



# 120-inch Water Main Break (WMB) Conclusion for the Board



# Agenda

- Recap of the last Board Presentation
- Inspection Draft Results
- Conclusion of Repair
- Operational Estimate on Cost

# 120-inch Water Main Break

## Largest size transmission main in GLWA system

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- 4:30am on Saturday, August 13, 2022
- 23 to 7 communities impacted
- 935,000 to 133,000 estimated people
- BWA issued – cleared in 7 days
- Pipe ordered – repair begins
- Flow reestablished from NE and SPW
- Inspection and damaged pipe removal





# Background

- Pipe failed on the morning of August 13, 2022, in a field approximately 0.6 miles from the Lake Huron Water Treatment Plant
- Late 1960s 120-inch PCCP
  - 26 miles (5 total contracts) from Lake Huron Water Treatment Plant to Imlay City Booster Pumping Station
  - 200 and 225 psi design pressure at 11 feet cover
  - 14-gauge cylinder with 5/16-inch wire wraps
- Failed in March 1985 approximately 1 mile west of LHWTP under the same contract (WS-219)





# Inspection Time

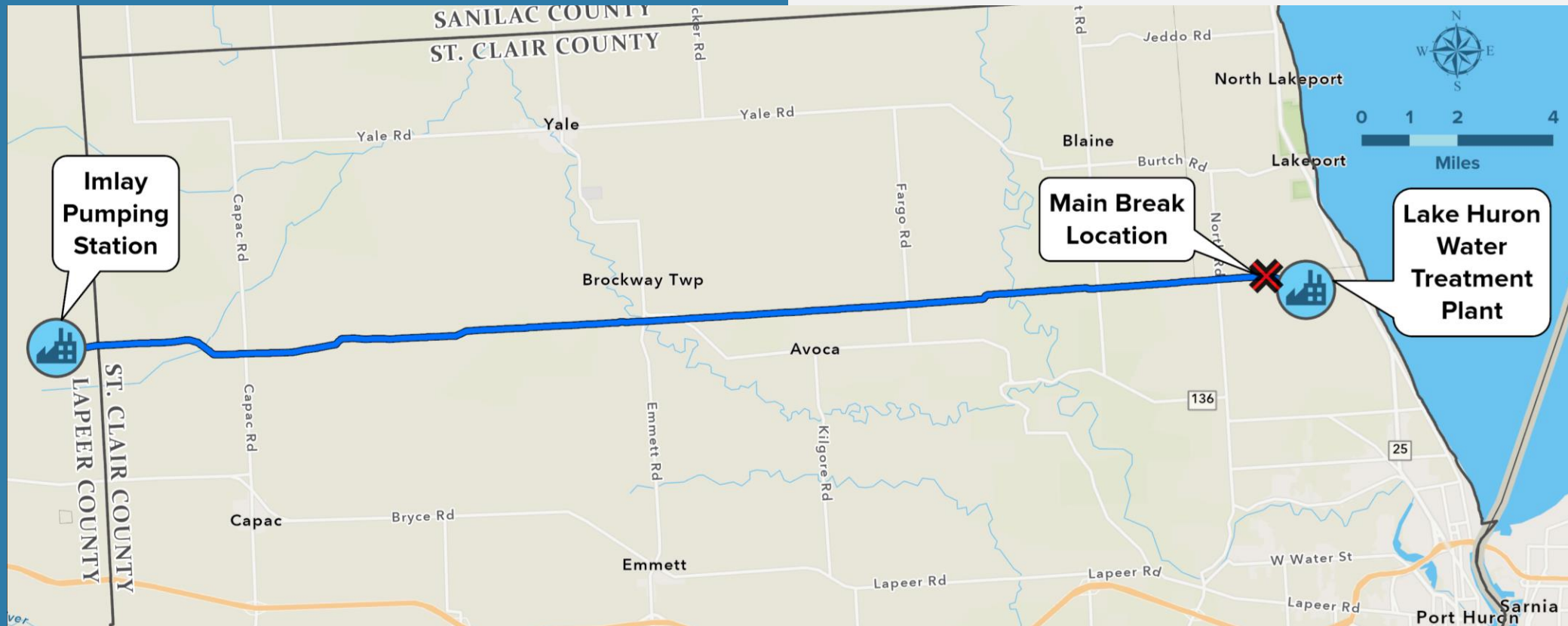
*Cause of failure currently unknown*





# Inspection Area

## 26 miles

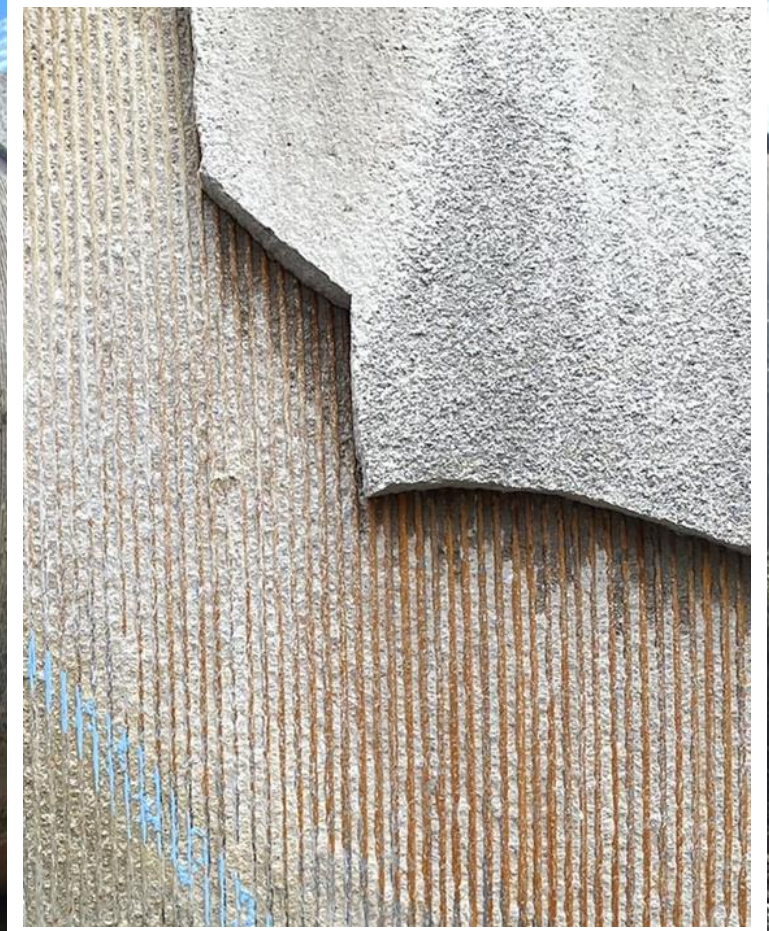


# Pipeline Inspection



# Forensic Investigation and Cause of Failure

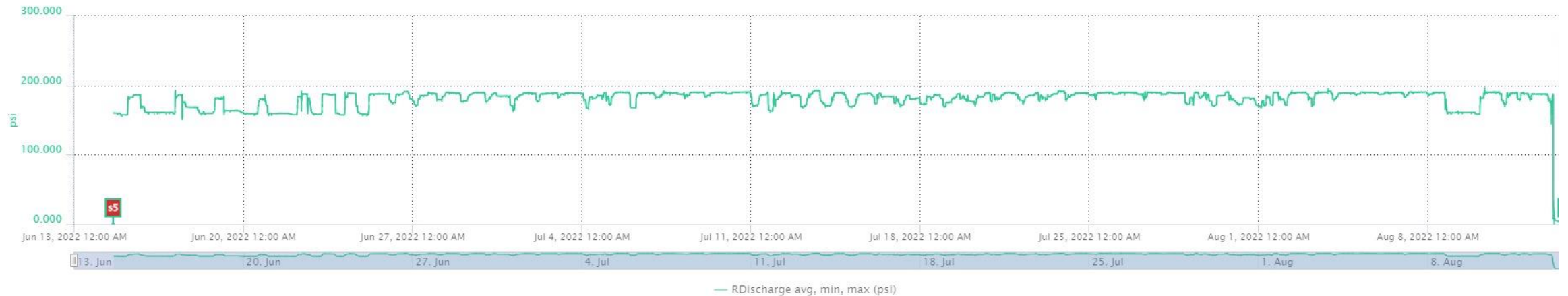




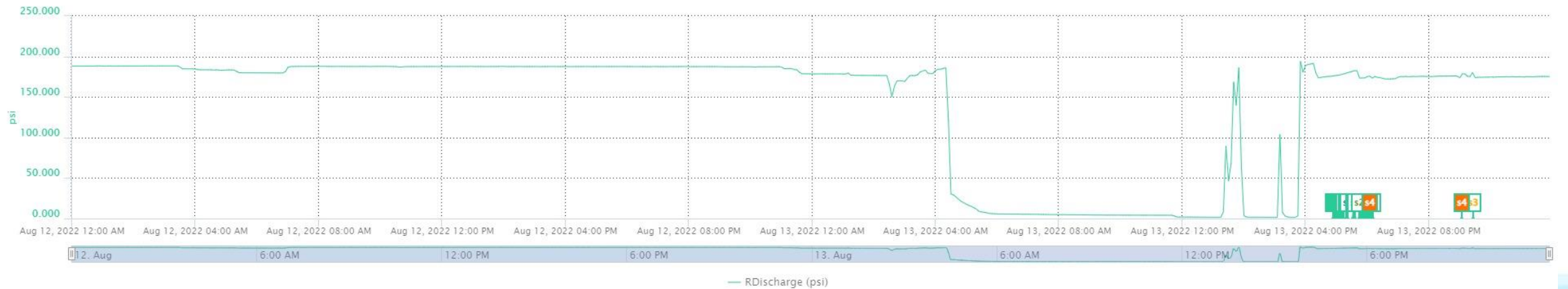


# 120-inch TM Pressure

10192821 Lake Huron WTP (Jun 13, 2022 to Aug 14, 2022)



10192821 Lake Huron WTP (Aug 12, 2022 to Aug 13, 2022)





# Preliminary Conclusion

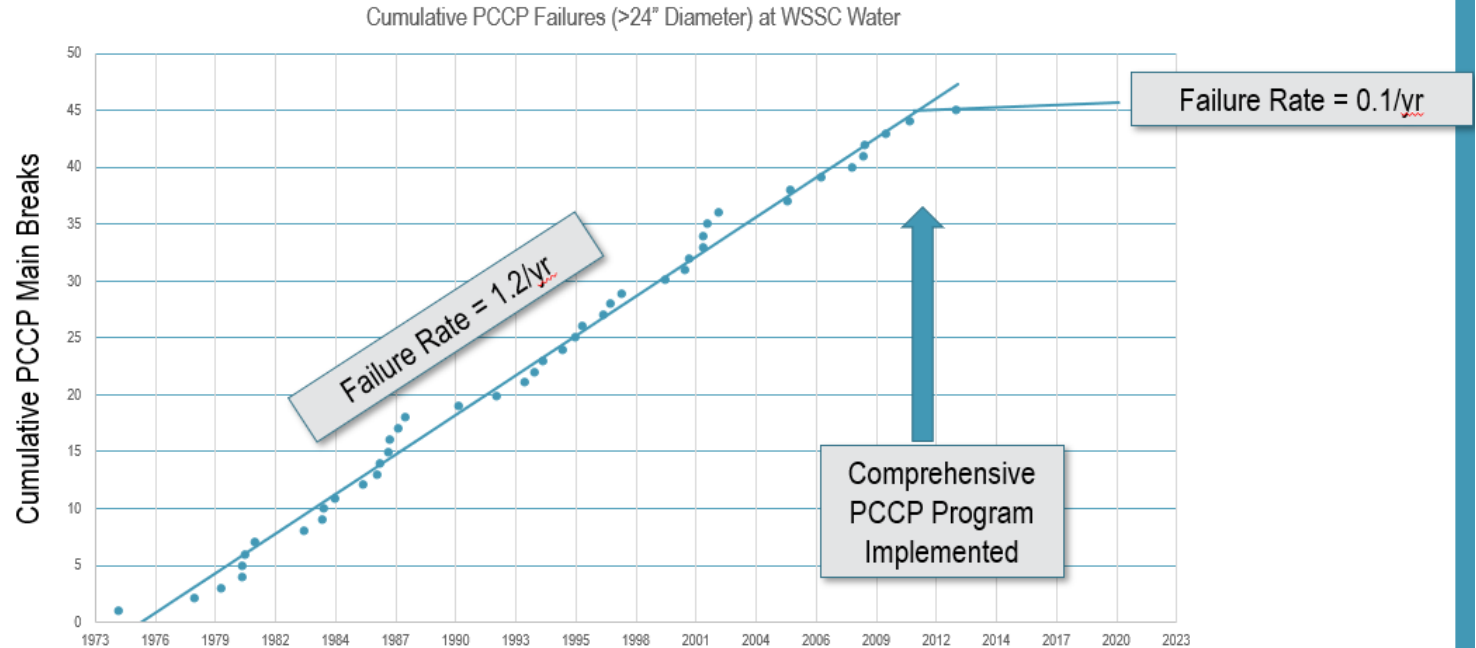
## Root Cause:

- Loss of strength due to broken wire wraps damaged from corrosion and hydrogen embrittlement.
- A defect in the mortar coating developed the environmental conditions for corrosion and embrittlement.
- Lack of cover contributed to the mortar coating defect.



# Linear System Integrity Program

- Stay the course
- Maintain funding
- Foster innovation
- Be diligent







Removal  
of  
Damaged  
Pipe





# Damage Pipe Removed















# New pipe installation







# Pipe in the ground welding continues

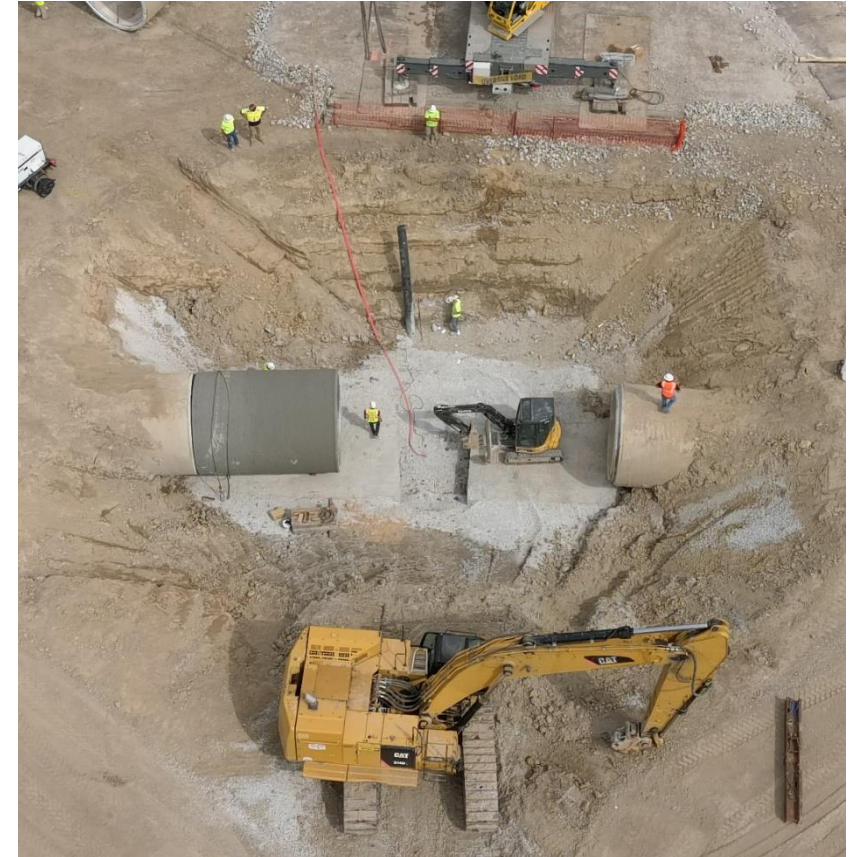




# 120-Inch Back to Normal Plans

## Procedure Sequence:

1. Lake Huron Water Treatment Plant
  - Water for filling and flushing
2. Field and Water Quality
  - Filling, Flushing and Testing
3. System Control Center
  - Valving changes to get flow from LH



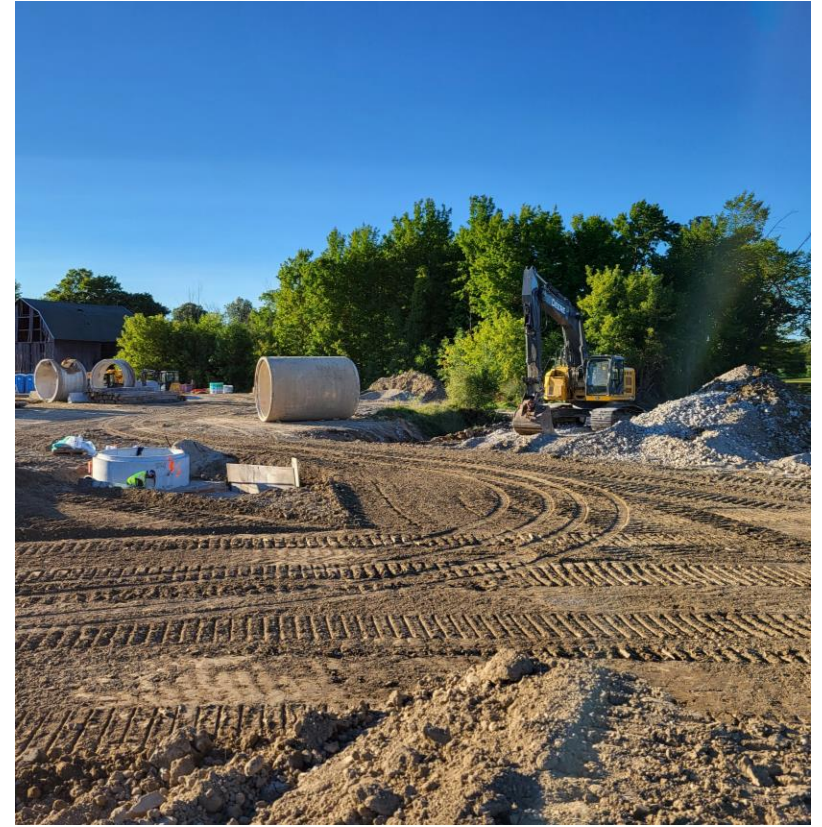


# Estimated Timeline

- This estimated timeline moved from September 3, 2022 to September 21, 2022
- Fill and flush extends timeline to October 5, 2022

ITEM	PROJECT	MINIMUM DAYS	MAXIMUM DAYS	COMMENTS
1	LAKE HURON TO KILGORE	2	5	Fill and Flushing
2	KILGORE TO IMLAY PUMP STATION	1	3	Fill and Flushing
3	SAMPLING	2	3	WQ Requirements
4	OPENING 108" VALVE AT LAKE HURON	1	3	To supply the 120 inch Main
5	SYSTEM BALANCING - (SCC)	1	2	SCC coordinating with the Plants
TOTAL		7	16	RETURN TO SERVICE

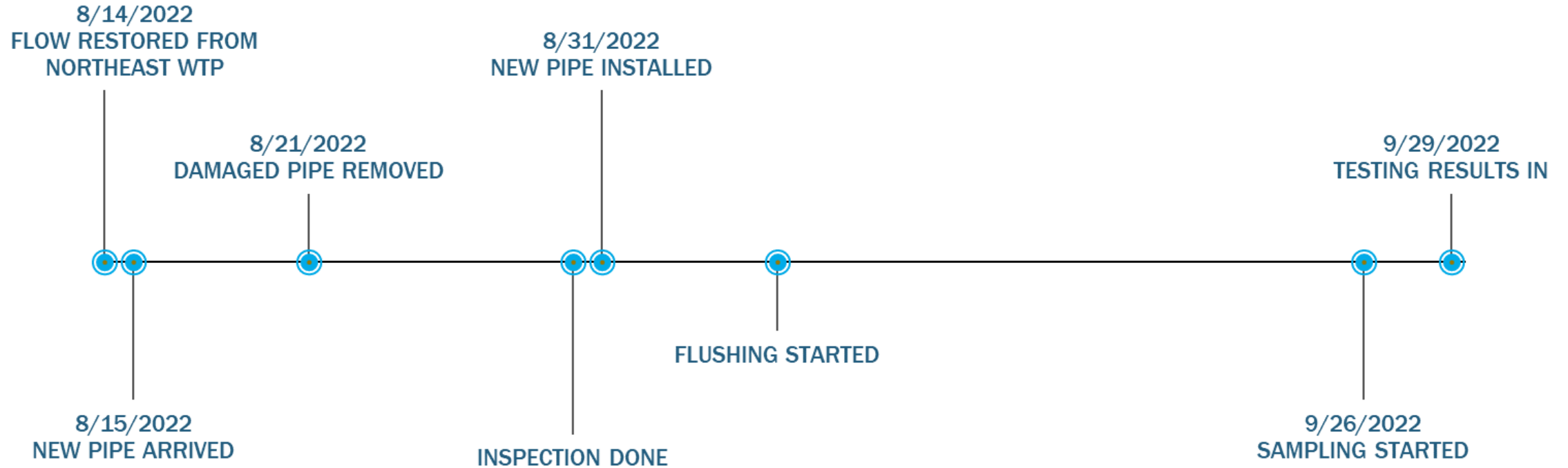




# Finalizing the repair

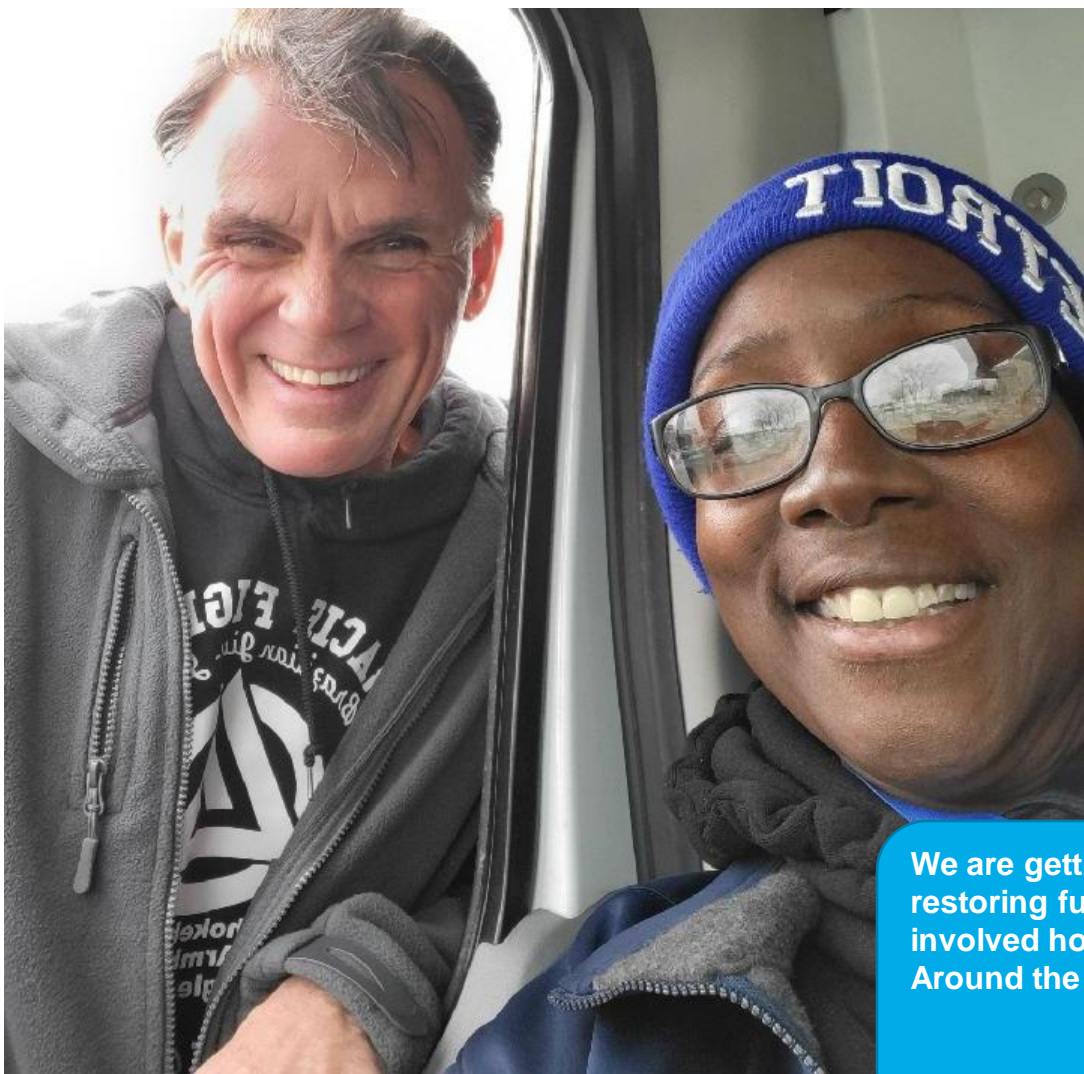


# 48 Days to Fix the 120-inch





# Appreciation expressed



This is just a note to say thank you for all your efforts to return normal water flow to all of us. I especially appreciate your promptness and diligence in making repairs in a timely manner. Also, your numerous updates to keep us informed about repair status and boil water advisory were helpful.

I am one satisfied Washington Township resident and GLWA customer. Again, thank you!

We are getting closer and closer to restoring full service. Please convey to all involved how grateful I am that they are Around the clock to complete the project.  
Director Zech

Thank you for giving me back my sanity with enough water to shower and do a load of laundry I greatly appreciate you!

**THANK YOU, THANK YOU, THANK YOU** to the Great Lakes Water Authority for developing this workaround. This is an example of the concern for clients that all government organizations and businesses adopt.

Shelby Township, Michigan



# Direct Costs

Contract No. 1802745: Ric Man Construction	\$2,021 K
Contract No. 2003730: Lakeshore Global Corporation	956 K
Valve Contractor: Hydromax	2 K
<b>Total Repair and Restoration Costs:</b>	<b>\$2,979 K</b>
Purchased Water: GCDC	\$118 K
LSIP : HDR Forensics and Investigation	833 K
<b>Total Costs:</b>	<b>\$3,930 K</b>





Questions?