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Oluwole (OJ) McFoy
General Manager
Buffalo Sewer Authority

DOING RIGHT BY THE ENVIRONMENT

Buffalo is on a quest to collect and
treat every drop of combined
wastewater in its system

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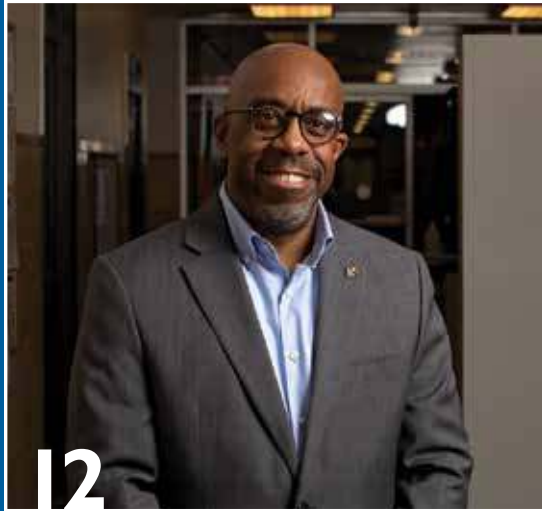
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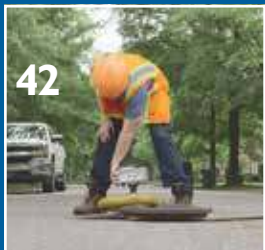
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Luke Laggis

SAVING FOR A SUNNY DAY

Stormwater should be treated as a resource rather than a nuisance to be channeled away.

Extrême weather cost the U.S. an estimated \$165 billion in 2022, according to the National Oceanic and Atmospheric Administration.

Back in January, California went from almost completely drying up to being underwater. Most of the rain from that series of storms ended up in the Pacific Ocean. Outflows from the L.A. River alone measured about 28,500 cubic feet per second at one point, according to a news story at the time.

Think of all that water just rushing out to sea, carrying a myriad of contaminants with it, exacerbating one problem while ignoring another. There is certainly a better way.

"I'll just note that we have to get more water in the ground," hydrogeologist and UC Santa Cruz professor Andrew Fisher said in a conversation with NPR. "We simply have no choice."

Climate change is one of those topics that can quickly cross from science to politics. It's fairly easy to demonstrate that catastrophic weather events are occurring more regularly than they have in the past.

And it's easy to see

the repercussions: scorched landscapes, empty reservoirs, flooding, landslides, etc. The topic gets greatly muddled, however, when discussion turns to causes. And maybe that's the problem, at least where local water utilities are concerned.

For the average utility operator, the reasons behind these occurrences don't matter nearly as much as the fact that they actually are happening. It's impossible to prevent a hurricane or stop the rain, but we have the ability to realign efforts and work better within these new circumstances, at least where water is concerned.

In 2018, Los Angeles County approved Measure W, a small tax on paved property that raises about \$280 million annually for stormwater projects. The earliest projects are beginning to make an impact, but the process is only just beginning and it's a massive undertaking. For thirsty southern California, making better use of unpredictable rains could have significant impacts.

"In a region that imports 60% of our water, it's just a huge untapped potential for a local water supply," L.A. Waterkeeper Executive Director Bruce Reznik told the *Los Angeles Times*. "We passed the Safe Clean Water Program to get us there, but we're just not there yet. It's going to take us some years."

Funneling stormwater out to sea served the purpose of protecting people and property, but at this point it's not enough, and Los Angeles is pivoting to better serve complementary needs. It'll be interesting to see the improvements that spring from Measure W, and how other communities learn from them and work to improve their own situations.

Reporting these stories and sharing examples of utilities taking new approaches to better serve their communities is what Municipal Sewer & Water is all about. The profiles of Buffalo, New York, and the Cleveland Water Alliance in this issue are good examples of that mission.

Enjoy this month's issue. ♦

Think of all that water just rushing out to sea, carrying a myriad of contaminants with it, exacerbating one problem while ignoring another.

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THE WATER COUNCIL

Tech Challenge Winners

The Water Council recently announced the winners of its fall 2022 Tech Challenge, chosen by industry leaders to help solve real challenges in the water sector. Innovations from the challenge address water quality sensors and water hardness monitoring. mswmag.com/featured

MANHOLE INFILTRATION

A Creative Solution

After discovering a simple answer for its manhole infiltration problems, a California sanitary district decided to get into the product development business. The Truckee Sanitary District made an agreement with Oatey to develop a new manhole sealant.

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COLORADO'S COSTLY WILDFIRE

How to Apply Lessons

Wildfire damage to drinking water systems can significantly delay a community's economic recovery. The costliest disaster in Colorado's history, the Marshall Fire of 2021, resulted in more than \$2 billion in losses. Now, a study has outlined the scientific and policy needs specific to drinking water systems' resilience to wildfires. mswmag.com/featured



OVERHEARD ONLINE

“Over the past several decades, the cost of providing clean water and drinking water services has risen, while federal dollars have almost disappeared.”

— **Low-Income Americans Overburdened by Sewer/ Water Funding Needs, Says NACWA Study** mswmag.com/featured



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DOING RIGHT BY THE ENVIRONMENT

Buffalo is on a quest to collect and treat every drop of combined wastewater in its system

By Giles Lambertson

The Buffalo Sewer Authority has a real-time sewer overflow map on its website, but it's doing much more than warning residents about sewer overflows. By 2034, it will have spent nearly a half-billion dollars in a quest to treat every drop of water that enters its combined sewer system — whether it originates as industrial wastewater, sewage or stormwater runoff.

"We put it forward-facing on our website so that if our customers are thinking about some recreation in a lake or river, they will know the likelihood of encountering untreated water," says the utility's general manager, Oluwole "OJ" McFoy. "After a rain event, it warns them, 'Be mindful when you enter the water.'"

The authority's problems aren't unique, but the solutions it's implementing stem from its own unique philosophy.

Combined history

The sewer authority dates from 1935 when New York Health Department officials mandated a cleanup of the Niagara River and other waters around the city. The authority was formed and a state-of-the-art sewer

treatment plant was built with a combined sewer system collecting both sewage and stormwater.

By 2000 or so, Buffalo — which by then was past its heyday as an industrial city and population center — was dumping nearly 2 billion gallons of untreated water each year into rivers, streams and Lake Erie. That computes to more than 5 million gallons per day on average. The problem was the combined system. During rainstorms, it was sending so much flow to the city's treatment plant that the facility couldn't handle it. The federal EPA finally gave notice that the situation had to be corrected.

That was the situation when McFoy signed on with the authority in 2006. He had earned a civil engineering degree and worked in the transportation industry — highways, bridges, flyovers — and then became a consultant before deciding to join the sewer authority. He certainly didn't blindly enter the situation: In addition to his professional credentials, McFoy is a Buffalo native.

"I was born and raised in the city of Buffalo and I wanted to do my best to help see the city through these environmental challenges."

OJ McFoy

"I was born and raised in the city of Buffalo and I wanted to do my best to help see the city through these environmental challenges. I recognized the challenge of maintaining the system and overcoming the sewer overflow problem and still keeping rates affordable," he says. "That was my reason for coming over, to try to do better than what we were doing."

The 47-year-old engineer says ultimately the work isn't about sewer treatment and pipes. "This is about our people. We sometimes get stuck in the science or in the numbers, but this is about people in their public health space."

McFoy joined the authority as chief operations officer. When retire-



A crew from the Buffalo Sewer Authority performs routine maintenance on a pump at the Buffalo Sewage Treatment Plant in Buffalo, New York.



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General Manager Oluwole "OJ" McFoy is helping guide the Buffalo Sewer Authority through a massive upgrade of its collections and treatment systems.

ments opened doors, he subsequently moved up to chief financial officer, chief engineer and finally, in 2015, became the authority's general manager. It was a long journey from his start in transportation.

"When I made my way over to the water side, the most difficult transition wasn't from pavement to pipes, it was understanding the treatment of water in our plant, the complexity of it," McFoy says.

The plant, which is situated on an island in the Niagara River just offshore from the city proper, is in the first stage of a \$55 million makeover. Ground-breaking on the project occurred in late October. The years-long project will begin with rehabilitation of the biological processing part of the facility and then a modernization of the mechanical part of the plant.

In-pipe solution

The more novel part of the effort to reduce the amount of untreated water ending up in the river and other tributaries is the construction of containment facilities connected to the collections system. Sixteen holding tanks — each about 600 square feet — are being connected to the mainlines so that, during heavy rains, the excessive flow can be diverted to them and then incrementally released at a rate the treatment plant can handle.

What makes it work is computerized technology in the tanks — dubbed a "real-time decision support system" — that lets operators in the plant monitor water levels in the tank and control its systematic release. The smart metering system will help track flow generally and regulate it so that, McFoy explains, "though the volume of water at our treatment plant might be heavier than usual for a longer time, it will not have the sharp peaks of flow that can overwhelm the system. It will stretch it out."

Moderate rainfalls — a half inch or inch — are not a problem for the system. They are routinely handled at the plant without untreated spillage. "We are great with those," McFoy says. "We capture all that water. But very intense rains are tough. Three inches in an hour or something. That's impossible for our present system."

The first of the containment tanks was installed in 2010. A total of three are at work now, with three more ready to go. So far, an estimated 450 million gallons of water that would have been dumped into open waters without treatment have been diverted and treated, a volume that exceeds what

engineers had predicted at this juncture of the upgrade.

The decision to add the tanks was somewhat philosophical. Looking back, McFoy says he understands why a previous generation of engineers built the combined system and then, in the 1970s, began to separate the storm and sewer systems. By 2007, though, when the sewer authority tackled the issue anew, the separate system solution didn't look like an appropriate one.

"We could separate our system," he says, "but that wouldn't do right by our environment. Some of our suburban neighbors are having water quality problems because their storm sewers collect all that falls on roadways and carries it to our streams and rivers. Is that good for our environment?"

Buffalo's response is to use the combined sewer system as a conduit for universal treatment. "The old is new again. We want to get all of our water to the treatment plant. Today, we have a 91% capture rate of every drop of water that flows here. By the end of the project, we will have 97% of it treated. In other communities, they are putting in end-of-pipe solutions for their storm sewers. When you can get everything piped to one place, as we are, you have an in-the-pipe solution. That's the best way."

"When you can get everything piped to one place, as we are, you have an in-the-pipe solution. That's the best way."

OJ McFoy

The sewer authority in 2008 asked two water solution firms how to implement this philosophy of handling water. They each reached the conclusion that temporarily holding water in intelligent tanks during excessive flow periods was the answer. The bid of South Bend, Indiana, firm EmNet was a million dollars lower and won the contract to implement the system. EmNet merged three years ago with the international firm Xylem.

"We have been working with the South Bend company for 14 years now," McFoy says. "Working with them has been a great, great opportunity to help our community."

Absorbing I&I

The combined sewer smart system doesn't entirely operate itself. The additional technology required additional professional development for employees in the water treatment plant as well as hiring some new technicians. In all, the authority employs 230 people.

Among them is a maintenance crew that handles most repair and replacement projects under 100 linear feet in size. The crew utilizes Camel and Vactor hydroexcavator and jetter trucks to expose and clean pipes. We're talking big pipes, with interceptor lines ranging in size from 6 to 11 feet in diameter. To inspect what is going on inside those pipes, the authority depends on EnviroSight inspection cameras.

Unlike many systems, Buffalo Sewer Authority doesn't expend resources fighting inflow and infiltration. In fact, it doesn't even track inflow and infiltration, according to McFoy. That's because groundwater leaking into

BACK ON THE MAP

Buffalo, New York, may have turned a corner. The city at the head of the Niagara River has endured some tough times. Once larger than Chicago, the city lost population for 50 years as industries fled south from the northern Rust Belt. But the 2020 census showed an uptick in population for Buffalo and Oluwole “OJ” McFoy thinks that’s an indicator of better days ahead.

“People are starting to come back,” says the general manager of Buffalo Sewer Authority. He adds that the authority is ready for an influx of people. “We have sewer capacity that was built for a population of three quarters of a million people and now there are just 270,000.”

To capitalize on the situation, the authority is spending \$55 million on its wastewater treatment plant and a half-billion dollars on its combined sewer system to control overflows as well as continue to build out its green space to reduce runoff. “The population decline was huge for us,” says McFoy, “but we’re trying to make lemonade out of lemons.”

He says the authority and city are mindful of the needs of Buffalo’s business community at this critical moment of redevelopment. Those needs are being factored into decisions about rates and services. “We want to make sure we are helping small businesses.”

He credits the congressional Build Back Better — or as he calls it, Build Back Smarter — infrastructure funding bill with helping Buffalo get its sewer system in better shape. “We are showing that water utilities can use that money efficiently. We need more of it coming in.”

Climate change also is a factor in the city’s possible resurgence, according to McFoy. “Buffalo is only going to get a little warmer. We are expecting more intense storms, but also we’re sitting here on the banks of Lake Erie and the mouth of the Niagara River with all this freshwater while some other communities are experiencing years of drought.”

In other words, he says, “We are sitting here as a climate resource for people to return home to or for people to move to for the first time.”

the system is mostly a good thing in a system wanting to capture all water. In egregious cases of pipe failure, of course, a lining contract is let to repair it.

On the other hand, Buffalo does have a lake push challenge. That is, winds whipping across the eastern end of Lake Erie push water toward the city, forcing the west-flowing Buffalo River back into the sewer system.

“A strong southwest wind has the potential to really back up our river. Our weirs are at a set elevation and the water flows back over them and into our system,” McFoy says. “We know that because we have high volumes of water at our treatment plant when there’s high wind but no rain.”

On the right track

Physical and technological improvement of a sewer system generally means that a rate increase is in the offing. Rates haven’t been raised in Buffalo since 2005, so charging a little more for the system would seem warranted. In this case, however, that’s a tricky proposition.

“We have a 30% poverty rate in Buffalo still, so raising rates is a chal-

“We need to operate our system in the cheapest, smartest and most efficient way in a community that has a lot of poor people.”

OJ McFoy



The leadership team at the Buffalo Sewer Authority includes (from left) Adam Sassone, Paul Harris, Roberta Gaiek, Joel Renzoni, Rosaleen Nogle, Lori Scaletta, Charles Riley, Alex Emmerson and Oluwole McFoy.

lenge,” McFoy says. “The question is, how can we keep our services affordable, be as efficient as we possibly can, and also keep our poor in mind? We need to operate our system in the cheapest, smartest and most efficient way in a community that has a lot of poor people.”

The authority offers an “affordability program” in which discounts up to 60% are available for residential connections that meet certain poverty standards. That was instituted in 2019 just before the COVID disruptions hit the economy. “We have put in a number of things to support our low-income folks while we are improving our system. If we don’t spend what we need to spend to improve the system, it will cost everyone more money.”

So, will rates go up to cover some of the half-billion dollars expended on improvements? “We are currently conducting a rate analysis that looks at all of our capacity and maintenance expenses and how we are going to operate going forward. We’re looking at all that right now.”

McFoy is satisfied that Buffalo Sewer Authority and the city are on the right track. Between the engineered smart sewer solution to the combined sewer overflow problem — which he believes more cities will emulate — he cites the 1,100 acres of green spaces the city has set aside. That acreage lets an estimated 1 billion gallons of water be absorbed into the ground instead of flowing into the sewer each year.

While there are lingering environmental challenges, McFoy is pleased with the authority’s progress. “I think Buffalo is seen as one of the leaders in innovative solutions on CSOs, and there’s local recognition that we are doing everything we are supposed to do for our water.” ♦

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BUILD STRONGER BRIDGES

Some of your best recruiters and brand ambassadors no longer work at your company

By Ken Wysocky

In the seemingly never-ending struggle to find quality employees in one of the tightest and most competitive labor markets in recent memory, organizations can wield a low-cost and effective — perhaps even surprising — secret weapon: former employees.

As counterintuitive as it may seem, increasing numbers of companies are establishing formal programs aimed at retaining relationships with ex-employees. Even though they're no longer part of the team, keeping in touch with them can help build companies' brands by creating a band of external ambassadors, says Matthew Call, a professor of management at the Mays Business School at Texas A&M University.

These corporate alumni networks also can generate quality job candidate referrals, maintain access to departed institutional knowledge and even provide channels to new customers that previously were inaccessible, he says.

"The need to leverage the power of former employees has grown on the heels of the 'Great Resignation' because there's this hyper talent war going on," Call points out. "More and more companies are realizing that employees don't have a sense of loyalty anymore, so they're trying to up their games and make use of this revolving door of turnover."

"I think this trend is gaining traction nationwide as companies begin to understand the benefits," he says.

The advent of job-search websites such as www.glassdoor.com and www.indeed.com make it even more important to stay in touch with ex-employees. Why? They provide a forum for people to post reviews of companies they either work for or have worked for, and job hunters read those reviews in just the same way that Amazon customers read product reviews to make purchase decisions.

"This shows how ex-employees can either build or hurt your company's brand," Call says. "I can't verify this, but I've heard that something like half

"This shows how ex-employees can either build or hurt your company's brand."

Matthew Call

of the reviews on Glassdoor come from ex-employees. And data shows that companies that focus on alumni networks get better reviews on Glassdoor."

Furthermore, some ex-employees might even find the grass isn't greener on the other side of the proverbial fence and become so-called "boomerang" employees who return to their former employers, notes Call, who's researched the issue for about seven years.

"Ex-employees are a good place to start when looking for talent because you know them and they know you, so there's much less uncertainty involved," he explains.

Building a network

These programs can take several forms. It could be something as simple as keeping a database of former employees and their contact information and sending them periodic newsletters. Or companies could establish virtual communities on social media platforms such as Facebook or LinkedIn to keep ex-employees in the loop about company doings.

Some companies even hire firms to manage these groups of ex-employees, Call says.

If companies handle things on their own, it's typically a human resources function. Some companies dedicate a human resources employee to supervise these networks; platforms such as Hivebrite, PeoplePath and EnterpriseAlumni can help them manage and engage alumni.

Other strategies include inviting former employees to company functions (think holiday parties, for instance), invite former employees who've become



Matthew Call

We invite readers to offer ideas for this regular column, designed to help municipal and utility managers deal with day-to-day people issues like motivation, team building, recognition and interpersonal relationships. Feel free to share your secrets for building and maintaining a cohesive, productive team. Or ask a question about a specific issue on which you would like advice. Call editor Luke Laggis at 800-257-7222, or email editor@mswmag.com.

“Give employees the sense that they’re part of an extended family that’s still respected even after people leave.”

Matthew Call

stars in their respective fields to come back and speak about their accomplishments or simply celebrate the departures of valued employees, Call says.

And when onboarding new employees, it’s important to tell them about the alumni network to reinforce a one-for-all, all-for-one corporate mentality, he notes.

“You need to embed this in your culture — give employees the sense that they’re part of an extended family that’s still respected even after people leave. It also shows them that your organization sees employees as people, not merely human capital. It sends an interesting message that former employees still are valued instead of shunned.”

That, in turn, can reduce turnover because it builds mutual respect between organizations and employees.

Training is critical

Managers also need to receive proper training so they don’t undermine alumni programs. They shouldn’t send mixed signals about or disparage former employees and need to learn how to react when an employee resigns, for example.

Those are the kinds of critical moments that can determine if a departing employee will become a good resource, and role-playing can be very helpful in training, Call says.

Some companies even go so far as to link formal and informal incentives for managers to metrics, such as how many former employees participate in alumni networks, how many former employees rejoin the company or how departing employees rate their exit interviews.

Of course, there are downsides to alumni networks, too. For example, companies that employ celebratory rituals when employees leave make it easier, on some level, for other employees to leave. And alumni networks and functions can provide bitter ex-employees opportunities to poach other employees or glean proprietary business intel, Call points out.

Be judicious

Which raises another point: If employees are fired for poor performance or behavior, you probably don’t want to include them in your alumni network.

“There’s one assumption built into all of this, and that is you want to maintain relationships only with regrettable-turnover employees — someone you didn’t fire. Sometimes you have to let good people go because of downsizing or reorganizations, but you still want to stay in touch with them.”

Moreover, sometimes employees are required to sign nondisclosure or no-compete agreements that can make it more difficult to sustain relationships. In addition, maintaining relationships with some employees, such as workers at big-box retailers, may not be as beneficial as others, Call adds.

In the end, however, organizations must treat employees well and create a culture of mutual respect and trust in order to most effectively leverage the power of ex-employees.

“If you start an alumni group and managers still treat employees like trash, it’s just not going to be effective,” Call says. “You have to have the right culture, the right incentives for managers and so forth. You can’t just set up an email group and expect good things to happen.” ♦

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raising the bar UNDERGROUND

GETTING ON GOOD FOOTING

Lift station repairs demonstrate efficacy of new chemical grout injection technology

By Suzan Chin-Taylor

Injecting chemicals to stabilize, lift, seal or compact weak soils and rocks is not new. Polyurethane grout material has been used for this purpose since the 1960s. However, the limitations of this process have often been frustrating, not only for asset owners but also installers. Historically, material injection has been limited to shallow depths of 20 feet or less, due to the technology, means and methods of application.

As the material is injected, it begins to synthesize (cure) inside the injection tube. While the synthesis rate can be accelerated or retarded by controlling the chemical temperature, that control is short-lived. The deeper or longer the injection tube, the longer time the chemical has to cure before exiting the tube. While this is happening, the diameter of the injection tube effectively shrinks in diameter as the cured material bonds to the tube wall. This limits the depth at which successful injection can occur, using the old technology. Another side effect is that the deeper it is injected, chemical being injected can lose its desired effect as it cools once leaving the tube.

This frustration is being abated by Deep Horizons Injection Grouting, a process developed by Polymer Technologies Worldwide. Their innovative method of injecting chemical grout allows the ability to inject at depths far exceeding previous limits. The following case studies describe how Polymer Technologies WW successfully injected their product to seal a leaking effluent line, with an invert depth of approximately 35 feet and an injection depth of 45 feet, at two Florida sanitary lift stations.

Multiple repair attempts

Lift Station 87 was under construction to replace existing Lift Station 7 on the wastewater collections system of the city of Sarasota, Florida. It would eventually forward about a third of the city's wastewater flows to its wastewater treatment plant. While testing the 36-inch influent line, which crosses Hudson Bayou, city crews discovered significant groundwater intrusion through several holes, breaks and joint failures. This infiltration would cause the sanitary system to unnecessarily work harder, putting more stress on the system. That would not only waste capacity but also shorten the life of WWTP equipment over time, so it had to be eliminated.

The first repair effort was a trenchless epoxy-impregnated liner installation. While this type of largely nondisruptive repair has worked in similar circumstances, it failed to stop this water intrusion. A second effort to repair the pipe involved injection of a two-component, fast-reacting chemical grout, intended to seal the pipe from the exterior in situ. This historic method failed for reasons previously described, as the pipe is situated deeper than 20 feet.

BETTER MOUSETRAPS

PROBLEM:

Infiltration around lift stations

UTILITY:

Sarasota Utilities Department

PROJECT PARTNER:

Polymer Technologies
Worldwide, Inc.

BENEFITS:

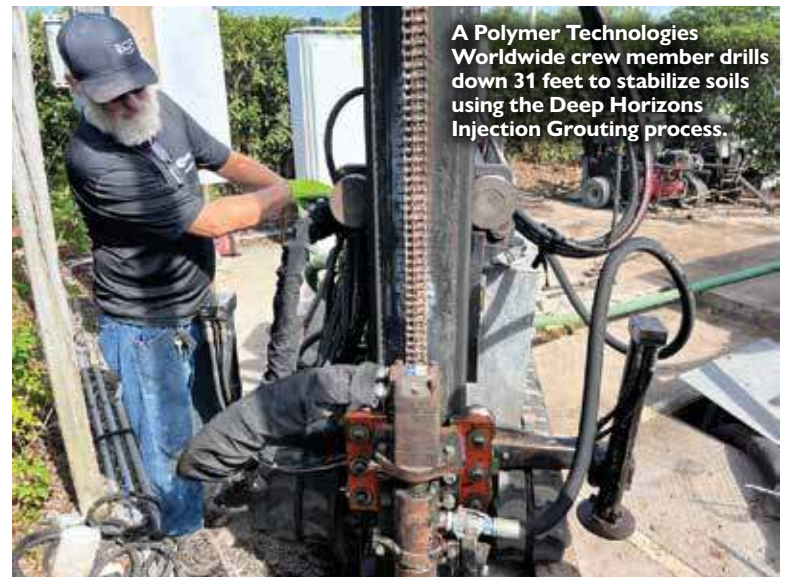
Able to seal and stabilize at greater depths

Third time's the charm

The method considered for a third try was traditional dig-and-replace, but that would have caused extensive disruptions to surrounding infrastructure and the local population, which was why previous attempts had been trenchless. This more traditional option was estimated to add an additional \$9-12 million to an already-over-budget project, along with extending completion time approximately another year for the already severely delayed project.

Highly motivated to avoid these major issues, the city took a chance on engaging the patented new DHIG process. Not only did this effort seal the pipe leaks, it also enhanced and further stabilized the foundation of the lift station structure.

Not only did this effort seal the pipe leaks, it also enhanced and further stabilized the foundation of the lift station structure.



A Polymer Technologies Worldwide crew member drills down 31 feet to stabilize soils using the Deep Horizons Injection Grouting process.



The first injection point on the project was 38 feet below grade and used 710 gallons of chemical grout.

Testing showed good control of the material, in that none of it encroached on neighboring properties.

Best of all, because the process is trenchless and requires a small physical footprint, it not only didn't disrupt the surrounding area, but was actually accomplished while the facility construction continued.

Another nearby lift station project at Symmes Road in Hillsborough County, Florida, also proved out other advantages of this new injection method. Station well inlet pipe cracks and some other damage was caused by approximately 4 inches of settling of the cover slab. Using the standard testing procedure, soils in proximity to the station — 10 feet between 18.5 and 28.5 feet below ground surface — were found to be very loose, displaying weight-of-rod conditions in which the boring tube drops under its own weight without any force applied.

The wet well for the station measures 8 feet in diameter and 30 feet in depth. To excavate and repair the station would again result in a large area of disturbance that could have possibly affected an adjacent residential community, underground utilities (electric, cable, etc.) and possibly Symmes Road itself. Again, the decision was made to take a chance on the still-new DHIG technique.

Post-injection testing

Standard ground borings demonstrated that injected material did not expand beyond the lift station property. Injecting 2,623 gallons of polymer through four injection points, with injection depths between 1 and 45 feet below grade, yielded the following results:

- Soils around the wet well were strengthened to the point where weight-of-rod conditions no longer exist.
- Soils outside the lift station footprint were shown to have insignificant change in soil stiffness. This indicated no adverse effects to surrounding properties or structures from the injection.
- The grout filled voids, stopping leaks from eroding the area around the system, and water intrusion into that system that had also caused erosion.



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Installers inject dual-component polymers to seal Sarasota Lift Station 87 while construction continues.



The small equipment footprint allows easy access in tight spaces. The five-day project included four injection points and 2,623 gallons of grout.

A post-injection analysis and report was rendered on the Symmes Road project by Integrity Drilling & Geophysical Services of Groveland, Florida. During the project covered here, testing showed good control of the material in that none of it encroached on neighboring properties. Also revealed was that soil adjacent to the grout was compacted and stabilized, despite no presence of material in those sampled soils.

Rig operation

The DHIG rig is used, in part, to advance injection casing to the desired depth. The 3-inch-diameter steel casing, threaded on each end, is advanced, with new sections threaded on as needed. While skin friction is considered negligible, it takes increasing power to turn the casing as it advances more deeply. Strength and adhesive properties of the material being advanced through the casing also affect turning power.

Upon reaching the desired injection depth, the rig withdraws the casing as the



A crew deploys the patented mixing device to 31 feet adjacent to the 10-foot void near the wet well.

polymer is injected. Care must be used to advance at an appropriate rate that avoids fouling the casing with the polymer; but not so fast that the polymer is under-injected.

To inject the polymer, a special nozzle is advanced through the casing and attached to the drilling head at the tip of the casing. This is the third use of the rig, to lower the casing head and attached chemical feed lines in a careful manner, to avoid fouling the lines or damaging the injection nozzle. Upon carefully lowering the equipment by attaching a lowering/turning bar, that bar is then rotated to lock the equipment to the head. As the casing is withdrawn, the lowering bar is removed in sections, just as the casing is removed.

How it works

The significant advantage of the DHIG process is that, theoretically, there is no limit to the depth at which the material can be successfully injected. This is due to the material being combined at the tip of the casing, which allows for full material strength to occur where it's needed rather than inside the feed line, which is standard practice using most existing systems.

Another benefit is that the material can be injected from a lateral point to avoid interference with nearby surrounding project activity. This results in reduced time, cost and impacts to the public and the environment. For example:

- A leaking cross drain can be sealed without closing down a busy highway or interstate system.
- A sanitary lift station can remain in operation while a leaking influent line is sealed.
- A building can remain in operation while a basement wall is sealed.
- A leaking earthen dam can be sealed without lowering water levels.
- Retaining walls can be sealed at depth without excavation or injection from the face, which can further weaken the wall.
- Stabilizing embankments — bridges, railroads, roadways, canal banks, etc.
- EPA-related concerns such as underground oil, frack well, hazmat or radioactive leaks at any depth can be sealed, preventing catastrophic contamination of surrounding freshwater aquifers or ecosystems.
- Sealing abandoned wells and mine shafts while allowing for future material removal so that the well or shaft can be put back into service.

The suitability of this process and material has been successfully applied below ground without any unforeseeable limitation. ♦

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FLUID INNOVATION

WORKING FOR WATER

CWA serves as a model for other coastal communities to build their own monitoring networks and improve infrastructure management

By Ken Wysocky

Aided by a network of eco-minded volunteers, a nonprofit organization is steadfastly monitoring water quality across the Lake Erie watershed and collecting data that will help local and regional agencies — and perhaps even utilities — make decisions about water-related policies and infrastructure.

The Cleveland Water Alliance organized the Lake Erie Volunteer Science Network, which comprises hundreds of volunteers that serve 16 different water-monitoring programs, says Max Herzog, CWA program manager.

The agency created the volunteer network, which is funded by philanthropic organizations, about three years ago. The goal: Galvanize and support local groups that were already monitoring water quality and turn them into a collaborative team whose data collection efforts will help inform policy and investment decisions and investments regarding items such as water management and governance, research and infrastructure, he says.

“We came to the table with funding and asked these groups if it would be worthwhile to work together and unlock the potential of their data to a greater degree, as well as standardize the ways they collect, manage and analyze data,” Herzog says.

“Some of these groups have been around for 10 to 20 years,” he adds. “They’re our eyes and ears out in the field. Sometimes they simply see things because they’re actually physically out there while they’re collecting data. Maybe they see excessive land erosion or too much standing water or even cows standing in a ditch, for example.”



“They’re our eyes and ears out in the field.”

Max Herzog

Driving business development

On a broader level, CWA also strives to nurture a so-called “innovation cluster” of businesses, research institutions and utilities that develop and implement water-related technologies. The organization helps these groups by testing pilot versions of technologies or having volunteers test them, then helping those companies bring the products to market, where they can be used to solve water quality problems both locally and regionally as well as nationally, Herzog says.

CWA helps both startups and established companies commercialize their products so they can provide benefits outside the region as well as boost regional business development and become a global hub of water technology innovation, he says.

To a large degree, these businesses clustered organically, in no small



The Cleveland Water Alliance organized the Lake Erie Volunteer Science Network, which comprises hundreds of volunteers that serve 16 different water-monitoring programs.

part because Cleveland stands on the shores of Lake Erie, a very rich, biodiverse ecosystem. It also was inspired by Cleveland's success in creating a biotechnology cluster.

"A study conducted a few years before our organization's formation tried to define the next big play for economic development in this region, to build on Cleveland's success in biotechnology," Herzog explains. "It determined that this area already has a lot of water sector components — all that was needed was someone to galvanize it."

He believes this two-pronged approach, combining economic development with marshaling teams of volunteers to monitor water quality, is unique to the CWA.

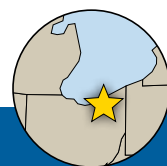
"There are other organizations nationwide that

are similar to ours, as well as water-innovation clusters," he notes. "But we think our approach is unique because we pursue cross-sector collaboration. Everything we do brings together folks from private research and public sectors.

"We want to be the Silicon Valley of water innovation — develop a high-density cluster of private-sector companies, high-intensity water users, water utilities and academic institutions that focus on water," he adds. "We're not there yet, but we're definitely on our way to becoming that. All the pieces are here."

Preserving a fragile ecosystem

The volunteer network is an outgrowth of the Great Lakes One Water partnership, created in



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Cleveland Water Alliance,
Cleveland, Ohio

ESTABLISHED:
2014

AREA SERVED:
Northeast Ohio Region

WEBSITE:
www.clevelandwateralliance.org



“Everything we do brings together folks from private research and public sectors.”

Max Herzog

2016 to help develop regional approaches to solving pressing challenges facing the Great Lakes.

The health of the seven Great Lakes is no small matter; they’re the source of 84% of the county’s surface freshwater and provide drinking water for 40 million people in Canada and the United States.

Lake Erie’s water quality has improved over the decades, but it’s still the only Great Lake considered at-risk or declining in terms of water quality. It’s subject to algal blooms, combined sewer overflows, legacy pollution from various industries and high concentrations of microplastics,

Herzog says. Furthermore, as the shallowest and warmest of the Great Lakes, it’s the one human activity most easily impacts.

“GLOW was looking for ways for Great Lakes communities to contribute more significantly to the health of the lakes on an individual level, but still collaborate for greater impact,” Herzog explains. “These volunteer groups have historically sprung up in response to local water quality issues.

“They collect really granular local data used to make decisions and inform restoration and development efforts in their communities. But because they were so locally focused, they often developed monitoring approaches in isolation from one another and the methodologies they used weren’t comparable.”

Standardized data collection

The problems with these inconsistent meth-

odologies led the CWA to notch one of its biggest wins so far: The development of the Lake Erie Baseline Assessment Framework, which essentially is a set of standards for data collected by volunteers. Standardized collection methods and data will help the volunteer groups “tell a new regional story about the health of the Lake Erie watershed and support smart environmental education, research and management,” according to a CWA news release.

The standardization will bolster the credibility of data collected by ensuring volunteers sample water the same way by using the same methodologies. In turn, that will allow local and regional authorities to better leverage that data because they can be confident about its veracity, Herzog says.

“Standardization allows these volunteer groups to better collaborate and present a united front,” he explains. “Then the data can be integrated into a regional set that’s more useful and trustworthy.

“By supporting the volunteer network with quality and standardized water monitoring methodologies, we help enable collaboration at a regional level.”

Herzog says the volunteer organizations spurred the development of the data collection standards, not the CWA.

“They wanted to build greater trust in their data so it could be used by local decision-makers, state agencies and folks in professional research.”

Volunteers are key

The Lake Erie Baseline Assessment Framework standards require volunteer groups to use sensor-based technology to test basic water chemistry. Many of these groups were already engaged in this type of monitoring but CWA, through a grant from the state of Ohio, has invested in additional sensors that are loaned long-term to LEVSN participants.

In other instances where sensors aren’t used, groups pay labs to analyze water samples.

“Some may have developed partnerships with labs where they get a good price for analysis,” Herzog notes. “But not all of the groups have access to labs, so that raises a barrier to the data collection they can do. So our goal is to expand the use of sensors.”

The volunteer groups generally collect data once a month, but some might do it twice a month. The number of sites the groups test varies greatly according to how many volunteers they can train.

Having volunteers out in the field is invaluable to CWA. For example, a volunteer group might identify water-quality issues related to upstream land management at construction sites, farms or golf courses. That provides a teachable moment where CWA can talk to landowners and explain the impact they’re having on water quality.

Testing pilot products

CWA — and sometimes their volunteers — also test-drive product prototypes for businesses. Within the last three years, three different technologies have been tested: one that monitors nutrient pollution, one that gauges the toxicity of harmful algal blooms and a field sensor that monitors basic water chemistry.

The latter sensor is what's called an in situ sensor that remains in the field — perhaps mounted on a buoy, bridge or dock, for example — to continually collect higher-frequency data at one site, as opposed to less frequent sample collections by volunteers at multiple sites.

“This is part of our broader effort to create a series of water technology test-beds to pilot new technologies in the water space,” Herzog explains. “Right now, the lowest hanging fruit is devices that can monitor the quality of surface water.”

To determine the veracity of the prototypes, the data they collect is compared to the data collected by the most-trusted standardized methods of gathering the same data.

The technologies tested aren't necessarily rejected or approved by the CWA. Instead, the group provides feedback about how to improve products, Herzog says.

“For example, this past summer we piloted (tested) technology that measures the toxicity of algal blooms,” Herzog says. “It compared really well to lab methods, so this year we're repiloting

“Right now, the lowest hanging fruit is devices that can monitor the quality of surface water.”

Max Herzog

a modified product that can detect a larger range of algal toxins.”

Even if technologies perform similarly to products already in use, they might offer advantages such as a lower price, easier usage, better portability, the ability to produce results faster and so forth, he notes.

CWA views the network of volunteers as an extension of its accelerator test beds.

“They plug into it,” Herzog notes. “Some companies might want volunteers to test their technologies, depending on the test case. For example, one technology might be used for long-term deployment on a buoy in a lake and others might be used to test water quality in a backyard.”

Creating a “smart” lake

CWA's ultimate goal is to make Lake Erie the most digitally connected freshwater body in the world. That effort is already underway via a project called Smart Lake Erie Watershed, which will rely in part on organization-tested technologies, Herzog notes.

It's the first project of its kind in the Great Lakes region and will improve the ability to monitor and manage area waterways.

“LEVSN and our accelerator test beds are part of a broader effort to create a Smart Lake Erie, which will allow us to scale the amount of data collected across Lake Erie and its watersheds,” he says. “It also will connect that data with decision-makers and help inform how we manage our water resources.”

The program will rely on a wireless network designed to receive data from tens of thousands of remotely deployed sensors, some of which could be located up to 20 to 30 miles on the open waters of Lake Erie. The data then will be uploaded to a cloud-based platform, where it can be analyzed.

The sensors will detect things such as chemical spills, sewage overflows and toxic algal blooms.

Herzog says CWA hopes the program can serve as a model for other coastal communities to build their own monitoring networks, which would help them strengthen their water infrastructure management efforts. ♦

Supporting the volunteer network with quality and standardized water-monitoring methodologies has helped enable collaboration at a regional level.



WORKING THROUGH THE WINTER

Cold weather presents risks and challenges that require safe practices

By Ronnie Freeman

Whether you like the cooler temperatures or not, it's only March and they're still here. Colder temps present some hazards we need to remember before heading outside.

The effects of cold weather on employees working outside can cause a decrease in performance and productivity as employees slow down or are distracted by the cold. Also, the colder weather can increase the risk of incidents and injuries as employees may suffer from cold related symptoms such as loss of concentration, lack of coordination and distractions.

But it's not just the cold temperatures you have to consider. Wind, dampness, getting wet, your overall physical fitness, medical conditions like diabetes and hypertension and inadequate clothing are all contributors to cold stress.

Risks of Cold Stress

Hypothermia is a medical emergency that occurs when your body loses heat faster than it can produce heat, causing a dangerously low body temperature. Normal body temperature is 98.6 F and hypothermia can begin when the body temperature falls below 95 degrees. When your body temperature drops, your heart, nervous system and other organs can't work normally. Left untreated, hypothermia can lead to complete failure of your heart and respiratory system and eventually to death.

In milder symptoms you can be alert but shivering constantly. In severe symptoms the shivering stops, you become confused, speech is slurred, and your heart rate and breathing will slow down. Getting medical attention is vital to surviving once severe symptoms are evident. If you notice a co-worker suffering from hypothermia, get them to a warm place and remove wet clothing and wrap them with blankets or jackets until medical help arrives.

Frostbite is the freezing of the skin and underlying tissues. In the earliest stage of frostbite, known as frostnip, there is no permanent damage to skin. Symptoms include cold skin and a prickling feeling, followed by numbness, and inflamed or discolored skin. As frostbite worsens, skin may become hard or waxy looking.

Frostnip can be treated by rewarming the area, however, frostbite is a medical emergency and needs treatment because it can cause permanent damage to skin, muscle, bone and other tissue.

Usually, the areas of the body that are most exposed will be the ears, face, fingers and toes as these parts of the body tend to be under protected or not protected at all. If you notice an employee suffering from frostbite call 911, loosely cover the area but do not rub the area, break blisters or try to rewarm the area.

Don't fall into a sense of cold-weather complacency thinking these things can't happen to you.

Preventing Cold Stress

- Know the symptoms of exposure
- Dress properly in layers
- Monitor yourself and your co-workers for symptoms
- Keep extra dry clothes handy to replace clothes when they get wet
- Drink warm drinks, but avoid caffeine as this promotes dehydration
- Stay hydrated (it's not just a summer thing)
- Wear the appropriate PPE (gloves, face coverings, head coverings, etc.)
- Take frequent breaks to get warm
- Avoid fatigue and exhaustion — get plenty of rest
- Use the buddy system

Don't fall into a sense of cold-weather complacency thinking these things can't happen to you. Cold stress can happen to anyone who isn't prepared no matter how much experience you have working in cold weather. Stay warm and stay safe. ♦

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	MyTana LLC 746 Selby Ave., St. Paul, MN 55104 800-328-8170/651-222-1738 • Fax: 651-222-1739 www.mytana.com mytana@mytana.com		Yes			Yes		Yes			Yes	

2023 TV/VIDEO INSPECTION & LOCATION DIRECTORY

ACOUSTIC INSPECTION	DRAINLINE INSPECTION	LARGE DIAMETER SYSTEMS	LASER MEASUREMENT	LATERAL LAUNCH	MAINLINE INSPECTION	MANHOLE INSPECTION	PANORAMIC SCANNING CAMERA SYSTEMS	PUSH SYSTEMS	SOFTWARE INSPECTION/MAPPING	SONAR INSPECTION	ELECTRONIC LOCATION EQUIPMENT	PIPE/LEAK/VALVE/SEWER LOCATION EQUIPMENT
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PEARPOINT  See Ad, Page 5	Pearpoint Inc. 39-740 Garand Ln., Unit B, Palm Desert, CA 92211 800-688-8094/760-343-7350 • Fax: 760-343-7351 www.pearpoint.com pearpoint.uk@spix.com		Yes				Yes		Yes			
 See Ad, Page 5	RapidView IBAK North America 1828 W Olson Rd., Rochester, IN 46975 800-656-4225/574-224-5426 • Fax: 574-223-7953 www.rapidview.com sales@rapidview.com		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
	Ratech Electronics, Ltd. 260 Spinnaker Way, Ste. 7, Vaughan, ON L4K 4P9 CANADA 800-461-9200/905-660-7072 • Fax: 905-660-1519 www.ratech-electronics.com sales@ratech-electronics.com		Yes				Yes	Yes	Yes	Yes		
	Spartan Tool, LLC 1618 Terminal Dr., Niles, MI 49120 800-435-3866 www.spartantool.com customerservice@spartantool.com		Yes				Yes		Yes		Yes	
See Ad, Page 11	Subsite Electronics 1950 W Fir Ave., Perry, OK 73077 800-846-2713 www.subsite.com info@subsite.com					Yes	Yes		Yes			
	Vivax-Metrotech Corp 3251 Olcott St., Santa Clara, CA 95054 800-446-3392/408-734-1400 www.vivax-metrotech.com salesUSA@vxmt.com		Yes				Yes		Yes	Yes	Yes	Yes
	WinCan 300 Cedar Ridge Dr., Ste. 308, Pittsburgh, PA 15205 877-626-8386 www.wincan.com sales.us@wincan.com		Yes				Yes	Yes	Yes			

See the Directory Online at
MSWmag.com/2023-tv-video-inspection-directory

ENHANCED ASSESSMENT

NASSCO preparing for launch of PACP Version 8 and other new programs

By Sheila Joy

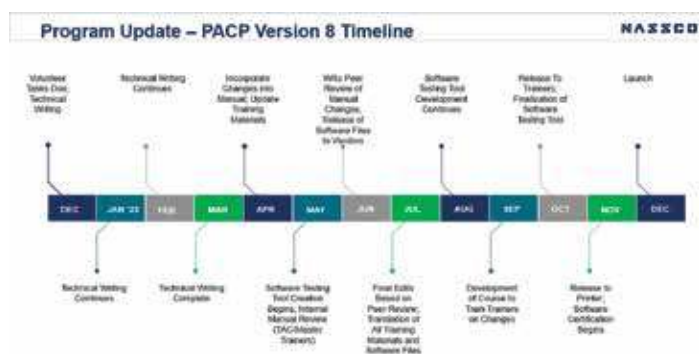
NASSCO's Pipeline Assessment Certification Program, Lateral Assessment Certification Program and Manhole Assessment Certification Program are the trusted sources for proper and consistent assessment condition coding of pipelines, laterals and manholes. The goal of these programs is to help pipeline system owners create comprehensive databases to properly identify, plan, prioritize, manage and renovate their assets based on condition evaluation.

Since the release of the current version 7.0 in 2015, NASSCO has been gathering comments from industry professionals who use these programs so that we may make improvements to the PACP/LACP/MACP to better suit the needs of those using the data.

A very dedicated PACP Version 8 workgroup comprised of NASSCO's Infrastructure Condition Assessment Committee and others have spent a lot of time reviewing and vetting all of the comments and code update requests. Below are some of the notable enhancements to be included:

- Reorganization of the manual to allow a more logical progression from PACP to LACP and then to MACP
- Updated photos, illustrations and examples
- Coding of new pipe versus existing pipe
- Stormwater code updates (aligned with AASHTO stormwater guideline)
- Additional surface damage codes to address materials other than concrete
- Pressure pipe codes
- Perforated pipe codes
- Update of condition grade scores

Below is a tentative timeline for activity leading to the launch which is slated for December 2023:



In addition to PACP Version 8, NASSCO is also working on training programs to help those who may not have a need to be PACP-certified, but nonetheless need a basic understanding of how to use the data.

PACP for Asset Management - Evaluating Condition Grades

This course will give an overview of PACP codes, the rationale behind the condition grades and scoring systems, and automated reports. This is intended for utility managers who require an understanding of NASSCO condition assessment results and how they can be interpreted to support proactive maintenance plans. The expected launch is summer 2023.



NASSCO is located at 5285 Westview Drive, Suite #202, Frederick, MD 21703; 410-442-7473; www.nassco.org

Sheila Joy is executive director of NASSCO. She can be reached at director@nassco.org.

PACP for Asset Management - Assessing Risk

A course for utility managers and engineers to understand how NASSCO's PACP condition assessment results combined with computerized maintenance management systems and off-the-shelf tools such as GIS can be used to predict maintenance, rehabilitation and/or replacement of gravity piping systems. The expected launch is fall 2023.

For more information or to take a NASSCO training course, please visit www.nasscotrainingsource.org. ♦

Get the Edge

Training and Continuing Education Courses

PACP TRAINING

March 1, 8 am PST

Virtual

Includes: PACP, MACP, LACP
Trainer: Brandon Conley

March 2, 8 am CST

Virtual

Includes: PACP
Trainer: Michael Lukas

March 6, 8 am PST

Virtual

Includes: PACP, MACP, LACP
Trainer: Michael Lukas

March 8, 8 am EST

Virtual

Includes: PACP, MACP, LACP
Trainer: Brandon Conley

March 8, 8 am CST

Ames, IA

Includes: PACP, MACP, LACP
Trainer: Jerry Weimer

March 8, 8 am CST

Virtual

Includes: PACP, MACP, LACP
Trainer: Bryan Ballard

March 14, 8 am EST

Virtual

Includes: PACP, MACP, LACP
Trainer: Paul Booth

March 15, 8 am EST

Virtual

Includes: PACP, MACP, LACP
Trainer: Michael Lukas

March 23, 8 am MST

Virtual

Includes: PACP
Trainer: Brandon Conley

ITCP TRAINING

March 9, 8 am EST

Virtual

Includes: ITCP-CIPP
Trainer: Lou Krch

March 13, 8 am EST

Carson City, NV

Includes: ITCP-CIPP
Trainer: Michael Lukas

March 14, 8 am CST

Virtual

Includes: ITCP-Manhole Rehab
Trainer: Tim Back

March 21, 8 am EST

Virtual

Includes: ITCP-CIPP
Trainer: Lou Krch

March 28, 8 am MST

Virtual

Includes: ITCP-CIPP
Trainer: Michael Lukas

March 30, 8 am PST

San Jose, CA

Includes: ITCP-Manhole Rehab
Trainer: Rocky Capehart

NASSCO

PRO

TRAINING



OTHER CLASSES FORMING

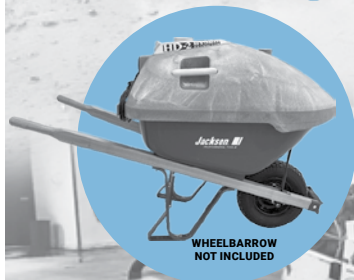
Contact one of the trainers listed above if you are interested in having a class at your facility or in your area.

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3012H Power Unit

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- ±800 cc EFI Honda Engine
- ±400' x 1/2" Jet Hose on DC Powered Reel

Call for Quote

4008H Compact Skid

- ±8 gpm @ 4000 psi
- ±800 cc EFI Honda Engine
- ±400' x 3/8" Jet Hose on DC Powered Reel

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3012H Compact Skid

- ±12 gpm @ 3000 psi
- ±800 cc EFI Honda Engine
- ±400' x 1/2" Jet Hose on DC Powered Reel

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- ±800 cc EFI Honda Engine
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MAINLINE TV INSPECTION AND LOCATION

By Craig Mandli



Crawler Cameras

1. Aries Industries Mobile Pathfinder System

The **Mobile Pathfinder System** from **Aries Industries** is a lightweight, portable system for accurately inspecting mainlines that are 6 inches or larger. It includes a powerful transporter, camera and lightweight reel; these components are operated by an all-in-one remote control. The transporter comes in a variety of wheel sizes and is equipped with a rear-viewing camera and an adjustable electric lift to keep the camera centered in a range of pipe sizes. It features a WiperCam pan-and-tilt camera with an in-the-pipe cleaning system and field-replaceable wipers. The camera has a 300-degree viewing angle and LED lighting system to capture pipe details and ensure accurate assessments. The lightweight reel has 1,000 feet of low-friction, multiconductor cable, making the system fully portable.

800-234-7205; www.ariesindustries.com

2. EnviroSight ROVER X

The **ROVER X** from **Envirosight** is the pipe inspection system that lets an operator do everything including run inspections, view and record video, log observations, generate reports and link directly to asset management software. The Flexpection sewer video capture platform adds even more capabilities to this versatile system. Three video resolution options

(SD and HD) allow operators to change file size and resolution depending on the needs of each inspection. Twelve wheel options enable ROVER X to inspect lines from 4 to 96 inches. Its six-wheel drive with proportional steering navigates past obstacles, and overlapping wheels climb offsets with ease. Powerful motors and a geared drivetrain maximize travel range. Not only can you add side-scanning, laser profiling and lateral launch, you can view data from onboard sensors and assess defects on-screen. The system's firmware updates automatically to the latest features.

866-838-3763; www.envirosight.com

3. Trojan Worldwide C1000 Crawler

For use in 6- to 24-inch pipe or storm drains, the **C1000 Crawler** system from **Trojan Worldwide** is a commercial pipe inspection system that provides a full HD 1080p resolution from the 360-degree pan-and-tilt color camera head. It is fitted with both front and rear cameras and LED lights. The crawler unit is equipped to pull the included 500-foot cable at a rate of 20 to 65 feet per minute and is backed by a motorized reel. The camera head is equipped with a laser sensor to measure pipe grade (angle), which displays the information on the 10-inch LCD along with the current internal pressure. The control unit records to USB via DVR and allows the user to add text information to the video using the integrated keyboard. The unit includes an additional set of larger wheels for larger pipes.

800-392-4902; www.trojanworldwide.com



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Electronic Locator

4. Hermann Sewerin GmbH SeCorrPhon AC 200

The **SeCorrPhon AC 200** from **Hermann Sewerin GmbH** combines the characteristics of a correlator with acoustic water leak detection, meaning prelocation, pinpointing and correlation in one single system. It includes an easy-to-read measurement value display and automated filter selection. It is based on the tried and tested housing and hardware concept of the **AQUAPHON A 200**. Each is ideal for use for leak detection across all sections, materials, diameters and lengths of pipelines. Numerous additional functions are also available for complex location scenarios.

888-592-9916; www.sewerin.com

Mainline TV Camera Systems

5. Electric Eel eCAM Ace 2 SL

The updated **eCAM Ace 2 SL** from **Electric Eel** includes a display screen that is twice as bright as comparable cameras in its class. This new feature is an important factor in the clarity and definition of viewing inspection camera images and data. A brighter screen provides better contrast and visibility of inspection, making it ideal in brightly lit environments like full and direct sunlight. The 1.43-inch self-leveling color camera inspects 3- to 10-inch lines. Other features include a new location on the rear of the monitor for the battery cradle and an AC/DC power input; the unit can now

handle both an 18-volt battery and 12-volt AC/DC adapter inputs (not at the same time); an entirely new operating system and menu navigation; and improved battery life off a single charge.

800-833-1212; www.electriceel.com

6. Hathorn Inspection Cameras H12

The **H12** control module from **Hathorn Inspection Cameras** is equipped with a bright 12.1-inch VividHD LCD screen. It is powered by 18-volt Milwaukee (or equivalent) batteries, and is available with PipeStream Wi-Fi technology, which allows the user to directly stream the video inspection to up to four devices at the same time (Apple or Android). This system also comes with a full keyboard, eight pages of text overlay, dimmable light control, record/pause to USB and sonde control. It is usable in any light condition (including direct sunshine), providing HD picture quality, high contrast and 8X digital pan and zoom technology. Command modules are paired with Hathorn Standard reels, which offer nine camera heads (straight view and self-leveling), five different reel sizes, five different rod sizes and lengths from 100 to 500 feet. 866-428-4676; www.hathorncorp.com

7. Subsite Electronics Push Camera System

When a transporter isn't an option because of pipe size or limited access, the **Subsite Electronics Push Camera** allows operators to complete inspections in the most challenging conditions. Ideal for pipes from 1.5 to 12 inches, it features single conductor technology with a rigid 1/4-inch fiber pushrod covered with a durable Hytrel jacketing that allows operators to inspect up to 500 feet down the line. Additionally, the 1/4-inch-diameter single conductor cable provides added strength without weight concerns, allowing operators to complete significantly longer inspections without the



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cable getting twisted or warped. The 1545 camera with an in-line 512 Hz beacon allows the operator to easily locate damage and blockage in the pipe. The camera is controlled by a 1575 controller, which features a rugged, durable and reliable enclosure. **800-846-2713; www.subsite.com**

8. Vivax-Metrotech vCamMX-2

The **vCamMX-2** from **Vivax-Metrotech** is a portable all-in-one camera to inspect pipes between 1 1/2 and 4 inches. The control module's 8-inch daylight-viewable LCD screen shows the distance of pushrod deployed as well as the current time and date. Recordings are made in MP4 video and pictures in JPEG format directly to a USB thumb drive, then instantly backed up to an SD card. The internal microphone allows audio commenting over recorded video. The pushrod is traceable with the use of an external locator transmitter and is available in 100 or 150 feet. The 512 Hz frequency sonde is standard equipment. It comes with two interchangeable camera heads. The smaller D18-MX camera is fixed position and 0.70 inch in diameter, and the D26-MX is self-leveling and 1 inch in diameter.

800-446-3392; www.vivax-metrotech.com

Recording/Archiving/Data Device

9. Syrinix PIPEMINDER-ONE

Syrinix PIPEMINDER-ONE water and wastewater monitoring solutions provide high-resolution data-led insights to transform network visibility. The solutions offer a broad range of applications, including network calming, asset performance tracking and acoustic leak detection. The technology combines GIS features with in-house analysis tools and software to advise utilities on the best deployment plan for units, including number and geographic placement for each pressure monitor device. The data loggers then measure pressure at 128 samples per second (constantly) and summarize this data into a one-minute summary time series containing minimum, mean and maximum pressures. This allows for not only transients to be cap-

tured but also bursts and more gentle trends. Data is integrated seamlessly into RADAR — the feature-rich, easy-to-use cloud analysis platform — where actionable insights help cost-conscious utilities move network management from reactive to proactive, improving performance and saving time and money. **844-279-7464; www.syrinix.com**

Smoke Locators

10. Superior Signal smoke generator

Smoke generators from **Superior Signal** locate sources of surface inflow resulting in wet-weather sanitary sewer overflows. A fast, inexpensive and easy way to find leaks and faults in collections systems, smoke candles provide visible smoke to detect more faults at longer distances and come in sizes to meet any need. Smoke candles, blowers and fluid systems for smoke testing are available. **800-945-8378; www.superiorsignal.com**

Software

CUES GraniteNet Defect Coding Services

GraniteNet Defect Coding Service from **CUES** lets machines process video using AI for consistent accuracy, speed-to-completion and final review by PACP-certified inspectors. It lets users get caught up and allows staff and engineers to focus on more inspiring and productive projects and let the machines do most of the work. CUES also offers a sophisticated decision-support service, called Prescriptive Planning, that is based on the results of the AI-processed inspections to help prioritize risk and organize the types of work that should be done along with the suggested method of repair or replacement, based on out-of-the-box or customized decision logic. Quantify the type of work, assess your budgets and streamline contractor bids for the specific rehabilitation jobs needing to be done.

800-327-7791; www.cuesinc.com

(continued)

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11. iWater infraMAP Software

infraMAP Software from **iWater** is a cloud-based maintenance management system that allows seamless data collection, map updates and digital record keeping for historical purposes. Originally designed to reduce overtime, eliminate paperwork and make everyone's job easier, the application has been perfected by the field personnel who use it every day. This easy-to-use software is geared toward mobile field crews, office staff and does not require GIS experience. It brings together field crews, management, GIS and engineering into a commercial off-the-shelf product. **949-768-4549; www.iwater.org**

12. RapidView IBAK North America IKAS Evolution

IKAS Evolution sewer analysis software from **RapidView IBAK North America** is capable of PACP, LACP and MACP data interface, can be adapted to the modern sewer inspection standards, and customized to the specific user's workflow. It is available in four base bundles with over two dozen extension options including: full digital HD resolution, laser mea-

surement and LaserScan continuous profile analysis. One module included in all four bundles is a powerful tool called 3D GeoSense. Compatible with all RapidView cameras (excluding AxialCam 2.0), each camera has an option to install a sensor that tracks the movement as it travels through the pipe. This allows it to capture distance, position and depth accurately and efficiently. **800-656-4225; www.rapidview.com**

13. WinCan

WinCan is an AI-supported sewer inspection solution that helps municipalities and contractors keep track of mainline conditions, locations and maintenance trends. With data analysis tools designed for even the most nuanced CCTV inspection, it brings the essentials of cloud-based inspection workflows to a truck, desktop or mobile device. Review inspection media, edit and log defect codes and create custom reports that give collaborators exactly what they need, all from a single cloud-based platform. Then, when inspections are complete, jump into its Enterprise environment for fast, simple work order tracking and systemwide analysis. For desktop users, a variety of modules assist in collecting essential measurements of mainline features, and asset management integration helps keep databases updated in real time. **877-626-8386; www.wincan.com** ♦

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Product Spotlight

Manhole shoring boxes keep utility workers out of harm's way

By Craig Mandli

Underground sewer maintenance work today utilizes many trenchless construction and rehabilitation procedures designed to reduce the need to dig trenches or excavations to install and maintain these systems. However, many heavy-duty manhole construction and rehabilitation excavations still require wide, deep trenches suitable for entry. That's why taking proper shoring precautions with every manhole excavation is paramount for keeping work crews safe and on the job.

Xtream Duty Manhole Boxes from Pinnacle Manufacturing are strong enough to handle the pressure from unstable soil conditions and provide a safe space for workers, protecting them from a trench collapse. Whether digging the foundation for a building or laying pipes or wires, these manhole boxes ensure worker safety and can play a major role in the prevention of cave-ins and injuries.

"Pinnacle Xtream Duty products are constructed with precision materials that provide the ability to reduce weight, offer the highest pipe clearance and maintain the ability to reach or exceed industry expected depth ratings," says Matthew Bliss, director of engineering for Pinnacle Manufacturing.

Manhole boxes help maintain a safe working environment for workers. They are specifically designed to offer protection on the third and fourth sides of a trench or excavation. Working in any kind of trench is accompanied by the risk of injury, as a dangerous situation can easily come up. Pipework can be a dangerous task, but fitting a manhole box



around the work area is an easy way to avoid accidents and injuries.

Xtream Duty Manhole Boxes come standard with tapered dog doors for ease of access in regard to the municipal and maintenance sectors of excavations. These boxes are intended for use in excavations for water, sewer, gas and electrical installations. If the job requires, trench boxes are available for the more expansive projects.

"Pinnacle Manufacturing spent two years developing a product that meets and exceeds industry expectations while offering a competitive product, both in performance and delivery," Bliss says. "Our customers have been impressed with the weight of our products first and foremost, as this reduces the overall logistics cost to the users. Secondly, customers have been impressed with the support from our quality, sales and engineering teams." **256-840-8031; www.pinnaclemf.com**

SPECIAL REPORT



OZ Lifting Aluma-Lite davit cranes

OZ Lifting Products announced the new Aluma-Lite davit crane for wastewater and water operators. The Winona, Minnesota-based manufacturer has released the ultra-portable davit crane in 500- and 1,000-pound capacities, each available with three bases: pedestal, socket (flush-mount) or wall-mount. The Aluma-Lite 500 weighs in at 24 pounds with a maximum capacity of 500 pounds and the Aluma-Lite 1,000 weighs in at 47 pounds

with a maximum capacity of 1,000 pounds. Both fold flat for easy storage or transportation, and are made of aerospace/military grade aluminum. The cranes are available with a manual winch (including drill drive adapter), AC or DC electric winches. The Aluma-Lites have a durable, powder-coated finish, no tools are needed for assembly/disassembly, and they are made in the USA. **800-749-1064; www.ozliftingproducts.com**

SPECIAL REPORT



Find Sources of Sewer and Plumbing Odors and Inflow with Superior 5E Smoke Blower

Smoke testing is a cost-effective solution ideal for hard-to-find odors, leaks and other faults in commercial, residential and municipal facilities. It's a quick and effective way to find plumbing faults when testing laterals and building plumbing. The Superior 5E Electric Smoke Blower gently pushes smoke throughout the system to find cracks, leaks and quickly identify problems. It takes only minutes to set up the blower and seconds to see the results. Superior's 5E Electric

Smoke Blower easily connects to any clean-out, port or vent to smoke test the entire system. Made in the USA, the durable 5E is complete with 8 feet of industrial grade hose. Use with 1A or 2B Superior smoke candles which create 4,000 or 8,000 cubic feet of smoke, respectively. Superior's smoke candles are also sold in convenient SealPac cans which extend shelf life.

732-251-0800; www.superiorsignal.com/MS5



ADS AVIMax monitoring sensor

The AVIMax is the newest sensor in ADS Environmental Services' flow monitoring sensor family. The AVIMax is an area-velocity sensor for the ADS TRITON+ monitors. The wetted sensor is installed directly in the pipe flow to provide consistent, high-quality data collection capability. Its low-profile, impact-resistant polycarbonate housing with recessed sensors brings new levels of durability in sewer flows. The sensor design is tested and proven to collect accurate and consistent data in depths from 1 to 60 inches and in flows of up to 30 feet per second. In areas of intermittent no-flows (dry-pipe) ADS recommends the AVIMax Sensor can be used in combination with one of ADS' noncontact sensors. The sensor measures four key parameters: depth — using ultrasonic UpDepth; depth pressure; velocity — using continuous wave ultrasonic Doppler; and water temperature.

877-237-9585; www.adsenv.com



Vermeer CS GT vacuum excavator water kit

Vermeer expanded the capabilities of its CS GT vacuum excavators with an optional water kit. Now horizontal directional drilling crews and light-duty vacuum operators can soft dig (pothole) utilities and power wash equipment and hard surfaces with this system. The optional water kit comes with a 100-gallon freshwater tank and a pump capable of delivering 2,500 psi at a flow rate of 3.5 gpm. The water kit is factory installed and available on all new CS GT models. **352-728-2222; www.vermeer.com**



Quest Controls TELSEC CPM monitoring system

The TELSEC system from Quest Controls is designed to address the monitoring and alarming requirements of critical infrastructure equipment and facilities that are without a network connection. This compact intuitive system provides wireless network connectivity to monitor environmental conditions like temperature, humidity, intrusion, AC/DC power, ATS, generators, fuel level and other critical systems found in small remote locations such as cell tower sites, microwave sites, repeater sites and equipment cabinets. The product provides a cellular connection northbound to a NOC

(or other management stations) and provides network connectivity to south-bound devices using standard port forwarding. The TELSEC CPM features encrypted communications protocols with support for IPv6, IPv4, HTTP, HTTPS, RADIUS password authentication, SSH, SNMP v1, v2c, v3, TL1 and SMTP (email). The TELSEC CPM can act as a standalone device or be integrated into Quest's OspreyFMS enterprise software, providing users a comprehensive view and management of all critical facilities.

941-729-4799; www.questcontrols.com



Mueller Water Products EchoShore monitoring sensor

The EchoShore-DX leak monitoring system from Mueller Water Products has expanded to include the new valve-based sensors to complement the existing hydrant-based leak detection system. Both sensors are rugged and non-invasive, and they work together seamlessly. Ramp up your reliability with up to 10-year battery life and 5G network compatibility. Get coverage where you need it, and detect, locate and monitor leaks before they form. 800-423-1323; www.muellerwaterproducts.com

Aquasight ACE Rain Heatmaps and Storm Catalog

Aquasight's ACE Rain Heatmaps and Storm Catalog solution provide critical insights to storm events in time for utilities to minimize flooding impacts or potential sewer overflows. It provides actionable, data-driven insights into current, past and forecasted storm events, enabling all aspects of wastewater utility operations from operator to utility executive to make better, more informed decisions. The GIS-based solution provides rapid, automated and on-the-fly live and historical storm event records correlated to each utility's unique design storm distributions. It provides powerful analytics to make accurate visualization of storm event characteristics for rapid, proactive response to the effects of extreme rainfall events. It also merges sewer flows and levels across sewer shed.

248-590-2190; www.aquasight.io ♦



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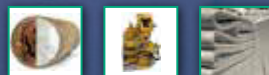
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TOTAL SYSTEM CONTROL

Texas utility changes its approach to asset management and gains systemwide efficiencies

PAGE 18

PRODUCT FOCUS:
PIPELINE REHABILITATION AND RELINING



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At *Municipal Sewer & Water*, we're looking for sewer and water departments with an interesting story to tell. If you'd like to share your story, send us a note at editor@mswmag.com.



Push camera and roller skid save time and money

Problem:

By the time a plumber showed up at a home in Valatie, New York, the customer was stressed because the sewer pipe was backing up. No amount of plunging had worked and professional help was needed. An access plug in the pipe leading to the septic tank was easily accessible. Once removed, several buckets were used to collect sewage.

Solution:

The plumber installed the **CPI Products Trapmaster** to get a 1.5-inch push camera into the 4-inch pipe and was able to pass by the remaining debris to view the blockage and determine exactly where it was. It turned out to be the last remaining section of a more than 30-year-old asphalt-coated paper pipe that had collapsed. They were able to pinpoint this by using the push camera with the roller skid.



RESULT:

The collapsed section was easily accessed, and it saved time since digging up the entire pipeline wasn't necessary. The repair was completed quickly, and the customer has a proper line all the way to the septic tank.

413-443-0925; www.cplproducts.com

Acoustic sewer inspection saves time and money



Problem:

The town of Oakland, Maine, has approximately 11.6 miles of gravity sewer piping. With a limited maintenance budget, the town needed a means to prioritize their maintenance operations. Historically, the town could only budget for 1 mile of cleaning and CCTV inspection, which they hire out at great expense.

Solution:

Oakland contacted **InfoSense** — manufacturer of the **Sewer Line Rapid Assessment Tool** — to help solve this problem. The SL-RAT is a highly portable assessment tool that utilizes acoustics to provide an understanding of sewer blockage conditions at less than 1/10th the cost of alternatives. Using the SL-RAT, a two-man crew inspected their gravity collection system in a few weeks. They used this data to identify pipes that need cleaning or CCTV inspection.

RESULT:


The SL-RAT program yielded two benefits. First, the inspection data showed that approximately 15% of pipes required follow up action. This helped Oakland meet their insurance due diligence requirements and direct their CCTV and cleaning resources to the correct pipe segments. Second, after completing a follow-up screening, town management identified underlying pipe defects — such as root growth — that caused certain segments to become clogged, even after a cleaning. In total, the SL-RAT program has realized over \$51,000 in crew labor and financial savings, while reducing the risk of further sanitary sewer maintenance issues. The SL-RAT has provided the town with a reliable, rapid, low-cost method to assess their collection system, providing peace of mind that the system is functioning properly.

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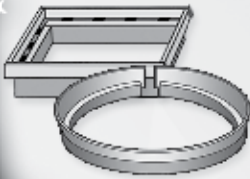


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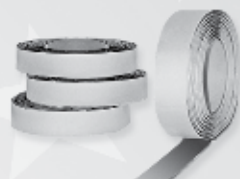
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NLB opens branch in United Kingdom

NLB opened a dedicated branch facility in the United Kingdom on Dec. 1. The company's new Darlington, England-based facility, and its abundance of available transport links, is well-located to serve NLB customers throughout the UK. With close to 25,000 square feet of workshop, office and yard space, the branch will house a range of NLB pump units for quick sale or rental, an increased inventory of accessories, and spare parts with room to conduct water jet demonstrations and customer training sessions. Large roll-up garage doors will make it easy for customers to bring units in for service support. The move from a shared location to a dedicated facility, with more space and increased staffing, will help NLB respond more quickly to European demand, reduce service times and give customers' personnel access to U.K.-based training.

Cindy Paulson joins board of directors of Axius Water

Axius Water, a portfolio of businesses focused on improving the effectiveness of the treatment processes to remove nutrients in industrial and municipal applications, announced in December that Cindy Paulson has joined the Axius Water board of directors. Paulson spent 35 years with Brown and Caldwell where she helped grow and diversify technical practices, advancing research and innovation, treatability testing, talent development and quality delivery programs. In 2017, she became the company's first chief technical officer. Paulson also spent 10 years as the executive director for the California Urban Water Agencies, collaborating directly with the general managers of the 11 largest water agencies in the state.

EPIC releases new report to guide replacement of lead pipes

The Environmental Policy Innovation Center released a new report, *From the Ground Up: A Guide to Replacing the Nation's Toxic Lead Pipes Over the Next Decade*, to highlight best practices for municipalities, communities and policymakers on replacing lead pipes quickly, efficiently and equitably over the next decade.

The report can be accessed at bit.ly/3PMRIda. The report draws from EPIC's Lead Free Water Challenge and work with Blue Conduit, Center for Geospatial Solutions, WaterPIO and other partners to help small and medium-sized municipalities replace lead pipes, including Chelsea, Massachusetts; Hazel Crest, Illinois; and Newburgh, New York.

McElroy names new Scandinavian distributor

McElroy announced the addition of a new distributor to sell and service fusion machinery in Scandinavia.

Bluegreen Technologies is a Stathelle, Norway-based company with a focus toward environmentally friendly solutions in aquaculture, environmental technology and traditional infrastructure. Bluegreen joins an extensive list of McElroy distributors around the globe that supply McElroy's thermoplastic butt fusion equipment.

Super Products celebrates its 50th anniversary

Super Products celebrates its 50th anniversary this year. Over the past 50 years, Super Products has grown from a small manufacturing company to a nationally recognized supplier of vacuum trucks. Super Products was founded at the end of 1972 by Lionel Moore, Charles O'Bryan and Tom Flynn. The company's first Supersucker industrial vacuum loader was manufactured in 1973, followed by the Camel combination sewer cleaner in 1976. In 1981, Super Products was sold to Inductotherm, followed by Specialized Industries LP in 2005, before being acquired by Alamo Group in 2014. Today, the company produces five different vacuum truck product lines and employs over 180 people across the country. Super Products is headquartered in Mukwonago, Wisconsin, and has a broad network of sales representatives supporting contractors, dealers supporting municipalities and, after expanding into the rental market in 2011, nine rental facilities supporting short- and long-term rentals, parts and service.

2023 grout school dates announced

Avanti Grout, CUES and Logiball are partnering for their annual two-day Municipal Sewer Grout School in Tavares, Florida. An emphasis will be placed on grouting, grouting safety, operating the equipment, testing and troubleshooting equipment, making sure the chemical grout mix has the right mixture and determining how much grout is used per joint or lateral. The classes are suitable for all experience levels. The school will present technical information on lateral and mainline test and seal packer operation and maintenance, mixing and optimizing AV-100 acrylamide grout performance, review and demonstration of new NASSCO/ICGA grout specifications, live infiltration and grout sealing demos, and new grout testing and monitoring information and methods.

To register, go to www.conta.cc/3w6mR2n. ♦



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WORTH NOTING

PEOPLE/AWARDS

Nathan Nguyen was hired as the director of public works for the city of Santa Cruz (California). Stormwater management is among his responsibilities.

The city of **Maryville** and Northwest Missouri State University will receive more than \$3.7 million for a stormwater drainage overhaul in neighborhoods near as well as on the campus. The funds are awarded by the Missouri Department of Natural Resources, which opened the grant program for a variety of water projects through the state's allocation of federal American Rescue Plan funds.

Pure Water Monterey, a recycled potable water project in the Monterey Peninsula (California), received an Outstanding Civil Engineering Achievement Award from the American Society of Civil Engineers. Pure Water Monterey is described as purifying urban stormwater, unused municipal effluent, food industry wash water and agricultural drainage water.

The New York State Environmental Facilities Corporation announced that nearly \$300 million in grants has been awarded for infrastructure projects across the state. All \$15.8 million of Green Innovation Grant funding was awarded to eight environmental justice communities for green stormwater infrastructure projects, including: **Albany Water Board, city of Yonkers, New York City Department of Environmental Protection, town of Whitestown, town of Harrison, city of Amsterdam, village of Hunter and PBF Hudson LLC.** ♦

CALENDAR

March 1-3

Michigan Stormwater-Floodplain Association Conference, H Hotel, Midland, Michigan. Visit www.mifloods.org.

March 28-31

American Water Works Association / Water Environment Federation Utility Management Conference, SAFE Credit Union Convention Center, Sacramento, California. Visit www.awwa.org or www.wef.org.

April 16-19

American Public Works Association North American Snow Conference, CHI Health Center, Omaha, Nebraska. Visit snow.apwa.net.

April 16-19

American Water Works Association Sustainable Water Management Conference, Hyatt Regency, Minneapolis. Visit www.awwa.org.

April 24-27

Center for Watershed Protection 2023 National Stormwater and Watershed Conference, The Westin San Diego Gaslamp Quarter, San Diego. Visit www.cwp.org.

May 1-3

International Erosion Control Association Municipal Wet Weather MS4 Stormwater Conference, Doubletree by Hilton Hotel, Chattanooga, Tennessee. Visit www.ieca.org.

May 10-12

Ohio Stormwater Association Conference, Kalahari Conference Center, Sandusky, Ohio. Visit www.ohioswa.com.

June 11-14

American Water Works Association ACE23, Enercare Center, Toronto, Ontario, Canada. Visit www.awwa.org.

June 27-29

Water Environment Federation Stormwater Summit, Kansas City Convention Center, Kansas City, Missouri. Visit www.wef.org.

July 17-19

American Water Resources Association Summer Conference, Hyatt Regency Denver Tech Center, Denver. Visit awra.org. Tech Center, Denver. Visit www.awra.org.

Municipal Sewer & Water invites your national, state or local association to post notices and news items in this column. Send contributions to editor@mswmag.com.

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