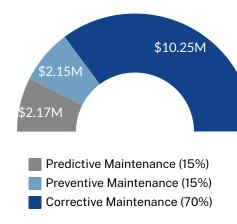




billion for the utilities it operated and maintained. These utilities include storm drains, sanitary and combined sewer systems, drinking water systems, lake levels and dams. It also includes new funds this year for operations and maintenance responsibilities for the cities of Sylvan Lake and Pleasant Ridge. As these systems age, they need maintenance, rehabilitation and eventual replacement. The WRC manages all this through the County's Collaborative Asset Management System (CAMS). CAMS provides the ability to optimize predictive, preventative and corrective operations and maintenance work for all systems under its authority. See Figure 1: Maintenance Breakdown for details. This maintenance program is critical for extending the useful life of system components and to prevent premature failures. It also promotes long-term sustainability and reliability while minimizing costs.

The approximately 44,000 work orders accounted for more than \$14 million of maintenance work. More specific asset details and maintenance efforts is further broken down by each utility in the following sections.

Figure 1: Maintenance Breakdown



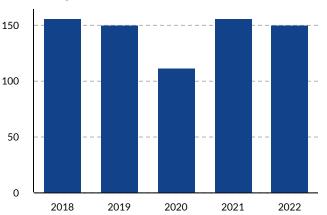
Drinking Water

Our team maintains 22 local water systems. This includes more than 1,460 miles of water main, 26 well houses and treatment facilities, 11 storage tanks and six water booster pumping stations. Water quality and protection of public health is of the utmost importance and there are numerous regulations including the Safe Drinking Water Act that operators must abide by for compliance and maintaining water quality. Our Consumer Confidence Report is designed to inform consumers about their water quality. The report includes information about the water supply source, detected contaminants and violations (with corrective actions) that occurred during the reporting year. We are required to prepare these reports by July 1 of each year. One important piece of water quality efforts being actively pursued is the replacement of lead service lines. In 2022, some 179 lead service lines were replaced with many more to be replaced in the coming years.

Pursuant to the five core outcomes, another top priority is system reliability. The main indicator of service reliability for drinking water systems is the frequency of water main breaks.

Increasing and decreasing main breaks can be attributed to the weather but can also be an indication of capital investment needs. As system main breaks increase, capital improvement repair projects are needed. In 2022, 5.5 miles of water mains were replaced, and 150 water main breaks were repaired. This is a typical number of breaks, especially considering the mild winter of 2021-2022 as seen in Figure 2: Water Main Breaks.

Figure 2: Water Main Breaks

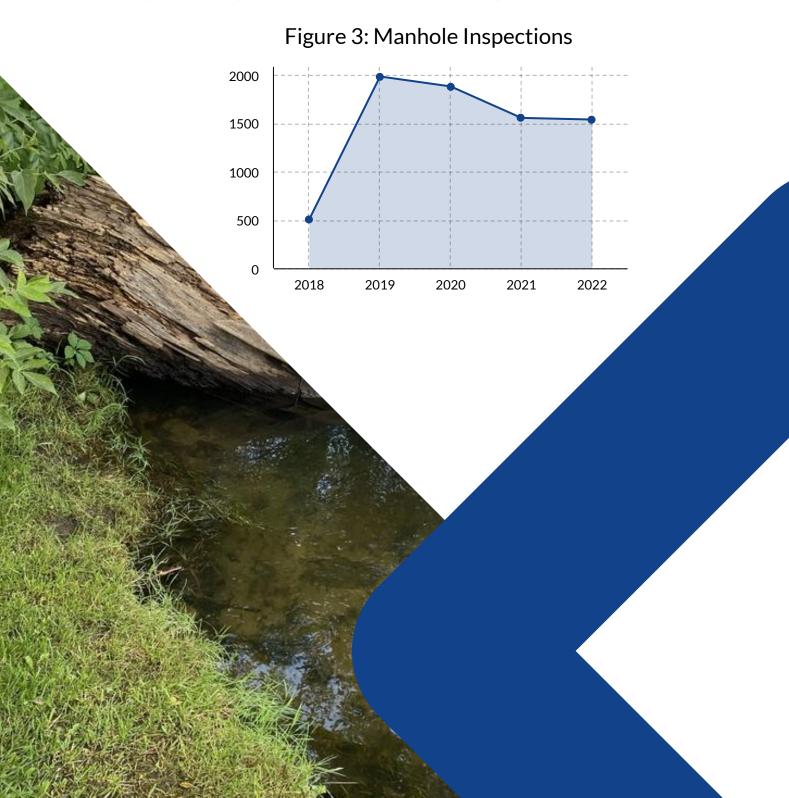




Storm Drains, Lake Levels and Dams

This fiscal year, we inspected 36 dams during the triennial dam inspection program. In general, Oakland County's dams were found to be in fair to good condition.

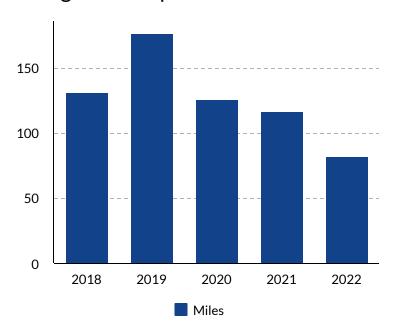
There are 429 storm systems overseen by our office with more than 545 miles of enclosed storm drains and 215 miles of open channel storm drain. Additionally, there are 40 lake level control structures and 10 pump stations. As part of the County's Municipal Separate Storm Sewer System permit, we inspect and clean manholes and catch basins. These inspections ensure that the storm systems stay in good condition while periodic cleaning removes any accumulated dirt and debris preventing it from entering the County's lakes, rivers and streams. See Figure 3: Manhole Inspections.





We operate and maintain 10 regional sewage disposal systems and 26 local sanitary systems which include more than 1,600 miles of sanitary and combined sewer, 11 water resource recovery facilities, four retention treatment basins, three septage unloading facilities and 159 sewage pump stations. One of the key performance indicators for sanitary and combined systems is the number of inspections of gravity mains. We inspected over 82 miles of gravity main in 2022. This is based on asset management plans for each system where assets are inspected at 5-, 10- or 15-year intervals depending on their criticality, condition and the level of service dedicated to each system. See Figure 4: Inspected Sewer Mains. Once inspected, findings are entered into an asset management program which adds any needed interventions into a 5-year plan. Projects within the longrange plan are prioritized by condition and criticality. Many of the findings turn into future capital projects.

Figure 4: Inspected Sewer Mains



Project Management

In addition to operations and maintenance responsibilities, we are responsible for capital replacement and major maintenance for most of the systems.

For 2022, our team managed approximately 76 capital and major maintenance projects over \$200,000 with a combined investment of \$251 million. See Figure 5: Project Investments. Our office continues to push the envelope to bring projects to light through innovative funding and delivery methods saving our communities time and money. This year we were one of the first organizations in the state to use the Construction Manager At Risk (CMAR) contractor procurement, a delivery method which embraces a commitment to deliver a project with a guaranteed maximum price, for a state revolving fund loan program.

Further, our office was the first to utilize the state revolving loan program to purchase increased flow capacity for sending sewage for treatment. One more example of how this talented team is always seeking opportunities to provide the most value for each investment dollar. This includes looking at alternate funding methods, collaborating with other utilities, coordinating with road agencies to "Dig Once" and working with state and federal agencies to ensure water infrastructure receives funding through various grant and loan programs.

In FY 2022, WRC's projects were funded utilizing the following methods. See Figure 6: Project Financing.

Figure 5: Project Investments

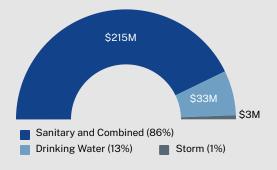
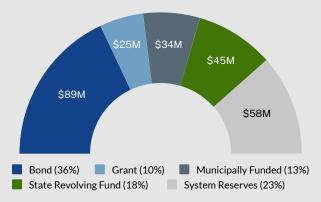


Figure 6: Project Financing





Water Infrastructure Solutions

The theme for the past decade has been do more with less. This is even more prevalent today with infrastructure replacement and rehabilitation projects, especially in the post pandemic era with its ever rising inflation. To maximize the value of infrastructure investment, both short- and long-term funding opportunities were sought for water infrastructure projects that would facilitate regional collaboration.

Water Affordability

Water affordability is an ongoing concern for many communities in Oakland County and across the nation. We were awarded a \$444,600 grant to investigate potential water affordability solutions for water utilities. Providing safe drinking water and reliable sewer services is a cornerstone of public health protection. Water utilities face the challenge of maintaining proper investment in water and sewer systems to ensure safe and reliable services, while simultaneously keeping water rates to pay for those services affordable. In October 2022, our team published a Water Affordability Solutions report that provided recommendations on how water utilities can balance infrastructure needs with affordability solutions. Some of the key findings include:

 Unlike with gas and electric utilities, there is no federal or statewide strategy to provide comprehensive solutions to address water affordability. A recent survey showed that affordability concerns are present in every geographic and demographic across the state. Therefore, a statewide plan was determined to be necessary to advance water affordability for all communities in Michigan. Water utilities should not forgo water and sewer system
maintenance and improvement projects to keep customer
rates low, particularly when inaction would compromise
the utility's ability to provide safe and reliable water
services. Short-term cost saving measurements to keep
rates artificially low usually result in more expensive
long-term financial consequences. To learn more about
our work, visit oakgov.com/affordability.



Water Infrastructure Funding

Two large infrastructure spending laws were adopted in the past few years. At the federal level, the Bipartisan Infrastructure Law was passed and at the state level, the Building Michigan Together Plan allocated some of the billions in federal American Rescue Plan Act (ARPA) dollars to water infrastructure in Michigan. Both funding mechanisms are processed through the State Revolving Loan Program for Michigan.

For its part, we spent significant resources applying for and receiving three Clean Water State Revolving Fund projects and five Clean Water Non-Point Source projects. These projects totaled more than \$31.5 million in grants and principal forgiveness and more than \$150 million in low interest loans. This saved the communities in Oakland County tens of millions in financing costs.

Our team did not stop there. Constantly looking for ways to offset expenses for water customers, it applied for and received two drinking water asset management grants to assist Pontiac and Royal Oak Township. The grant money will be used to optimize a plan to replace lead service lines and aging water infrastructure. In addition, we teamed with several communities to obtain more than \$1 million in ARPA money allocated to Oakland County. That money was used to cover sanitary sewer inspections and project planning expenses.



Our organization is constantly working to maintain the distinguished level of service that its customers have come to expect. Part of that process is continual capital improvements where needed. In 2022, we worked on more than 76 large capital projects over \$200,000 with a combined investment of \$251 million. These projects broke new ground with respect to industry standards and ensured that the facilities owned and operated by us created an exceptional value, return for investment dollars while protecting public health and providing reliable service.

Northeast Sanitary Sewage Pumping Station and the North Interceptor-East Arm Rehabilitation Projects

In the spring of 2019, the Oakland-Macomb Interceptor Drain Drainage District (OMID) and the Great Lakes Water Authority (GLWA) entered into an agreement to allow OMID to manage the day-to-day maintenance and capital improvement projects for the downstream Northeast Sanitary Pumping Station (NESPS) and the North Interceptor-East Arm (NI-EA) sewer that solely serve OMID. Previously, GLWA was handling only the maintenance services for these facilities at an annual cost of more than \$8 million.

Both the Northeast Sewage Pumping Station with its contract capacity of 423 cubic feet per second (cfs) and the downstream NI-EA, with a diameter than ranges between nearly 12 feet and nearly 18 feet, were constructed in the 1970s and need significant repairs. Consequently, OMID engaged in three capital projects to rehabilitate these facilities.

The third NI-EA project begun in 2022, consists of lining approximately 800-feet of the interceptor on Gratiot Avenue near Mack Avenue in Detroit using multiple lining products as part of a pilot study similar to the project previously mentioned. These lined sections will be monitored to evaluate long-term performance of the various liner products. This practice will increase the knowledge base of the industry experts in the region which will be helpful when considering options for future repairs.

Additionally, as part of the project, two flow control structures will be added to provide as-needed flow diversion between the existing interceptor and the existing sewer at Seven Mile Road to facilitate lining operations. The project also entails debris removal, leak sealing and spot repair of the interceptor at various locations. Work is scheduled to begin in June 2023 and be complete by June 2025.

Collectively, these projects represent an estimated investment of \$100 million.

There is **no additional cost to the ratepayers** thanks to \$8 million per year in annual maintenance savings offset by a GLWA agreement to cover the yearly bond payment.

The NESPS electrical upgrades project entails a complete upgrade of existing pumps, electrical switchgear, transformers, process piping, valving and other appurtenances to restore acceptable functionality and reliability to station operations. The work is being performed using a Construction Manager At Risk (CMAR) contract to help with pre-procurement of longlead equipment to accelerate the project. Construction began in August 2020 with a new building to house new electrical components and facilitate the transfer of assets while keeping the facility operational. Work is anticipated to be complete by August 2024. One of the NI-EA projects, which is under construction, consists of lining approximately 1,700 feet of corroded pipe that measures 18 feet in diameter immediately downstream of the pumping station.

A 45-foot-deep access shaft has been constructed to perform the lining effort. The project also includes manhole repairs and leak sealing as well as removing debris from inside the interceptor pipe. As part of the bidding process, contractors were required to install three different liner sections within the interceptor at varying lengths of their choosing based on price. This process allowed for increased competition among lining suppliers. It also gave OMID the opportunity to study the various liners' viability in an area with one of the highest concentration of hydrogen sulfide in the region.

This project is estimated to be the largest sanitary sewer slip lining project in the world. The project is expected to be complete by June 2023.



Evergreen-Farmington Corrective Action Plan: Thinking Differently About Overflow Management

On occasion, heavy rains cause sanitary sewer and combined sewer overflows throughout southeast Michigan. The Evergreen-Farmington Sanitary Drain Drainage District (EFSD) was created to address these issues and to minimize the amount of untreated sewage entering the Rouge River, which flows into the Detroit River and eventually to Lake Erie. These overflows have the potential of sending E. coli to the Rouge River and exerting increased oxygen demand on the river. This can cause a reduction in dissolved oxygen in the river, which can be harmful to fish and other aquatic organisms.

Collaborating to reduce discharges

The need to manage these overflows in the region is significant. But rather than relying on each sewerage district in the area to develop its own local solution, three entities (Oakland County, the Great Lakes Water Authority and the City of Detroit) have come together to form a unique collaboration with a regional focus to reduce combined sewer and sanitary sewer discharges into local waterways. From a regional perspective, several construction projects have been identified for consideration over the next five years.

The Evergreen-Farmington Sanitary Drain is increasing its conveyance capacity along 8 Mile Road through increased capacity at an existing pump station and a new force main. The 8 Mile Pump Station will be modified to increase its ability to manage more sewage flow. This includes improvements to the pumps, modifications to the discharge piping, electrical equipment, mechanical equipment, and modifications of the structural elements. The existing pumps will be replaced with four 460 horsepower pumps. The electrical equipment will be replaced and upsized to supply the increase in power for the new pumps. The pump station structure will be modified to allow room for the larger pumps to be installed. This requires the removal of one of the floors within the pump station in addition to other structural modifications. Modifications will also be done to the downstream Evergreen Emergency Sanitary Sewer Overflow (SSO) Chamber as part of this work. The weir wall will be both longer and higher by several feet to accommodate the increased flow. The electrical, mechanical, and level monitoring system will also be replaced at the chamber.

A new force main will be constructed to convey the additional flow from the pump station. This includes the construction of 6,040 feet of 54-inch diameter sanitary sewer force main. The force main will run down 8 Mile Road from the pump station to the existing Evergreen Emergency SSO Chamber. Two lanes of 8 Mile Road will be reconstructed as part of this project. Additionally, the force main phase of the project will be coordinated with the work at the pump station, the SSO chamber and the Michigan Department of Transportation (MDOT) project approximately a mile away at the intersection of Telegraph and 8 Mile Road in the City of Southfield.

Together, these modifications will allow for more sewage flow to be conveyed through the system. The project has an incredibly detailed construction sequence which requires phased construction and a vast amount of temporary construction. This allows the existing pump station, which serves nearly 300,000 Oakland County residents, to remain in service throughout construction process. This project also utilized the Construction Manager At Risk (CMAR) procedure which allowed the team to pre-purchase long lead items such as the generator, pumps, electrical equipment and actuators. In addition, the CMAR procedure provided input on how the project was designed and sequenced to minimize risk. With this enlarged capacity, the Evergreen-Farmington Sanitary Drain will not only improve system reliability but will also avoid the higher cost of constructing a new wet-weather storage facility, and the associated costs of its long-term operations and maintenance.

The City of Detroit will construct the West Warren Green Infrastructure Project in a residential neighborhood immediately west of the Rouge River and North of West Warren Avenue. The project includes sewer separation, neighborhood drainage improvements and a green stormwater infrastructure (GSI) feature in the Rouge Park. The GSI feature will act as a filter for stormwater entering the rouge river. It also will reduce peak flow rates from the new storm sewer system to the Rouge River. The existing combined sewer will continue to collect and convey flow from sanitary leads, footing drains and various other connections but will convey it at a much lower volume to the Great Lake Water Authority. That will free up much-needed capacity for the Evergreen-Farmington Sanitary Drain.

For its part, the Great Lakes Water Authority will accelerate its schedule for a two-part improvement project at its West Warren combined sewer outfall located along the Rouge River in Detroit. This project will address and reduce wetweather discharges from this site. The project will be completed in two parts. Part one includes constructing a new diversion weir chamber at the existing outlet of the Rouge River and part two will triple the size of an existing 18-inch diameter pipe to a 54-inch pipe east of the Rouge River.

Combined, the projects will prevent approximately 48 million gallons of untreated wet-weather discharge from flowing into the Rouge River each year.

The drainage district will invest more than \$130 million in this joint effort. Ultimately, providing a significant environmental benefit while obtaining system reliability. Working together as a region to solve this problem produced a mutually beneficial outcome that maximized the investment value and provided a cost savings for customers in these communities.

I-75 Modernization and GWK Dequindre Pump Station Rehabilitation Projects

As part of the Michigan, I-75 Modernization Project from north of 13 Mile Road to north of 8 Mile Road in Madison Heights, Royal Oak, Hazel Park and Ferndale, we entered into agreements with MDOT to improve regional water quality. MDOT is constructing a 25-million-gallon, four-mile-long, deep tunnel adjacent to the service drives. They are also is building a new pump station on our George W. Kuhn Drain Drainage District (GWK) property in Madison Heights. The GWK staff will operate the pump station once it is constructed to ensure that operations between the I-75 project and the GWK interface to the greatest benefit of the region.

Through a coordinated effort between our office and MDOT, this project will allow MDOT to capture stormwater runoff from I-75 from most storms up to a 100-year rain event without increasing discharge to the GWK's retention and treatment basin. This project, which involves widening the interstate, allows for the so called "first flush" capture of stormwater runoff from I-75. First flush refers to the initial runoff of surface water and prevents most of the polluted water from entering the storm drains. Water found in the first flush, which is treated at the GWK facility, is more concentrated than subsequent stormwater runoff.

After the first flush runoff is captured and treated, any additional stormwater runoff from I-75 will be directed to a new stormwater outlet, preventing the majority of the expressway's stormwater runoff from entering the combined sewer system. The additional 25 million gallons of storage and the stormwater outlet frees GWK's basin capacity previously utilized by MDOT for some storm events. That increased capacity is expected to reduce the volume and frequency of treated discharges to the Red Run Drain.

Some of the equipment in the Dequindre Pump Station were nearing the end of their useful life and before conditions deteriorated, they needed to be rehabilitated to reduce the potential of future failures. Because of this the majority of the mechanical and electrical equipment was rehabilitated, and in the process, piping was replaced in the pump station. This project ensures that the GWK can discharge the maximum allowable flow rate to the Great Lakes Water Authority.

Together these two projects align with the approved Regional Operating Plan for the Great Lake Water Authority. This plan has been reviewed and approved by GLWA to maximize both existing and proposed facilities to improve water quality throughout the region.



JANUARY

Kids' Calendar Contest Inspires Youth

Our popular Kids' Clean Water Calendar Contest continues to highlight exceptional artwork from local fourth and fifth graders. More than 700 art submissions were received with a record number of 42 schools participating in the contest. The 2023 calendar includes the artwork of 12 finalists—one for each month of the year—and 12 honorable mention semifinalists. The artwork depicts how to prevent water pollution, promoting water conservation and more.

Job Shadow Program

We were excited to start offering job shadowing opportunities in 2022. Our mission is to excite potential candidates about a career in the water industry by allowing them to see and experience the tasks performed for a specific job. We hosted 12 job shadows for 20 people in 2022. Anyone interested in a job at our organization should visit our website where you can request to spend a day learning about aspects of a career in water that most interest you.

FEBRUARY

Stormwater Art Contest

We launched our first ever stormwater manhole cover design contest to help promote stormwater education in 2022. Participants were asked to create a design to be displayed on covers throughout Oakland County. The winning artwork was selected from 74 entries. The winning artist was a senior from Troy Athens High School, Mandy Chu. You can see her art on covers in walkable areas throughout Oakland County.

Linking Students to Water Careers

For the third year in a row our office partnered with Junior Achievement Inspire for a virtual career fair. The event was held online for more than 15,000 middle school and high school students. Our interactive booth promoted life-sustaining careers in water and gave participants the opportunity to learn more about us.

MARCH

Water System Improvements

Our office received \$1.6 million through a community project grant that will be used for water system improvements in the City of Pontiac and the Charter Township of Royal Oak. Our team will work to replace watermain and lead service lines in each community. This funding will help to offset costs to water customers in these communities.

New Technology Used For Sewer Lining

Our team used innovative technology to create a fiber-reinforced polymer pipe to rehabilitate a total of 1,694 lineal feet of the Oakland-Macomb Interceptor Drain that serves 23 communities in southeast Michigan. This technology allows the pipe to withstand a highly abrasive and corrosive environment for more than 100 years. It also provides cost savings on labor and maintenance.





APRIL

Educating the Next Generation

Our water resource recovery team presented to approximately 60 students in the agriscience classes at Oakland Schools Technical Campus Northwest about careers in water. This event resulted in six job shadows with our organization and one new employee after graduation.

Royal Oak Earth Day Event

Commissioner Nash celebrated Earth Day at the Royal Oak farmers market by selling rain barrels and educating the public about how individual actions affect our waterways with our Dirt Doctors' program. Our demonstration teaches children the connections between vegetation, soil erosion, water quality and more.

MAY

Water's True Cost Documentary

Our office continues to educate the public regarding the importance of investment in water infrastructure and water affordability. Circle of Blue journalist Brett Walton sat down with Commissioner Nash to talk about water affordability for residents in Southeast Michigan. Visit our website to view the video and learn more.

Career Fair in Farmington Hills

Commissioner Nash presented our careers at Tech Night in Farmington Hills. The career fair was well attended. After the presentations, our team was able to connect with participants and answer questions about careers in water.

Facility Tour for Students

We hosted 40 advanced placement students from Troy Athens High School at our George W. Kuhn Retention Treatment Basin in Madison Heights. The students spent a morning learning about the historical environmental changes that have impacted the development of our facility and how it operates today.

JUNE

Community Outreach Event

Our office along with the Charter Township of Royal Oak Parks and Recreation, Hubbell, Roth & Clark, Inc. and D'Angelo Brothers, Inc. held a community outreach event to meet with residents to discuss the lead service line replacement project in their neighborhood. Event participants could learn about the upcoming project schedule and use our interactive model to determine how to identify the service line materials in their homes.

Northwest Oakland Sanitary Drain Project

The Oakland County Board of Commissioners voted unanimously to award \$10 million to help expand sewer capacity to service several Oakland County communities. This project is a partnership between our office, Genesee County, the Village of Ortonville and the Townships of Holly, Groveland and Brandon.

JULY

Design Thinking Event

We hosted Oakland School's d.Solve program at our George W. Kuhn Retention Treatment Basin facility. Educators toured the facility and local rain gardens to learn about stormwater management and treatment. The educators were also tasked to solve a real life stormwater management challenge, which they took back to their classrooms for students to solve.

Young Southeast Asian Leaders Initiative Visit

In support of the City of Birmingham we were thrilled to provide tours of our Clinton River Water Resource Recovery Facility, Commerce Wastewater Treatment Facility and the George W. Kuhn Retention Treatment Basin to Young Southeast Asian Leaders Initiative fellow, Martinha Amaral. This organization is the U.S. government's signature program to strengthen partnerships with emerging leaders in Southeast Asia.

AUGUST

Spotted Lanternfly Invasive Species

The Michigan Department of Agriculture and Rural Development worked with our office to limit the spread of the spotted lanternfly invasive species. The U.S. Department of Agriculture confirmed a small population of the spotted lanternfly in Pontiac. This was the first confirmed case of live spotted lanternfly in Michigan.

Apprenticeship Recognized

In August, we received a certificate that the U.S. Department of Labor certified an apprenticeship program for our Clinton River Water Resource Recovery Facility. Based on staffing needs of the facility, apprenticeship opportunities are open for applicants through the Oakland County jobs website.

SEPTEMBER

Back to School Event

Commissioner Nash and volunteer superhero ambassadors brought their superpowers to Herrington Elementary School in Pontiac to greet students. They helped students start the school year on a positive note by encouraging them to do their absolute best in class. Volunteers passed out school supplies and other educational items. Students were thrilled to see the superheroes on their first day back to school.

Lieutenant Governor Press Conference

Lieutenant Governor Garlin Gilchrist II and Commissioner Nash assembled with EGLE Director Liesl Clark and other local elected officials to discuss the Clinton River Water Resource Recovery Facility's biosolids project funding. The project was financed through the State Revolving Fund Loan program in partnership with the involved communities. The project cost is approximately \$32 million.





OCTOBER

Blue Planet Jobs

Our office, Pure Oakland Water, the Freshwater Forum at Cranbrook Institute of Science and Oakland Schools' Career Readiness program hosted Blue Planet Jobs: Careers in Water. This unique event educated high school students about the importance of the water industry, what it means to be a water professional, current labor and market trends, water industry career pathways, education requirements, industry technology advancement and so much more.

Regional Stormwater Summit

The Regional Stormwater Summit celebrated its 10th anniversary in October. The event brought industry experts, government officials and engineering leaders together to discuss stormwater management, climate change and nature-based green infrastructure design. The event had 160 attendees and was hosted by Lawrence Technological University in Southfield.

NOVEMBER

Septage Hauler Site Open

The Clinton River Water Resource Recovery Facility septage unloading site opened its doors in November 2022. A new building houses septage processing equipment, pumps, electrical equipment, instrumentation and controls. A 60,000 gallon underground concrete tank was built to store highly organic and inert material received at the plant.

Firsthand Demonstration

We partnered with the City of Auburn Hills to highlight careers in water for fifth grade students at Avondale Middle School. Students heard a presentation about careers in water before viewing vactor trucks and driving our closed circuit TV camera to see firsthand how Oakland County sewers are inspected and maintained.

DECEMBER

Holiday Extravaganza Parade

Commissioner Nash and his volunteer ambassadors joined the Holiday Extravaganza Parade in Pontiac and passed out candy to parade-goers. Participation in this event brings awareness about our organization, who we are and what we do in order to build relationships with local communities.

Connecting Community to Resources

Commissioner Nash and the water affordability team partnered with the Oakland Livingston Human Service Agency to promote the Low-Income Household Water Assistance Program. Qualified residents can now receive up to \$1,500 for household accounts to reduce or eliminate past-due water bills.



Questions? Contact us!

248-248-858-0958 or wrc@oakgov.com

24-Hour Emergency Line

Call 248-624-6366 for water, sewer and grinder pump maintenance 24 hours a day, seven days a week. We will respond in two hours or less.

24-Hour Pollution Hotline

Call 248-858-0931 to report any suspicious discharges or illegal dumping of pollution into storm drains, lakes, creeks or streams.