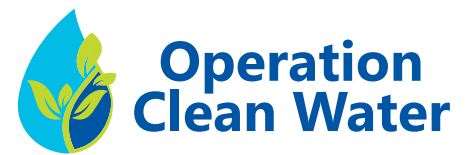


# Faces of Water

Working Together in Southeast Michigan



Clean, fresh water is all around our Great Lakes State. For decades, water drawn from the Detroit River and Lake Huron has been used as the source of our public drinking water. The Detroit Water and Sewerage Department (DWSD) treats this water so it is safe to drink and pumps it to 126 suburban communities who maintain local distribution systems that provide water to our taps. This process is managed with precision and routinely upgraded with new technology.

The workforce behind the water treatment and distribution process encompasses hundreds of water professionals who work diligently each day drawing upon engineering, scientific, operations and maintenance expertise and years of hands-on experience. These individuals manage the treatment process, keep water flowing through transmission mains at the required pressure, monitor water quality, and perform needed repairs. They are guardians of public health delivering some of Michigan's best tasting tap water and ensuring adequate flows for fire protection. The stories behind these faces are told here.

For additional information on each of these individuals and an accompanying video go to the News section of [www.dwsdoutreach.org](http://www.dwsdoutreach.org).



**Connie Colandrea, Head Water Plant Operator  
Springwells Water Treatment Plant  
Detroit Water and Sewerage Department  
Years in the Industry: 24  
Licenses: Water Treatment F-1, Water Distribution S-4**

The first thing Connie Colandrea does when she reports to work is to check operational data and find out how the plant has been keeping up with consumer demand during the previous shift. Every day is different and her initial assessment usually gives her a good idea of how the shift will progress and what she needs to do to keep the Springwells Water Treatment Plant producing the volume of water being consumed in the distribution system. While continuous monitoring systems keep a close eye on each of the different treatment processes and pumping operations, operator judgment is crucial to keeping safe drinking water in constant supply.

If pressure is dropping and demand is rising, Connie will increase the volume of raw water being pumped into the plant. If it is a night shift and reservoir

*“Normally, just coming in and monitoring the process is kind of a joy. When everything is running well, everyone is comfortable and happy. If challenges do arise, we are ready to address them.”*

levels dropped during the day, she'll increase production to bring levels back up to meet the morning demand. She will keep a close eye on equipment performance and power consumption. She will investigate any instrument alarms received via SCADA (Supervisory Control and Data Acquisition) and put redundant equipment in service at that point. The malfunctioning equipment is then evaluated and any problems are resolved.

Connie keeps in contact with the chemist on duty to monitor turbidity and residual chlorine levels and determine if an adjustment in alum or chlorine dosing is required. Because the source water from the Detroit River is of such high quality, the operator and chemist do not need to worry about mineral levels typically found in groundwater that can complicate the treatment process.



Annie Philip, Supervisor of Filtration  
Northeast Water Treatment Plant  
Detroit Water and Sewerage Department  
Years in the Industry: 24  
License: Water Treatment F-1

As the Chemist in charge of the Northeast Water Treatment Plant, Annie Philip manages the plant's certified laboratory where tests are conducted throughout the water treatment process. Based on analytical results, the on-duty chemist maintains or modifies each step of the process to achieve drinking water standards and assure regulators and the public that safe water always flows from the tap.

Many people don't realize that their tap water is monitored 24/7 by a chemist licensed to operate a water treatment plant. Three different chemists work 8-hour shifts to perform testing each day. Annie manages the lab to maintain certification from the Michigan Department of Environmental Quality (MDEQ), monitors chemists' work, maintains chemical inventory for treatment, and prepares regulatory reports. Water samples are tested for more than a dozen parameters with a closer focus on two critical parameters: turbidity and chlorine residual.

Turbidity and chlorine residual are continuously monitored and grab samples from the nine different faucets in the laboratory are analyzed on an hourly basis.

Turbidity measures the cloudiness of the water. The higher the reading, the more particles there are in the water. An increase or decrease in turbidity level requires an alum dosage adjustment. Chlorine is used to disinfect water during treatment to kill microorganisms. If residual levels are lower

"We produce some of the best water in the world. The EPA has their standards that the State of Michigan enforces. We have our own internal standards that are even higher than what is required."

than anticipated, there are more microorganisms in the water and more chlorine should be added. The chemist also tests for fluoride used to prevent tooth decay, phosphoric acid used for corrosion control in lead and copper pipes, and bacteria.



Sal Conigliaro, PE, Public Works Director  
City of Sterling Heights  
Years in the Industry: 20  
License: Professional Engineer

Sal Conigliaro easily moves from managing implementation of a 10-year water master plan that ensures the City's infrastructure keeps pace with its needs and incorporates cost-saving technology, to brainstorming ideas with his Water Division Supervisor on pinpointing a leak in the distribution system. His ability to work on a broad range of issues with operations staff, residents, business owners, contractors and council members is critical to keeping the City's Department of Public Works running smoothly. Sal is also responsible for sewers, roads, parks and engineering.

"Maintaining the level of public service that residents expect with decreasing revenue and a smaller staff is challenging. Efficiencies from technology are helping us bridge the gap."

With a population of more than 120,000, Sterling Heights is DWSD's fifth largest wholesale water customer. As water passes through 10 metered connections, its safe delivery to customers' taps becomes the responsibility of the Water Distribution Division. The division conducts meter reading, testing and installation; water main repairs; hydrant repairs; backflow prevention inspections; sampling within the distribution system and marking water utilities for the MISS DIG program.

A carefully crafted Capital Improvement Plan (CIP) guides infrastructure improvements each year. Large, capital-intensive projects are drawn from the master plan and modeling studies, and broken into phases to make them more affordable. Input from the Water Division Supervisor and his staff is used to identify current rehabilitation needs. Each plan feeds the other providing checks and balances that the City's assets are being maintained.



**Scott Roselle, Water and Sewer Leader**  
City of Novi  
Years in the Industry: 23  
License: Water Distribution S-1

Maintaining and operating a water distribution system requires a unique mix of problem solving, mechanical and public relations skills. It's a demanding job that can take Scott Roselle from analyzing the City's water usage data from DWSD's Wholesale Automated Meter Reading program one hour to adjusting pressure regulating valves and pump motor speeds at a booster station the next hour. Then he'll move on to the City's Cross Connection Program or checking a water main repair or meter replacement. As Novi's licensed Water Distribution Operator, Scott is responsible for ensuring

*"We have a large amount of work in a lot of different areas on a day-to-day basis to keep the City's water and sewer infrastructure operating as planned. We take pride in providing quality drinking water to our residents."*

the system is maintained and operated according to state of Michigan and federal standards.

Scott and his 7-member field team take care of a lot of infrastructure – over 300 miles of

water main, 2 booster stations and around 4,000 fire hydrants that serve the City's 14,000 water accounts. Because of elevation changes, the water system is divided into four pressure districts. The booster stations and pressure reducing valves are used to keep water at required pressures as it travels through different elevations. The Cross Connection Program safeguards the water system through regular testing and inspection to make sure that non-potable water sources are not connected to water mains.

As a Captain for the Milford Township Fire Department, an on-call position, Scott understands the critical role water systems play in fire protection firsthand. He works closely with the Novi Fire Department to keep them abreast of how the distribution system is functioning. His team works diligently to maintain pressure and volume throughout the system to meet consumer and fire demand, and to maintain hydrants.



**Doc (Donovan) Walton, Assistant Superintendent of Water System and Maintenance Construction**  
Detroit Water and Sewerage Department  
Years in the Industry: 29

The Central Services Facility impressively houses three of DWSD's four district yards used to maintain the large transmission mains connecting to suburban communities, and all of the pipes within the City of Detroit. Doc Walton moves throughout the 23-acre facility supervising the activities of more than 300 employees who maintain and repair water mains, sewers and catch basins to make sure the system flows efficiently. His steadfast approach and ability to develop practical solutions enables him to skillfully manage any maintenance situation.

Doc's crews are responsible for 3,438 miles of water main within the City, 402 miles of transmission main in suburban communities, hundreds of valves and 27,244 fire hydrants. Assignments include investigating customer issues, repairing water main breaks and service leaks, connecting/disconnecting service, hydrant repair, catch basin repair and sewer cleaning. Crews also assist with repairs at water plants and pump stations and perform routine maintenance on larger infrastructure components.

*"The sheer size of the pipe we work with can be eye-opening. It's one thing to hear about a 48-inch water main but it's a completely different experience to stand next to that pipe and see what is involved in repairing it."*

DWSD's large transmission mains range in diameter from 3 to 8 feet with a valve every 2,000 feet so that sections can be isolated for repairs. Valves are turned on a monthly basis to ensure they will operate when needed. Crews also assist suburban communities when work needs to be performed on a local water main. Doc will meet with the community to address potential issues and establish traffic control and a shut down schedule so the project goes smoothly. He also works closely with the Systems Control Center on major projects.



Erik Trudeau, Water System Control Instrument Tech  
Detroit Water and Sewerage Department  
Years in the Industry: 7

Decision making based on timely and accurate operational data is critical to efficient water treatment and distribution. No other tool is more beneficial to troubleshooting problems and making key operational decisions than the SCADA (Supervisory Control and Data Acquisition) system that Erik Trudeau helps DWSD maintain. Each morning Erik checks his computer for any faults in the system to see which alarms were triggered indicating SCADA monitoring equipment that needs to be checked out.

*“The SCADA system provides real time data that operators use to control the treatment and distribution process and work more efficiently.”*

DWSD’s SCADA system collects data from thousands of points from the five water treatment plants, 20 booster stations, 34 reservoirs, transmission mains, and master meters. Collected data is sent to a computer, also called a human machine interface or HMI, that is continually monitored by an operator who makes decisions based on the data. Treatment plant SCADA data is sent to the operator’s and chemist’s HMI. SCADA data for the entire water distribution and wastewater collection system is sent to DWSD’s Systems Control Center. Operators and engineers analyze that data, modify operations to meet system demands, and send maintenance workers out to address equipment problems 24/7.

Erik is one of the instrument techs responsible for making sure that the control systems and field instrumentation throughout DWSD’s system are sending data to operators and chemists every day so they can perform their jobs. Controllers are used to monitor equipment operations and alert operators to any problems in the system. Operators can also go back in time by retrieving past performance data from the historian stored on the SCADA servers to pinpoint exactly when a problem started or when equipment performance began to decline.



Yvette Hayes-Johnson, Senior Distribution Water System Investigator, Detroit Water and Sewerage Department  
Years in the Industry: 23  
License: Water Distribution S-3

Yvette Hayes-Johnson knows the sampling and testing performed by DWSD’s Water Quality Division provides regulators and suburban water departments with a high level of confidence that the tap water is safe to drink. In addition to testing tap water in 83 communities each month, the Division completes state and federal testing requirements, responds to water quality complaints, and disinfects and tests pipes and treatment plant reservoirs brought into service after repairs. Years of experience investigating water quality problems and a calm demeanor enable Yvette to manage hectic, deadline-driven days to meet regulatory requirements throughout the distribution system.

Yvette schedules the 5 water system investigators who collect at least 722 samples monthly from 422 locations identified by wholesale customers and within the City of Detroit to meet Total Coliform Rule requirements. Samples are collected from faucets in fire stations, city halls, gas stations and restaurants after running the water for several minutes to ensure the sample comes from the distribution system. Samples are analyzed at the Division’s Laboratory for bacteria and residual chlorine is measured in the field at the time of sampling. Infrequent positive samples are usually traced to the faucet aerator or the plumbing, not the distribution system. Monthly reports are submitted to the Michigan Department of Environmental Quality (MDEQ) on behalf of the wholesale customers.

*“Monitoring of our drinking water does not end when it leaves the plant. We are in the system sampling the water every day.”*

The Water Quality Division also collects samples as part of federal and state monitoring requirements. This monitoring addresses the new rules on lead and copper, arsenic, organic compounds and other contaminants. In October 2011, a total of 2,426 samples were analyzed for total coliform, E. coli, chlorine residuals, heterotrophic plate count, microtox, and other parameters. 2,075 of these samples were from suburban communities and 351 from within Detroit.



**Michelle Gendron, Account Clerk II**  
City of Southgate  
Years in the Industry: 3

The upbeat, reassuring voice Southgate residents hear when they call their Water Department with a question about their utility bill belongs to Michelle Gendron. She manages the water meter reading and billing process for 13,000 accounts in the City. The deadline-driven job requires her to quickly analyze usage and have a repairman address questionable meter readings before billing is completed.

A new billing cycle starts each month when Michelle schedules meter readers to collect readings. Two of the City's four ledger areas are read each month with customers receiving a bill every two months. Michelle loads ledger meter data into two electronic meter reading devices or guns that send a wakeup call to meters in homes and businesses as the meter reader drives the route. Customers' meters respond by sending their meter reading to the gun. After each ledger is completed, Michelle downloads the data to her computer and compiles

*"About 30% of our customers still have older meters that must be read on foot. As we replace these meters, we increase our ability to detect leaks within homes."*

a list of meters that could not be read. A consumption report is then generated that shows the difference between the current and previous meter readings. Line

by line, she reviews each account for abnormally high or low readings. Work orders are then generated for these accounts and meter readers are sent to check the meter before the bill goes out.

Michelle's other responsibilities include setting up automatic payment plans, processing final bills when people move, preparing history status reports for title companies, rolling delinquent balances over to the tax roll and addressing residential customer concerns.



**Len Smith, Meter Reader - Laborer**  
Charter Township of Canton  
Years in the Industry: 11

Technology enables Len Smith to read up to 24,000 water meters in Canton Township from his vehicle in less than one week, a job that used to take four meter readers two weeks to complete on foot. Using radio-controlled transfer units, global positioning system (GPS) software and a systematic approach, the meter reading process is faster, easier and more accurate. The updated process also requires a higher level of technical and decision-making skills.

*"There are a variety of reasons for a high meter reading – a toilet that runs, a broken irrigation system, a water-activated backup sump pump malfunction – all are worth investigating."*

Each month, Len reads one or two of the Township's geographic billing areas so that quarterly water bills can be generated for residential customers and bi-monthly bills for commercial customers. Driving a van outfitted with a roof-top radio antenna and a laptop, Len collects meter readings from as far as two streets away. The vehicle transfer unit (VXU) on top of the van sends a wakeup call to all of the meter transceiver units (MXUs) in residents' basements. The MXUs then send a signal back to the VXU containing the actual meter reading. As each meter is read, its green dot on the map disappears from the screen.

Len is helping Canton Township's 90,000 residents reap the benefits of their 8-year program to install radio meters and streamline the reading and billing process. Account information for meters has been integrated into the Township's geographic information system (GIS), enabling Township staff to access owner information and historical notes on previous repairs. Radio-read meter information flows electronically from meter reader to billing clerk providing additional time to focus on other aspects of water services. When he isn't collecting electronic meter readings, Len is completing meter repairs, working on the sump removal program, working on the cross connection program, and maintaining his vehicle, parts inventory and equipment.



Laura Verona, PE, Environmental Manager  
Michigan Department of Environmental Quality  
Years in the Industry: 14  
License: Professional Engineer

The Michigan Department of Environmental Quality (MDEQ) safeguards public water supplies by providing technical assistance to communities operating water systems and enforcing Michigan’s Safe Drinking Water Act. The MDEQ’s Resource Management Division accomplishes this through managers like Laura Verona who works with four District Engineers and a Quality Analyst to administer the compliance program for more than 200 public water systems in Wayne, Oakland, Macomb and St. Clair Counties. Energetic and technically astute, Laura manages the reporting process for the Southeast Michigan District, handling complex permitting issues as well as compliance plans when communities experience difficulties.

Laura’s group monitors municipal water systems through monthly and annual reports, and conducts site evaluations every three years. Water treatment plants prepare daily and monthly operations reports that are analyzed by the Resource Management Division.

Municipalities operating distribution systems must submit three annual reports to the MDEQ: the Pumpage Report, Cross Connection Control Report and Consumer Confidence Report. These reports, combined with required monthly bacteriological sampling results, enable the District Engineer to monitor water usage, continued protection measures to prevent backflow contamination and water quality. Detroit collects and analyzes monthly bacteriological samples throughout

the entire distribution system as a courtesy to its customer communities.

“Continuous monitoring is going on at many levels throughout the water treatment and delivery process. We all take protection of public health very seriously.”



Jody Caldwell, PE, Chief Engineer  
Oakland Co. Water Resources Commissioner’s Office  
Years in the Industry: 13  
License: Professional Engineer

Not all communities have the technical resources or desire to operate and maintain their water systems. In Oakland County, 17 communities depend on Jody Caldwell, his two engineers and three operations and maintenance groups within the Oakland County Water Resources Commissioner’s office to keep their systems running smoothly. It is a complex job that requires engineering expertise, a strong asset management and operations knowledge base, and the ability to customize programs to meet individual community needs.

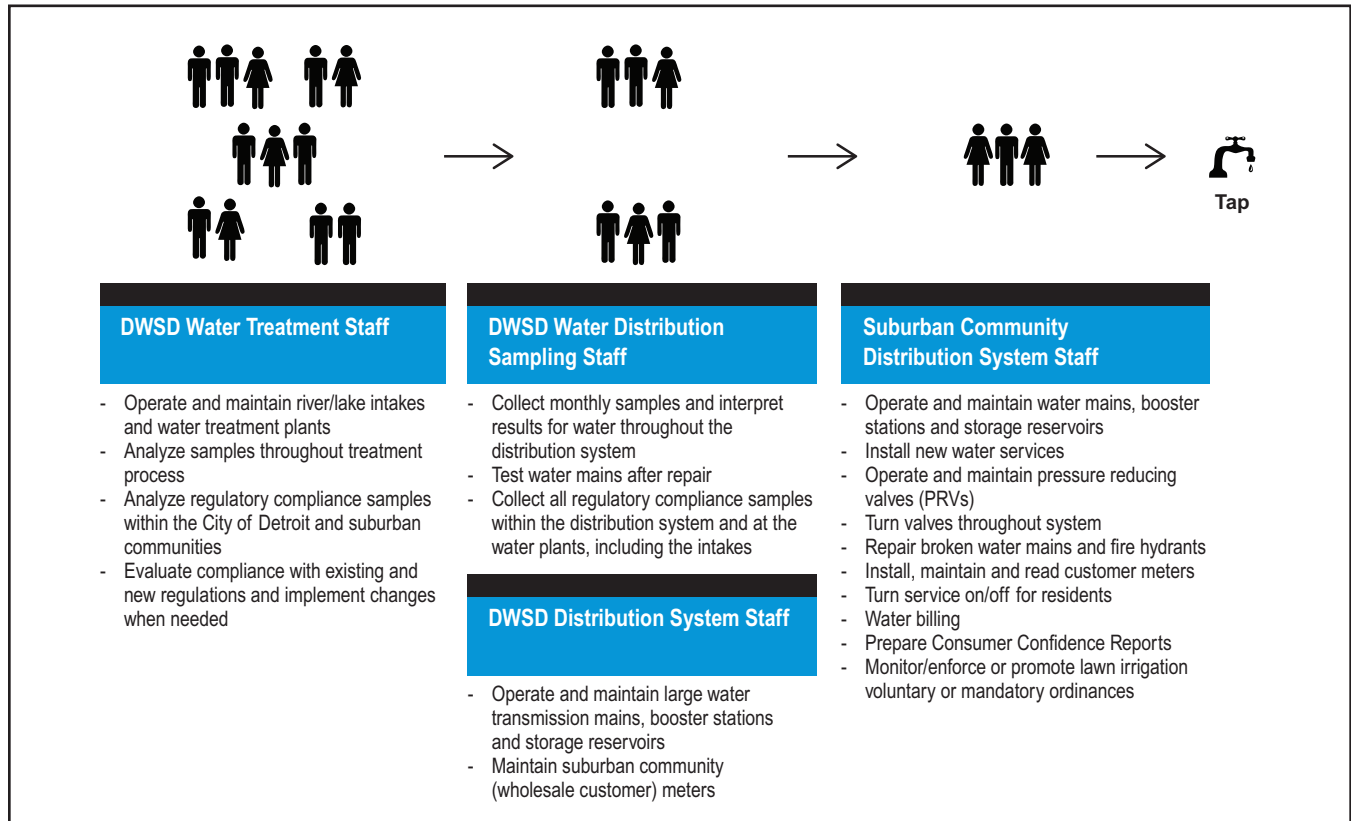
“In these economic times of decreased water sales, we are challenged to improve efficiencies, use more productive technology and collaborate to reduce costs.”

Services provided range from full service operation, management and maintenance of the community’s water system to partial service for activities like maintaining booster stations or performing emergency repairs. Jody maintains compliance with the Michigan Safe Drinking Water Act for each community system and ensures maintenance and capital improvement programs are developed and followed. He also sets capital budgets and works with each community to establish their water rate. Engineering projects include master planning, hydraulic modeling, capital improvement programs, water main rehabilitation and replacement and meter replacements.

Jody recently worked with the City of Farmington Hills to develop a long range strategy to reduce water loss in its system. It was determined that \$1.1 million of revenue savings could be achieved through a 7-year, citywide water loss reduction strategy.

Continuing to find operational efficiencies is critical and Jody sees asset maintenance programs as one of the best ways to accomplish this. These programs provide detailed information on system performance and frequency of failure enabling better decision making to optimize system performance.

## Workers Delivering and Safeguarding our Water



## Water Professional Positions in Our Region

- Chemist (certified)
- Construction Inspector
- Cross Connection and Pretreatment Coordinator or Supervisor
- Customer Service and Billing Representative
- Department of Public Works Supervisor
- Distribution System Operator (certified)
- Engineer (licensed)
- Engineering Aide or Technician
- Engineering Systems Coordinator
- Environmental Planner
- Geographic Information System Specialist
- Hydraulic Modeler
- Instrument Technician
- Laboratory Manager
- Laboratory Technician
- Meter Mechanic
- Meter Reader
- MDEQ District Supervisor
- MDEQ Quality Analyst

- Microbiologist
- Programmer/Analyst
- SCADA (Supervisory Control and Data Acquisition) Technician
- Utility Billing Customer Service Coordinator or Assistant or Supervisor
- Water Quality Manager
- Water Maintenance Supervisor
- Water System Leader or Superintendent
- Water System Investigator
- Water Treatment Plant Operator (certified)

### Additional Information

[www.drinktap.org](http://www.drinktap.org)  
[www.water.epa.gov](http://www.water.epa.gov)  
[www.workforwater.org](http://www.workforwater.org)

Every year each public water supplier publishes a Consumer Confidence Report by July 1. The report summarizes information about source water, any detected contaminants, and compliance and educational information. DWSD provides treatment information to customer communities for inclusion in their reports.

January 4, 2012

Operation Clean Water features articles on how the Detroit Water and Sewerage Department (DWSD) and its suburban wholesale customers manage our water and sewer infrastructure to protect public health and the environment. It was created by the DWSD Wholesale Customer Outreach Public Education Work Group that includes individuals from wholesale customers (Macomb, Oakland and Wayne Counties), DWSD, MDEQ, SEMCOG and consultants, and is published on the DWSD Customer Outreach Portal at [www.dwsdoutreach.org](http://www.dwsdoutreach.org).