

GLWA

Great Lakes Water Authority



LINEAR SYSTEM
INTEGRITY PROGRAM

2024 ANNUAL REPORT

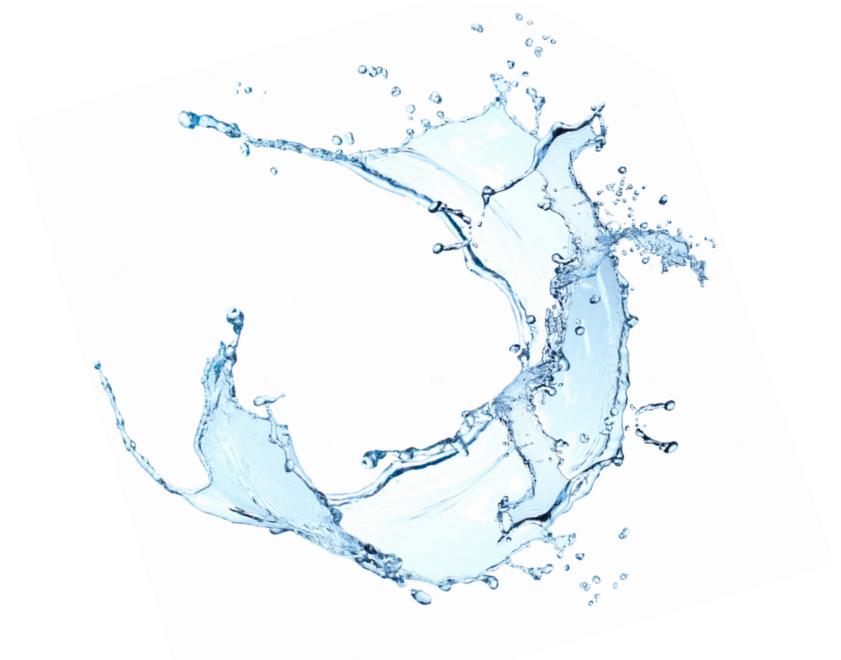
WELCOME

As we continue to implement the Linear System Integrity Program, it is important to reflect on the significant investment that the Great Lakes Water Authority (GLWA) has made in the management of its water and wastewater infrastructure. This investment has had a profound impact on the surrounding communities and delivers on our goal to provide water of unquestionable quality to our Member Partners.

Linear System Integrity Program Goals

The Linear System Integrity Program will provide a management structure for GLWA's linear assets to improve overall system reliability, reduce failures, and maximize the life of the water transmission system.

To accomplish this work, six program goals were identified.



01

Develop a framework to proactively manage linear assets.

02

Increase system reliability to meet service levels.

03

Limit transmission main failures on high-consequence assets.

04

Reduce the overall risk of water main failures.

05

Maximize the useful life of GLWA's transmission mains.

06

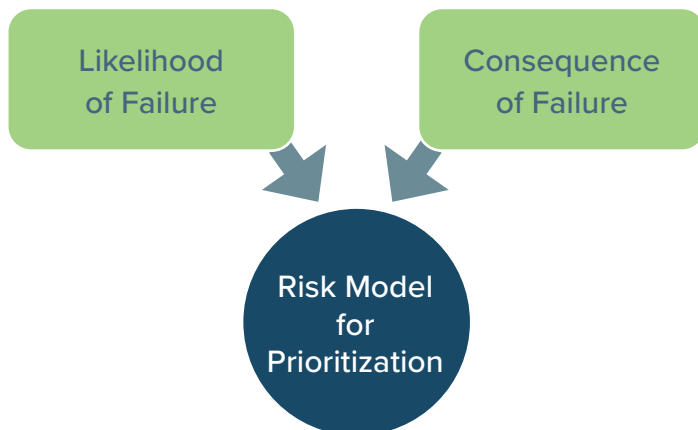
Implement consistent and effective data management protocols.

Accomplishments and Milestones

In 2024, the following accomplishments were achieved toward these goals which will continue to shape the trajectory of the program.

Updated Risk Assessment Model

The updated risk model included uses GIS to simplify the model update process. This risk model will continue to help prioritize transmission main inspection and will help drive the most efficient and effective use of GLWA's resources.



24 Mile Road Transmission Main Condition Assessment

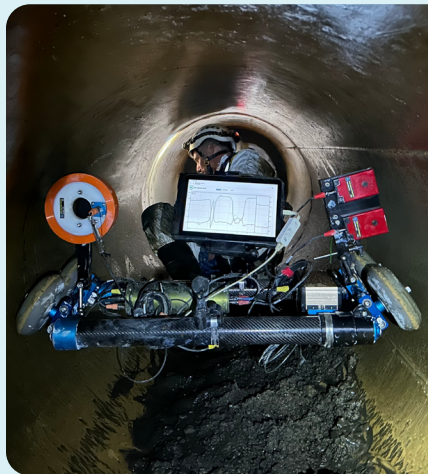
The full condition assessment of the 36-inch transmission main included:

- High resolution electromagnetic inspection
- Visual and sounding inspection
- Laboratory material analysis
- Stray current investigation
- Soil corrosivity surveys
- Structural analysis review

This assessment has been the longest inspection length to date for LSIP. As a result, nine pipes were renewed in 2024. The inspection identified 94 pipes to be renewed in 2025 and 23 additional pipes to undergo opportunistic renewal. Of these, 115 will be renewed using carbon fiber reinforced polymer (CFRP) and 2 will be replaced using open-cut.

Program Highlights

As GLWA developed the management structure for the Linear System Integrity Program, opportunities for proactive renewal and assessment were determined. In 2024, the following projects were completed in collaboration with GLWA's Research, and Innovation, Resiliency, Water Transmission, and Engineering Groups.



24 Mile Road Manned Inspection

High resolution electromagnetic inspection and visual and sounding inspection along the 11.4 miles of the 36-inch transmission main were performed.



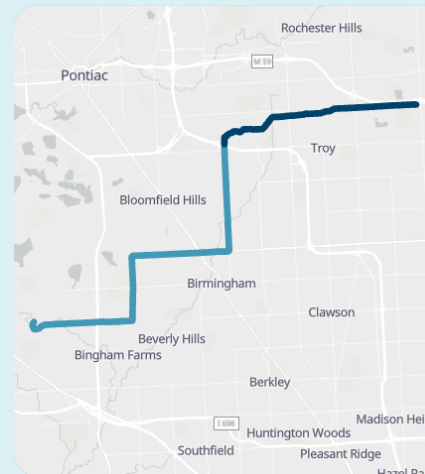
24 Mile Road Soil Corrosivity Report

Electromagnetic conductivity survey (EMAG), Wenner 4-Pin testing, and soil sampling and lab testing were performed along the 24 Mile Road Transmission Main.



24 Mile Road Transmission Main Renewal

Carbon fiber reinforced polymer (CFRP) lining of the 36-inch transmission main following condition assessment. Nine CFRP repairs were completed, and 115 are planned for 2025.

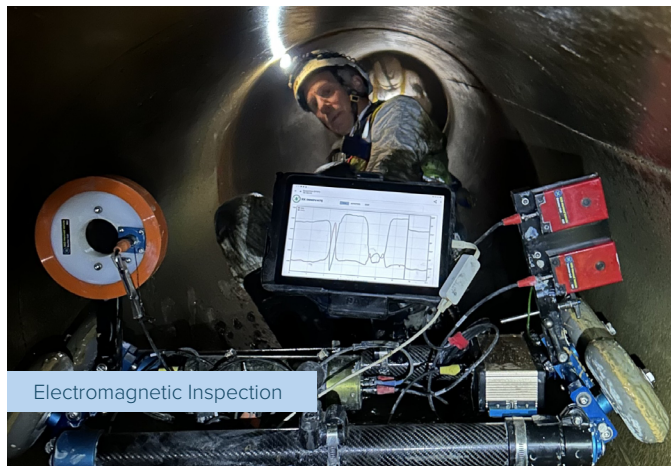


Feasibility Assessment for the 72"/84" Transmission Main

The feasibility report for condition assessment of the 72"/84" transmission main was submitted. The next stage is to plan for the condition assessment.

By the Numbers

Development and implementation of the Linear System Integrity Program began in 2021. These statistics provide a snapshot of the magnitude of work completed in 2024.

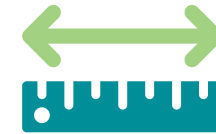


LSIP Achievements This Year:



60,298

linear feet of visual and sounding inspection and above ground survey



59,770

linear feet of high resolution electromagnetic inspection



137,800

linear feet of high-resolution condition assessment planned to be implemented in 2025



180

linear feet of proactive pipe renewal, including CFRP repairs

LSIP Achievements To-Date:



91,872

linear feet of high-resolution condition assessment deployment



1,472

linear feet of proactive pipe renewal



87,648

linear feet of visual and sounding inspection condition assessment deployment

The Future

At inception, GLWA identified three critical pipelines for evaluation during the first six years of the Linear System Integrity Program. Those included the 96-inch (Imlay City BPS to North Service Center), 84/72-inch (North Service Center to Franklin BPS), and 120-inch (Lake Huron WTP to Imlay City BPS) water mains. Combined with the 36-inch transmission main located on 24-Mile road, the goal was to design condition assessment for approximately 100 miles of GLWA's water transmission system. Below is our progress towards that goal, documenting the miles of pipe inspected annually, and our forecasted plan for 2025.

