	8,312	10,882	13,659	10,852	12,280
Transfer In from I&E - Strategic	-	-	5,000	-	5,000	5,000
Total Revenue (Sources)	49,774	50,808	122,438	169,819	26,233	167,767
Expenses (Uses)						
Construction	60,465	88,803	89,479	76,916	97,688	136,274
Engineering Services	4,953	8,001	13,290	15,639	9,184	6,630
Internal Costs	5,214	8,379	8,386	5,989	6,619	9,554
Other	-	-	-	13,408	22,920	16,000
Total Expenses (Uses)	70,632	105,183	111,155	111,952	136,411	168,458
Increase/(Decrease) in Reserves	(20,858)	(54,375)	11,283	57,867	(110,178)	(691)
Beginning Net Position	136,000	115,142	60,767	72,050	129,917	19,739
Ending Net Position	$ 115,142	$ 60,767	$ 72,050	$ 129,917	$ 19,739	$ 19,048

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Next Steps & Closing Remarks

Next Steps

Comments and questions are accepted throughout the remainder of this process. All feedback, comments and suggestions are welcomed!

Date	Description
October 2017	Review Committee Meetings
October 12, 2017	Executive Leadership Team Reviews BCE's & Modifications to CIP
October 24, 2017	Introduce New BCE's & Major CIP Modifications to AM/CIP Customer Outreach Work Group
November 2017	Executive Leadership Team Reviews BCE's & Modifications to CIP
December 15, 2017	First GLWA CIP Committee Review of CIP – Version 1
December 19, 2017	First Customer Review of CIP – Version 1 at Customer Charges Rollout Meeting #1
February 6, 2018	Second GLWA CIP Committee Review of CIP – Version 2
February 8, 2018	Second Customer Review of CIP – Version 2 at AM/CIP Customer Outreach Work Group
February 14, 2018	First GLWA Board Workshop for Review of CIP – Introduction
February 28, 2018	Second GLWA Board Meeting – Proposed CIP Adoption
March 14, 2018	Proposed Alternate GLWA Board Meeting for CIP Adoption
July 1, 2018	Effective Date of 2019-2023 CIP

GLWA Great Lakes Water Authority

Closing Remarks

- It's all about Continuous Improvement
- It's a work in progress……Your feedback is greatly appreciated!
- THANK YOU Karen Mondora, City of Farmington Hills and Sam Smalley, City of Detroit for actively participating in the Water and Wastewater Review Committees, respectively.
- THANK YOU to the Authorities Members for your comments, feedback and assistance in visualizing and identification of needed improvements!
- THANK YOU Team Members (Engineers, Finance Partners, etc.) for all of your hard work and effort you put into improving this document. We truly appreciate your patience with our continuously changing practices, targets and improvements.

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Questions

CIP Break-Out Session

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Meeting Results Form

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Have a Great Day!