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Not Flint: Waukesha testing pipes and water quality in advance of switching to Lake Michigan supply

Don Behm, Milwaukee Journal Sentinel Published 6:00 a.m. CT Sept. 10, 2018



(Photo: Michael Sears/Milwaukee Journal Sentinel)

The City of Waukesha does not want to become like Flint, Michigan — known for lead poisoning caused by drinking tap water — after it switches to a new water supply.

So the city is taking precautions now, nearly five years in advance of the transition to a [Lake Michigan water supply \(http://greatwateralliance.com/\)](http://greatwateralliance.com/), to prevent such a public health crisis and ensure water quality, officials said.

Michigan regulators failed to properly treat Flint's drinking water after switching the city to a river source in 2014, and they were responsible for causing lead poisoning as the toxic metal leached out of lead pipes in the

distribution system.

Waukesha plans to begin distributing Lake Michigan water provided by Milwaukee in 2023. The diversion of lake water approved by the eight Great Lakes states will enable Waukesha to halt the use of wells drawing radium-contaminated water out of a deep layer of sandstone.

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But Waukesha officials are not waiting for the switch to be made to monitor the effects of treated lake water on pipes in its distribution system or inside older homes, [Waukesha Water Utility \(http://www.waukesha-water.com/\)](http://www.waukesha-water.com/) General Manager Dan Duchniak said.

Utility employees last week trucked two pairs of residential and municipal water pipes to Milwaukee that will be tested as lake water flows through the lines.

Long sections of copper pipe with lead solder joints were removed from Waukesha residences and connected to sections of iron pipe, known as a service line, that previously linked a street water main with a residence. Each pipe assembly is 8 feet long and 7 feet tall.

RELATED: [Waukesha Common Council approves 40-year agreement to buy Lake Michigan water from Milwaukee \(http://www.jsonline.com/story/news/local/milwaukee/2017/12/05/waukesha-common-council-approves-40-year-agreement-buy-lake-michigan-water-milwaukee/921232001/\)](http://www.jsonline.com/story/news/local/milwaukee/2017/12/05/waukesha-common-council-approves-40-year-agreement-buy-lake-michigan-water-milwaukee/921232001/)

Both assemblies were placed this week in the Grange Pumping Station on Milwaukee's south side where Milwaukee water will circulate through the Waukesha pipes for the next eight months, Duchniak said.



September 5, 2018 Staff from the Waukesha Water Utility worked with City of Milwaukee to install test apparatus in the Grange Pumping Station of the Milwaukee Water Utility. The test apparatus contains actual older cast iron service pipes from the street in Waukesha, and in home copper water pipes with lead solder joints. Milwaukee water will be run through the pipes for several months to determine if lead leaches out of the solder and other buildup leaches out of the cast iron service pipes. This is part of the preparation for Milwaukee water being piped and sold to Waukesha. Here the test apparatus, with cast iron service pipes pulled from under Waukesha streets and copper pipes with lead solder pulled right out of Waukesha homes. MICHAEL SEARS/MSEARS@JOURNALSENTINEL.COM (Photo: Milwaukee Journal Sentinel)

Testing for problems

"To mimic conditions and schedules of a home, water will flow for several hours inside the pipes and then be turned off to be stagnant for several hours" as it would be overnight or while residents are away at work or school, he said. Stagnant water is able to react with the metal pipes.

Water samples will be collected after each stagnant period and tested for lead, copper and other metals, including radium, as well as pH and other water quality indicators, said Tony Myers, project manager for Jacobs, an engineering consulting company based in Dallas.

Pipe scale, the buildup of minerals inside pipes from the city's use of groundwater and a corrosion control chemical, has trapped low levels of radium, separate test results show. So the project will check if the radioactive element is released when Milwaukee water flows through the pipes, Myers said.

"That to me is the biggest issue of the transition" and a potential health risk if it is not prevented, Duchniak said in referring to the possible release of radium from pipe scale. Exposure to radium over long periods of time can cause a variety of health effects, including anemia, cataracts, fractured teeth and cancer.

The testing also will show if lake water will impact the mineral scale and cause it to flake off and drop into drinking water.

RELATED: [Waukesha alerts hundreds of property owners in three communities to field work along route of lake diversion pipeline \(story/news/local/milwaukee/2018/04/23/waukesha-calls-hundreds-property-owners-supporting-cast-hundreds-start-field-work-along-lake-water-d/529650002/\)](https://www.jsonline.com/story/news/local/milwaukee/2018/04/23/waukesha-calls-hundreds-property-owners-supporting-cast-hundreds-start-field-work-along-lake-water-d/529650002/)

Such extensive testing is needed because the two cities use different chemicals in treating water for drinking, according to Duchniak.

Milwaukee adds orthophosphate to lake water to control corrosion of lead from lead service lines in its distribution system as well as copper pipes with lead solder in older homes.

Waukesha currently adds sodium silicate to groundwater pumped from wells to control corrosion of lead from the few remaining lead pipes in its distribution system as well as the copper pipes with lead solder found in many older homes in the city.

Waukesha has replaced all of its lead service lines and will remove the remaining 30 or so lead gooseneck-shaped connections between water mains and iron service lines in the next few years, long before the switch to lake water, Duchniak said.

The current testing of pipes with Milwaukee water will show if Waukesha needs to continue adding sodium silicate to water after the switch to maintain a coating inside pipes that will prevent leaching of lead from solder or radium from the pipe scale, he said.

Building water supply system

Milwaukee will provide Waukesha a connection to its regional water distribution system by building around two miles of pipeline from South 60th Street and West Morgan Avenue to South 76th Street and West Oklahoma Avenue. At that intersection, Milwaukee will build a new booster pumping station to push flow out to Waukesha. Milwaukee also will be able to use the new pumping station to improve its service on the southwest side of Milwaukee County.

The cost to Milwaukee is estimated at \$20 million.

Waukesha will build a water line from the booster pumping station west through West Allis and New Berlin to Minooka Park in Waukesha.

Waukesha plans to build a 10-million-gallon storage reservoir and a booster pumping station at the park. A new pipeline will be built from there to carry water to a connection with Waukesha's distribution system near the intersection of Racine Avenue and Highway 164.

Waukesha's cost is estimated at \$140 million.

A separate pipeline will be built from Waukesha's sewage treatment plant to the Root River in southern Milwaukee County where the fully treated wastewater will flow downstream and be returned to the lake. The planned discharge location is on the riverbank east of South 60th Street and south of Oakwood Road in Franklin.

The discharge, known as return flow, was required by the eight Great Lakes states as part of their 2016 approval of the diversion of lake water to Waukesha.

That is expected to cost Waukesha about \$146 million.

RELATED: [Great Lakes governors approve Waukesha water request \(/story/news/local/waukesha/2016/06/21/great-lakes-governors-approve-waukesha-water-request/86220734/\)](https://www.jsonline.com/story/news/local/waukesha/2016/06/21/great-lakes-governors-approve-waukesha-water-request/86220734/).

Waukesha will pay Milwaukee around \$3 million in 2023 to deliver an average of 6 million gallons of lake water a day when the service begins that year. Milwaukee will provide Waukesha with up to an average of 8.2 million gallons a day by midcentury.

Waukesha also will contribute a one-time infrastructure fee of \$2.5 million to Milwaukee that will be used to help pay costs of removing lead service lines, Milwaukee officials said.

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