

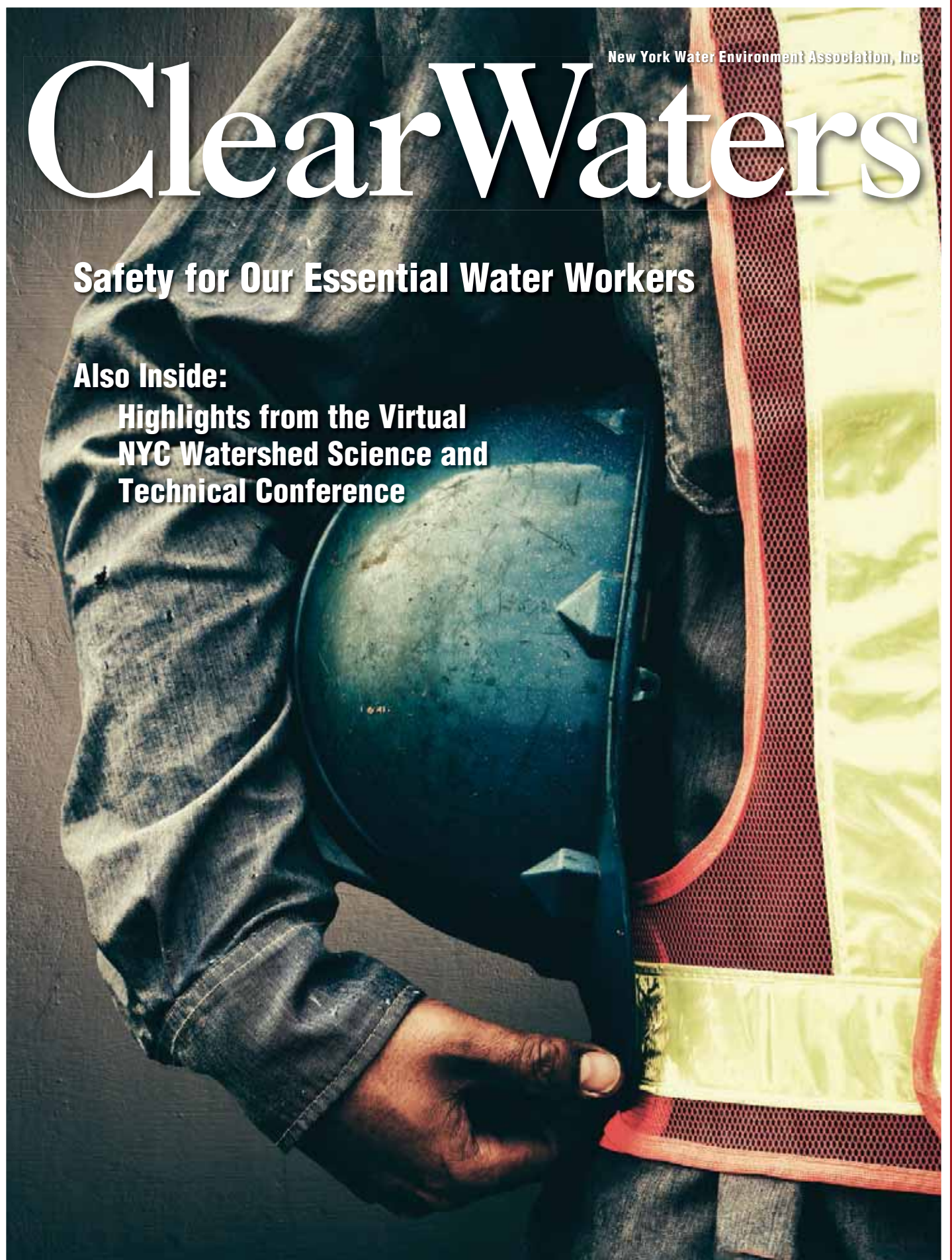
New York Water Environment Association, Inc.

# ClearWaters

**Safety for Our Essential Water Workers**

**Also Inside:**

**Highlights from the Virtual  
NYC Watershed Science and  
Technical Conference**



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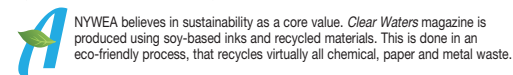
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# Clear Waters

New York Water Environment Association, Inc.

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Cover: Our essential water workers have stepped up in response to the COVID-19 pandemic, pivoting as necessary to meet shifting safety guidelines and keeping operations up and running.  
*istockphoto.com, shih-wei*

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I hope everyone is well and having success with their social distancing and virtual learning needs. The New York City Watershed Science and Technical Conference was successfully held virtually, and lessons learned will be applied to make our other virtual meetings a success!

**Annual Meeting Status**

NYWEA's 93rd Annual Meeting and Exhibition in February 2021 will be held virtually. This was not a decision that was made lightly. Direction on the format of the conference needed to be made to allow time to plan for either scenario, virtual or in person. Based on distancing guidelines, as well as input from vendors and attendees, the decision was made to transition from in-person to a virtual conference for our annual meeting. The Program Committee and the Conference Management Committee will take what we have learned from the past virtual meetings we've held to provide the best experience we can with quality technical content. We will also be taking notes from our participation at WEFTEC Connect to incorporate any lessons learned.

**Watershed Science and Technical Conference**

NYWEA held the New York City Watershed Science and Technical Conference virtually September 15 and 16, 2020. Additionally, a viewing of the WEF documentary *Brave Blue World* was held Tuesday evening followed by a panel discussion. Over 13 continuing educational credits were offered for another very cost-effective registration.

The format of this virtual conference was slightly different from the Spring Technical Conference and Exhibition to experiment with which method seemed to work the best for the attendees. The Spring Technical Conference was a series of five days from 8 a.m. to 1 p.m. By contrast, the September Watershed Conference was a dual track of concurrent sessions all day Tuesday and half day Wednesday, like the typical in-person conference experience. The lessons learned from both conferences will be incorporated into the planning for the annual meeting.

The Watershed Conference commenced with an opening session hosted by Lisa Melville with engaging discussion from the New York State Department of State, Paul Rush from NYC DEP's Bureau of Water Supply, and Tim Burns from the New York State Environmental Facilities Corporation. Technical sessions followed, ranging from topics like fate and transport models, dry and wet weather event management, reconstruction of historic streamflow, taste and odor investigations, dam rehabilitation, lead and copper rule revisions, treatment of emerging contaminants, and salinization due to road salt usage.

I would like to thank the many members who helped to make this conference a successful one, including our volunteers from the Watershed Conference Planning Committee, moderators, and the Syracuse University Environmental Finance Center's Tess Clark, Savannah Betkowski, Khris Dodson and Madison Quinn for their technical assistance. Finally, none of this would be possible without our speakers who are willing to share their experiences, as well as the moderators who helped keep everyone on time.

**Other Items of Note**

The 2021 Spring Technical Conference and Exhibition is scheduled to be in Syracuse June 7 through June 9 and is being planned as an in-person conference. We have several new committee chair appointments and I would like to thank those who have stepped up to fill these very important roles. In addition to keeping these positions filled, NYWEA is also excited that these positions are being filled by Young Professionals. Join me in welcoming Daniel O'Sullivan as chair of the Utility O&M Committee and Ethan Sullivan as chair of the Stormwater Committee. A new committee has also been created, the Diversity, Equity & Inclusion Committee, that will be chaired by Walter Walker. The goal of this committee is to further opportunities for diverse and multi-disciplinary representation in the water industry by growing the level of engagement through our events and programs. We need to make sure the people working in our field and our programs are reflective of our society. Please see the committee section on the NYWEA website for more information.

**Virtual Operations Challenge**

We are very proud to report that NYWEA had the greatest number of teams (out of all Member Associations) participate in the virtual Operations Challenge held during WEFTEC. We were tremendously proud to have five teams step up to the challenge! Congratulations to the Long Island Brown Tide who won 1st Place in the Process Control Category Division 1, achieving the highest score ever recorded in the history of the event! Our newest team, The Watertown Water Bears won 1st Place in the Process Control Category for Division 3. The Bowery Bay Coyotes won best competition space. The Rockaway Sludge Hustlers earned the award for the most spectators and the Genesee Valley Water Recyclers and Watertown Water Bears were recognized for outstanding camaraderie and mentoring. Many thanks to all team members and the coordinators. *See page 48 for pictures of all five teams.*

*William J. Nylic III*  
William J. Nylic III, PE, NYWEA President



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Promoting the interconnection between public health and the water environment is a challenge that members of NYWEA understand and appreciate through the work they perform daily. The COVID-19 pandemic may bring us a few steps closer to raising public awareness of this interconnectedness because of the importance of coronavirus testing and tracing that is occurring at many of our wastewater treatment facilities statewide. We are delighted

to have articles on this very topic included in this issue.

The Water Environment Federation recently took a big step forward to promote the connection between public health and the water environment by hiring a Chief Medical Officer, Dr. Andrew Sanderson, a gastroenterologist. The Chief Medical Officer position was created in collaboration between WEF and the global water technology company Xylem, which has provided foundational funding for the position to support the safety of water sector workers and their communities.

As Chief Medical Officer, Dr. Sanderson will guide and assist WEF in providing reliable medical information to wastewater utility managers and workers, as well as conducting research and serving as a representative on medical issues for the sector. His additional responsibilities include being a liaison between WEF and Occupational Safety and Health Administration, the World Health Organization and the Centers for Disease Control.

This is a bold move that emphasizes the interconnectedness of public health protection and the great work that essential water professionals do.

### On the Horizon

This year has been tremendously challenging for all of us, and it is important to look to the future through optimistic lenses. The way we engage with members has changed. The way we do business will change as well. However, our educational mission remains the same, and is even more important now, as training is no longer within the walls of a conference room, but open to a whole new virtual world. In 2021, we have some excellent programs planned, including a USEPA Effective Utility Management workshop. This two-day workshop will take place in March and help utilities address a full range of challenges and explore sustainable management of their operations and infrastructure. As we are learning from the pandemic, this workshop will help us move from “reacting” to hot priorities of the day to proactively planning for the future.

Another wonderful program planned for the summer of 2021 is the Work-in-Water Internship program that was made possible by a WEF Member Association Seed Grant.


One of our industry's greatest challenges is to continue to entice young people into the field. Promoting water careers as viable and rewarding has proved to be a challenge. Because of relationships we have fostered with the New York State Science Teachers Association and the Syracuse City School District, we are hopeful we will be able to match up and fund several internships at various municipalities throughout the state.

### Thomas J. Lauro Member Education Program

The NYWEA board of directors recently approved the renaming of the Member Education Committee training program to the Thomas J. Lauro Member Education Program to recognize and honor our dear friend and longtime member, (past-president and treasurer) Thomas Lauro, who died April 22 of this year from COVID-19. It is important to pay tribute to someone who did so much for this organization, and I am personally appreciative of the approval of the Member Education Committee and board for endorsing this idea. The training offered through this program is timely, relevant and structured to keep participants on top of the latest technology and trends. In the short term, we will be offering these events virtually, so be sure to check the website for the schedule of upcoming webinars. Many thanks to Bill Davis and the members of the Member Education Committee along with Madison Quinn for scheduling and carrying out this important training. Our heartfelt appreciation to the speakers for sharing their expertise!

The featured articles in this issue are a tribute to the members of the Publication Committee who identified Safety as a topic long before there were whispers of the coronavirus. Our thanks to each one of the authors for taking the time to put together the research behind what we hope others will learn from.

Wishing you all a healthy and colorful fall season!

  
Patricia Cerro-Reehil, [pcr@nywea.org](mailto:pcr@nywea.org)

## Brave Blue World Film Discussion Panel



The feature-length documentary, *Brave Blue World*, examines how new technologies and innovations can create a sustainable water future.

WEF's goal is to have Member Associations use the film to raise public awareness about the solutions to water challenges. The film was shown Tuesday evening after the first day of the Watershed Conference. The following leaders shared their thoughts and perspectives after the film.



**William J. Nylic III**  
NYWEA President  
Moderator, CDM Smith



**Geoff Baldwin**  
CDM Smith



**Steven Fangmann**  
D&B Engineers and  
Architects, PC



**Robert Kukenberger**  
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**Paul Rush**  
NYC DEP



**Steve Sanders**  
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## Highlights from NYWEA's Virtual NYC Watershed Science and Technical Conference.

Just under 200 people participated in NYWEA's virtual NYC Watershed Science and Technical Conference held September 15 and 16, 2020. This unique conference was NYWEA's second foray into a virtual meeting format, and was brought about due to the continuing situation caused by the COVID-19 pandemic. Featured here are the speakers and moderators who stepped forward to share their knowledge. The program involved over 40 speakers and 12 moderators. During the breaks exhibitor videos were featured. Many thanks to the sponsors and exhibitors who helped support this meeting.



**Lisa Melville**  
NYS Department of State  
Opening Session



**Paul Rush**  
NYC DEP  
Opening Session



**Sara Igielski, Moderator**  
Carollo Engineers  
Session 1



**Katie Ottoboni, Moderator**  
Carollo Engineers  
Session 1



**Kerri Alderisio**  
NYC DEP  
Session 1



**Danny Murphy**  
Carollo Engineers  
Session 1



**Rich Van Dreason**  
NYC DEP  
Session 1

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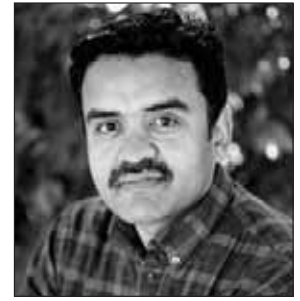
**Susan Butler  
Jacobs  
Session 2**



**Scott Davis, Moderator  
Carollo Engineers  
Session 2**



**Allan Frei  
Hunter College  
Session 2**



**Rajith Mukundan  
NYC DEP  
Session 2**



**Thomas Boland  
NYC DEP  
Session 3**



**Chad Davis  
HDR  
Session 3**



**Dahlia Thompson, Moderator  
Hazen & Sawyer  
Session 3**



**Kevin Draganchuk  
CEA Engineers, PC  
Session 4**



**Jim Mayfield  
NYC DEP  
Session 4**



**Karen Moore  
NYC DEP  
Session 4**



**David Van Valkenburg  
NYC DEP  
Session 4**



**Robert White, Moderator  
AKRF  
Session 4**



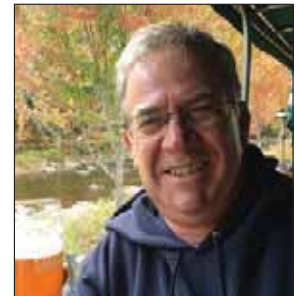
**Rakesh Gelda  
NYC DEP  
Session 5**



**Flakë Gjonbalaj  
NYC DEP  
Session 5**



**David Quentin  
NYC DEP  
Session 5**



**Michael Bonomo, Moderator  
ADS Environmental  
Session 6**



**Nicole Camilliere  
Ossining Union Free School  
District, Session 6**



**David Stahl, Moderator  
Dewberry  
Session 6**



**Andy Thuman  
HDR  
Session 6**





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## Water Views | Fall 2020



### Water Quality Monitoring

As the saying goes: “you can manage what you can measure.”

This summer, DEC samplers again fanned out to obtain data on waterbodies across New York to help identify current water quality and trends over time. This information, so fundamental to success, was built into the basic construct of the Clean Water Act.

DEC’s intensive monitoring efforts are conducted annually in two to four of the

state’s 17 major drainage basins, allowing us to obtain comprehensive data statewide on a five-year cycle. In 2020, DEC sampled the Lake Ontario, Erie/Niagara, and Mohawk River basins. DEC’s core monitoring responsibilities include three programs:

- Rotating Integrated Basin Studies: monitoring rivers and streams to assess water quality; identify long-term water quality trends; characterize naturally occurring or background conditions; learn of standard violations; and establish baseline conditions to measure the effectiveness of on-going restoration and protection actions.
- Stream Biomonitoring: assessing aquatic macroinvertebrate diversity and populations to monitor the water quality of streams and rivers, as well as detect changes over time.
- Lake Classification and Inventory: monitoring freshwater lakes, ponds and reservoirs to assess water quality; support watershed management plan development; and evaluate the effectiveness of protection activities.

DEC’s data portals provide access to current and historic stream

monitoring data in an easy to use map format. All monitoring is conducted according to stringent procedures to ensure high-quality, accurate data; samples are analyzed by state-accredited laboratories.

The Citizens Statewide Lake Assessment Program provides critically important assistance, training hundreds of volunteers and providing high-quality data for over 25 years. DEC sponsors the Professional External Evaluations of Rivers and Streams Partners to compile river and stream biological data collected by professional organizations. Citizen scientists collect water bugs in the Water Assessments by Volunteer Evaluators program to help assess water quality in wadable streams.

DEC partners who collect sampling data on a water are usually its leading stewards. In fact, much of DEC’s nation-leading program to identify harmful algal blooms relies on citizen photos assessed by DEC experts, who then post warnings and take other actions as needed.

All these monitoring programs are used to support assessments, including the Waterbody Inventory/Priority Waterbodies List, New York State’s Clean Water Act Section 305(b) Water Quality Report, and the Section 303(d) List of Impaired Waters. This information is used in everything from permitting to enforcement to total maximum daily loads to remedial action plans to pollution track-downs to grant scoring. Other DEC programs and other state agencies often rely on these assessments when making important decisions. You can find the most up-to-date water assessments on the DEC’s website, through the Water Monitoring Data Portal, the DECinfo Locator, and the Water Quality Monitoring & Assessments pages.

– James Tierney, Deputy Commissioner for Water Resources  
NYS Department of Environmental Conservation

## Focus on Safety | Fall 2020



### Welcome to My World

I don’t want to go back to “normal.” I want to have agitation, stress and worry, at least for a little while longer. This way, more people will understand what my work life is about: preparation, worst case scenarios and resilience. It’s about uncertainty, remembering Donald Rumsfeld’s term “unknown unknowns,” and thinking about things that may not happen often but when they do, they are life- and business-

altering. My work life does not focus on the normal; it focuses on the abnormal.

Imagine working in a career where the mark of achievement is when something does *not* happen. All the scorecards in the world don’t measure what doesn’t happen. At best, they measure stand-ins or surrogates to extrapolate about what doesn’t happen. How do you look at a poster that professes safety is the No. 1 priority and just shake your head because that is precisely the problem? As a safety professional, you may find yourself getting burned out, when your No. 1 priority is stressing and worrying over the worst-case scenarios. And now you have the pandemic. Wonderful.

Wonderful in a way that welcomes others into your weird, safety-focused world and lets them experience the stress and worry, then understand where you are coming from. Remember how that

budget item for respirator filters needed justification at the level of requesting a nuclear warhead? Remember the plea not to sole-source safety equipment because all the safety eggs shouldn’t be in one basket? Remember the argument that an emergency inventory is a good thing even if it means money sitting on a shelf? Remember the conversation that critical safety items shouldn’t all be manufactured overseas even if that impacts the budget? Remember the reminders for the safety inspections, the safety meetings and the safety trainings? I have colleagues that do remember, and now we have a connection that wasn’t there when life was “normal.” Right now, in this crazy moment, we are in the groove. Safety projects are getting done. Injuries are practically nonexistent and incredibly minor. We are focused; we are nailing it.

Eventually, however, the pandemic will become manageable with either vaccine, treatment, or by fading away into the sunset. In my private life, I hope that happens tomorrow. I fear, though, the time when my work life will return to normal. I fear that low probability, high impact events, like this pandemic, will not have the same visibility in the workplace as other business issues that routinely occur. I fear our safety awareness will disappear and be forgotten. I fear that our sense of urgency will fade and that, while safety should be a value that is baked into our work, it will slide in priority, shifting in the sand. So, because of these fears, I want the stress, agitation and worry about safety to continue – for just a little while longer.

– Eileen M. Reynolds, Certified Safety Professional  
Owner, Coracle Safety Management

# COVID-19:

## Basics and Prevention Strategies for the Water/Wastewater Workplace

by Nellie J. Brown

“Be a virus, see the world.” Or, as the U.S. Centers for Disease Control and Prevention (CDC) has said, “If a disease is anywhere in the world, it will eventually be here.”

The current pandemic is caused by a novel coronavirus, SARS-CoV-2, and while there are similarities to severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS), there are also differences, new challenges and a new name to the disease, COVID-19, that is caused by SARS-CoV-2.

### Viruses and SARS-CoV-2 Transmission

A virus is not a living cell. A living cell has machinery to repair and reproduce itself and to produce energy. A virus carries information but lacks machinery to reproduce itself. Or, as some people like to say, a virus is a bit of bad news wrapped in a protein coat. So, a virus on a surface might survive or die off, but it cannot reproduce until it enters our bodies, attacks our cells, and hijacks them to force them to reproduce new viral components. The viral parts self-assemble and leave the host cell to go on and attack other cells. SARS-CoV-2 attacks cells in both our upper and lower respiratory tract, our gastrointestinal tract, and some cells lining blood vessels, producing a range of symptoms.

How is the COVID-19 virus transmitted? There are two predominant methods of transmission from one victim to another:

1. Through droplets generated by coughing and sneezing.
2. Through smaller aerosols produced by speaking, shouting, singing, spitting or increased breathing rate caused by physical exertion.

The droplets from coughing and sneezing can land on the mucous membranes of the eyes, nose or mouth of a person less than 6 feet from the source. These droplets fall by gravity, usually within seconds, and contaminate clothing or surfaces; we touch these contaminated surfaces (fomites) and then touch our eyes or face.

The smaller aerosols can remain airborne for minutes to hours, depending upon whether we are in motion and creating eddies in the air and – if indoors – depending upon the ventilation system in use. Certainly, there is greater risk of exposure indoors than outside, but we can inhale these aerosols along with any viruses contained within.

The information we currently have suggests that the airborne route is more important than the contact with contaminated surfaces. A recent study of health care personnel being infected from patients indicated that the probability of infection from these various sources was probably 35% for droplets, 57% for inhalation and 8.2% from contact with contaminated surfaces (Jones, 2020).

### Risks in Water, Wastewater and Biosolids

Figure 1 illustrates the Occupational Safety and Health Administration (OSHA) risk exposure levels for hazards. OSHA believes that wastewater work does not have high or very high risk for coronavirus exposure; that most work is low risk. However, they do note that handling waste from health care facilities generated in the care of suspected or confirmed COVID-19 patients is medium risk, which is the designation for handling any routine medical waste,

not just that of COVID-19 patients. A medium risk category would include performing maintenance tasks on equipment used to process medical waste, so workers should continue to use routine controls for these types of work tasks (OSHA 2020a).

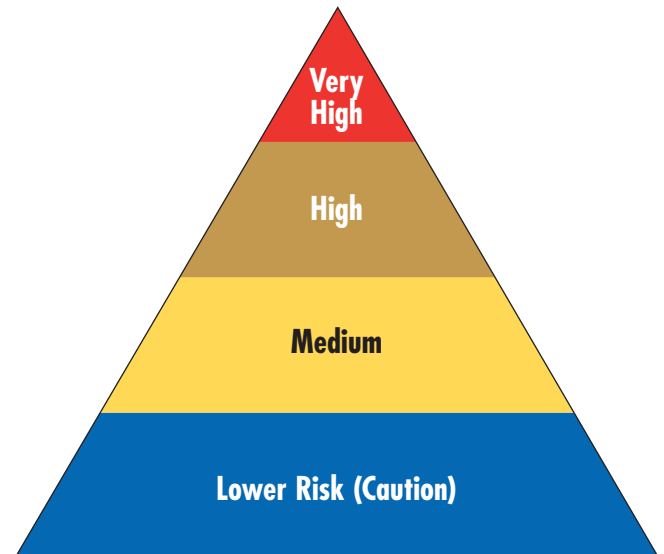


Figure 1. The four exposure risk levels represent probable distribution of risk. OSHA

The SARS-CoV-2 could be present in untreated drinking water, but, as of the end of July, infectious virus has not been detected in drinking water supplies (WHO 2020). While there has been at least one documented case in which a river was found to have RNA fragments of SARS-CoV-2 during the peak of the epidemic in northern Italy, this is believed to be the result of contamination with raw sewage. Also, other coronaviruses have not been detected in surface or groundwater sources, so it is thought that drinking water is a low risk exposure source (WHO 2020).

Coronaviruses die off rapidly in wastewater. Infectious SARS-CoV-2 (that is, whole, intact virus) has not been detected in untreated or treated sewage. Fragments of this coronavirus' genetic material have been detected in untreated sewage and sludge in a number of countries and municipalities, generally starting around the same time cases were first reported and increasing as the number of confirmed cases in the sewershed increased. Fortunately, SARS-CoV-2 is an enveloped virus. Enveloped viruses are less stable in the environment compared to nonenveloped human enteric viruses with known waterborne transmission, such as adenoviruses, norovirus, rotavirus and hepatitis-A virus. Standard wastewater treatment processes are effective for neutralizing enveloped viruses, including SARS-CoV-2 (WHO 2020; Gundy 2009).

OSHA has stated that there is no evidence to suggest that additional, coronavirus-specific protections are needed for employees involved in wastewater management operations, including those at wastewater treatment facilities. Wastewater treatment plant operations should ensure workers follow routine practices to prevent exposure to wastewater, including using the engineering and administrative controls, safe work practices and personal protective equipment (PPE) normally required for work tasks when

handling untreated wastewater (OSHA 2020b; WEF 2020).

What about land application of treated sewage sludge? The USEPA has stated that existing requirements and guidance help ensure that biosolids are processed, handled and land-applied in a manner that minimizes the risk of exposure to pathogens, including viruses. There is no evidence that biosolids contain infectious SARS-CoV-2 virus when requirements under 40 CFR Part 503 are met for Class A biosolids. Generally, pathogens may exist when requirements are met under 40 CFR part 503 for Class B biosolids, which is why USEPA's site restrictions that allow time for pathogen degradation should be followed for harvesting crops and turf, for grazing of animals, and public contact. The CDC has issued guidance for workers exposed to Class B biosolids, but with no additional coronavirus-specific protections (USEPA 2020a).

What about fresh fecal material from a coronavirus-infected person and especially with diarrhea? While diarrhea is not a common symptom of COVID-19, aerosols from a flushed toilet may be a potential exposure route from an infected person. This has been observed with SARS-CoV-2; there are some data from laboratory studies on the coronavirus that found live virus in feces surviving several hours and in urine surviving three to four days. Moreover, we frequently design restrooms with overhead exhaust fans. These fans lift aerosols into our breathing zone. In a person infected with SARS-CoV-2 and staying home, the bathroom's window-exhaust fan disseminated the virus 600 feet outdoors, producing a COVID-19 cluster with more than 400 people infected (Li et al 2020; Liu et al 2020; Derman et al 2020).

If COVID-19 symptoms develop, a person's viral load declines steadily, and they become increasingly less infectious. However, people keep shedding the virus in saliva and feces for about two weeks after they recover (Wölfel et al 2020).

## Controlling a Pandemic

According to scientists, there is much we do not know yet about this coronavirus. There may be further resurgence of infections depending on how well the virus is transmitted during warmer months, and how long immunity lasts in people who have recovered from the viral infection (Burke 2020). Given these uncertain-

ties, how do we go about controlling a pandemic?

Phase 1 involves containment, by limiting the geographic spread of the disease by testing people for virus; then "isolate" if infected, "quarantine" if exposed. We trace the contacts of the infected person to test them as well.

Phase 2 involves mitigation to slow the spread of the disease to buy time to develop treatments or vaccines. These mitigation measures include:

- Social distancing strategies put in place to protect the most vulnerable. To keep people at a distance, only "essential services" are provided; other entities must work remotely or shut down.
- Identify seasonal change impacts. Will warm weather reduce transmission of this virus? Will winter and the flu season increase the rates of illnesses?
- Prevent health care systems from being overwhelmed by distributing the cases of illness over time (i.e., flatten the curve). This is particularly crucial to saving lives.

To address coronavirus as a workplace hazard, we need to look at our workplaces through the lens of communicable disease; this is not typically the lens used outside of the health care industry. As with any workplace hazard, we can use the tool of the Hierarchy of Controls (Figure 2).

### Elimination

We really won't be able to truly eliminate SARS-CoV-2 from entering our workplaces until we have a vaccine and/or preventive antiviral medications, but there are some strategies that are helpful to keep the coronavirus away from the workplace. We can screen our workforce, including visitors, contractors, clients, students and others who enter the building. Screening involves checking a person's body temperature for fever and asking about symptoms and recent travel. This could be done as people arrive at a workplace or as a self-check using software or other system at home. You can identify a lot of illnesses this way, as well as COVID-19, but this is a "coarse" screening technique. What makes the coronavirus such a successful pathogen is that it can be transmitted by people who are asymptomatic or pre-symptomatic, so without a fever or other symptoms the screening process will not be able to detect them

(Lawton, 2020). According to the CDC, half the people infected with the coronavirus could not identify a person with COVID-19 with whom they had had close contact in the last two weeks (Tenforde et al 2020). While regular testing for virus or antigen can help with this process, it can be expensive; delays in receiving virus test results can render the testing almost useless.

Some other elimination strategies that can be helpful include policies such as:

- If sick, people should stay home or go home; sick leave policies should be nonpunitive.
- Postpone or cancel large gatherings; do these virtually, if possible.
- Visitor policy should restrict

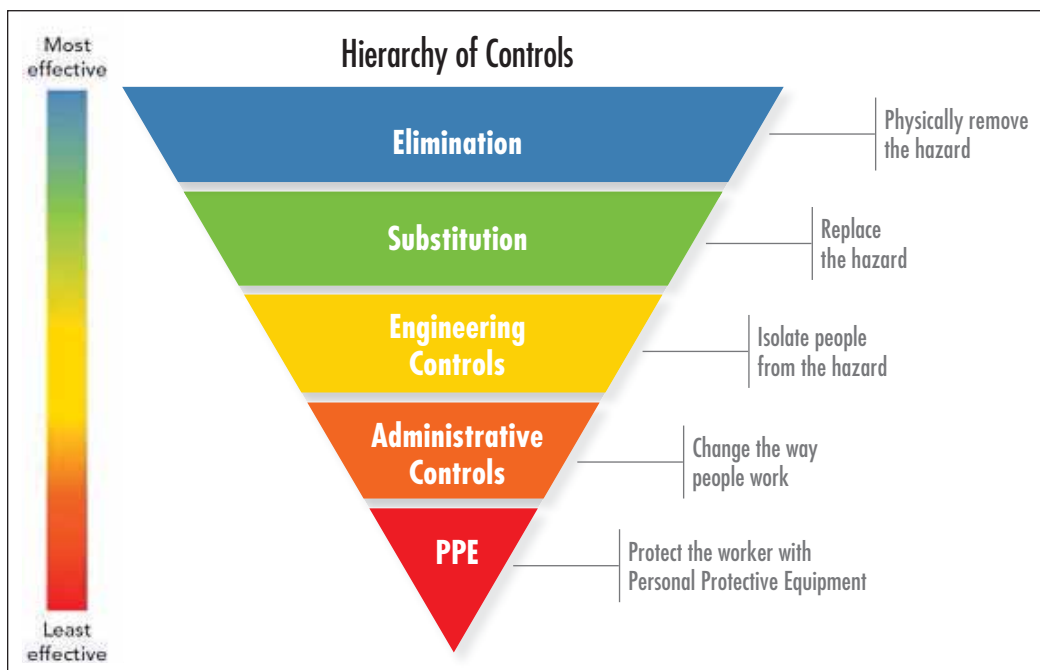
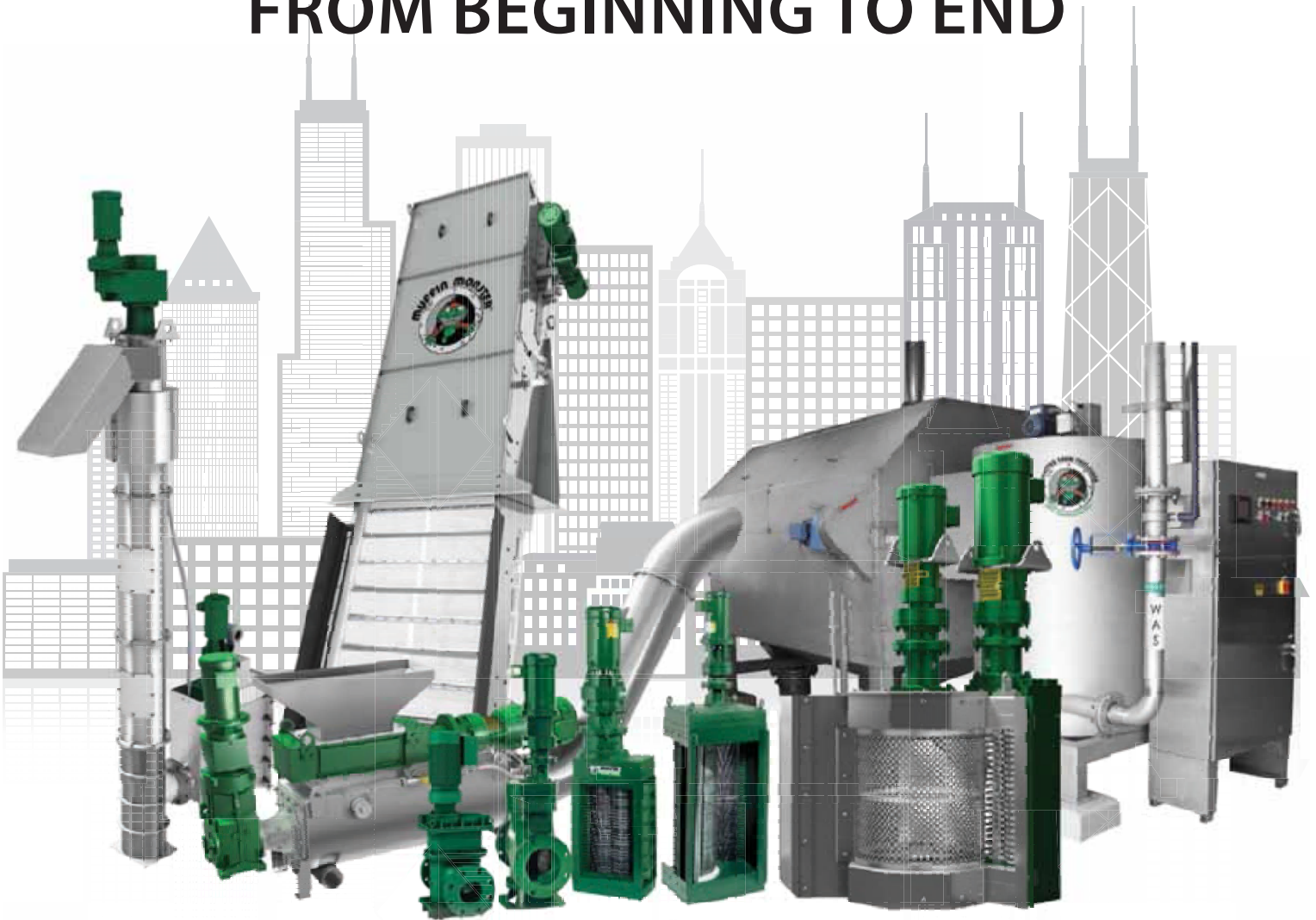


Figure 2. Hierarchy of Controls for communicable disease.

CDC

continued on page 13

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visitors to as few as possible; use appointments and avoid gathering visitors in waiting areas.

- Concentrate on providing your workplace's basic services and activities only, not the extra events, tours, parties or celebrations involving large gatherings.
- Work remotely whenever possible.
- Have entry/exit logs for the facility; this provides contact tracing information for your local department of health to prevent further disease spread.
- Limit unnecessary work travel as much as possible.
- Think about how the workforce gets to work, either by walking, public transit, car or carpool. Altering work schedules' start and stop times may spread out the rush hour, enabling people to use public transit during less-busy times.
- Encourage the workforce to get the coronavirus vaccine when it becomes available.

It is so important for us to get our annual vaccination for the current season's influenza. Remember, antibodies take about two weeks to develop in the body. As businesses reopen, mandatory influenza vaccination policies could become policy at private businesses.

### **Engineering Controls**

Looking at the workplace through the lens of communicable disease has us rethinking how we use our spaces and what would be the appropriate occupant density for social distancing and keeping about 6 feet away from others. For treatment processes or tasks that can generate splashes or aerosols, physical barriers should be used where feasible. A barrier, such as a transparent plastic panel, should be used at reception areas for visitors or deliveries.

Social distancing can be highly effective, especially for protecting vulnerable people. Without social distancing, the infection rate can skyrocket, especially since the coronavirus is so very infectious; one person can infect two to three other people (*Hsiang et al 2020*).

We might consider staggering workers' start and end times or shift schedules; perhaps having some staff work remotely on alternate days. This includes considering how many people can occupy meeting or training rooms, break rooms and lunchrooms, restrooms and locker rooms. Of course, there is an advantage to keeping people in groups, or bubbles, who only associate with each other; this can limit disease exposure, as well as make any future need for contact tracing much easier.

If we can increase ventilation in our buildings, as well as upgrade the filtration of the recycled air, we can reduce exposure to coronavirus-carrying aerosols. By lowering the number of building occupants, we simultaneously are increasing the ventilation rate per person. It also helps to reduce commonly touched items, where possible. For example, see if things can be made automatic or install foot controls such as on doors, handwashing stations, lighting, trash receptacles, water fountains and the like. It may also help to reduce aerosol exposure by having toilets with lids; then make a practice of closing the lid before flushing.

### **Administrative Controls**

Thinking about all the potential germ surfaces that we touch brings us to the subject of our work practices, such as cleaning and disinfecting procedures and handwashing technique. Wastewater workers, of necessity, are mindful about handwashing. I would like to hope that, during a pandemic, we would all be more conscientious about handwashing wherever we are. However, studies of the

last influenza (H1N1) pandemic indicated that 54% of surveyed people said they did not wash their hands more frequently in public restrooms. After using the bathroom, 28% had fecal bacteria on their hands and 46% did not wash for at least 15 to 20 seconds, or the time it takes to sing "Happy Birthday" twice (*Coppotelli, 2010*). So, we clearly need to get in the habit of a good handwashing procedure, and then avoid recontamination by using the paper towel to turn off the faucet and even to open the restroom door, disposing of the towel as we leave.

We need to work out the frequency for cleaning and disinfecting our commonly touched items. For shared tools or equipment, having disinfectant available to apply before and after we use the item makes this doable. We always want to consult the USEPA list of registered products for coronavirus disinfection and use the product as per its directions, application method and with the appropriate "dwell" time (*USEPA 2020b*). For diluting household chlorinated bleach, follow label directions on the bottle; over-the-counter bleach could be 5% or 8% sodium hypochlorite, while higher concentrations are used for wastewater disinfection. With all this attention to cleaning and disinfection, you might be switching to new products or increasing the frequency of use, so be prepared to respond to reports of odor, symptoms, and adverse effects in people or on surfaces.

When you think of disinfecting contaminated items, don't forget to disinfect your cellphone before you leave work and as soon as you arrive at work, so you don't exchange diseases between work and home. For a common kitchen or break room, consider disinfecting coffee machines, refrigerator handles, ice machine handles, and water or beverage faucets about three times per day; or you could provide disinfectant/wipes for people to do this themselves. If there is an ice machine, discontinue the handheld scoop. If toilets have lids, remember to close them before flushing. If toilets do not have lids, considering installing them.

Managers and supervisors need to model work practices and policies. Consider posting signage at entrances and docks to remind delivery personnel of the safety requirements when arriving on-site. Another administrative control is training on topics such as up-to-date general coronavirus information as well as workplace-specific COVID-19 information, how to properly don and doff PPE, how to report illness signs and symptoms, and good handwashing technique. Handwashing is preferred, especially if hands are dirty, but if soap and running water are not available, use an alcohol-based hand rub that contains at least 60% alcohol and beware of imported products containing poisonous methanol!

As always, wastewater workers should not smoke or chew tobacco or gum at work since there is the potential for hand-to-mouth transfer of contaminants. Any open sores, cuts, or wounds should be kept covered with clean, dry bandages.

### **Personal Protective Equipment**

Wastewater worker PPE is the basics: protective outerwear, heavy-duty gloves, boots, respiratory protection and eye/face protection. Sewage work, as always, should include washing dedicated tools and clothing, performing hand hygiene frequently, obtaining vaccinations for sanitation-related diseases, and self-monitoring for any signs of COVID-19 or other infectious disease. Work clothing should be changed before leaving the worksite and preferably laundered at work. Showering at work before changing to street clothing is also a good idea. If laundering work clothing at home

*continued on page 14*

is necessary, clothes should be bagged until put into the washing machine.

For viral protection from any treatment process that generates bioaerosols, you want at least a minimum of an N-95 disposable respirator. Of course, you can always wear higher forms of protection such as a half-face or full-face air-purifying respirator but put a surgical mask or a facemask over the exhalation valve. You would need to do the same for an N-95 with an exhalation valve. Due to supply chain problems, we have needed to reserve the N-95s for health care personnel, so we have been asked to use facemasks instead. An N-95 blocks about 66% of viruses when not properly fitted, which is the same performance as for surgical masks. Wearing a respirator requires that a workplace follow the OSHA Respiratory Protection Standard (29 CFR 1910.134). Even for voluntary use of a respirator, you still need to follow the Standard's Appendix D. Be aware that a respirator that fits too tightly can produce a pressure injury (NPIAP 2020).

If you are not in a situation requiring a respirator, both the CDC and the World Health Organization (WHO) advise the use of simple cloth face coverings. New York state requires employers to provide them and everyone to wear them, especially if you cannot maintain good social distancing, and especially when indoors. You want a facemask that is easily washable, if not disposable, with no exhalation valve, and a clean one for each day. Cloth face coverings can be fashioned from household items or made at home from common materials at low cost (Howard, 2020; Pleil, 2020).

A facemask works best at capturing the larger droplets by both filtration and adhesion. However, the smaller aerosols are not captured very well and escape around the edges of the facemask (Patel, 2016).

A disadvantage of facemasks is that they prevent lip-reading. There is technology to assist with hearing impairment, as well as interesting facemask designs that incorporate a transparent plastic zone over the mouth, including a surgical mask with Food and Drug Administration approval.

If you cannot wear a facemask due to breathing problems or claustrophobia, it is possible to use a loose scarf folded to make two or three layers, or a face shield, but these have their limits. Face shields are good for what face shields have always been used for: protection from direct impact, such as droplets from coughing or sneezing. There is some information on this concerning influenza, rather than the coronavirus, which makes it clear that a face shield is good for droplets, not for aerosols that can be airborne easily around the edges of a face shield (Perencevich et al 2020).

For eye protection from the coronavirus, unvented goggles are a good choice; use an antifog wipe or spray to address the fogging problem. Also, there are goggle/face shield combinations that look a bit like Iron Man.

Of course, rubber gloves, either disposable or reusable, are options for skin protection, along with protective clothing and boots for larger exposure scenarios.

How effective are social distancing, facemasks and eye protection? A review of over 200 studies from around the world (Chu et al 2020) has indicated the following:

- Physical distancing of 1 meter (about 3 feet) or more reduces exposure; for each additional meter, exposure dropped by half.
- Facemask use could result in a significant reduction in the risk of infection.
- Eye protection was associated with less infection.

Remember, any of the items you employ from the hierarchy of

controls work together to reduce exposure risk to the coronavirus (and lots of other diseases, as well!).

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# Coping with COVID-19 in Monroe County

by Corky Kelsey

Transitioning through the season always brings challenges to water resource recovery facilities in upstate New York. Warming water equates to reducing mass in our facility, whether through increased wasting or reducing tanks in service. Springtime also brings the start of construction season and rainstorms. The colder weather of fall and coming winter makes us dress warmer and changes once again the chemistry of the plant. The Silver Tsunami continues its sweep across the industry. The year 2020 started much like any other in the last 15 years ... until COVID-19 came along.

Almost overnight across New York, social distancing became a must, face coverings became a necessity, and families began scrambling to cover child care needs. State and federal labor rules were evolving; the only things that remained constant were State Pollutant Discharge Elimination System (SPDES) permit requirements.

Monroe County Department of Environmental Services (MCDES) is blessed to have a dedicated team of water resource recovery personnel operating the county's two water resource recovery facilities (WRRF): the 135-million-gallon-per-day Frank E. Van Lare WRRF and the 22-million-gallon-per-day Northwest Quadrant WRRF. Much like many WRRFs across the country, our certified operator group is always dynamic as retirements, recruitment and training continue to be the norm.

## Staffing Challenges

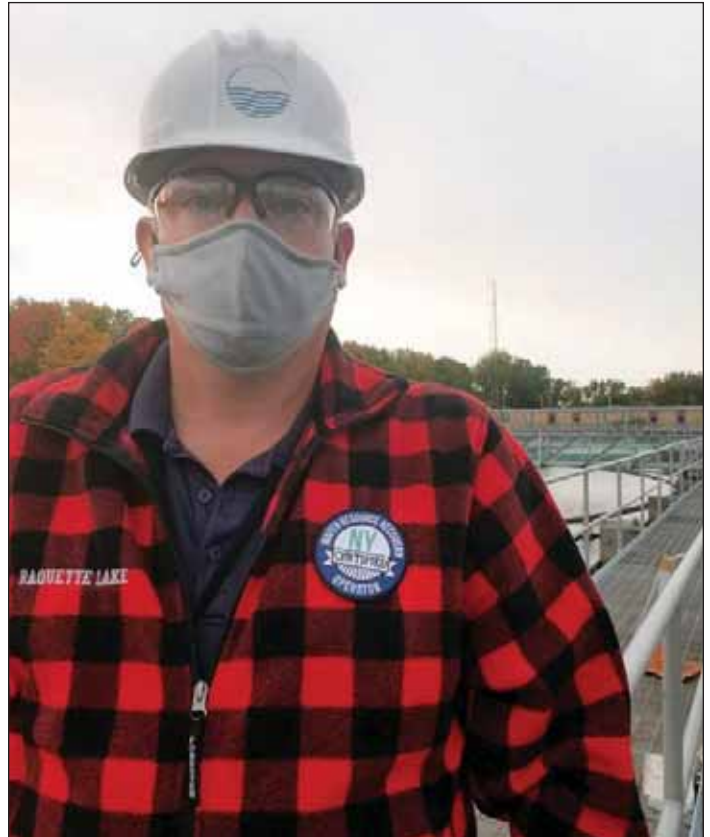
The call came March 16 to prepare a temporary staff reduction plan in response to COVID-19. I immediately convened with Alan Oates, Wayne LaVair and Justin Slentz, my assistant chief water resource recovery operators (WRROs), to develop a schedule to run bare-bones, minimal staffing until further notice. The resulting schedule for coverage of the 29 shifts per week was approved and implemented March 18. Those staff affected by school or day care closures were given preference for time off with pay. Additional staff were given a week off on a rotational basis to further encourage social distancing while still maintaining permit-compliant staffing levels. Assistant chief WRROs and senior WRROs were divided into two groups and rotated weeks off.

Scheduling staff was an ever-changing nightmare. Some employees needed child care for entire weeks, some needed certain days off, and time-off needs changed as spouses' schedules changed. To top it all off, we also had a United States Army reservist called into action, removing him from the staff roster from February until the second week of August.

As chief WRRO, I came in daily to manage the remaining staff and assist in the workload. I also helped bridge the communications gap between weeks spent on-site for the socially distanced staff who were working from home. Zoom and Microsoft Teams virtual meetings, which took some time to acclimate to, replaced the in-person progress meetings that I prefer. Conference call bingo made attendees listen closely and helped to alleviate stress.

## Construction Projects Move Forward

Managing WRRF processes and juggling staff while preparing for construction projects was not as fun as it sounds. Reliving the "good old days" was a refreshing change of pace as an upcoming aeration project found me descending a 40-foot step ladder into a couple of tanks to hose and squeegee the floor with an assistant chief by my



Corky Kelsey, chief WRRO, wears a face covering to protect himself and his staff.

Corky Kelsey

side. Thankfully, the construction project went off without a hitch aside from a short delay in equipment shipping. Daily temperature checks of contractors and filing of COVID-19 surveys did not affect the project start nor delay the completion.

Another project that was just wrapping up for a final clarifier did get impacted by the socially distant, reduced staffing. Our environmental laboratory staffing was reduced 50% through social distancing and as a result scheduled performance testing of the clarifier was put on hold. For approximately 12 weeks, sampling was reduced to minimum permit requirements and the most critical process control parameters. Once the lab was back up to full staff in June, testing of the clarifier resumed.

The mechanical and instrumentation and electrical groups also reduced staff. Thankfully, equipment stayed up and running during staffing reductions with no power issues or major breakdowns. Reinforcements were ready to come in from standby if any issues arose.

## Certification Testing Delayed

One of the most trying challenges to come from the pandemic was getting operator trainees tested for state certification. MCDES had six employees eligible for the 3A certification exam late this winter. Two of the six managed to get into test centers just before they were shut down. Test centers tried to reopen in mid-June and two employees scheduled exams for early August that were then postponed due to test center closures and rescheduled for September. MCDES currently has four employees still waiting to

*continued on page 19*

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Personal protective equipment (PPE) in 2020. *Corky Kelsey*

test for 3A certification that, when achieved, will result in promotions and salary increases.

### Uncertainty Lingers

White knuckles and gray hairs were probably the norm around the country during this time for chief operators. Uncertainty abounded. Will I still get hypochlorite deliveries? Do I have enough ferric on plant site? Will biosolids hauling trucks show up every day and will the landfill be open for them? What will happen to the

WRRF's loading? Is manufacturing going to cease production or change processes? Will staff stay healthy and available? All these questions with no definitive answers.

As operators, we frequently make educated guesses and predictions to plan ahead; COVID-19 just made it that much more challenging. Never in my 20-plus years of water resource recovery, was tomorrow so unpredictable every day. Phone calls and emails to suppliers and haulers increased dramatically. Staff required frequent reassurance that it would all work out. To boost employee morale, our bosses provided lunch in the form of socially distanced pizza parties. Barbecue Friday was also a big hit that motivated the staff to work even more weeks. MCDES was more fortunate than most as no staff were lost to illness or injuries, no equipment failed, adequate staff was available, and the power stayed on.

### Hats Off

In the "end" all has worked out as everyone adjusts to the new normal. My hard hat is off to all truck drivers but especially the ones that never missed a chemical delivery or a biosolids haul here for Monroe County.

MCDES staff responded well to the crisis, stayed safe, stayed healthy and worked hard 24/7 to serve our community. Their commitment, dedication and environmental stewardship resulted in continued SPDES compliance at both of Monroe County's WRRFs.

*Corky Kelsey is the chief water resource recovery operator with the Monroe County Department of Environmental Services at the Frank E. Van Lare WRRF and may be reached at [kkelsey@monroecounty.gov](mailto:kkelsey@monroecounty.gov).*

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# City of Watertown Responds to COVID-19

by R. Mark Crandall

In March 2020, the state of New York was dealing with a rise in COVID-19 cases, caused by the novel coronavirus SARS-CoV-2. The state incrementally began to shut down to control the spread of the virus. On March 16, Governor Cuomo issued an order that nonessential state workers must begin working from home, and local governments were instructed to reduce their workforce by 50%.

At the Pollution Control Facility (PCF) in the City of Watertown, New York, we were notified that we were essential workers and we had to keep the facility and its outlying lift stations up and running. As the Chief Operator, I automatically set the facilities into a minimum staffing mode. I did not want to lose the whole staff for 14 days or more due to one person testing positive for COVID-19 or, worse, becoming ill.

On Tuesday afternoon, March 17, we had a plant staff meeting. The facility would go down to minimum operating status. The duty operator and the biosolids operator would work on normal shift. Only emergency maintenance would occur for the next few weeks. All other operators were told to go home and self-quarantine so as not to expose themselves to the virus. All staff were notified that they were on call in the event this minimal staffing plan could not be sustained for the time span needed or if a maintenance situation arose and the on-duty personnel could not fix it.

Each key position in the plant has a backup: Chief Operator has the Senior Operator; Laboratory Director has Pretreatment Director; and Maintenance Director has Process Worker II. During the minimum staffing stand-down, the backup and the lead person were not on duty at the same time. This was done so that if a key person were incapable of working due to the virus, their backup would not also be exposed.

The Watertown Pollution Control Plant is a 16-million-gallon-per-day facility with secondary treatment. The facility first went online as a primary plant in 1966.

In the 1980s two new processes were added: a secondary trickling filter capable of providing effective secondary treatment for sustained flows up to 8 million gallons per day, and an activated sludge process that facilitated the Fort Drum expansion.

We currently have two influents and two effluents, which discharge into the Black River, and can now sustain flows up to 16 million gallons per day.



Aerial view of the City of Watertown Pollution Control Facility.

Google Earth

The plant operated as if it was a weekend schedule with one duty operator on per shift. For the Monday through Friday day shift, we operated with one person managing our biosolids process. The 3 p.m. to 11 p.m. and 11 p.m. to 7 a.m. shifts were already covered as we normally operate in rotating shift status. We also have two laborers at the facility that alternated workdays. Every day the laborer on duty would come to work and commence disinfection of control buildings and vehicles.

After about six weeks of minimal staffing it was obvious that the facility needed its operators. Preventative maintenance needed to be accomplished and it was the time of year our biosolids production increases. The staff were called back and followed the protocols that were already set in place.

We socially distance whenever possible and if not possible, masks are worn. Hand sanitizer is readily accessible to all staff. Upon entry into the building all staff have their temperatures taken and must answer all COVID-19 exposure questions. If they answer yes or have a temperature, they must self-quarantine or have a COVID-19 test administered. To date we have not had one person on staff come down with the COVID-19 and the plant is up and running at 100%.

After things were back to normal the senior staff completed an after-action review of the past few months. The key take-away was the need to improve, or better yet expand, a few of the Standard Operating Procedures (SOPs) that were more administrative to help with the flow of information at the key staff level. Another recommendation was to develop a checklist of items that need to be completed daily, weekly and monthly.

It took a few weeks for the crew to get back to the daily routine, but overall, the facility and the crew did very well. We learned that even though you can make do with so little staffing for a while, it cannot be sustained long-term.

*R. Mark Crandall is the chief operator for the City of Watertown PCF and may be reached at [mcrandall@watertown-ny.gov](mailto:mcrandall@watertown-ny.gov).*

Source: City of Watertown, New York

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# Lessons Learned: Working Safely in a COVID-19 Hot Zone

by Eleanor Jennings, Christine Kimak, Melissa Layfield and Todd Frantz

In late 2019, plans were being finalized by the Parsons Corporation to begin a groundwater remediation project at a former refinery (Facility). The goal of this project was to inject contaminant-degrading microbes directly into impacted groundwater to biodegrade, or breakdown, the target contaminant. This process of enhanced in situ biodegradation (EISB) has a long history of success. However, this is not necessarily true with the particular contaminant of concern (COC) being targeted under the specific conditions found at the Facility. The project being planned was the first of its kind, worldwide, and therefore already came with its own set of challenges.

And then came a killer global pandemic.

The COVID-19 pandemic has impacted almost every aspect of daily life for most people in the U.S., but none more than those living and working in areas experiencing high infection rates. Essential work occurring inside these hot zones had to be reinvented, as once mundane activities suddenly became potential issues of life and death. The lessons learned from this project can be applied to work ongoing in many locations, including emerging COVID-19 hot spots.

## Background

The site is a former petroleum refinery that operated for over 70 years before ceasing most of its activities in the 1980s. The Facility currently operates as a petroleum storage and gasoline blending facility.

During the various investigations performed at the Facility, the contaminant that was specifically targeted in soil and groundwater was benzene. Several different remedial technologies were employed across the Facility to address the different needs and conditions of the various areas on-site. Many of these areas were remediated to a point where bacteria could likely be used to finish breaking down remaining target material. Each area of the site has its own unique characteristics based on its history of use and associated construction, type, location and state of decommissioning, and natural subsurface characteristics. However, there was one area of the Facility that seemed to exemplify many common elements reported across the site. As such, it was determined that this location would be an ideal place to try an innovative approach to microbial COC biodegradation. It was believed that the results and lessons learned could then be rolled out to other areas of the Facility and even to other sites.

Throughout 2019, a series of analyses were conducted to create a detailed biogeochemical profile of the groundwater. A wide range of groundwater geochemistry parameters were analyzed, not only measuring COC concentrations but also monitoring the level of groundwater chemicals traditionally associated with subsurface microbiology. Of particular interest were groundwater constituents used by microbes as a natural part of their metabolisms, or those produced as a result of these metabolisms. Additionally, a number of highly technical molecular technologies were employed on area groundwater to directly assess the membership of the entire microbial community, as well as the range of microbial activities occurring. Further molecular testing was conducted to quantify microbes known to be key to benzene biodegradation under the particular site conditions. Finally, a series of analyses based on stable isotopes were conducted to definitively prove microbial benzene

biodegradation. Once this information was compiled, the resulting biogeochemical profile was used to discern the best path forward.

It was determined that EISB injections had a high chance of success, if a particular benzene-degrading microbe was grown in a laboratory and then injected into site groundwater to augment the indigenous population. With the onset of winter, the commercial Canadian laboratory responsible for the contaminant-degrading microbes was tasked with growing enough of the needed bacteria in preparation for injections scheduled for early spring 2020. Simultaneously, work was being done at the Facility to finalize the injection plans, secure necessary permits from the regulators, and then gather the needed equipment.

## The Arrival of COVID-19

In early March 2020, the presence of COVID-19 was first confirmed in counties surrounding the Facility. The total number of cases soon began to rise locally, and it quickly became clear that new policies and restrictions were going to be put in place at both a state and local level.

A mandatory safety stand-down was held to discuss the new safety protocols that were being developed to respond to the situation and mitigate risks to Facility workers. Daily meetings between Facility management and safety teams were being conducted, and a business continuity/contingency plan was formalized based on guidance by the Centers for Disease Control and Prevention to protect workers, identify vulnerabilities, and limit impacts on the project. These protocols were specifically developed to be fluid, allowing for adjustments to be made as new information was learned about the virus, its transmission and successful prevention. Early protocols directed employees to:

- Stay home if feeling sick or exhibiting any symptoms such as a fever or coughing.
- Wash hands frequently using soap and water.
- Use alcohol-based hand sanitizer frequently as recommended.
- Avoid touching their face.
- Wear nitrile gloves at all times when handling laboratory coolers, bottle ware and rental equipment.
- Practice social distancing with no more than 10 persons gathered together at a time.
- Maintain 6 feet between personnel.
- Discontinue lunch gatherings.
- Employ teleconferencing for meetings.
- Increase the cleaning frequency established with the contracted office cleaning service.
- Perform twice daily disinfection of all hard surfaces in high-use areas.

It should be noted that the national guidance at the time regarding the use of face masks was that they be limited to medical personnel, first responders and those who felt sick.

Swift action was also being taken at Parsons' corporate level to protect its employees. A Corporate Response Management Team had already been launched to focus on protecting employees while maintaining the critical support provided to customers. A COVID-19 response website was soon established to centralize information, policies, office-status updates, and information on the health care coverage of testing expenses. A corporate "contact tracker" system

*continued on page 24*



Tripping hazards mitigated and overview of work area as the team practices social distancing and wearing their face masks along with other required PPE.

Melissa Layfield



EISB injection manifold and connections to the mixing tanks, which were within secondary containment.

Melissa Layfield

was put into place to alert personnel who had potentially interacted with an infected employee. Reminders were sent to all company personnel about a crisis-alert phone app, as well as a health hotline available to all employees that would connect the user to appropriate personnel, including mental health specialists. Policies regarding accrued time off were adjusted to provide better flexibility to employees dealing with work reductions, illnesses, or family issues related to COVID-19. Select corporate subject matter experts were teamed together to assess the situation, the internal corporate response, and how the company could possibly contribute to national support efforts. Throughout this time, the Corporate Response Management Team continued to meet daily to continuously evaluate and improve the company's safety protocols.

Within a week of the mandatory Facility safety stand-down, the Facility was under a state-issued shelter-in-place mandate.

### Essential Work

Part of the COVID-19 contingency planning at the Facility involved the identification of work that could be done remotely versus in the offices. In addition, individual field projects were evaluated to determine if they met state and local guidelines for essential work. Because the EISB injection project was determined to be "essential" as a remediation project on a Facility that was also categorized as "essential," involved personnel could perform the work without breaking the rules of the stay-at-home directive from the state.

Construction of the EISB manifold, well head connections and piping continued as planned. Although a Site Safety and Health Plan had been written specifically for this task, additional plans were put in place to abide by the state, local, and Facility safety rules regarding the virus. The procurement of additional personal protective equipment (PPE) needed to comply with state, corporate and Facility requirements was sometimes hampered by the nationwide spike in demand and the preferential shipment of masks and nitrile gloves to medical personnel and first responders.

During these activities, regular communications were being maintained with the Canadian laboratory responsible for growing the microbial cultures. The border between the two countries was beginning to close, and after confirming that the culture would remain alive and healthy while in storage, it was determined that the first shipment of microbes would be sent to the Facility. After almost two weeks, however, the shipment had not arrived and was apparently stuck in the carrier's U.S. warehouse due to shipping disruptions. Because it was not certain if the culture would ever get to the Facility, the Canadian laboratories began preparations on a replacement shipment, which was sent and arrived without incident.

Once the injection system was constructed, a safety review was conducted with the on-site personnel who would be handling the work. An emphasis was placed on the new COVID-19 guidelines, such as the need to constantly communicate between personnel in order to coordinate proper social distancing. In addition, a review of materials concluded that enough gloves and equipment cleaning/sanitation supplies had been procured to safely proceed. In addition, the use of



face masks was now required, and supplies had to be secured either from existing stocks or new sources.

## Getting to Work

Injections began in late April and continued through June. Daily safety meetings, conducted by on-site teams before the start of work, continued but also contained reminders of the new virus-related protocols. Employees soon adjusted to the “new normal” of conducting the task under the cloud of COVID-19, including:

- Daily temperature checks and completing a medical screening questionnaire before working.
- Donning their face masks at all times, in addition to regular PPE usage.
- Practicing social distancing while working.
- Gathering for lunches was prohibited, and the use of lunch tables and other traditional gathering locations were now off-limits.
- Holding all meetings outdoors.
- Specialized cleaning protocols were implemented, using approved cleaners and sanitizers, for equipment which included but were not limited to:
  - Work vehicles and trailers.
  - Clipboards, pens, phones.
  - All injection and monitoring equipment.

These COVID-19-related tasks consumed additional time. However, the safety of Facility personnel was paramount and would not be compromised.

As the months of injections progressed, outdoor temperatures warmed, and the wearing of face masks became an irritation to some workers. However, it was understood that these masks were a critical line of defense against the virus. As such, additional breaks were planned during some tasks, to allow for rest and rehydration. Some of the thicker masks were replaced by lighter-weight disposable surgical masks. However, as colder weather returns in late autumn and winter, site workers may choose to wear the heavier and warmer masks made of thicker material.

As the state-issued, mandatory shelter-in-place order was lowered, corporate leaders deployed a global work from home program, immediately transitioning most of the workforce to remote work. A task force was established to support eventual reentry that would be in line with state and local requirements. This provided time to adjust some staff to permanent work-from-home status, and nearly 90% of employees are currently working remotely in some regions. For those who needed to be in an office, schedules were adjusted such that personnel only worked in the office a few days per week, staggering their presence. The overall effect was to significantly reduce the number of people in each office, including the office located at this Facility.

For employees declared to be essential to operations, a multi-pronged approach was employed to ensure that workspaces would be safe. Efforts included:

- Implementing strict cleaning and sanitation protocols.
- Providing masks to personnel.
- Outfitting workspaces with appropriate safety signage, such as marking hallways as being “one way” traffic-flow only.
- Encouraging employees to work from home, while providing alternate work schedule agreements.
- Offering enhanced training for employees on virtual working.

The Facility cleaning and sanitation protocols put in place for field trucks, work trailers and out-door work locations were contin-

ued. Policies and supplies were put in place to facilitate frequent handwashing and use of hand sanitizer.

Injections were completed in June 2020, and all preliminary data suggests that they will be successful. This project had to overcome:

- The geography of technical experts located across the U.S. working together to develop a cutting-edge, first-of-its-kind EISB injection event.
- Site temperatures that ranged from freezing to over 90 degrees, and site conditions with multiple challenges including simultaneous operations from other projects.
- International colleagues with logistical challenges that required constant communication and coordination in order to deliver the necessary microbes at the right times.
- Many recognized hazards that exist with this kind of work under the best of circumstances.
- A deadly viral pandemic.

In the end, there were zero injuries, illnesses or safety incidents during the duration of this project.

## Lessons Learned

This project exemplified how to adapt to new and potentially lethal events in a quick and efficient manner through already-existing strong communication, clear leadership, and a strong commitment to safety.

One of the biggest lessons of this project is the importance of communication. Even without the aspect of COVID-19, an extremely high degree of communication is needed to successfully execute this type of a project with this type of project team. However, the added variable of COVID-19 made communication essential. This communication was not just between project team members, but also Facility leadership who helped bridge the ever-changing federal and state guidance to those on the Facility expected to uphold and execute these new safety policies. Leadership also had to ensure that personnel had proper access to critical PPE, as well as cleaning and sanitation materials. The project manager then had the task of rolling these guidelines out to the actual personnel in the field doing the injections, making sure they understood the importance of following new protocols and enforcing compliance.

Keeping up with, and often ahead of, the fast-paced changes that were occurring at the Facility at the onset of the U.S. involvement with the COVID-19 pandemic would not have been possible without a strong culture of safety already established. Safety plans are created so that people have a set of protocols already in place to follow if an emergency occurs. For any project, adaptations to the plan may have to occur, but at least the framework should already be there, and the chain of command should be known. The strength of the safety culture at this Facility and within the company has been tested by the virus, but it was proved that pre-planning efforts and training were successful.

The COVID-19 pandemic appears to be far from over. However, the lessons learned from this project can be applied to any project from groundwater remediation to wastewater treatment.

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*Eleanor Jennings is the lead author and contact for this article. She is a project principal environmental microbiologist/biogeochemist and Fellow with Parsons Corporation and may be reached at Eleanor.Jennings@Parsons.com. Co-authors Christine Kimak (principal scientist and project manager), Melissa Layfield, ASP (program safety manager) and Todd Frantz (senior project manager) are also with Parsons Corporation.*

# How to Safely Wear and Take Off a Mask

Accessible: <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/diy-cloth-face-coverings.html>

## WEAR YOUR MASK CORRECTLY

- Wash your hands before putting on your mask
- Put it over your nose and mouth and secure it under your chin
- Try to fit it snugly against the sides of your face
- Make sure you can breathe easily
- Do not place a mask on a child younger than 2



## USE A MASK TO HELP PROTECT OTHERS

- Wear a mask to help protect others in case you're infected but don't have symptoms
- Keep the mask on your face the entire time you're in public
- Don't put the mask around your neck or up on your forehead
- Don't touch the mask, and, if you do, clean your hands

## FOLLOW EVERYDAY HEALTH HABITS

- Stay at least 6 feet away from others
- Avoid contact with people who are sick
- Wash your hands often, with soap and water, for at least 20 seconds each time
- Use hand sanitizer if soap and water are not available



## TAKE OFF YOUR MASK CAREFULLY, WHEN YOU'RE HOME

- Untie the strings behind your head or stretch the ear loops
- Handle only by the ear loops or ties
- Fold outside corners together
- Place mask in the washing machine
- Wash your hands with soap and water



© 11/4/20 0079/2020

Personal masks are not surgical masks or N-95 respirators, both of which should be saved for health care workers and other medical first responders.

For instructions on making a mask, see:

[cdc.gov/coronavirus](https://www.cdc.gov/coronavirus)

# New York Water and Wastewater Agencies Team Up with NYWARN in Statewide Mask Distribution Effort

by Marty Aman

While most businesses and schools were shuttered throughout New York state in response to coronavirus concerns, our water and wastewater utilities continued to work tirelessly to fulfill their role as providers of essential services.

In doing so, our utilities were forced to comply with ever-changing rules, restrictions and recommended protective measures. Although the initial impacts of the COVID-19 pandemic were felt more strongly downstate, the shortages of protective gear, including masks, were felt throughout New York.

In early April, the U.S. Environmental Protection Agency (USEPA) reached out to the Water/Wastewater Agency Response Network (WARN) in several states, indicating that the Federal Emergency Management Agency (FEMA) was making large quantities of washable cloth masks available for water and wastewater utilities. As part of this outreach, New York WARN (NYWARN) was contacted as a first destination for masks due to the magnitude of impacts downstate, particularly in New York City.

In response, routine conference calls were held between NYWARN regional co-chairs and representatives from the New York Water Environment Association (NYWEA), the New York Section of the American Water Works Association (NYSAWWA), the New York Rural Water Association (NYRWA), the New York State Department of Environmental Conservation (NYSDEC), the New York State Department of Health (NYSDOH) and other organizations.

It was determined that five Points of Distribution (PODS) would be created in New York to facilitate initial distribution. These five PODs were established at the Wayne County Water and Sewer Authority in western New York, the Mohawk Valley Water Authority in central New York, the City of Troy Water Department in the Capitol Region, the New York City Department of Environmental Protection in Kingston and the Suffolk County Water Authority on Long Island. An initial quantity of 92,000 masks were distributed among the five PODs and an additional 90,000 masks were delivered in a second shipment.

These masks, supplied through FEMA, were specifically targeted for distribution to water and wastewater utilities only, with documentation required to request the masks and verify that the requesting entity was a qualifying utility.

FEMA and USEPA specified that these masks needed to be offered to all water and wastewater utilities in the state, so outreach was accomplished through multiple messages and website postings through the partnering organizations: NYWARN, NYSAWWA, NYWEA and NYRWA.

Once initial requests for masks came into each POD, various means of delivery were coordinated, including mailing for smaller quantities and the pairing up of neighboring utilities for shared pickup and delivery of larger quantities. NYRWA provided vehicles and circuit riders to assist with delivery to smaller utilities in remote locations and NYWEA offered redistribution through their Syracuse office.

In addition to providing needed masks to requesting utilities, this overall effort served as a testament to the dedicated group of committed individuals and organizations that represent the water and wastewater sector.

Many individuals went above and beyond their normal work



Wayne County Water & Sewer Authority (WCWSA) Technical Director, Derek Ceratt, displays a stockpile of masks at the Authority's Walworth facility. The WCWSA has helped to distribute over 60,000 masks to water and wastewater operators across New York state. *Jessica Freling, WCWSA*

duties to create tracking spreadsheets, modify trailers, drive great distances and work extended hours, all in the spirit of helping fellow utilities stay better protected. In addition, the weekly conference calls among all participants served as a valuable forum to share feedback on regional updates and ideas, while also providing the assurance of a ready support network during a pandemic.

Please continue to spread the word that masks are still available for those in need, as substantial quantities remain at each POD. In addition to the cloth masks as supplied by FEMA, Xylem has donated a large quantity of KN-95 masks that are also available for distribution to water and wastewater utilities. If interested, please contact the Wayne County Water and Sewer Authority ([www.wcwsa.org](http://www.wcwsa.org)) or any of the supporting organizations as listed above.

As the state chair for NYWARN, I would like to express my sincere thanks to all who have helped with the mask distribution program. Your efforts are certainly appreciated!

*Marty Aman is the executive director of the Wayne County Water and Sewer Authority and may be reached at [maman@wcwsa.org](mailto:maman@wcwsa.org).*

## NYWARN Volunteers Needed!

We are currently looking for representatives for **Region 5 (Long Island)** and **Region 3 (Capital/Adirondacks)**. Please contact Patricia Cerro-Reehil ([pcr@nywea.org](mailto:pcr@nywea.org)) if you are interested in helping out.

A network of utilities, New York Water/Wastewater Agency Response Network (NYWARN), helps other utilities and communities recover quickly from disaster by providing rapid, short-term services – personnel, equipment, materials and other resources on a voluntary basis.

When you sign NYWARN's Mutual Aid Agreement, you become part of a request-and-response system that understands why/what your utility needs to recover and get back on-line.

NYWARN helps members **before, during and after** an emergency with emergency planning, response and recovery.



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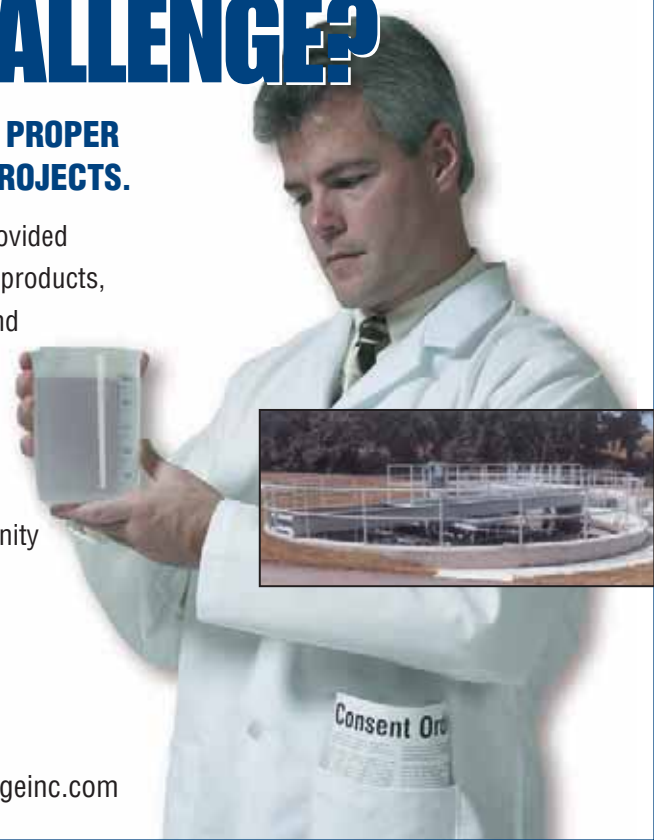
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# Stressful Times: How Do We Learn to Cope?

by Eileen M. Reynolds

**M**y grandmother was born just before the infamous pandemic year of 1918. She obviously survived. However, two of her older brothers did not live to see her birth, succumbing to the regular influenza and dysentery endemic in a desperately poor immigrant community. How can parents from any age withstand that? How my great-grandparents must have worried over my grandmother. The stress of keeping an infant alive, the remembering of the passing of two boys not that long before, the knowledge of the developing influenza pandemic, the war, and the anxiety of just living must have been difficult. Were they stressed out new parents? Did they worry about anything beyond getting through the day, when thinking about their tomorrow was a luxury? Did they just put one foot in front of the other and slog on?

So now it is a hundred years later. I don't have a newborn to worry about. I stood on those ancestors' shoulders to earn an education and with that some economic stability. I can think about tomorrow. Maybe because I don't have the burdens that faced my ancestors, I can think about other things. Like our very own pandemic.

## Our COVID-19 Worries

I admit to thinking about our pandemic a lot. I think about it at work because my position as a safety professional demands that I think about it, about how to prepare and react to it simultaneously, how to protect my colleagues, jump supply chain hurdles, and be a voice of reason. I stress over the lack of certain items of personal protective equipment and burrow into rabbit holes following a lead or a leap of faith to find respirator filters. I worry that although I am able to work some of the time at home, others will think that I am not working hard enough or long enough and therefore I work longer than I did at the physical plant. And then I worry about all the work that is at the physical plant that I must squeeze into two days each week that I return.

I think about the pandemic when I am home, either working or being the one who ventures forth into the fray for provisions and other necessities. I don't even call groceries "groceries" anymore. They are "provisions" like I am Shackleton or Amundsen gearing up for a polar expedition. I worry about my spouse and my mother, who lives with us, because of their vulnerability due to health issues and age. I worry a lot.

I am not alone. Many of you have the same worries and have similar anxieties. Is that good or bad? I choose to think it is a good thing in one way because there are others out there that know how I feel. It works the other way, too. I think I have more empathy now than pre-COVID-19. It is a bad thing, though, when the worries and anxieties take up more headspace than they really need. So how do we manage that?

## Signs of Stress

A little bit of stress can be a good thing on task-oriented matters. It can help with focus, efficiency, and give you the adrenaline to carry your father down the attic steps when he fell off the ladder (he was not a small man). But too much stress can be detrimental. Stress that continues for weeks or months can cause physical, mental, emotional or behavioral issues. Stress hurts all systems of your body.

So, what are the signs of continued heightened stress? Stress may manifest itself in many, and sometimes contradictory, ways. Symptoms can manifest physically, emotionally and cognitively.

### Physical symptoms of stress include:

- lowered energy state
- headaches, muscle pains
- digestive issues
- chest pain, high blood pressure

### Emotional symptoms of stress include:

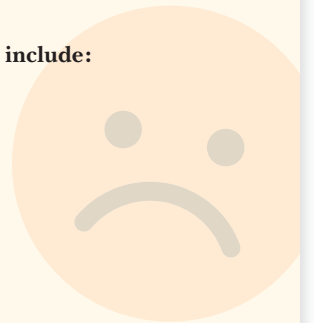
- agitation, frustration, irritability, moodiness
- lowered self-esteem, motivation
- avoidance of friends, relatives
- difficulty relaxing one's body or mind
- feelings of loss of control

### Mental or cognitive symptoms may include:

- forgetfulness
- pessimism
- constant worry
- lack of focus
- judgment issues

### Behavioral symptoms may include:

- increased drug or alcohol use
- procrastinating
- eating or sleeping more or less than usual



The list is by no means complete. Adding to these general signs of stress are those work stressors related to the current pandemic such as the uncertainty of employment, being forced to adapt to working at home, trying to juggle child care at home while working, lack of access to work materials at home, and/or different job responsibilities. Stress and mental health issues have become a huge concern in the working adult population. And just as the symptoms of consistent stress may manifest in physical issues in a person, through heart, digestive, circulatory, skin or reproductive symptoms, stress also impacts work and home life.

There aren't any impacts that are solely work related or solely home related. The impacts are the same, only manifested in different ways. For instance, under continued stress, teamwork suffers. This can be with either your colleagues or your spouse and probably at the same time. No matter, you aren't functioning as that well-oiled machine right now. Your irritability is up, your temper is up, alienation is up, and consequently your marital and work relationships suffer.

Under continued stress, leadership suffers. Decisions aren't being made or are being made only after seemingly endless analysis. Emotional intelligence is down; you aren't aware of your emotions, you can't control your emotions, you are lacking self-motivation, your empathy is low and your social skills stink. You are not a teddy bear; you are a grizzly bear.

Under stress, your productivity suffers as things just don't get done. Laundry isn't folded, articles aren't written, and reports are put off. You are busy all the time but not in the right way. Memory and focus suffer with constant stress also. Too much time in the fight or flight mode is good for short term survival but compromises forward-thinking processes. People are fixated on the things over which they have no control instead of concentrating on those

that are within their control. Creativity suffers as people return to rote-learned behaviors when faced with a difficulty. The theory of “this is how it has always been done” does not work anymore because nearly everyone is doing everything differently at work and at home.

## Our Responses to Stress

People under constant stress generally fall within three camps: those who resist, those who surrender and those who cope.

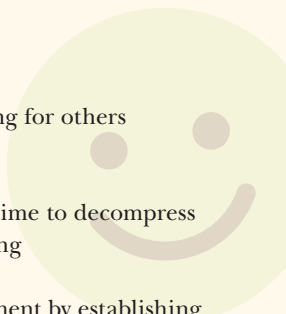
Resisters are people who have a mistrust of authority figures, including scientific authorities. They fight, physically or otherwise, against almost anything. Resisting COVID-19 recommendations, scapegoating, or demonstrating are all types of catharsis.

Those who surrender are on the other end of the spectrum. This group may self-medicate or overmedicate in an effort to make the issues disappear. Unfortunately, this group may also have a negativity bias, meaning that they see negative stimuli more easily than the positive and the negative has more of an impact that can make them vulnerable. This has a serious effect on self-worth.

Then in the middle are the copers. Copers are those who have their own individual internal resilient strength coming from within themselves and a community/social resilient strength coming from their interpersonal relationships. Some are lucky enough to have the internal resilience as part of their inner wiring, but others can use characteristics shown by copers to help them through times of constant stress.

### Characteristics of Copers:

- Establish a routine for rising, sleeping, eating, working and playing
- Make time to decompress
- Exercise or move their bodies
- Maintain good nutrition
- Take care of others, do something for others
- Turn off the news cycle
- Connect with others
- Productive or pleasurable “me” time to decompress
- Take regular breaks while working
- Get some sun
- Control the immediate environment by establishing a level of order
- Take pride in accomplishments
- Reduce anxiety by reducing risk
- Rely on facts rather than on rumors or conspiracy theories
- Realize that we all have a role and responsibility in the world
- Realize that we all are in an unusual situation and time
- Adapt
- Practice mindfulness by being intentionally aware and nonjudgmental
- Practice self-care
- Practice positive self-talk
- Focus on things that are within control, let go of things that cannot be controlled
- Model more peaceful behavior



This list is not exhaustive, but it has two distinctive sets of characteristics: those in which the individual does something external and those in which the individual internalizes something. For those who are not copers but are looking to change a little bit, then attempting a few of the more external characteristics may be

possible. Most people can set a schedule, take a walk and get some sun. The internal characteristics are more difficult for most people and would take some time to fully embrace.

One other characteristic is that of gratitude or gratefulness. This is an awareness of the good things around you, the good things in you, and an affirmation of them; a personal reflection of thankfulness. It is a practice among some to have a daily gratitude affirmation. Saying out loud something as simple as they are happy for a spouse beside them, the weather is fine, and curried chicken is for dinner. By saying the affirmation out loud and hearing it with your ears, not just in your head, both internalizes and externalizes your gratitude and makes the day start with a positive outlook. Couple that with a walk, and the day is bound to be better.

## Available Resources for Help

This pandemic has thrown a monkey wrench into everyone’s life. Most of us are under some sort of stress and some level of stress. Some people will roll with it. Some people will not be able to self-help and will need professional assistance for that journey. There should be no stigma attached to that. Many people don’t cut their own hair but use a professional barber so why not have the same attitude about using a mental health professional?

Many employers have an employee assistance program (EAP) as an employee benefit. The call to the EAP provider is confidential and is a great resource to get the ball rolling. Online or phone support is also available. If, however, you or a loved one is in crisis, make the call to 911 for immediate assistance.

### ***NYSOMH Emotional Support Helpline: 1-844-863-9314***

The Emotional Support Helpline provides free and confidential support to callers experiencing increased anxiety due to the coronavirus emergency. The Helpline is staffed by volunteers, including mental health professionals, who have received training in crisis counseling.

### ***Crisis Text Line: Text GOT5 to 741741***

New York has partnered with Crisis Text Line, an anonymous texting service available 24/7. Starting a conversation is easy, just text GOT5 to 741741.

### ***National Suicide Prevention Lifeline: 1-800-273-TALK (8255)***

If your life or someone else’s is in imminent danger, please call 911. If you are in crisis and need immediate help, please call: 1-800-273-TALK (8255).

### ***Domestic Violence: 1-800-942-6906***

If you or someone else in a relationship is being controlled by another individual through verbal, physical or sexual abuse or other tactics, please call: 1-800-942-6906.

### ***Mindfulness and Meditation: [www.headspace.com/ny](http://www.headspace.com/ny)***

New York is partnering with Headspace, a global leader in mindfulness and meditation, to offer free meditation and mindfulness content for all New Yorkers as a mental health resource for residents coping with the unprecedented public health crisis. New Yorkers can access a collection of science-backed, evidence-based guided meditations, along with at-home mindful workouts, sleep and children’s content to help address rising stress and anxiety at [www.headspace.com/ny](http://www.headspace.com/ny).

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# Employee Assistance Programs, the Go-To Resource for Help in Challenging Times

by Elizabeth McCarthy

None of us has been immune to the stress that the COVID-19 pandemic has created. Most of us have felt the impact of that stress in our daily lives both personally and professionally. Experiencing some level of emotional distress is also a normal response to the challenges of the pandemic. But to what extent has the pandemic effected our well-being?

In June of this year, the Centers for Disease Control and Prevention (CDC) reported on a panel survey of 5,470 respondents. Of those respondents, 40.9% indicated that they were having an adverse mental or behavioral health condition associated with COVID-19 (Czeisler, et al. 2020). *Time* magazine in May reported on a study from San Diego and Florida State universities revealing that rates of moderate to severe mental distress in April 2020 tripled in comparison to 2018 rates in the U.S. (Heid 2020). The full repercussions to our emotional well-being in the COVID-19 era is yet to be understood. Common issues that have been associated with or exacerbated by COVID-19 have been anxiety, depression, grief, insomnia, isolation, marital and family conflicts, domestic violence, substance abuse, workplace stress and child care challenges.

Now more than ever it is important to have a reliable go-to resource when experiencing emotional distress. Employee Assistance Programs (EAPs) are employer-sponsored programs designed to be that resource for employees and their family members to use whenever needed. They are staffed by mental health and substance use disorder professionals to confidentially help with a broad range of personal and work-related challenges, such as the challenges that many are currently facing. An EAP counselor is trained in providing therapeutic short-term interventions and in understanding the work cultures of their clients at the same time.

The essential services that are provided in an EAP are problem assessment; short-term counseling; customized recommendations and referrals to providers and support services; professional consultation for employees, family members, supervisors and administrators; critical incident response and training for supervisors and employees on leadership; and various wellness topics. Services are generally delivered face-to-face or via telehealth with licensed behavioral health clinicians. Currently, most EAPs are conducting interactions with employees and family members via telephone or video-conferencing platforms in keeping with social distancing. Accessing help from an EAP simply involves making a brief phone call to obtain an appointment or consultation. The programs are voluntary, even though there are times when an employee is asked by a supervisor, manager or human resources professional, to seek services through their EAP.

Employers typically pay an annual, quarterly, or monthly fee for the EAP service so it is free to the employee or family member using it. The motivation for employers is to provide a benefit to employees to help them maintain their well-being and productivity levels at the same time. Information regarding a person's involvement with the program is confidential and not shared with any other person or entity unless an employee provides written consent or unless required under specific legal exceptions to client-counselor confidentiality.

The American Psychiatric Association reports that one in five



EAPs are conducting interactions remotely in keeping with social distancing.

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of us will experience some type of mental illness in a given year (Parekh 2018). Managing a mental illness on your own can be compared to managing any health crisis on your own. Successful outcomes are derived from professional treatment and guidance. As recent months have elevated normal stress levels for most of us, many of us are also in need of guidance, support and counseling. Attending to our mental health has never been more important than it is now, and it is essential to sustaining our overall health. Furthermore, ignoring mental health issues can lead to more chronic conditions such as depression and anxiety. An EAP can be that resource for help. It is a safe place to talk about your issues in a confidential setting. It is where you can experience sensitivity and understanding, gain insight, enhance a variety of skills, and obtain direction all at the same time.

Many people who have utilized their EAP report through client surveys that they wish they had accessed EAP services sooner. In fact, they often return for a welcome “tuneup” from time to time when experiencing another wave of life’s challenges. We all face circumstances that impact our mental well-being. This has been especially true during this COVID-19 era. Remember that the EAP can be a vital asset in times of need. It is a place to turn that will get you on a path of recovery, growth and emotional resiliency.

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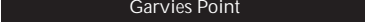
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# Working from Home at the Computer Workstation: Basic Issues and Troubleshooting Problems

by Nellie J. Brown

Often, we have put considerable effort into setting up and tweaking our computer workstations at work. In fact, the Occupational Safety and Health Administration's (OSHA's) website has an e-tool on computer workstations, but there is no OSHA regulation on ergonomics. However, OSHA has cited employers for ergonomic hazards under the General Duty Clause of the OSH Act of 1970.

When we use a computer at home, we may not have put much thought into its ergonomics. After all, we may be using it for short periods of time, for personal email, for games or for shopping. But with COVID-19 requiring us to work from home, we may often work for long hours without the interruptions we might typically have in our workplace setting. It can be difficult to separate work life from home life. More, and concentrated, hours at the computer can cause even small deviations from the ideal workstation to become magnified.

So, let's look at the characteristics of a good workstation and see if we can improve what we have at home.

## The Chair – Let's Start at the "Bottom"

We ought not to sit on the couch, but what makes a comfortable chair at the computer? Ideally, a chair should have three important adjustments:

1. The seat should be able to move up and down.
2. The back should be separate from the seat and be able to move up and down independently of the seat so that the lumbar support can be placed in the small of the back.
3. The back should be able to move in and out horizontally to accommodate the thigh length and rear end size of the seated person.

### Seat Height

What about the height of the chair? The chair is at a comfortable working height when you feel even pressure along the length of



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your thighs. Your thighs should be horizontal and your feet resting flat on the floor. To determine the correct chair height, stand up and use a tape measure to determine the distance from the hollow or bend of your knees to the floor. If you subtract 1 to 3 inches, the resulting measurement is the correct height for the top of your chair seat.

The chair should not be so high that the legs dangle. If your chair is too high, pressure from the seat edge could make your legs go to sleep – you would notice that and find yourself wiggling your feet or trying to curl your legs around the base of the chair. If this occurs, use a footrest to minimize pressure from the seat front on the legs. You might like to start with a phone book or a catalog and open it to the height that you think will work and try that height for a day or two; play with adjusting the thickness of the phone book and see what feels right. When you think you have the right thickness, then you could purchase a footrest of that height.

A chair that is too low for you will cause your spine to curve the wrong way in your lower back – that can pinch spinal discs and give you a backache. You need a higher chair or put a cushion on the chair seat to raise you up to the right height.

### Lumbar Support

The backrest of the chair should fit comfortably at the small of your back and support the curvature of your spine to give you good support. So much of the time, we focus so intently on the computer screen that we bend forward a lot, rounding our shoulders. We really need to sit up and let the chair do the work of keeping us in a good position.

### Seat Length

Chairs at home are probably not ideal in terms of seat length. Signs that a chair's seat is not a good fit for you include:

- You feel "perched" on the edge of your chair; your legs feel tired a lot; the seat is just too long, and you have a gap at your back with no back-support.
- You feel like you are almost sliding off your chair because the seat is not long enough.
- You have a large rear end and your chair doesn't provide any room for your body.

A chair with that third adjustment would address these issues. If you can't get a chair like that and you feel "perched," then consider investing in a lumbar cushion to fill in the space. A rolled-up towel can also do, in a pinch. If you have long thighs or a large rear end, you need a chair with a longer seat length. This is why having a chair with that third adjustment enables you to push the back of the chair further back and provide a longer seat length to give you a chair that supports you properly.

### The Keyboard and Mouse

Are you using a laptop only? Or a separate keyboard attached to your laptop? Either way, look at your arms and wrists. Your upper arms should be vertical, your forearms should be horizontal, and your wrists straight. You especially want to avoid having your wrists bent or your forearms or wrists leaning against the edge of a desk

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or table. A palm rest that is soft and squishy (such as a gel-filled rest) can help to support your hands and keep your wrists straight, as well as cushion the edge of the desk or table. Typing with bent wrists can aggravate the nerves and tendons in the hollow carpal bones of the wrist and lead to carpal tunnel syndrome, so it is important to look at good angles and support so that your hands and forearms are in one long line. If you can't get a wrist rest right away, use a folded towel to support and straighten your wrists and to cushion a desk/table edge.

The mouse should be used just to the side of the keyboard. It is best if you can keep the arm close to your body when using a mouse. If you have to stretch out your arm to use the mouse, you are supporting the weight of your arm while doing fine handwork with the mouse; this can tire your shoulder and produce a shoulder or neck ache. Also, consider a mousepad with a gel palm rest attached, as this avoids the bent wrist when using the mouse. There are many mouse designs, both wired and wireless, which can fit your hand. It is also possible to have a keyboard with a roller mouse in the center.

You really want to be facing a table or desk squarely if you possibly can. Avoid putting your computer into a corner and sitting at an angle to a table or desk. This often means that one arm will be leaning against the table edge and experiencing contact stress, or one arm will be unsupported and stretched out to use the mouse. Neither of these positions are comfortable for very long.

Ideally, a keyboard tray that holds both keyboard and mouse can resolve many problems. A universal keyboard tray can be screwed to the underside of an ordinary table to produce a very nice workstation. Often, older furniture can be updated in this way.

## **The Screen Distance, Height and Viewing Angle**

Most people tend to be comfortable with the screen at about arm's length away from the body.

When it comes to screen height, what is the highest text on the computer screen that you use all the time? For some people, it is a toolbar at the top of the screen; but, for others, it is the middle of the screen for their email. Whichever it is, the highest item you read virtually all the time should be no higher than eye level. You should be looking straight out at that item, then looking down to everything else on the screen. You don't want to have to tilt your head back to look at an upward angle at anything, since this will tire your neck and shoulders very quickly. It is a lot of work to support the weight of the head at that uptilted angle. This is where it can be very helpful to have a separate keyboard for a laptop because you can have a comfortable typing experience for your hands and wrists at the separate keyboard, while using books or a box to raise your laptop so that the screen is at eye level.

If you find that there is glare on the screen, keep the screen vertical rather than tilted backward. You may find that a task lamp on the desktop is a better choice for lighting than a ceiling light fixture. Also, you may have reflected light from a window and need to adjust the window treatment accordingly.

If you find you have neck or shoulder aches, are you using bifocals glasses? You may be moving your head up and down all the time to use the proper part of your bifocal lenses. All this nodding or if the head must be tilted back or into an uncomfortable position to see the screen, glasses may need to be changed. You may wish to consider computer glasses with lenses for use at the focal distance of your screen and desk area. Typically, the lenses recommended for computer use, in usual order of preference, include:

monofocal, full-width bifocal, flat-top bifocal, then progressive addition lens. Tinted or polarized lenses and glare screens are not recommended; while they can reduce some reflection, they can create problems by reducing contrast which makes it more difficult to read screen characters. In other words, you are substituting one eye problem for another.

Also, remember to wipe the dust off your screen, since static electricity from the screen can attract dust.

## **The Document Holder**

You may find a document holder useful, particularly if you work primarily from source documents. A document holder can be a stand-alone item, or you could use an adhesive clip that attaches to the side of the computer screen and holds one or two pieces of paper. When properly positioned, a document holder can reduce the number of times you have to move your head when looking back and forth between the screen and source documents. You will want to position the document holder close to the screen and at the same height. Placing the document at the same distance from the eyes as the computer screen helps to avoid visual fatigue and sore neck and shoulder muscles. A document holder with a transparent ruler-type overlay is helpful if you need to be able to readily locate data on a source document.

## **Varying Your Time and Tasks**

We humans don't seem to do well with prolonged sitting – or any static position, for that matter. Sitting for more than one hour:

- Induces biochemical changes in enzymes involved in fat and in glucose metabolism that leads to fat storage rather than use by muscles.
- Increases heart disease risks.
- Reduces blood flow.

Sitting in a fixed position for extended periods of time can be fatiguing. A static position for the body means that the muscles that support you in a sitting position are kept taut; this can restrict blood flow and lead to muscle fatigue. If you were at work, instead of at home, you would probably have changed position to interact with others, attend meetings or go to a breakroom/lunchroom, not just sitting at the computer doing work and having virtual meetings. Prolonged periods of continuous computer work would have been less frequent due to the kinds of interruptions that lead to conversations and other tasks. Of course, there are interruptions at home, such as from family members or pets that distract from work; these personal responsibilities would have been less likely to intrude at the workplace.

While there are recent studies indicating a possible increase in the risks of coronary heart disease and kidney disease from excessive sitting, these data are correlational. It is unclear from these studies whether it is sitting that causes these health problems or whether, because people have these health problems, they sit more than healthy people. Regardless, we need to move around; standing alone is not sufficient. So, plan to:

- Walk around, get a drink of water.
- Stand for a meeting.
- Take a stretch break.
- Focus your eyes on something else; when we use a computer, our eyes blink less frequently so they can become dry and irritated.
- Change your body position for one to two minutes about every 20 to 30 minutes.

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## Symptom/Problem and What to Check.

<p><b>Body Aches</b></p> <p><b>Backache</b></p> <ul style="list-style-type: none"> <li>• Chair height, design – foot support, backrest, seat</li> <li>• Workplace height – keying, screen</li> <li>• Location of computer and source documents</li> <li>• Contrast on computer screen</li> <li>• Bifocals/trifocals worn – consider computer glasses instead</li> <li>• Time on task</li> </ul> <p><b>Neck and shoulder discomfort, hunched/elevated/tensed shoulders, twisting head from side to side</b></p> <ul style="list-style-type: none"> <li>• Seat height, chair design, chair armrests too high, keyboard height</li> <li>• Work material arrangement, bring closer to centerline of view</li> <li>• Computer screen contrast</li> <li>• Environmental stressors</li> <li>• Glasses worn</li> <li>• Habit or tension training</li> </ul> <p><b>Arm, hand, wrist discomfort</b></p> <ul style="list-style-type: none"> <li>• Armrest adjustment</li> <li>• Work materials arrangement</li> <li>• Height adjustment – poor wrist postures</li> <li>• Typing with hand bent to right (ulnar deviation)</li> </ul>		<ul style="list-style-type: none"> <li>• Typing with thumb or little finger elevated</li> <li>• Pounding keyboard</li> <li>• Highly repetitive keying – time on task</li> <li>• Change keyboard design or slope</li> <li>• Pad sharp edges or corners</li> <li>• Alternate hand using mouse</li> </ul> <p><b>Leg discomfort</b></p> <ul style="list-style-type: none"> <li>• Seat height</li> <li>• Foot support</li> <li>• Leg clearance</li> <li>• Time on task</li> </ul> <p><b>Vision Problems</b></p> <p><b>Blurred vision</b></p> <ul style="list-style-type: none"> <li>• Computer screen contrast</li> <li>• Glare/reflections on screen</li> <li>• Office lighting level</li> </ul> <p><b>Screen blurry</b></p> <ul style="list-style-type: none"> <li>• Viewing distance</li> </ul> <p><b>Distant or near objects blurry</b></p> <ul style="list-style-type: none"> <li>• Time on task</li> <li>• Eyeglasses prescription</li> <li>• Viewing distance</li> </ul>	<p><b>Double vision</b></p> <ul style="list-style-type: none"> <li>• Viewing distance</li> <li>• Arrangement of work – computer screen and source document</li> <li>• Time on task</li> <li>• Eyeglasses prescription</li> </ul> <p><b>Color vision</b></p> <ul style="list-style-type: none"> <li>• Green phosphor on computer screen</li> <li>• Color blindness</li> <li>• Computer contrast</li> </ul> <p><b>Burning eyes</b></p> <ul style="list-style-type: none"> <li>• Time on task</li> </ul> <p><b>Eyestrain – squinting</b></p> <ul style="list-style-type: none"> <li>• Computer screen contrast – glare, reflections</li> <li>• Viewing distance</li> </ul> <p><b>Headaches</b></p> <ul style="list-style-type: none"> <li>• Environmental stressors</li> <li>• Time on task</li> </ul>
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istockphoto.com, PeopleImages

There is software that will interrupt you to do these things in case you forget and become intent and focused too much.

What about a standing workstation? By its nature, standing computer work causes greater wrist extension. People end up leaning, which also compromises wrist posture and increases the risks of carpal tunnel syndrome. Field studies found little evidence of dramatic widespread benefits when users only stand for very short periods, such as 15 minutes or less total per day. Other studies have found that the use of standing desks rapidly declines so that, after one month, most people are sitting all the time.

But, if you like to stand, you could try it. Or use it to alternate with sitting throughout the day.

What about a dynamic workstation, such as a treadmill, bicycle, elliptical or hamster wheel workstation? The research on these appears to indicate that people's typing and mousing slow down and they make significantly more mistakes. However, there appear to be minimal effects on reading and other nonmanual motor tasks.

Above is some troubleshooting help – if you experience a particular symptom or problem, here are some things to check and see if they need change or adjustment.

*Nellie J. Brown, M.S., CIH, is the director of Workplace Health & Safety Programs and lead programs manager with The Worker Institute of the ILR School at Cornell University, and may be reached at njb7@cornell.edu.*

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# COVID-19 Early Warning at Municipal Water Resource Recovery Facilities

by Jim Cunningham

Water Resource Recovery facility managers are working across the country to help provide early detection of COVID-19 cases well before people show COVID-19 symptoms. Municipalities and laboratories are currently working around the clock sampling and testing their wastewater.

Wastewater has long been a source for determining a wide range of community diseases, as well as drug consumption, within the specific community's collection system. Wastewater testing for the SARS-CoV-2 virus has become an exciting public health means of proactive epidemiological reconnaissance. COVID-19 is the third coronavirus epidemic to impact the U.S. in 20 years, after severe acute respiratory syndrome (SARS) in 2003 and Middle East respiratory syndrome (MERS) in 2012.

## Early Detection in Wastewater

Several of the larger municipal wastewater facilities that had been testing for SARS detected spikes that they believed to be SARS in February 2020. They soon realized that they were observing our current COVID-19 worldwide pandemic, which was officially declared March 11, 2020, by the World Health Organization (WHO). Researchers have determined that pre-symptomatic people with infections have an increase of viral shedding in feces that can be detected well before development of symptoms and subsequent individual testing. SARS-CoV-2 early detection programs help municipal leaders, public health officials, public school boards, senior living managers, colleges, and many others make policy decisions, as well as providing a path for source tracking for individual testing.

Coronavirus, like the human immunodeficiency virus (HIV), is an RNA virus, meaning its primary genetic material is made up of RNA. Municipalities are sending samples to laboratories that concentrate the samples and test for SARS-CoV-2 RNA; the results are used to identify trends over time. The samples are also tested for a common human virus that is found within typical wastewater. This base line testing, along with flow data and the known population of contributors to the system, such as the number of students at a school or college, helps scientists estimate potential cases.

The cost associated with wastewater testing is significantly lower than testing the population of an entire college student body. Once results show trend lines of a spike for a specific area in the collection system, facility managers can then sample closer to the source, such as at a college dorm.

At this point at least seven species of coronaviruses can infect humans, using our lungs as the staging ground for genetic replication.

## Past U.S. Epidemics

The COVID-19 virus may be novel, but the pattern is old. In 1832 a cholera pandemic locked up one of the largest ports in the world and home to a quarter million New York City residents and businesses. Doctors pleaded with the city's health board and mayor to make the public aware of the outbreak, but with great fear of the business impact they hesitated. Once deaths from the cholera outbreak were made public in the *Evening Post*, it was reported that the wealthier New York City residents became panic-stricken and fled the city, emptying their bank accounts. Many city merchants went out of business. Sounds much like what we are hearing on the

news these days.

Our nation's list of infectious disease is not small and includes polio in New York City in 1916. *The New York Times* reported that children under 16 were banned from movie theaters and many babies were taken from their homes and quarantined on Swinburne Island in New York Bay. The polio virus is spread almost completely by feces, so wastewater testing being used today can detect if polio is still lurking around. As communities developed indoor plumbing polio began to subside, but it was not until 1962 in the U.S. that vaccines were being widely used to control polio. In 1979 polio was officially eradicated in the U.S.

The 1918 influenza pandemic killed an estimated 50 million people globally and 650,000 in the U.S. alone. It killed nearly as many people in a year as the bubonic plague killed in a century in the Middle Ages. The 1918 flu was caused by a strain of the H1N1 virus. Other flu outbreaks occurred in 1957 (H2N2 virus), 1968 (H3N2 virus) and 2009 ((H1N1)pdm09 virus). Thank goodness vaccines have reduced the mortality rates significantly. Flu viruses are relentlessly adjusting and mutating, which is why a permanent vaccine has not been developed like they have been for unwavering viruses like smallpox and measles. Both proteins hemagglutinin (H) and neuraminidase (N) frequently evolve in a process called antigenic drift.

Pandemics and outbreaks of new infectious diseases classically dawn when a new virus in an animal mutates and routes to a human who has no previous immunity. SARS, Ebola, HIV and likely the COVID-19 viruses all began in animals. Poverty in developing tropical locations fosters hunting of wild animals for sustenance, which is frequently the only source of protein available. Thus, the consumption of infected animals has the potential to transmit new animal-to-human viruses.

## Testing in Upstate New York

As the novel coronavirus has shown, viruses have no boundaries. We live in a world where air travel can take us to any location in about a day. Today we are at much greater risk than when the 1918 flu pandemic occurred, with 8 billion humans packed into communities with great worldwide interconnectedness. We desperately need many early-warning forecasting methods, including groups like the New York-based nongovernmental organization EcoHealth Alliance partnering with local government, the Centers for Disease Control and Prevention, WHO, Harvard University's Health-Map,

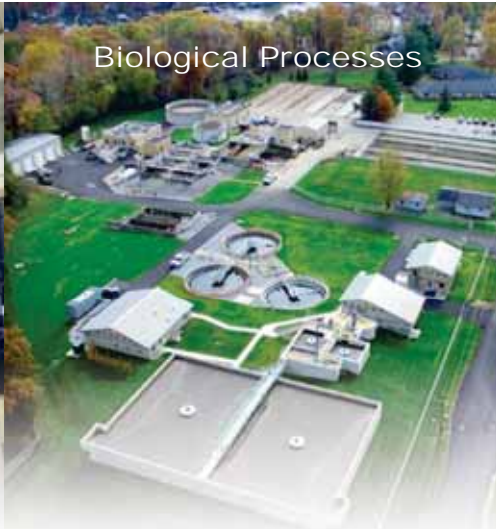
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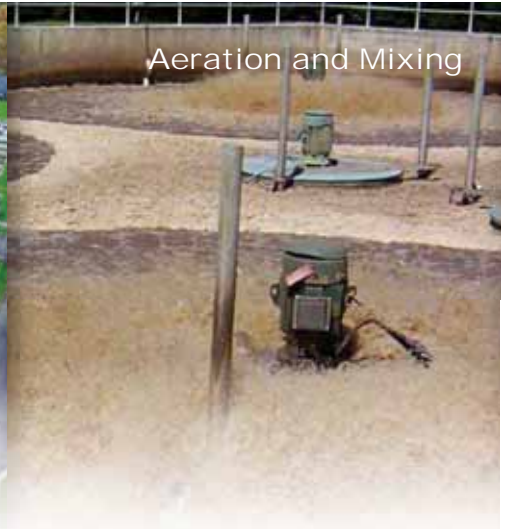
Laboratories are crucial to virus tracking efforts. *istockphoto.com, AnnaStills*



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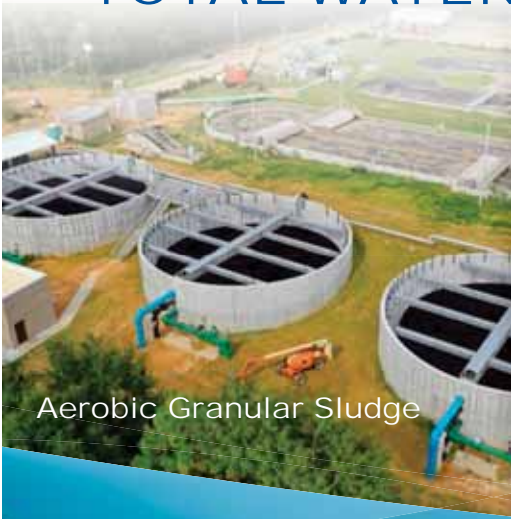


Biological Processes



Aeration and Mixing

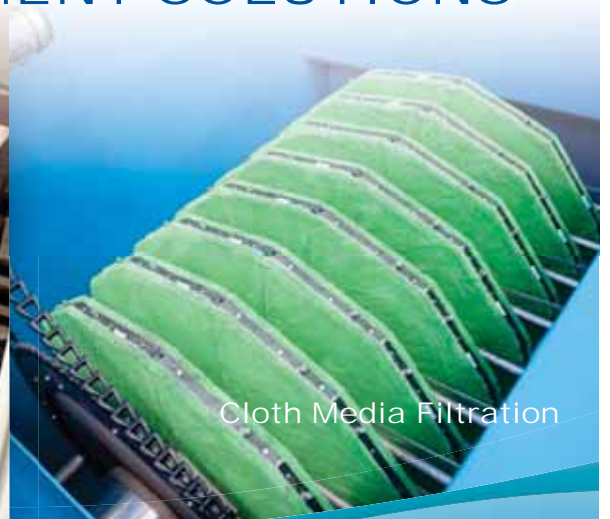
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and the University of Toronto's Bio-Diaspora to track real-time infectious diseases with global travel patterns. Most recently, wastewater coronavirus testing is provided by such companies as BioBot Analytics in Boston.

Pandemic scientists from Syracuse University, the State University of New York College of Environmental Science and Forestry, and the State University of New York Upstate Medical University are providing SARS-CoV-2 testing programs in Syracuse, New York, working a platform scaled to 13 counties and six universities across upstate New York. Their early warning wastewater surveillance platform, SARS2-EWSP, utilizes the ultrasucrose method of analyzing samples, wherein wastewater samples are spun at a high speed through a syrupy sucrose cushion and then analyzed for SARS-CoV-2 RNA to provide COVID-19 virus early warning every day, seven days per week.

After months of sampling and testing a growing list of colleges and schools in several New York state counties, one of the most difficult aspects that has surfaced is: what does a municipality do when the laboratory alerts them that their testing shows positive COVID-19 virus results? Fortunately, we conducted numerous Zoom meetings with our local colleges, schools and senior living groups to let them know about our proactive testing effort as these institutions came back this fall, and how the results would be used.

The larger private colleges informed us that they would be testing students weekly, which was great but expensive. The smaller public colleges and local schools simply did not have this level of testing in their current budgets. COVID-19 virus RNA testing is not low-cost and ranges from \$300 to \$1200 per sample. We formed an intermunicipal agreement (IMA) that each partner agreed to help

pay a percentage of the cost for the testing, as well as purchasing 24-hour composite samplers for each maintenance hole we planned to sample from.

We started testing weeks before the students' arrival to establish a base line from which to build a trend line as the students returned to campus. We set up a protocol for testing locations to test at strategic points in the collection system. Once spikes occurred, we implemented our plan to move sampling closer to the source.

Each partner in our IMA recognizes that we are all impacted by a local outbreak and are working amazingly well with this team effort. Madison County Department of Health (MCDOH) took a proactive approach by setting up a county wastewater coronavirus testing program and funded the testing. I want to thank the MCDOH director Eric Faisst and Madison County board chair John Becker for their proactive vision to protect Madison County residents. The Village of Clinton's mayor, Steve Bellona, and the village board have been Command Central, coordinating many aspects of a first-time community effort to get out in front of this horrible disease.

Feel free to contact me if you want help developing a similar program in your community or if you would like to reach out to the MCDOH or mayors involved with our proactive COVID-19 virus early warning programs.

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*Jim Cunningham is a frequent writer for Clear Waters. He holds a Public Health degree and provides training for the water and wastewater industrial and municipal utilities. Jim has been recognized with national and state water management awards and serves as a Madison County legislator and town supervisor. Please contact Jim at Supervisor.NelsonJimC@gmail.com.*



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# Monitoring Coronavirus Transmission Utilizing Wastewater

by *Brittany L. Kmush*

Most people are familiar with the saying: “You are what you eat.” Likewise, you can tell a lot about a person by what they excrete. Anything that enters the body through the mouth or nose is processed by the digestive system, including food, medications and pathogens. The body absorbs the useful parts for energy and growth whereas the waste or excess is excreted as urine or stool. Once in the toilet, the human waste is flushed into the wastewater collection system and transported by the sewer system to a water resource recovery facility. Monitoring wastewater at the facility’s intake is useful to assess the health of the population in the catchment area, that is, the area from which wastewater flows into a sewer system.

## Historical Perspective

Monitoring wastewater for infectious disease was first widely used in the 1990s as a major tool in the polio eradication campaign (*World Health Organization 2003, Brouwer, et al. 2018, Asghar, et al. 2014*). Paralysis is perhaps the most infamous and visible consequence of a polio infection but only occurs in one out of every 200 cases of polio (*Harvard Medical School 2019*). By the time a paralysis case is detected in the health system, polio has been circulating in the community for weeks and there are hundreds of infectious cases. It is difficult to control an outbreak once it gets to that stage. Fortunately, public health officials can inexpensively and continuously monitor polio transmission in communities by testing wastewater periodically for polio. When polio is detected, public health officials initiate mop-up polio vaccinations. Monitoring wastewater has even caught polio outbreaks and triggered mop-up vaccination campaigns before any children were paralyzed.

To monitor infectious disease transmission through wastewater, the pathogen of interest must be excreted in the stool and be detectable in the wastewater. Even though Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), the virus that causes coronavirus disease 2019 (COVID-19), largely affects the respiratory system, the genetic material of the virus is excreted in human stool (*Chen, et al. 2020, Wang, et al. 2020, Xu, et al. 2020*). Additionally, this genetic material can be detected in wastewater (*Medema, et al. 2020, Green, et al. 2020, Wu, et al. 2020, Nemudryi, et al. 2020*). Importantly, while parts of the virus are detected in wastewater, the human digestive system seems to do a good job of

destroying the virus. As of April, 2020, SARS-CoV-2 virus that is capable of infection, “live virus,” has not yet been found in wastewater (*Randazzo, et al. 2020*).

## Monitoring Coronavirus Transmission

Typical public health surveillance systems to monitor coronavirus transmission rely on indicators that lag the transmission events, like using cases of paralysis to monitor for polio. Detecting cases of COVID-19 depends on symptoms and the availability of test kits. Symptoms, if they occur at all, often do not appear for a week or two after infection, and results of laboratory tests confirming a case can take an additional week or two. Hospitalizations also lag weeks behind the transmission, with deaths typically occurring four to six weeks after symptoms occur. Therefore, policymakers relying on data from public health surveillance systems that use cases, hospitalizations and deaths are using data that are weeks, or even months, old.

Monitoring of wastewater for SARS-CoV-2 is a better indicator of coronavirus transmission in real time. People infected with SARS-CoV-2 begin shedding viral RNA in their feces shortly after infection. This RNA is deposited in the sewer system, and levels in the wastewater are highly correlated with the number of cases one week later (*Wurtzer, et al. 2020, Peccia, et al. 2020*). There is minimal delay between infection and RNA shedding. People who are infected with SARS-CoV-2 that do not seek treatment because they do not have symptoms, have mild symptoms, or do not have access to health care, are not missed by monitoring the wastewater system. The results from wastewater surveillance are comparable across communities independent of access to care, community demographics, and the prevalence of other conditions that can make SARS-CoV-2 infection more severe, such as heart disease and diabetes.

Wastewater monitoring has the additional benefit of being anonymous. The information gathered from this platform cannot be linked back to any specific individual but gives information on a population level. To get equivalent, population-level data, public health officials would have to test thousands of randomly selected people several times per week, making monitoring wastewater a cost-effective public health surveillance system.

Multiple studies have shown that increases in the levels of SARS-CoV-2 genetic material in the wastewater provide one to two weeks



Panoramic view of a water resource recovery facility.

*Hyatt Green*

warning relative to increases in the number of COVID-19 cases in a health system (Wurtzer, et al. 2020, Peccia, et al. 2020). Experts estimate that had the United States responded to the pandemic with widespread social distancing and closures just one week earlier, 62% of cases and 55% of deaths could have been avoided (Pei, Kandula and Shaman 2020).

## Introducing SARS2-EWSP

The SARS-CoV-2 Early Warning Wastewater Surveillance Platform (SARS2-EWSP) team is a collaboration of scientists and practitioners that began working on an early warning surveillance platform for the novel coronavirus in March 2020. Our team developed this wastewater early warning platform and have been monitoring SARS-CoV-2 patterns in the wastewater in various counties across upstate New York since April (Green, et al. 2020). We have optimized the method to give same-day results using low-cost materials that are unlikely to be affected by supply chain challenges (Green, et al. 2020).

The platform can recognize increasing, decreasing and stable transmission patterns. Further analysis using machine learning algorithms can be used to develop location-specific trend lines, capable of highly accurate predictions for changes in SARS-CoV-2 transmission. Results obtained from the platform have confirmed the decline in SARS-CoV-2 transmission across upstate New York that has been subsequently observed in the health care system, as well as warned of potentially increasing transmission in several specific locations. As the United States experiences a surge of SARS-CoV-2 transmission outside of New York state and schools welcome back students, we expect the platform to be of critical service in warning the public, health officials, and organization leadership as to when local transmission increases occur.

We expect this technology to be useful at a more granular level to monitor high-use buildings and residences, such as dormitories and barracks, allowing for more targeted health monitoring and intervention. Syracuse University and the State University of New York College of Environmental Science and Forestry (SUNY-ESF)

*Wastewater monitoring has the additional benefit of being anonymous. The information gathered from this platform cannot be linked back to any specific individual but gives information on a population level.*

have announced that they will use the early warning wastewater platform SARS2-EWSP to monitor campus dormitories and other buildings. Following suit, other colleges and universities are considering incorporating this early warning platform into their campus reopening and community health plans.

Wastewater surveillance can provide accurate information on the transmission patterns of SARS-CoV-2 in real time. Public health officials can use the SARS2-EWSP platform to monitor reopening, not only for the community but also for schools, universities and colleges, factories, offices and public buildings. Observing trends in coronavirus transmission as indicated by levels of viral RNA in the wastewater gives an early warning that may indicate an impending surge in cases. Specific information about transmission in a community or school can increase participation in prevention measures needed to lower transmission or keep transmission low. This platform by design can also predict when cases and hospitalizations may increase to allow for timely mobilization of personnel and supplies where they will be most needed. The platform can also give confidence in the absence of transmission from a wastewater catchment area when there are no cases in the health care system.

Accurate information about transmission status in communities derived from wastewater monitoring will increase the likelihood that individuals will follow recommended safety measures such as social distancing, public masking, handwashing and contact tracing. This is particularly relevant for individuals in areas where numbers of known COVID-19 cases are low. These low numbers may misrepresent actual transmission and lag-related increases. The resultant misinformation may give individuals a false sense of insignificant risk, which ultimately impacts their decisions not to engage in precautionary behavior and accelerates the spread of SARS-CoV-2 transmission. This is particularly important in New York state where the current relatively low infection rates can fuel complacency and relaxed attitudes toward precautionary behaviors. Early detection is critical to promoting enhanced vigilance before transmission becomes widespread.

When this pandemic finally ends, the infrastructure used by this wastewater surveillance platform can be leveraged to monitor other public health indicators. Due to climate change and deforestation, new infectious disease threats are inevitable. This platform can easily be adapted to monitor the next pandemic pathogen. Further, wastewater can also be used to monitor both prescription and illicit drug use, which can serve as markers of the overall health status of a population. This information can be used by public health officials to budget and plan for the appropriate resources to improve the health of their community.

## The SARS2-EWSP Team

Participating Syracuse University scientists include epidemiologist David Larsen as team lead, epidemiologist Brittany Kmush, environmental engineer Teng Zeng, information scientist Lee McKnight, computer scientists Chilukuri Mohan and Pramod Varshney, science communications Brice Nordquist and Leonard



Wastewater pellet before being tested for SARS-CoV-2 RNA.

Maxwell Wilder

*continued on page 49*



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Five teams competed in the Operations Challenge during WEFTEC Connect. Top row, left to right, **NYC DEP Bowery Bay Coyotes** (Chris Reyes, Yue Yue Guo, Anthony Quadrino, Mike Prats and Dragan Pilovic); **Watertown Water Bears** (Seth Foster, Angel French, Jay Slate, Mark Crandall) and **Genesee Valley Water Recyclers** (Anthony Filer, Michelle Hess, Angelo Dinottia, Lucas Kasperowicz and Will Monier). Bottom row, left to right, **NYC DEP Rockaway Sludge Hustlers** (Yu Tung Chan, Ettore Antenucci, Robert Ferland and Robert Ortiz) and **Long Island Brown Tide** (Jake Miller, Rob Jentz, Nick Barresi and Hector Soto). NYWEA was well represented during the virtual Operations Challenge. Thank you to all the coordinators and team members who put so much effort into the competition!



### Benefits of Wastewater Monitoring for SARS-CoV-2

- Able to detect community-level transmission trends at a fraction of the cost of testing individual people.
- Detects presence of coronavirus up to one week earlier than other methods.
- Information is completely anonymous – there is no way to link individuals to wastewater.
- Provides reliable, real-time transmission data to guide decision-making and resource allocation.
- More equitable data collection from sewers does not rely on local medical infrastructure.
- Testing method can be low cost and resist supply chain disruptions.
- Technology is easily implemented and scalable from individual buildings to municipal catchments.
- Platform can be adapted to monitor other pathogens, chemicals, and public health indicators.

Grant, recent master's of public health graduate Pruthvi Kilaru, and Syracuse University students Tanvi Borkar, Rahul Rathod, Yao Tong, Dishank Solanki and Aarthe Jayaprakash.

Collaborators at SUNY-ESF include microbiologist Hyatt Green, environmental scientist Mary Collins, and doctoral students Maxwell Wilder, Ariana Fenty and Dustin Hill.

State University of New York Upstate Medical University scientists include microbiologist Frank Middleton.

Cazenovia College collaborators include psychologist Rachel Dinero.

The scientists have also teamed with engineering firm Arcadis and biotechnology company Quadrant Biosciences to pursue a statewide surveillance platform.

***Brittany L. Kmush, Ph.D., is with the department of public health, Syracuse University, Syracuse, New York, and presents this article on behalf of the SARS2-Early Warning Wastewater Surveillance Platform Team. She may be reached at blkmush@syr.edu.***

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# Public Education and Outreach Spotlight: Keeping Wipes Out of Pipes

by Madison Quinn

The rush on toilet paper purchases during the early weeks of the COVID-19 pandemic brought to the forefront an unexpected education and outreach opportunity for water resource recovery utilities: the ongoing need to educate the community on what to flush and what not to flush. Some utilities focused on the toilet paper substitutes that should not be flushed: paper towels, napkins and especially wipes, even those labeled “flushable.” Others focused on the only things that are truly flushable, “the 3 Ps” – pee, poop and (toilet) paper.

While the toilet paper shortage of 2020 seems to be behind us, it’s an important reminder that the public still needs guidance on what not to flush. Consider incorporating these messages into your public outreach strategies from mailings to social media messaging. Increase the visibility of your social media posts using popular hashtags such as, #WhatNotToFlush, #WipesClogPipes and #ToiletsAreNotTrashcans.

## No Wipes in Pipes

When reaching out to residents and homeowners about keeping wipes out of pipes, it’s important to emphasize that wipes, even when they are marketed as “flushable,” are not safe to flush. Wipes and other disposable items don’t break down like toilet paper and can clog pipes anywhere from in your home to the water resource recovery facility. Even wipes labeled “flushable” can greatly increase the possibility of a sewage backup into your home. While many are still working from home and home schooling, nobody wants to be stuck in their home with a sewage backup in the bathroom or basement! You can download the No Wipes in Pipes graphic from the Public Outreach Tools page on the NYWEA website, [nywea.org](http://nywea.org).

## Wipes Clog Pipes

Plumbing emergencies are expensive. Keeping wipes out of your pipes will save you money – money on an emergency call to a local plumber to address a sewer backup. They can also cause costly damage to infrastructure that ultimately will be paid for through taxes or sewer use fees. This message is something you may want to include if you’re communicating with your customers through mailers that are sent along with their bill. This may also



“No Wipes in Pipes” graphic from NYWEA’S Public Outreach Tools. Downloadable at [nywea.org](http://nywea.org). NYWEA

be a salient message when working with facilities such as nursing homes or hospitals that sometimes have recurring problems with improper disposal of wipes.

## Toilets Are Not Trashcans

The National Association of Clean Water Agencies (NACWA) began a campaign several years ago with the message “Toilets are not trashcans – only flush the 3 Ps.” The logo may be used free of charge on any consumer education materials. Utilities are welcome to add to the existing trademark artwork without removing any of the text currently on the logo. More information from NACWA is available at <https://www.flush3p.org/>.

Madison Quinn is the communications manager and Scholarship Program administrator for NYWEA and may be reached at [madison@nywea.org](mailto:madison@nywea.org).

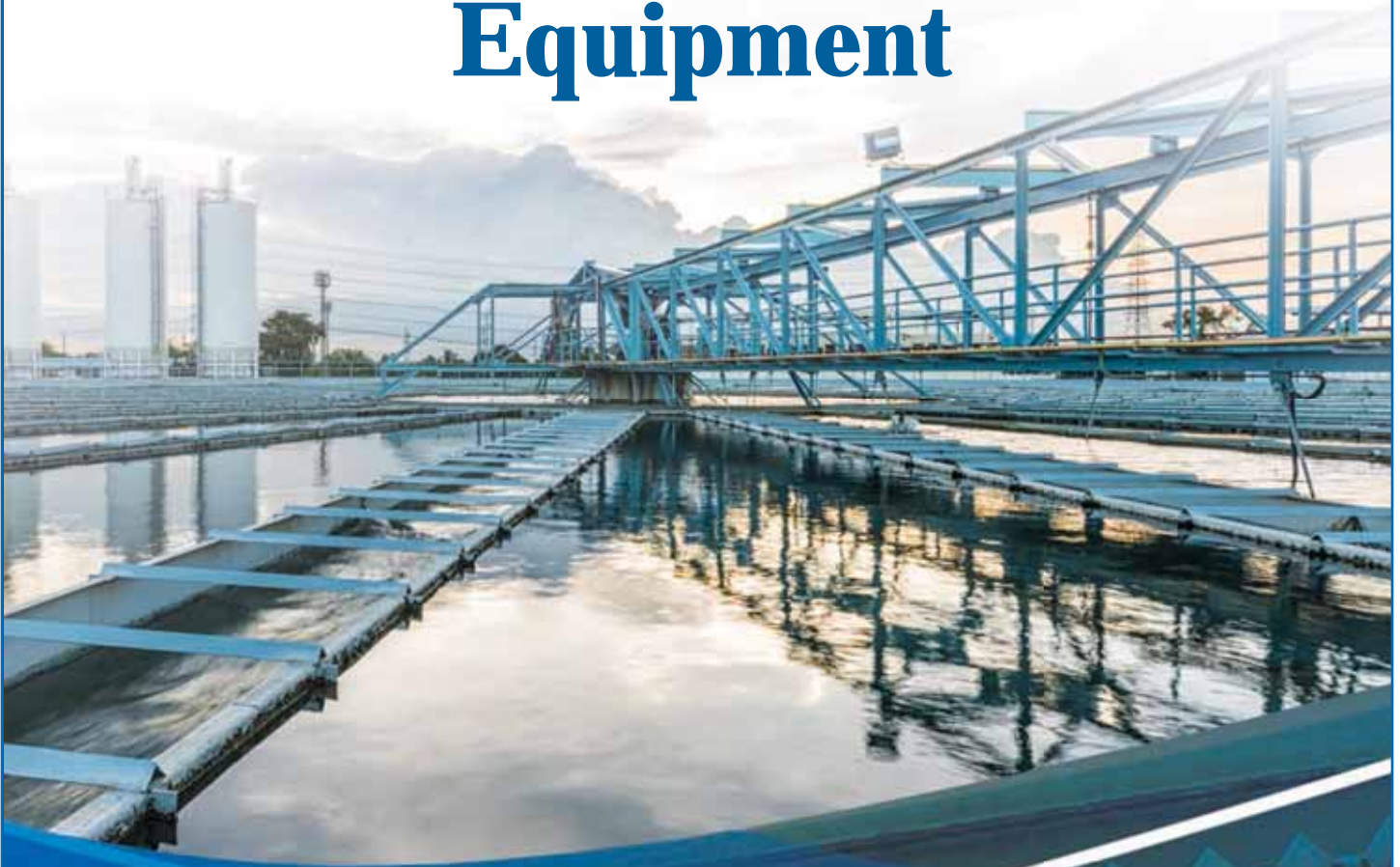


Utilities may use this free logo on consumer education materials.

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# Tragedy Results in Positive Change

by Angel French and R. Mark Crandall

Imagine receiving a call in the late evening hours that there has been a tragic accident in your water resource recovery facility. You arrive at the facility only to learn that one of your co-workers has lost their life.

In a water resource recovery facility setting, there is potential for injury with confined spaces, walking-working surfaces (any horizontal surface on or through which an employee works, walks, or gains access to a work area or workplace location), explosive environments and moving machinery, just to name a few. The employees of the City of Watertown Pollution Control Facility (PCF) were aware their place of employment could be potentially dangerous, but they did not realize how dangerous until events escalated on a second shift in the fall of 2017. The lives of many people were drastically affected in an instant.

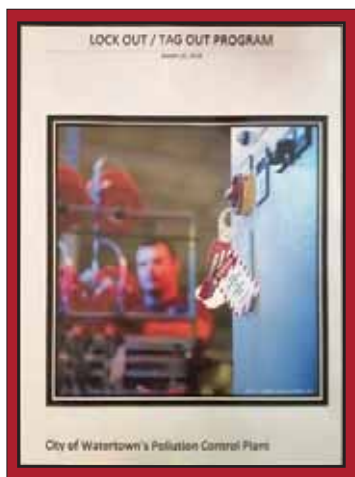
On Nov. 20, 2017, two employees were trying to stop a high-pressure hydraulic hose from leaking when the hose broke free. As a result, a valued employee was fatally injured on the job at the City of Watertown PCF.

Senior staff was notified shortly after the incident. The Public Employee Safety and Health (PESH) Bureau and the Occupational Safety and Health Administration (OSHA) were notified within a few hours of the occurrence. The following morning the rest of the staff was notified. PESH was at the facility by 9 a.m. the following morning.

Prior to the incident, an invitation was sent to PESH compliance to visit our facility in May 2017; we wanted to ensure that PESH guidelines were being followed. We had a safety training program and our maintenance crew working during the day. Apparently, however, we were not doing enough because we lost one of our own to an accident that could have been prevented.

In order for our employees to move past the tragedy of losing their friend and co-worker, we had to figure out what went wrong and ensure that it does not happen again. Over the next few months, the employees worked on policies and trainings.

So, what really went wrong? And what did we learn?



City of Watertown's Lock Out/Tag Out Program, which details the safety procedures to deactivate equipment for repairs using locks and tags that prevent equipment from being re-activated before repairs are completed.

Angel French

## Lock-Out/Tag-Out Procedures Were Not Followed

A Lock-Out/Tag-Out program (LOTO) was in place. LOTO procedures were in the office a mere 100 feet from the where incident occurred, but procedures were not being followed. We trained on LOTO annually, but sadly it was not enough.

We learned we need to constantly remind each other of procedures. Currently, we have LOTO procedures for each piece of equipment and the procedures are attached to the equipment and utilized. Our operators are well versed in LOTO procedures



The Lock Out/Tag Out station is the central location at the facility for access to the locks and tags.



Kept below the Lock Out/Tag Out station is the Lock Out/Tag Out shift change log.

Angel French

and know firsthand the dangers that occur when LOTO is not followed.

### Maintenance Staff Were Not Notified

Although maintenance staff were working the day of the accident, our maintenance supervisor was not notified about the leaking hydraulic fitting. The two employees who were working second shift took it upon themselves to fix the leaking fitting.

Prior to the casualty, maintenance on second shift was highly discouraged by management. The policy has changed to only allow emergency maintenance back shifts with the maintenance supervisor's approval.

### Safety Programs Had Become Rote

Employees worked individual safety programs; they were going through the motions, but they were not committed to their safety programs. Program administrators gave annual training and maintained training updates, as required, for the program.

After the death of an operator there was a new sense of commitment. Each administrator of the safety programs went through their respective program with the fresh memory of their lost employee. Administrators ensured they were current in their safety programs and their co-workers understood how to work safely.

### Toward a Safer Future

Reflecting back on the events of Nov. 20, 2017, is hard. It was like a tsunami hit our PCF, but the tsunami has had a ripple effect of several positive waves of change. Our crew has been through one of the worst tragedies a workplace can suffer, but we learned from it and can share our experience with others. The accident forced the crew to learn a new culture of safety. Communication between employees has increased. Co-workers are more willing to share their concerns and/or ideas to make a safer work environment.

Not only did the City of Watertown PCF learn a new safety culture, but the city as a whole took a step back and put safety as the No. 1 commitment. The city has since initiated a safety committee and is working toward ensuring safety is a top priority starting with management and flowing across all departments.

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Each piece of equipment has an Energy Control Procedure hanging from it to remind employees about the safety requirements specific to that piece of equipment. The Energy Control Procedure details the hazards involved with the equipment, the safety protocols for de-energizing it for repairs and the process for restoring it back to service. *Angel French*



## 2021 Upcoming NYWEA Meetings

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**February 8-10, 2021** 93rd Annual Meeting  
Virtual format

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**June 7-9, 2021** Spring Technical Conference and Exhibition  
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# Climb onto Ladder Safety

*Reprinted with Permission from American Water Works*

**Y**ear after year, falls from ladders rank as one of the leading single causes of occupational fatalities and injuries. Fall protection and prevention are ongoing major concerns of OSHA.

Regardless of the type of ladder you use, you risk a fall if the ladder is not safely positioned. It needs to be set on stable, level ground to keep it from slipping or moving. You can lose your balance by simply getting on or off an unsteady ladder.

Following are the key safety tips to keep in mind.

- Position the ladder so its side rails extend at least 3 feet above the landing. When a 3-foot extension is not possible, secure the side rails at the top to a rigid support and use a grab device.
- Make sure the weight on the ladder can't cause it to slip off its support. Also, never put more weight on the ladder than it is designed to support. And be sure to include the weight of the tools and materials you are using. The safe weight load should be labeled on the ladder.
- Before you use the ladder, inspect it for cracked or broken parts such as rungs, steps, side rails, feet, and locking components. By law, if it has any damage, it must be removed from service and tagged until repaired or discarded.
- Avoid electrical hazards. Never use a metal ladder near power lines or exposed energized electrical equipment. Look for overhead power lines before raising the ladder, and never allow the ladder to get closer than 10 feet to power lines. Also make sure that once you've climbed the ladder, your body and tools cannot come in contact with the power lines.
- Never use a self-supporting ladder (such as a stepladder) as a single ladder or in a partially closed position.

- Never use the top step/rung of a ladder as a step/rung unless it was designed for that purpose.
- Always maintain a three-point (two hands and a foot, or two feet and a hand) contact on the ladder when climbing.
- Keep your body near the middle of the step and face the ladder while climbing.
- Only use ladders and appropriate accessories for their designed purposes.
- Keep the rungs free of wet or slippery materials.
- Never place a ladder on boxes, barrels, or other unstable bases to obtain additional height.
- Do not try to move or shift a ladder while a person or equipment is on the ladder.
- The proper angle for setting up a ladder is to place its base a quarter of the working length of the ladder from the wall or other vertical surface.
- A ladder placed in any location where it can be hit or displaced by other work activities must be secured, or a barricade must be erected to keep traffic away from the ladder.
- Be sure all locks on an extension ladder are properly engaged.

For additional safety information, go to the American Ladder Institute website: [www.laddersafety.org](http://www.laddersafety.org).

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*American Water Works Association, copyright 2020, part of the series "Let's Talk Safety: 52 Talks on Common Utility Safety Practices for Water Professionals".*



Care must be taken to ensure safety when using ladders. Pay attention to the angle of the ladder, the extension above the landing, and the stability of the base.

*istockphoto.com, mauinow1*

# Army Corps Data Driven to Improve Coastal Projects for the 2020 Atlantic Hurricane Season

by JoAnne Castagna



The JALBTCX team standing with COL. Thomas Asbery, Former District Commander, New York District, U.S. Army Corps of Engineers (far right), in front of their aircraft, at Long Island MacArthur Airport in Ronkonkoma, New York. USACE



The remote sensing platforms inside the JALBTCX aircraft. USACE



COL. Thomas Asbery, Former District Commander, New York District, U.S. Army Corps of Engineers being shown the interior of the JALBTCX aircraft.

JALBTCX

In a hotel conference room on Long Island, New York, a team of experts is processing data and information on computers. Alongside them is a large display monitor screen that's projecting the information.

"It's a beautiful thing. On the screen they are able to observe the condition of New York's and New Jersey's coastlines almost in real time," said Jeffrey Cusano, Geospatial Coordinator, New York District, U.S. Army Corps of Engineers.

The team is the Joint Airborne Lidar Bathymetry Technical Center of Expertise (JALBTCX). Recently, Cusano and other members of the U.S. Army Corps of Engineers, New York District seized the opportunity to use this team to obtain cutting-edge survey data about the current condition of New York and New Jersey's coasts.

Not only did the team get the data to them fast, but the Army Corps is already using it to monitor and cost-effectively improve its coastal projects, as it enters the Atlantic hurricane season.

Earlier this year, the Army Corps tapped the expertise of the JALBTCX that is based at the Army Corps' Mobile District in Alabama.

The center's team members perform operations, research, and development in various airborne geospatial technologies to support the coastal mapping and charting requirements for the Army Corps.

The center also partners with the federal government, which includes the Army Corps, industry, and academia to further develop these technologies to meet its respective programs.

One of the center's programs is the National Coastal Mapping Program. The mission's intent is to acquire regional, high-resolution, high-accuracy elevation and imagery data along the sandy shorelines of the United States on a recurring basis.

To obtain this data, JALBTCX uses an aircraft equipped with government-owned state-of-the-art airborne remote sensing platforms.

These platforms are comprised of a lidar sensor with both topographic and bathymetric capabilities, and two addi-

tional aerial mapping cameras.

The lidar's topographic capability measures the elevation of the coastline's beach and dune systems and its bathymetric capability measures the seafloor elevations.

The lidar sensor provides highly detailed and very accurate elevation measurements both on land and under the water, while the two additional cameras provide very detailed images and spectral information from the same land and water.

This data is acquired along the sandy coastlines of the United States, approximately every five years. The last time JALBTCX flew over the coasts of New York and New Jersey was in 2017 and scheduled to fly again in 2022. The Army Corps' New York District wanted to get this information sooner.

When the Army Corps discovered that JALBTCX had a small pocket of time available to do a fly, the Army Corps' district coastal team quickly worked together to take advantage of this opportunity.

"They wanted to understand the current coastal condition and how it compared to the 2017 condition to see what work needs to be done now to improve the condition of the coasts. This work may involve such things as sand replenishment and environmental work. They also wanted to see if the work they already performed is functioning well," said Cusano.

Over a two-week period in late January 2020, the JALBTCX team flew their lidar and cameras over portions of the New York and New Jersey coasts.

The Army Corps' coastal team worked closely with the JALBTCX team to design flight plans that would produce good data coverage over New York District's coastal projects.

Approximately, 157 miles of coast was flown. The area included a stretch of coast from Manasquan Inlet to Sandy Hook, New Jersey, a portion of Staten Island, New York, and another stretch on Long Island from Rockaway Inlet to the tip of Montauk Point, New York.

To capture the best data, the flight crew flew primarily during daylight hours at or near low tide, at an altitude



## U.S. Army Corps of Engineers, New York District Coastal Projects

Following are the U.S. Army Corps of Engineer, New York District, New York and New Jersey Coastal projects that are benefiting from the JALBTCX Mission.

- The Manasquan to Sandy Hook, New Jersey, Project
- The South Shore of Staten Island, New York, Project
- The East Rockaway to Rockaway Inlet and Jamaica Bay, New York, Project
- The Jones Inlet to East Rockaway Inlet Long Beach, New York, Project
- The Fire Island Inlet to Montauk Point, New York, Project and its subproject the Fire Island Inlet to Moriches Inlet Emergency Stabilization Project

To learn more about these projects visit:

<https://www.nan.usace.army.mil/Missions/Civil-Works/>.

of 1,300 feet above ground level and at an air speed of 140 knots. They flew overnight operations only in the vicinity of John F. Kennedy International Airport in order to work with existing airspace restrictions.

The survey aircraft operated out of the Long Island MacArthur Airport, in Ronkonkoma, New York. Nearby, in Islip, New York, the JALBTCX team stood up a flight operations and data production center in a hotel conference room.

There the team stored its equipment, conducted twice-daily flight operations meetings, and networked a series of computers that were used to download data from each day's flights, process and quality control the data, and develop it into data products for use by the Army Corps.

Cusano said, "They used these sensors to gather a swath of information all along the beach area that included between 1,000 and 2,000 meters of the nearshore and onshore area."

In addition, the JALBTCX team will soon provide the Army Corps with what is called a Change Analysis. To perform this analysis, JALBTCX used this newly acquired 2020 continuous digital elevation dataset and compared it to their dataset from the last time they flew in 2017. Results will reveal where erosion or loss of sand occurred and where deposition or accumulation of sand occurred along the coastlines of New Jersey and New York between 2017 and now.

Cusano said, "We now have valuable information that shows us where there may be storm damage and sand loss that requires repairs. It also shows us how we are progressing with on-going coastal projects, of which we have done many in the last three years."

Suzana Rice, Senior Coastal Engineer, New York District, U.S. Army Corps of Engineers said, "This data is a great tool for us to monitor and understand our coastlines, and compare data from previous years, to use during the 2020 Atlantic hurricane season."

She added that the timeliness of the data, having been delivered only in 10 business days after the last flight, was helpful and enabled one particular coastal project to move along faster. "Because of this new data, we were able to expedite the pre-construction engineering and design phase of the Fire Island Inlet to



The JALBTCX team showing COL. Thomas Asbery, Former District Commander, New York District, U.S. Army Corps of Engineers the airborne remote sensing platforms on their aircraft. USACE



COL. Thomas Asbery, Former District Commander, New York District, U.S. Army Corps of Engineers watching the JALBTCX team working in their flight operations and data production center they stood up in a hotel conference room in Islip, New York. USACE

Montauk Point Project."

She added that this data is also being used to cost effectively create the plans and specifications for the Fire Island Inlet to Moriches Inlet Emergency Stabilization Project.

When plans and specifications are created by the project team, the team has to have an idea of how much sand will be needed to replenish the beach. Without this JALBTCX data, traditional surveying techniques would have had to be done and this would have taken longer and been more expensive.

The JALBTCX data is also being used to perform environmental work on some of these coastal projects.

Robert Smith, Senior Biologist, New York District, U.S. Army Corps of Engineers said, "The data is being used to design and track changes to habitats we built for endangered species, such as the Piping Plover, an endangered bird that nests along the shore in the summer. We built habitats for the plovers for it to nest and forage."

This data is valuable to the Army Corps' projects, and also educates the public about our projects.

Cusano said, "This past fall we had a number of nor'easters that caused coastal damage. Because of this, residents contacted us. They sought information about damages and if rebuilding was

*continued on page 58*



A sample of the type of elevation images the JALBTCX team developed for the U.S. Army Corps of Engineers, New York District. This image shows the shoreline elevations along the coast of Staten Island, New York. USACE

needed. We were able to use the data to better respond to their inquiries.”

This data is also available to the public and other agencies. The JALBTCX team posts the data on the National Oceanic and Atmospheric Administration’s Digital Coast website. The website is a multiyear archive of survey data acquired along U.S. coasts by partners in the federal mapping community and some state agencies.

A person is able to search for a specific coastal area, learn about available data, customize exactly what they want to view using the multiple layers of information available, and save the information in the format they can use for their intended purpose. To view the dataset the JALBTCX gathered recently for the Army Corps’ New York District, please visit: <https://coast.noaa.gov/dataviewer/#/lidar/search/where:ID=9000>

Cusano said, “In my opinion, this data is a win for everybody. It helps the Army Corps monitor and cost-effectively improve our coastal projects and it helps our agency educate the public about their coasts and the work we are doing for them, as we begin a new Atlantic hurricane season.”

This all would not have been possible if the Army Corps’ coastal team didn’t have the drive to pursue this valuable data. They saw the opportunity and they took it.

*JoAnne Castagna, Ed.D, is a Public Affairs Specialist and writer for the U.S. Army Corps of Engineers, New York District. She can be reached at [joanne.castagna@usace.army.mil](mailto:joanne.castagna@usace.army.mil).*



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## Experts Share Advice on Continuity of Operations During Coronavirus Pandemic

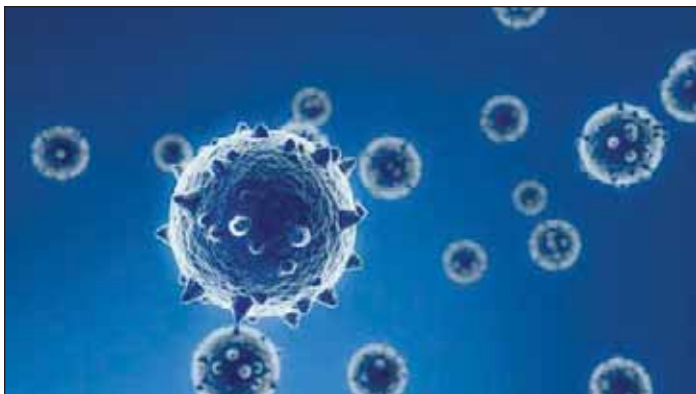
by Justin Jacques, WEF Highlights, March 27, 2020

Even during the coronavirus pandemic, water resource recovery facilities (WRRFs) cannot cease operations even for a moment. It remains critical, then, for WRRF managers to develop actionable plans to ensure continuity of operations despite potential staffing shortages and supply chain disruptions.

For utility managers, effectively responding to coronavirus requires additional attention to employee safety and welfare, workplace hygiene and public communications. Water sector experts discussed these vital considerations for WRRFs during the Water Environment Federation (Alexandria, Virginia) webcast, “Pandemic Continuity of Operations (COOP) Essential Personnel”.

### Provide Flexibility and Reassurance Where Possible

Essential personnel, which includes many WRRF operators, must remain on-site despite social-distancing requirements, John Bennett, Deputy Executive Manager for the Trinity River Authority (TRA; Arlington, Texas). These workers are there to continue providing clean water and maintain regulatory compliance. For these employees, work shift exceptions and schedule modifications often are done on a case-by-case basis.



**Water resource recovery facilities must remain in operation at all times despite staffing shortages related to the ongoing coronavirus pandemic. In a new Water Environment Federation (Alexandria, Virginia) webcast, utility managers discuss issues related to ensuring continuity of operations at water facilities.** *Image courtesy of Pixabay*

“Trying to ‘navigate the waters,’ so to speak, to find options that are most equitable and work best for the specific duties of the employees that are out there has been quite a challenge,” Bennett said.

TRA manages both large and small WRRFs, ranging from a 3-mgd facility with seven employees to a 162-mgd facility with over 200 employees. While the majority of TRA’s support staff are working remotely, a large fraction of operators are on the job.

In recent weeks, TRA has begun staggering operator shifts such that only the bare minimum number of employees are operating equipment at a time. Dusti Lowndes, Director of Emergency Management for DC Water (Washington, D.C.) described a similar approach, in addition to limiting all fieldwork and con-

struction activities to only the most essential, emergency-related projects. Charlotte (North Carolina) Water also is using work-force staggering. And the utility is updating and restocking its emergency operator supply kits in case operators need to stay at their WRRF stations for extended periods of time, according to Operations Chief Joseph Lockler.

Recognizing that shift modifications may lead to irregular work hours with financial repercussions, Charlotte Water also is ensuring its operations staff are compensated fairly.

“There were operators who may not have necessarily gotten in 40 hours per week,” Lockler said. “We have made a commitment as a department that we are going to ensure, no matter what, that our employees are paid for a minimum of 40 hours. Right now, they are our most critical asset and we know that. We have to keep them healthy and in the plant.”

On the other hand, employees who must work overtime to keep services operating during the coronavirus pandemic also must be compensated accordingly, advised Teresa Jakubowski, a partner at the law firm Barnes & Thornburg (Washington, D.C.).

“It’s very important to accurately track overtime during this period. Some employees may be working longer shifts to cover for those have to be absent due to illness or exposure,” Jakubowski said. “Also, to the extent employees are working outside of their regular positions, you will need to ensure that your determinations of exempt or nonexempt status remain accurate.”

### Maintain a Clean Workplace

Although Jakubowski emphasized that the U.S. Occupational Safety and Health Administration has specified no additional requirements to stem the spread of coronavirus, she also reminded employers about their general requirement to address known

*continued on page 60*



**Many water resource recovery facility operators are essential personnel who cannot work remotely. Utilities can keep employees safe and motivated by communicating frequently with their staff, minimizing infection risks, and being flexible with their scheduling, webcast speakers advised.**

*Image courtesy of Preston Keres/U.S. Department of Agriculture*

continued from page 59

hazards in the workplace. In the case of coronavirus, this entails observing U.S. Centers for Disease Control guidance as well as directives from state and local health departments, Jakubowski said.

Speakers from TRA, DC Water and Charlotte Water described new, rigorous cleaning and disinfection regimens of all their facilities, occurring at all common WRRF areas as often as before each shift.

At DC Water, all contractors who must be on-site at its facilities must now fill out a detailed form that helps the utility's dedicated emergency response team identify potential infection risk factors, Lowndes said.

TRA's official procedures have always specified that operators are not to bring their personal protective equipment home after their shifts; however, Bennett admitted that that rule was not always enforced. Operators now must change into street clothes on-site at the end of their shifts to limit disease transmission risks, he said. TRA also has instituted a maximum limit of two people at a time traveling in any TRA vehicle.

Charlotte Water currently has five major construction projects ongoing, meaning construction crews and contractors still must move in and out of utility facilities, Lockler said.

"We put notice out to all our contractors that work is going to continue, but that contractors, inspectors, vendors should have no in-person contact whatsoever with operations and maintenance staff," Lockler said.

### Communicate Both Internally and Externally

As the effects of the coronavirus pandemic become more evident, Steve Frank, executive vice president of emergency communications firm SDF Communications (Laguna Niguel, California) urged utility managers toward transparency about their challenges and preparedness.

"Your job of continuing to provide service to your community isn't done until you've considered the communication part of it," Frank said. "You have two audiences to consider – your external audience, your customers; and your internal audience, your employees."

Leadership at TRA are first making sure that employees have authoritative information about how coronavirus spreads and what they can do to mitigate it. They also are being sure to consult employees about potential schedule changes or workflow modifications.

"We're constantly making sure credible information is getting on bulletin boards, getting posted on doors, and that the supervisors are talking to their crews about what's going on and the best way to proceed," Bennett said. "Make sure your staff know that they do have a voice, and though not all suggestions can be implemented, that they're at least being considered."

Lowndes also described how employees are being kept in the loop about DC Water's operating plans as they change.

"We are open and operating as normally as possible with some provisions to our operations and our mission. We're telling people that we're not closing, we're just adjusting how we're meeting our customers' needs and communicating with each other."

Frank recommended that utilities who do not already have a media spokesperson designate and train one as soon as possible. Concerns about water quality due to the coronavirus pandemic are bound to arise, he said. When performing public outreach activities, Frank advised that water professionals should stress that evidence suggests risks to water supplies related to coronavirus are low and the utility's disinfection protocols are effective.

"Think about this as an opportunity to show your community that you've given this some serious thought. Even if you don't think you have a message, you do, and it's this: We've prepared for this," Frank said.

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Article is available online at <https://news.wef.org/experts-share-advice-on-continuity-of-operations-during-coronavirus-pandemic/>

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# Operator Quiz Fall 2020 – Operator Safety in the Workplace

The following questions are designed for individuals/trainees pursuing certification as they prepare to take the ABC wastewater operator test. It is also designed for existing operators to test their knowledge. Each issue of *Clear Waters* will have more questions from a different process of wastewater treatment. Good luck!

1. What is the proper slope of a ladder?
  - a. Every 4 feet up the ladder is 1 foot out from the wall.
  - b. Every 5 feet up the ladder is 1 foot out from the wall.
  - c. Every 6 feet up the ladder is 1 foot out from the wall.
  - d. Every 7 feet up the ladder is 1 foot out from the wall.
2. Hydrogen sulfide at 130 ppm smells most like:
  - a. Degreaser.
  - b. Rotten eggs.
  - c. Bleach.
  - d. Nothing.
3. What is the safe oxygen level for entering a confined space?
  - a. 14 to 16 ppm.
  - b. 17 to 19 ppm.
  - c. 20 to 22 ppm.
  - d. 23 to 25 ppm.
4. Cluttered work areas can cause accidents. Keep work areas clean. When you are finished with tools, put them:
  - a. On the table.
  - b. Under the table.
  - c. On your supervisor's desk.
  - d. In the tool cabinet.
5. What type of tools are recommended to perform maintenance on an anaerobic digester?
  - a. Brass.
  - b. Stainless steel.
  - c. Carbon steel.
  - d. None of the above.
6. Before entering a permit-required confined space, you must:
  - a. Check the atmosphere with a calibrated gas detector.
  - b. Make notification that personnel are entering the space.
  - c. Lock out and tag out all equipment.
  - d. All of the above.
7. When working on a chemical feed pump, what of the following is not required?
  - a. Nitrile gloves.
  - b. Safety glasses.
  - c. Leather work gloves.
  - d. Full face shield.
8. When making a sulfuric acid dilution, the appropriate method is:
  - a. Add the water to the acid.
  - b. Add the acid to the water.
  - c. Add both at the same time.
  - d. None of the above.
9. When aluminum sulfate mixes with water, a very \_\_\_\_\_ combination occurs.
  - a. Noxious.
  - b. Slippery.
  - c. Colorful.
  - d. Tacky.
10. Operators working with any form of lime are exposed to a number of hazards. Goggles, approved respiratory protection, emergency eyewash and deluge shower are necessary safety precautions. What else may be kept on hand to help flush eyes in case of severe exposure?
  - a. Inert absorbent materials.
  - b. A mild solution of acetic acid.
  - c. A mild solution of boric acid.
  - d. None of the above.

## Answers on page 62.

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*For those who have questions concerning operator certification requirements and scheduling, please contact Tanya May Jennings at 315-422-7811 ext. 4, [tmj@nywea.org](mailto:tmj@nywea.org), or visit [www.nywea.org](http://www.nywea.org).*



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## Operator Quiz Fall 2020

**Answers from page 61:**

- (a) Every 4 feet up the ladder is 1 foot out from the wall.
- (d) Nothing. At concentrations above 30 parts per million (ppm), hydrogen sulfide has a sickly, sweet smell that someone might get for a second before olfactory fatigue occurs. At the 100-ppm threshold, instantaneous damage to olfactory nerves occurs so someone would smell nothing.
- (c) 20 to 22 ppm.
- (d) In the tool cabinet.
- (a) Brass.
- (d) All of the above.
- (c) Leather work gloves.
- (b) Add the acid to the water.
- (b) Slippery.
- (c) A mild solution of boric acid.



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