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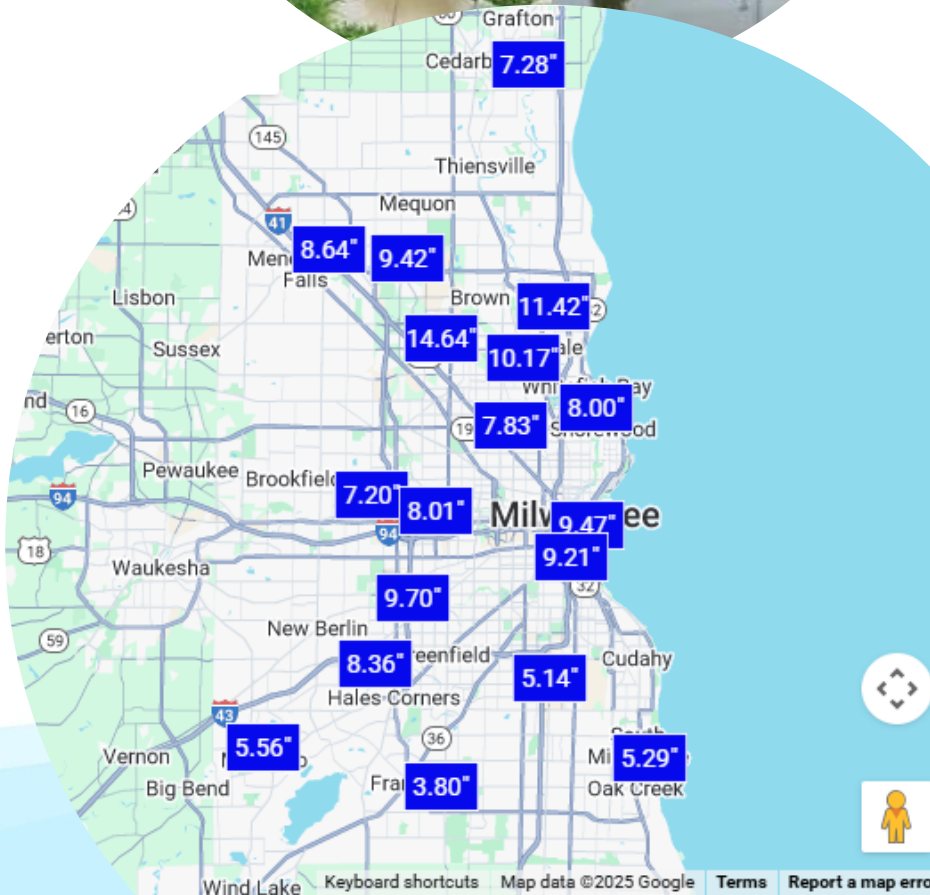
Resiliency Team Progress
GLWA Board of Directors

September 24, 2025 | Navid Mehram, P.E.

Another Bigger Storm

Southeast Wisconsin was hit by a record-breaking storm in early August 2025.

- Most extreme flooding since 2010
- Rainfall Totals
  - Peak 1-hour accumulation: 3.71” per hour
  - Peak 24-hour was 14.5” per day
  - 13” reported within 12 hours
- Design Storm Comparison (Milwaukee vs. Detroit):
  - 10-year, 1-hour: 1.91” (+0.2” vs Detroit)
  - 25-year, 24-hour: 4.52” (+0.5” vs Detroit)
- Annual precipitation was approximately 34.57”



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Communication and response

The **Milwaukee August flood** w
on August 9 and 10, causing sig
areas. The National Weather Se
locations receiving over 12 inch
leading to widespread damage
directly blamed, the flooding wa
conditions and inadequate drai
Milwaukee Magazine +3

MILWAUKEE INDEPENDENT

playground. City crews and
stormwater drain, but in ma
efforts moot.

'This was an intensity issue
to move it all out before it c

MICHIGAN

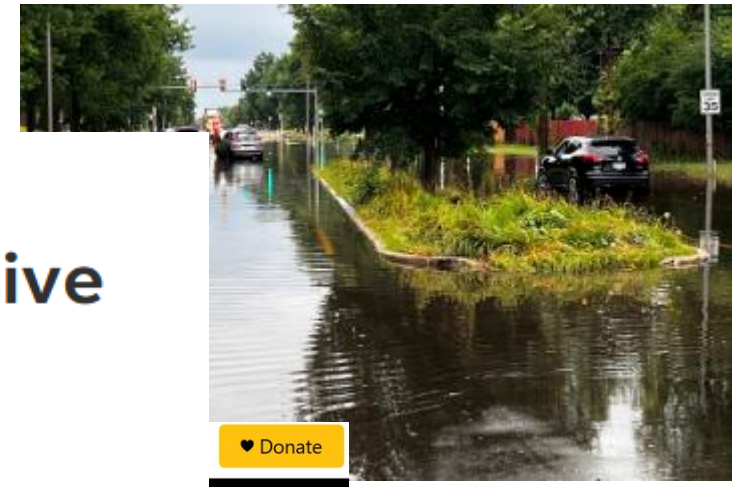
What caused last summer's massive floods? Probe of regional water authority released

Christine MacDonald
Detroit Free Press

Updated June 22, 2022, 7:33 p.m. ET

A heavy, historic rainstorm was primarily to blame for last summer's devastating floods in metro Detroit, although damage was "likely exacerbated" by electrical problems at two east-side pumping stations that reduced the ability to pump wastewater by more than a quarter, a panel of experts reported Wednesday.

Investigators used data and technical models to project what would have happened if the system managed by Great Lakes Water Authority (GLWA) worked "as intended" without electrical issues on June 25-26, 2021, when 6 to 8 inches of rain fell over a 24-hour period across the area.



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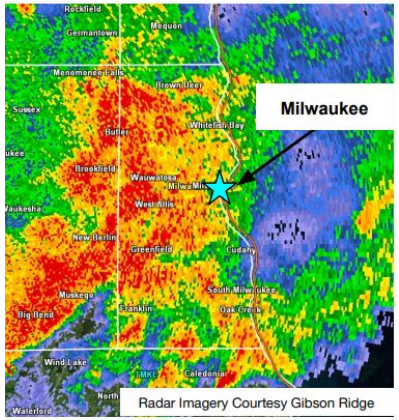
PM Radar Image 8/9/2025



Tosa Village Flooding
Credit: Milwaukee-Journal Sentinel

Image of cars in a flooded roadway near American Family Field. Credit: Wisconsin 511.

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Independent Investigation of 2021 Flooding Status of 33 Recommendations

18 of the measures have been **completed**	**13** of the measures are currently **in progress**	**2** of the measures have not started
78% short term, 46% of the medium term, 45% of the long term.	**8** will be completed **in the Regional Flood Mitigation Study** USACE.	The items not started are dependent on the completion of the projects currently in progress.

USACE - US Army Corps of Engineers

Executive Summary - Short Term Measures

Project Milestone	Project Status			
	Not Started	In Progress	Completed	Notes
Short Term Measures				
General Recommendation				
Pump availability during storm events.				GLWA completed monitoring the system closely to ensure no more than 1 pump is out of service at each station.
Pump Stations				
Testing of the Vacuum Priming System.				
Pump sequence testing.				
Operational documentation and communication.				This effort is complete. Several standard operating procedures (SOPs) have been implemented with some minor modifications.
Electric Equipment				
Power conversion from Public Lighting Department to DTE.				
Back up generator measures.				This measure is complete, and recommendations are being evaluated for implementation.
Confirm that the power supply for each DTE can support the entire station.				This review is incorporated into the larger electrical resiliency project.
Mechanical Equipment				
Conner Pumpstation Seal Water System.				This work has been completed.
Vacuum Priming System upgrade.				Start up and commissioning.

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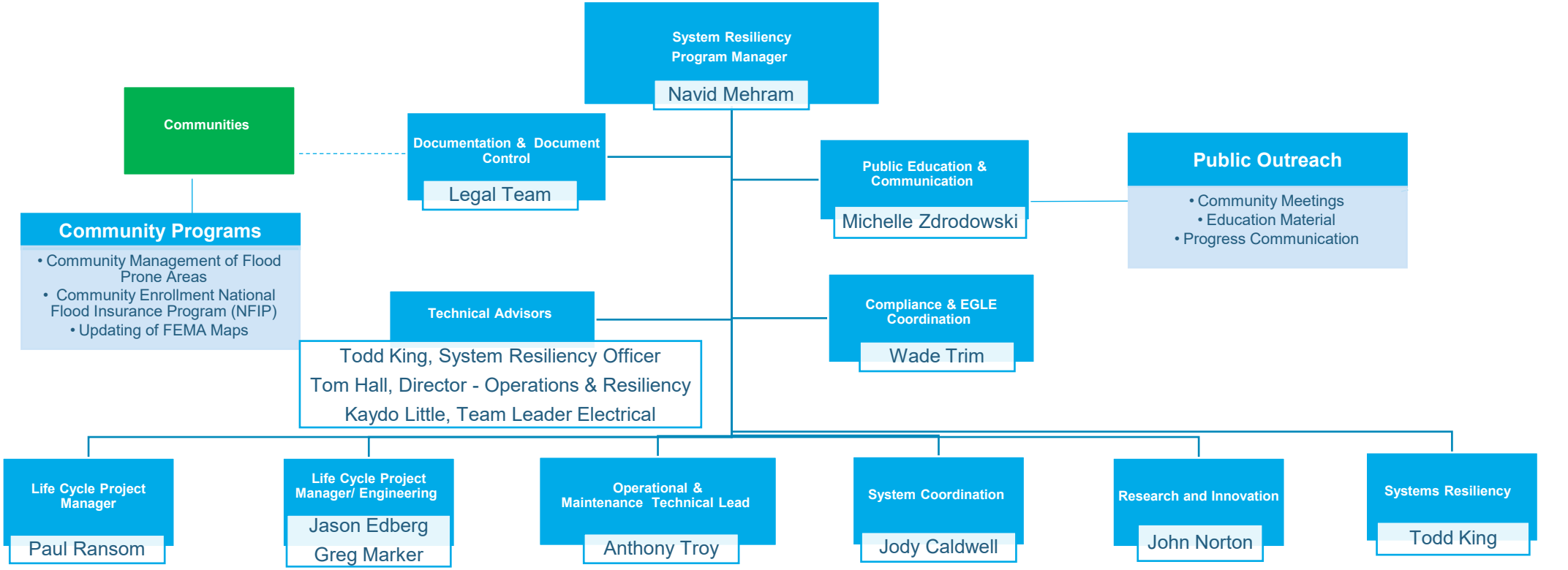
Executive Summary - Medium Term Measures

Project Milestone	Project Status			
	Not Started	In Progress	Completed	Notes
Medium Term Measures				
General Recommendation				
Prioritization of the Wastewater Capital Improvement Planning (CIP) projects.				This task is complete and will remain ongoing.
Evaluation of future rainfall beyond the Atlas 14.				This task will be captured within Water Resource Development Act with USACE.
Take into consideration other climate change factors into the design.				This task will be captured within Water Resource Development Act with USACE.
Pump Station				
Continue with the Freud Pump Station projects.				Construction taking place.
Electrical Equipment				
Upsize the transformers at each facility to run the entire facility.				This review is incorporated in the larger electrical resiliency project and has been completed.
Electrical reliability study for Freud and Conner Pump Stations.				
Mechanical Equipment				
Complete other scenarios as proposed through the Clemson Engineering scale model.				
Review the idea of vertical pumps for the Conner Storm Station.				
Operational Measures				
Inspection and monitor the Intake Flow Conditioning (IFC) in both the Conner and Freud Pump Stations.				This item is pending the improvements to Freud and Conner Pump Stations.
Review of previous studies.				GLWA completed the review of prior studies as new projects progressed.
Studies				
Level of service.				This task will be captured within Water Resource Development Act with USACE.
Dynamic System Operations Study				This task will be captured within Water Resource Development Act with USACE.
Stormwater/Wastewater Master Plan				This task will be captured within Water Resource Development Act with USACE.

Executive Summary - Long Term Measures

Project Milestone	Project Status			
	Not Started	In Progress	Completed	Notes
Long Term Measures				
General Recommendation				
Feasibility of moving to a 100-year storm.				This task will be captured within Water Resource Development Act with (USACE).
Local government program for voluntary purchase of flood prone areas.				
Local government public outreach campaign for flood risk and purchasing flood insurance.				
National research of other large-scale flood reduction projects.				This task will be captured within Water Resource Development Act with (USACE).
Pump Stations				
Medium-term solutions are not successful.				The project team has incorporated this into the Conner Storm project schedule.
Further automation of the pumping stations.				Steps are being taken toward this effort. An example includes the seal water system for the Conner Pump Station.
Regional System Coordination				
Review of the member partners' optional strategy to find alternative operations.				GLWA started discussion around the Regional Operational Plan. Additionally, GLWA is coordinating with Member Partners during major storm events.
Local government engagement in the National Flood Insurance Program (NFIP).				
Local government should consider updating the flood maps.				
GLWA community outreach.				Regular cadence has been established.
Community flood collection data to provide guidance into modeling validation.				This task will be captured within Water Resource Development Act with USACE.

Resiliency Delivery Team



Proposed Projects

- All - Electrical upgrades at all sanitary stations
  - Evaluate emergency generator operational strategy- Evaluation under the Electrical study
- CCPS - Vacuum priming system upgrades
- CCPS - Seal water system upgrades
- CCPS - Vertical pump alternative
- Pumpstation Level Sensor

Existing GLWA Projects

- CIP - 260204 Conner Creek Sewer Cleaning and Rehab
- CIP - 260701 In system Storage Dam and Outfall Rehab
- CIP - 232002 Freud Storm Pump Station Rehab
- CIP - 232002 Freud Sanitary Pump Station New Construction
- Sewer Level Sensors project.

Operational & Maintenance

- Standard Operating Procedure updates
- System testing
- Evaluate operational change recommendations

System Planning

- Regional system coordination with all communities

Research

- National survey of other flood projects

Resiliency

- Feasibility of moving to a 100-year storm
- Level of Service
- Comprehensive flood solution

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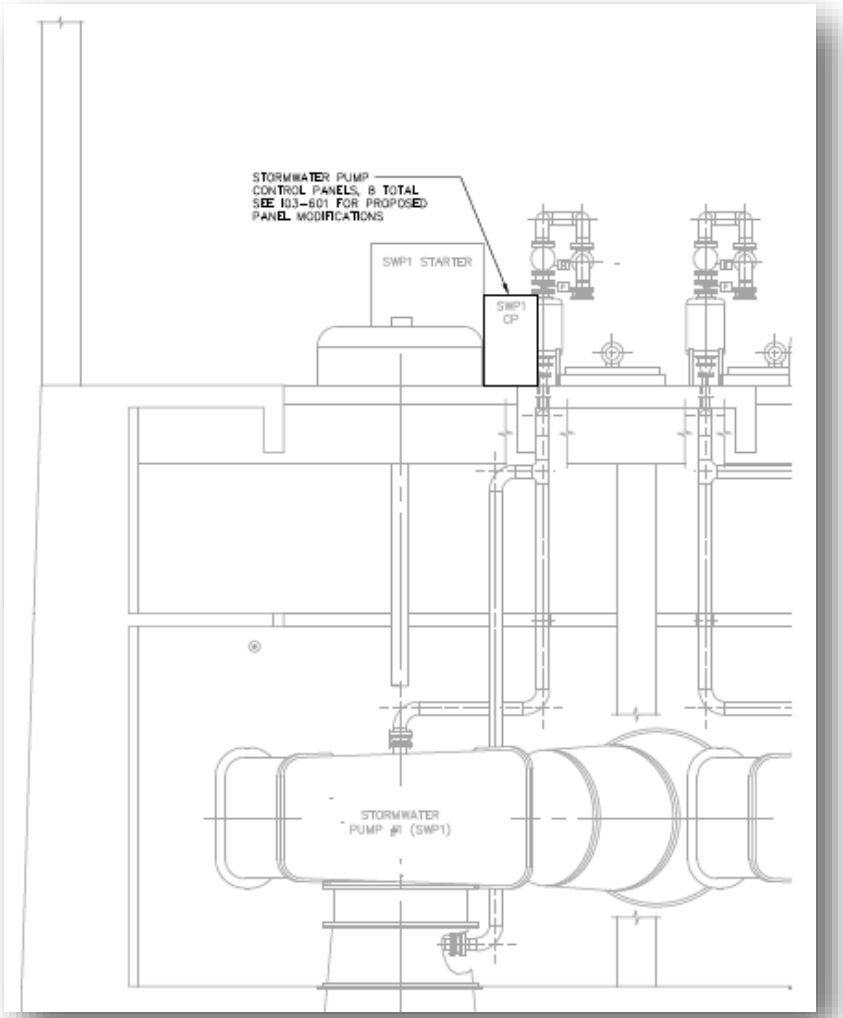
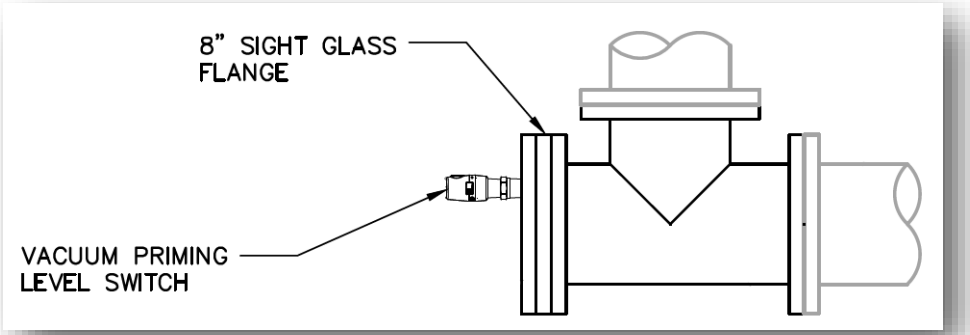
Conner Creek Pump Station – Vacuum Priming Level Switch Addition

- 06/25/24 – Project Posted on Bonfire
- 08/01/24 – Bid Submissions Due
- 10/07/24 – Notice to Proceed
  - Weiss Construction
  - $485,500
- 02/13/25 – Pre-Construction Conference
- 06/20/25 – Mechanical Work Complete
- 06/30/25 – Electrical Work Complete
- 07/16/25 – System Testing
- 08/06/25 – Sensor Troubleshooting
- *09/24/25 – Final System Retesting*

We are here





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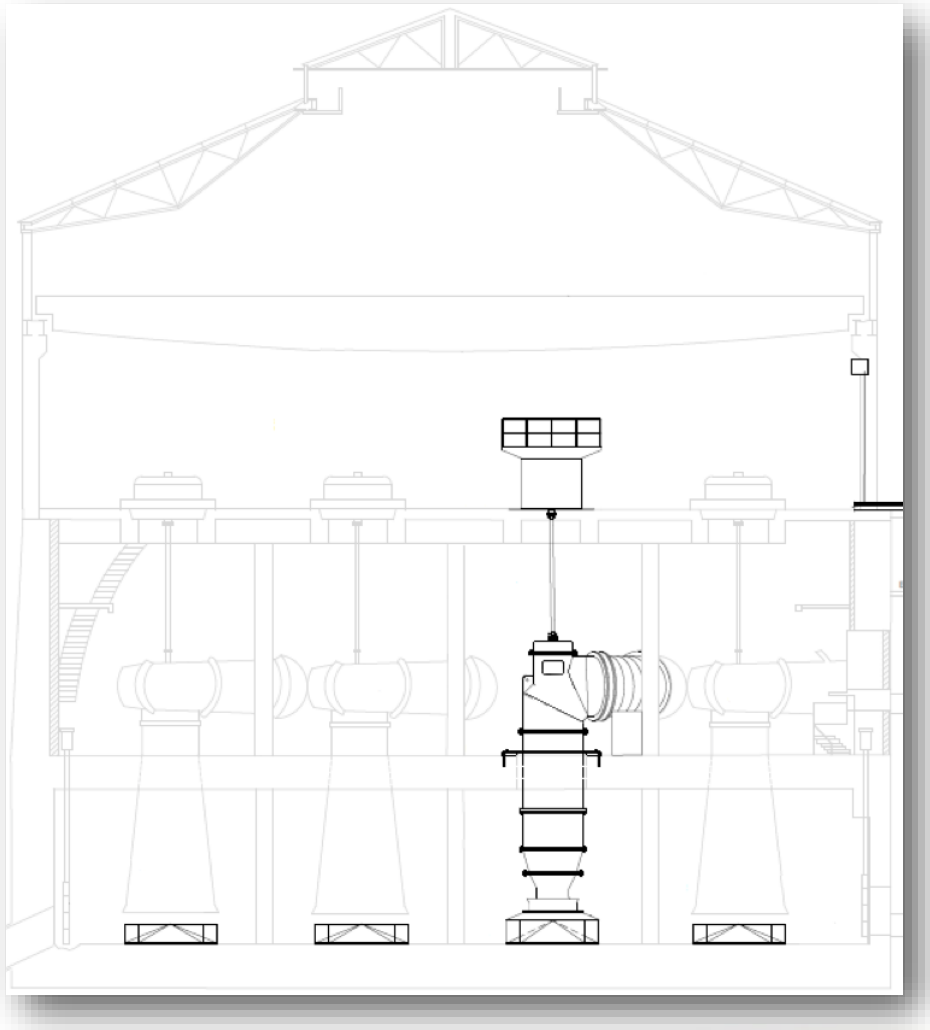
Conner Creek Pump Station – Pump Replacement Design

- 02/15/24 – 60% Design Workshop
- 05/15/24 – 90% Design Workshop
- 06/21/24 – 100% Design Submittal
- 08/09/24 – Issue for Bid Design Complete
- 10/23/24 – Project Posted on Bonfire
- 01/10/25 – Bid Submissions Due
- 03/26/25 – Contract SCN-0000586 Awarded
  - Kokosing Industrial, Inc.
  - $35,360,000
- 04/07/25 – Notice to Proceed
- 04/29/25 – Pre-Construction Conference
- 05/12/25 – Begin Submittal Process
- 08/04/25 – Begin Excavation Work
- *12/01/26 – Pump #3 Delivery*
- *09/10/27 – Milestone #1 – Pump #3 Acceptance*
- *08/26/28 – Substantial Completion*
- *12/16/28 – Final Completion*

We are here



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Conner Creek Pump Station – Sanitary Pump Station Design

- 04/17/24 – 30% Design Workshop
- 09/18/24 – 60% Design Workshop
- 02/14/25 – 90% Design Submittal
- 02/19/25 – Hydraulic Analysis Witness Test
- 03/10/25 – PPR Submission
- 03/14/25 – 90% Design Workshop
- 06/02/25 – Instrumentation Design Update
- 07/31/25 – PPR Meeting
- 08/20/25 – PPR Follow-up Meeting
- *10/17/25 – 100% Design Submittal*
- *11/01/25 – CWSRF Intent to Apply Submission*
- *03/29/26 – Project Posted to Bonfire*
- *09/25/26 – Bid Submissions Due*
- *02/07/27 – Notice to Proceed*
- *11/18/30 – Substantial Completion*
- *02/28/31 – Final Completion*

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PPR – Preliminary Plan Review
CWSRF – Clean Water State Revolving Fund

Freud Pump Station – Improvements

07/05/24 – Right-of-Way Vacation & Dedication Approval
07/15/24 – Notice to Proceed Date
09/16/24 – Traffic Circulation Study Complete
10/21/24 – Rezoning Application Submitted
11/21/24 – City Planning Commission Rezoning Public Hearing
12/02/24 – Structure Abatement & Demolition Complete
01/16/25 – City Planning Commission Rezoning Public Hearing
02/10/25 – Freud Street Closure
04/07/25 – Building Permit Issued
05/23/25 – Building Permit Rescinded
06/05/25 – City Planning Commission Rezoning Meeting
06/11/25 – Begin DRI Structure Construction
07/29/25 – All Utility Relocations Complete
08/04/25 – Begin Navahoe Force Main Construction ← We are here
09/30/25 – City Council Meeting
10/23/25 – Planning & Economic Development Committee Public Hearing
10/27/25 – City Council Meeting
11/17/25 – Navahoe Force Main Construction Complete
11/18/25 – Rezoning Application Approval
01/09/26 – DRI Structure Construction Complete

Meeting Dates & Time:
5:30 – 7:30 pm

12/11/24
03/19/25
05/21/25
09/17/25

Meeting Location:
Eastlake Baptist Church
12400 E. Jefferson Ave.
Detroit, MI 48215

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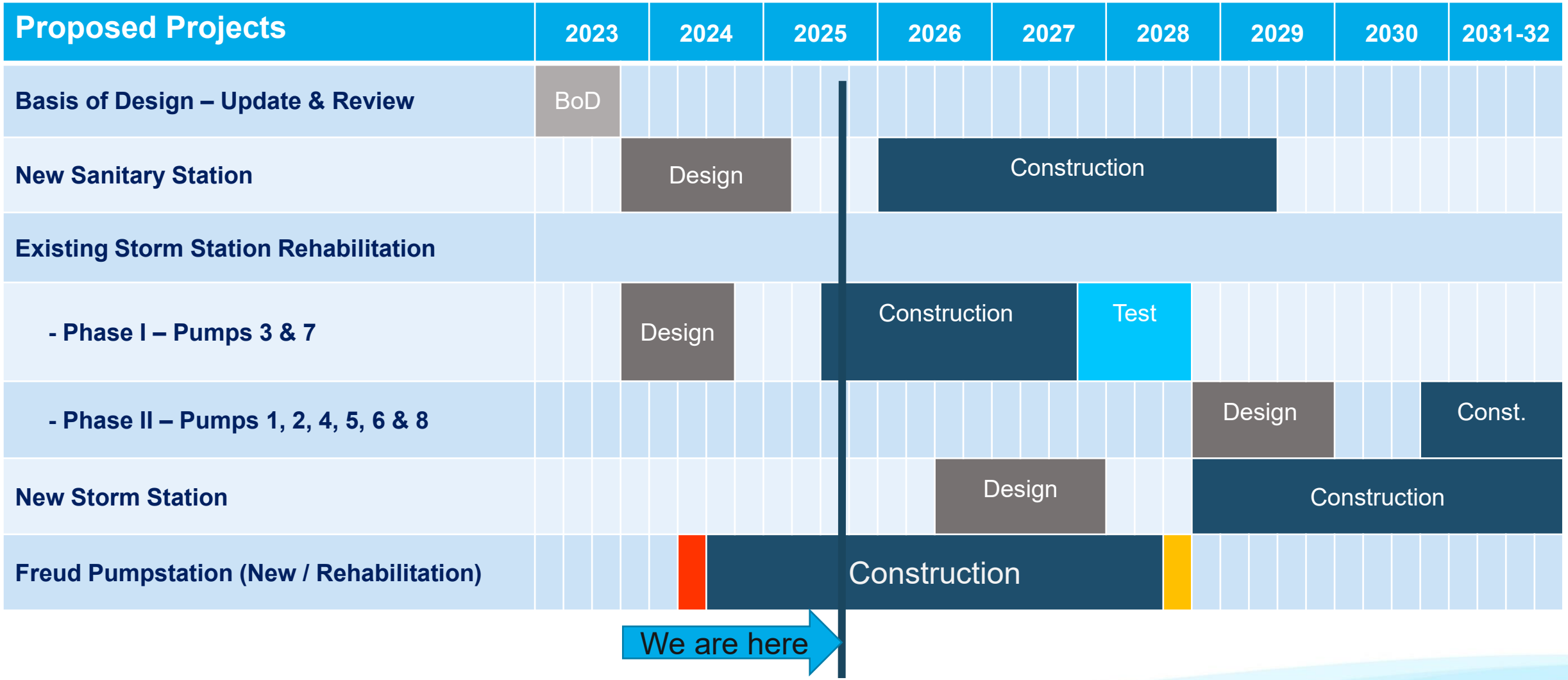
DRI – Detroit River Interceptor

Conner Pump Station Design/Construction Road Map



- Revised Basis of Design – Critical Path
  - Workshops: May – July
  - Review: August – September

Existing GLWA Projects

- **CIP - 260701 In System Storage Devices (ISD), Valve Remotes (VR), and Outfall Infrastructure Elements Rehab**

- **Outfall Infrastructure Project (86% complete through January)**
  - Structural improvements and modifications to the regulators are complete at 31 of 36 outfalls.
  - Backwater gate fabrication and installation is nearing completion.
  - Instrumentation and controls are being installed throughout, with 20 of 40 sites having been tested and approved by GLWA.
  - The project is scheduled to be substantially complete in October 2025 but is running behind. Negotiations for a time extension are in progress.

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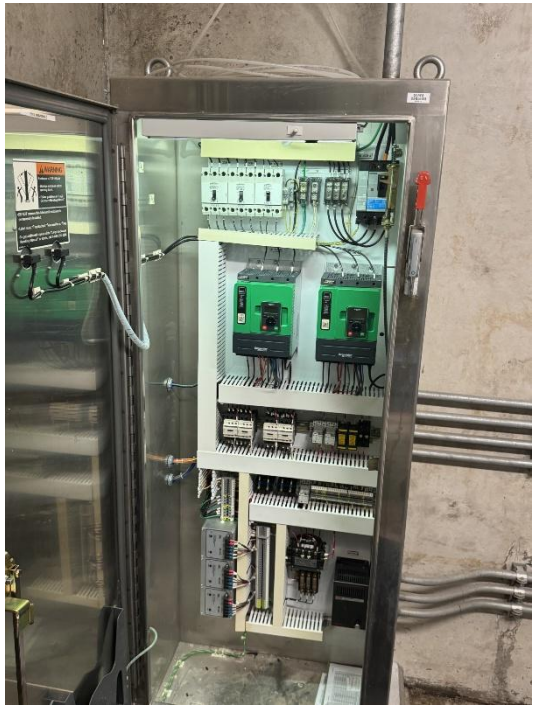
Existing GLWA Projects

- **CIP - 260701 In System Storage Devices (ISD), Valve Remotes (VR), and Outfall Infrastructure Elements Rehab**
  - **ISDs and VRs Project (77% complete through July)**
    - ISD equipment installation is complete.
    - Improvements at B (outfall) sites are complete.
    - Equipment startup and testing by the contractor and GLWA staff is ongoing.
    - Improvement and repairs to VR gates are ongoing.
    - All ISD sites manhole modifications are complete.
    - Engineer-directed repairs to the inflatable dams are complete.
    - A change order for time extension was approved by the GLWA Board of Directors at its August meeting.



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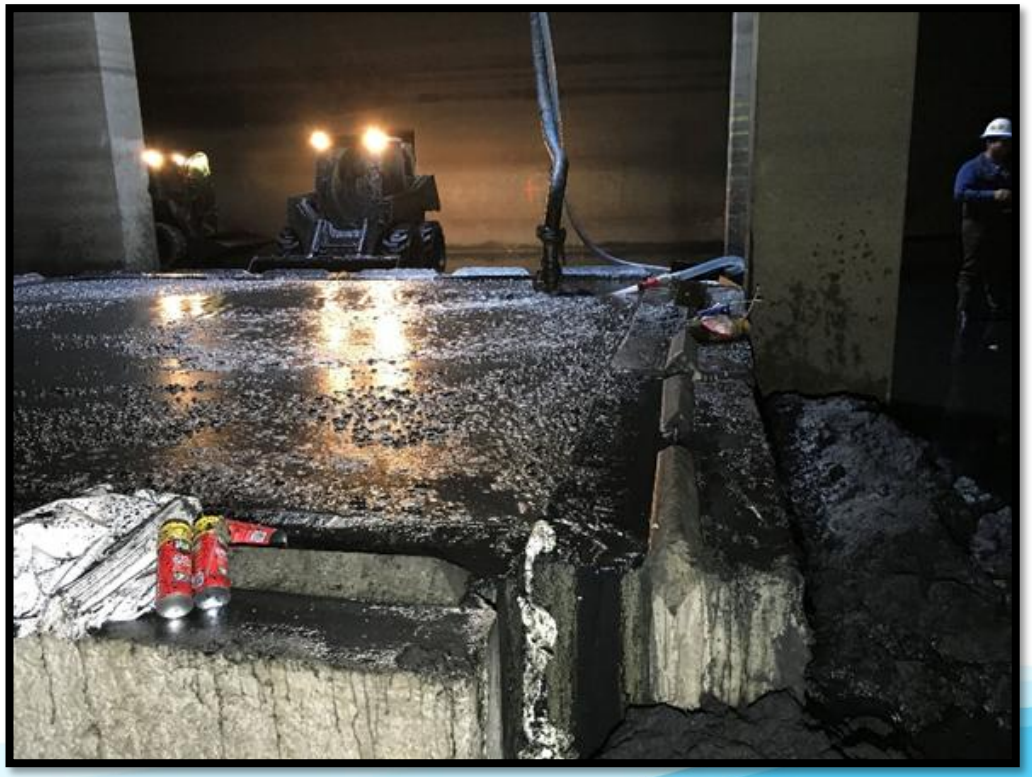
Existing GLWA Projects Continued

- **CIP - 260204 Conner Creek Sewer Cleaning and Rehab – 80% complete**
  - Rebar coating and spot repairs for the project are complete. Grouting will begin from Warren toward Jefferson in the triple barrel beginning in September.

  - Slip lining for the project is complete. Warranty inspection will be in three months.
  - The project has added design of forebay modifications upstream of Conner Combined Sewer Overflow (CSO) to allow the facility to perform debris removal in the future for better maintenance operations. The work is being added to the current project.



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Recommendations that will be included in the Southeast Michigan Flood Resiliency Study

- Level of Service
- Dynamic System Operations Study
- Stormwater/Wastewater Master Plan
- Feasibility of Moving to a 100-year storm
- Evaluation of future rainfall beyond the Atlas 14/take into consideration other climate change factors into the design.
- National research of other large-scale flood reduction projects
- Community flood collection data to provide guidance into modeling validation.

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Southeast Michigan Flood Resiliency Study

- GLWA's Office of Resiliency is teaming with United States Army Corps of Engineers (USACE) to perform a General Investigation Study.
- USACE has been funded from the President's approved budget for $500K for FY 24 and $600K for FY 25 and $1.2 M for FY26/27.
- GLWA will match USACE funding efforts on a 50/50 basis with in-kind services.
- GLWA has selected LimnoTech to provide the In-Kind Contribution services for the study.
- The current scope is estimated to be approximately $11 million over 8 years.
- The USACE Vertical Team has approved the study's scope, schedule and budget.
- Awaiting final approval from Assistant Secretary of the Army for Civil Works.

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Southeast Michigan Flood Resiliency Study – MAJOR MILESTONES

- ✓ USACE and GLWA have executed a Feasibility Cost Sharing Agreement (FCSA)
- ✓ Received USACE funding to begin the Southeast Michigan Flooding Study
- ❑ A feasibility study will be completed that identifies a recommended plan
- ❑ The Chief's report will be submitted to Congress requesting construction authorization & appropriations
- ❑ Engineering/design and construction follows, pending availability of funds

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Southeast Michigan Flood Resiliency Study

Stand up of site website:

https://www.lrd.usace.army.mil/semifloodstudy/

Other initiatives:

- The Southeast Michigan Council of Governments (SEMCOG) Flooding Task Force
- The National Fish and Wildlife Foundation (NFWF)

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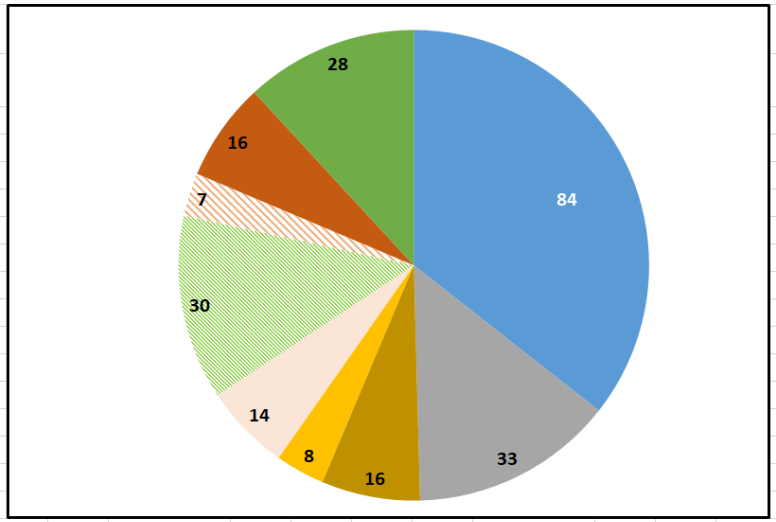
GLWA continues to review the sewer system instrumentation and make corrections in a phased approach.

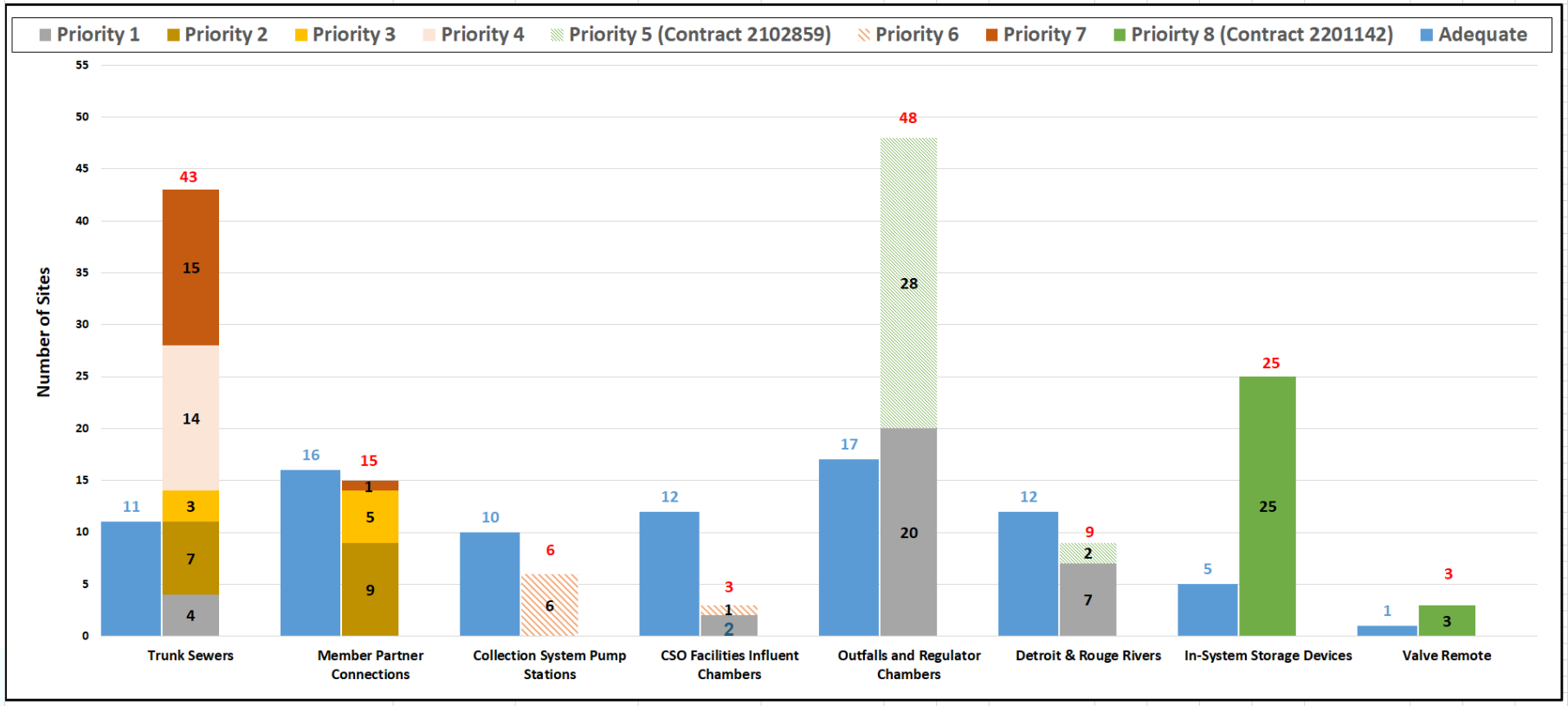
GLWA released around $3.55M for revisions to nearly 87 sites. This will complete priority 1, 2, 3, 4 and 7 sites.

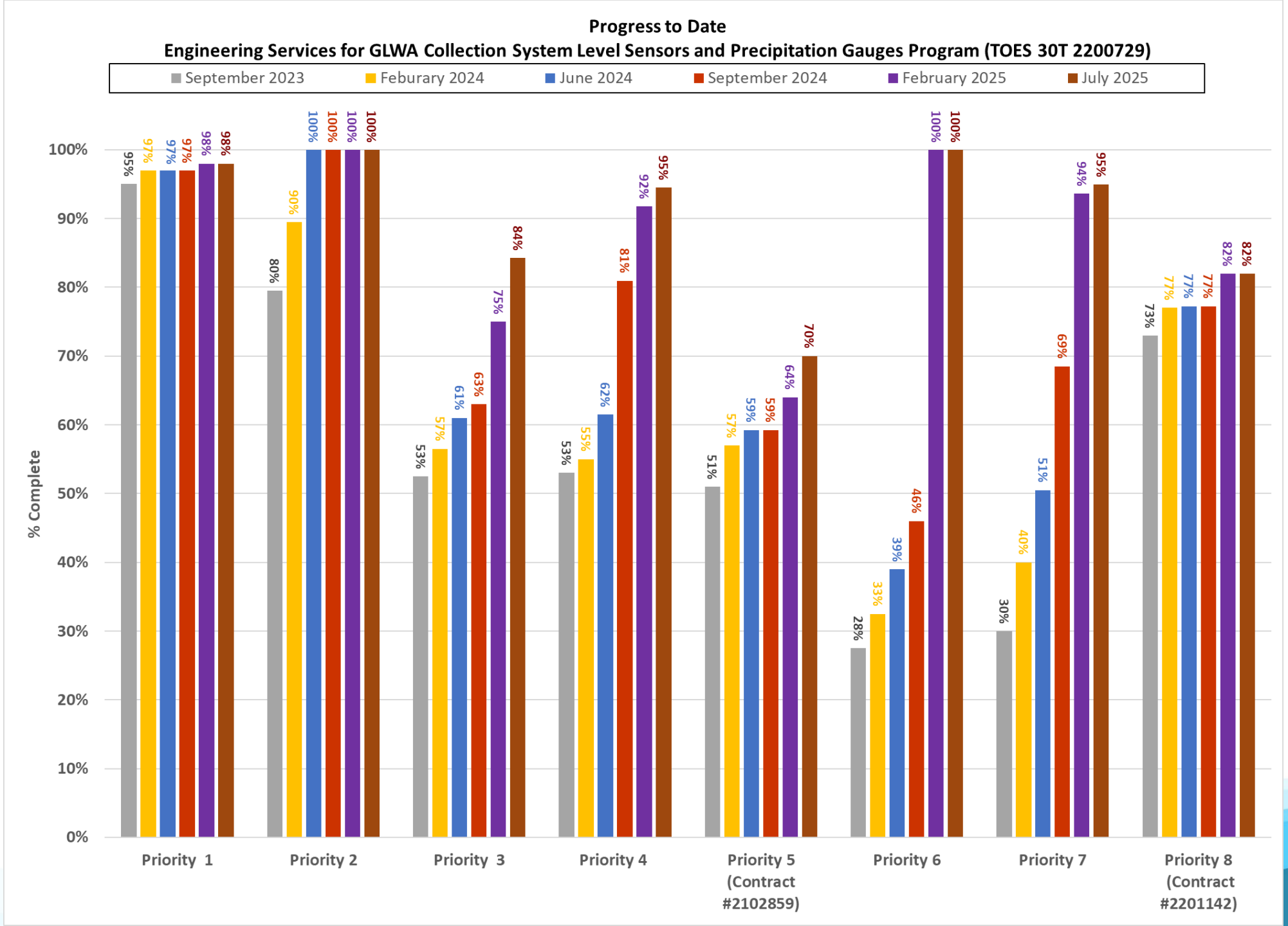
Baseline Conditions

Engineering Services for GLWA Collection System Level Sensors and Precipitation Gauges Program (TOES 30T 2200729)

Level Sensor Group	Priority #	No. of Sites (some sites may include multiple sensors)		
		Adequate Installation	Need Improvement (or New Installation)	Total
Trunk Sewers				
Original L-Series	1, 4, 7	7	24	31
10 L-Sites Surveyed in 2022	1, 2	2	8	10
Sewage Meters (DT-S-00)	1, 4, 7	2	8	10
Hydraulic Viewers	3	0	3	3
Member Partner Connections				
Existing Flow Meters	3, 7	16	6	22
9 Additional Sites (L-Sites & Flow Meters)	2	0	9	9
Collection System Pump Stations	6	10	6	16
CSO Facilities Influent Chambers	6	12	3	15
Outfalls and Regulator Chambers (Contract #2102859)	1, 5	17	48	65
River (Detroit & Rouge) Level Sensors	1, 5	12	9	21
In-System Storage Devices (Contract #2201142)	Other Contracts	5	25	30
Valve Remote (Contract #2201142)	Other Contracts	1	3	4
TOTAL		**84**	**152**	**236**







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Thank you

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