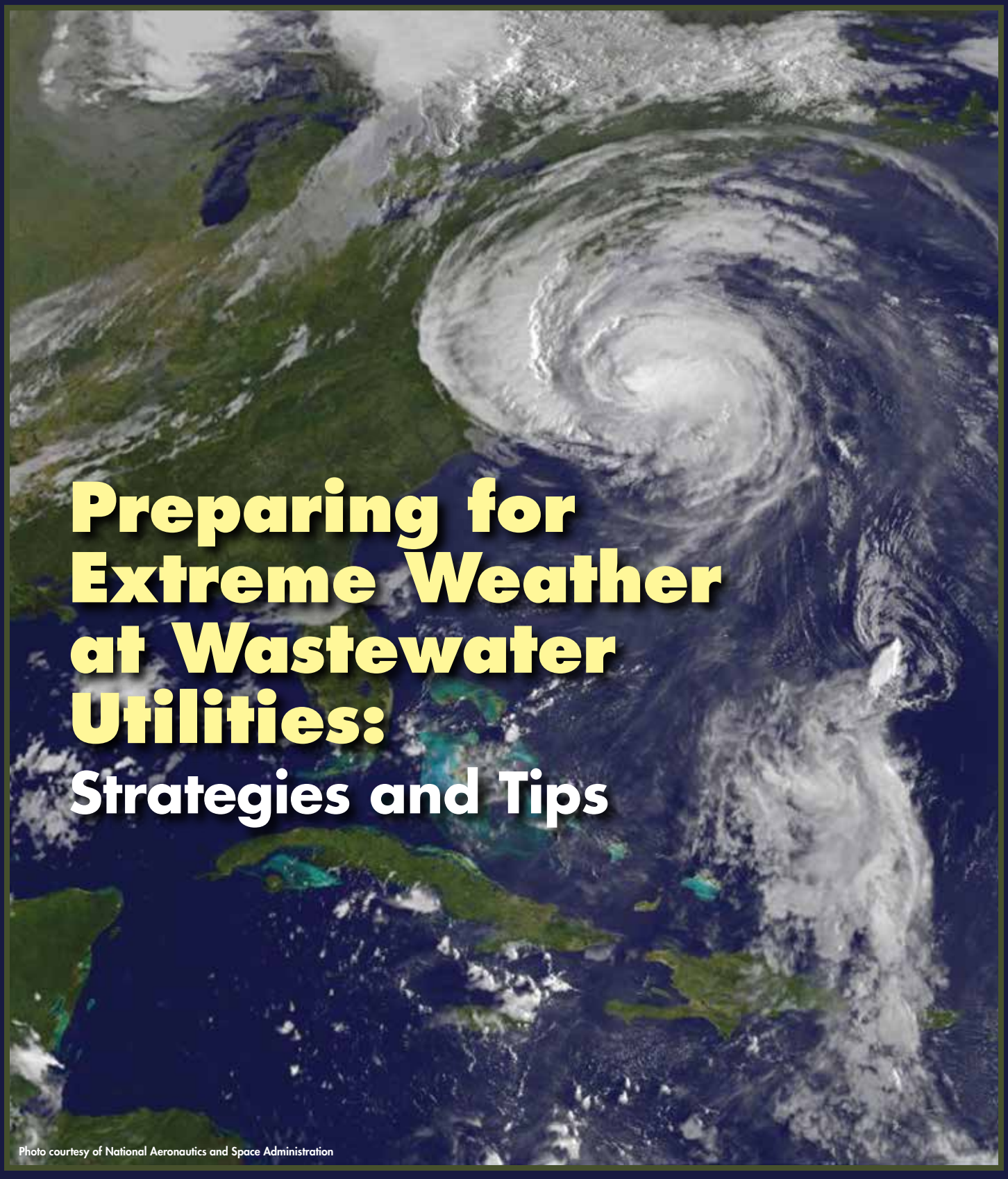
NEIWPCC
New England Interstate Water Pollution Control Commission



Preparing for Extreme Weather at Wastewater Utilities:

Strategies and Tips

Photo courtesy of National Aeronautics and Space Administration

September 2016

Foreword

The wastewater manager who is tasked with planning for extreme weather events faces challenges both critical and difficult. This guide can help, with a description of the central issues and with tips and stories gleaned from the experience of wastewater professionals in the Northeast.

The goal of this publication is to orient the reader to the problem of emergency preparation and to offer many points of departure for further information. The material is organized generally by time period, starting with pre-storm planning and ending with post-storm assessment and repair.

The focus of this guide is on operations. Wastewater professionals interested in design issues related to extreme weather may wish to consult NEIWPCC's *Guides of the Design of Wastewater Treatment Works (Technical Report 16)*. This design guide has been recently revised to incorporate the latest thinking about resiliency and adaptation in the siting and design of physical plant.

The tips and strategies presented in this report are suggested to wastewater utilities in the New England states and New York State by the New England Interstate Water Pollution Control Commission. This project was funded through Grant Agreement I-00199114-106 awarded by the U.S. Environmental Protection Agency to NEIWPCC. The guidelines do not represent policy positions of any state agency or of the U.S. EPA.

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Introduction

In the Northeast and throughout the world, extreme storm events are growing in frequency and force. Hurricanes and blizzards threaten the operation of wastewater infrastructure and in some cases the infrastructure itself. Consequently wastewater facilities should be made more resilient though preparedness planning and physical upgrades.

Scientists agree the growth of storm severity is a direct consequence of the warming of the earth's oceans, land, land-ice, and atmosphere brought about by industrialization. This long-term trend is well underway and will not be reversed quickly. Wastewater-plant operators, policy makers, and local governments should plan accordingly.

In the Northeast in the last five years Hurricanes Irene (2011) and Sandy (2012), and winter blizzards such as the February 2013 northeaster, produced widespread economic harm. Sandy caused nearly 11 billion gallons of sewage to be released into coastal waters, rivers, and other bodies of water as power outages and storm surge overwhelmed wastewater-treatment plants. 94% of these releases were a result of flooding and storm surge as waters overwhelmed sewage-treatment plants.

Extreme weather events often result in power disruption, forcing wastewater plants to rely on emergency generators. In February of 2013 a combination of extreme weather and design issues led to the failure of a generator in East Providence, Rhode Island, culminating in the discharge of 600,000 gallons of raw sewage. The story illustrates the disruptive power of storms, during which recovery may be hampered by adverse weather conditions, loss of power, and storm debris.

Resiliency is the capacity of a utility to withstand an event, minimize damage, and recover quickly to provide reliable service. Increasing resiliency requires both capital investment and a concerted effort to implement mitigation measures. These mitigation measure can be an emergency-planning activity, an equipment modification or upgrade, or new capital investment for construction.

To support this important work, NEIWPCC offers this supplement to the revised eleventh edition of its *Guides for the Design of Wastewater Treatment Works* (Technical Report, or TR, 16). This addendum provides lessons learned from staff at facilities in the Northeast that have been affected by major storm events. In addition, practical tips and sources of additional information are provided.

A wastewater treatment facility must be able to operate under all conditions. Failure to operate can lead to raw or partially treated sewage being discharged into rivers, oceans, and other bodies of water; or backing up into streets, homes, and businesses. The threat that hurricanes and other storms pose to wastewater treatment works is thus a direct environmental threat to communities and the public. As a result, most wastewater plants have precautions and plans in place to remain in service even under extreme conditions.

Nonetheless as storms grow more frequent and more powerful, further improved infrastructure and mitigation measures are needed. Wastewater facilities should prepare for flooding, power outages, equipment damage and failures, and much more.

Historically, wastewater plants have been sited near the waters to which they discharge. This often makes the facilities vulnerable to flooding, storm surge and climate change. Wastewater operators, and state and local planners and policy makers, are tasked with preparing for such events. They do not control the weather but must be prepared for it nonetheless.

Planning

Preparation for extreme weather events begins long before there is a storm in the forecast. Extreme weather scenarios and their impacts to facility operation should be incorporated into all long-range planning activities. These can include asset-management plans, wet-weather operating plans, hazard-mitigation plans, emergency operating and response plans, capital-improvement plans, etc.

A. Communication

- Make sure that wastewater personnel are on your community's emergency response contact list so police and emergency personnel will allow access to the plant.
- Become part of your municipality's incident command structure with emergency management available when needed.
- Know whom to contact for help prior, during, and after an event. Make sure that wastewater personnel have access to the community emergency response contact list at the time of an emergency. Building these relationships prior to the event and knowing whom to contact and when are critical in the emergency response process. It is important to know where and how to get help and resources to prevent, mitigate and recover from disasters.

B. Development of Emergency Plans and Procedures

- Participate in the development of an emergency committee to look into what must be done to protect municipal infrastructure, not just wastewater. Check your resources to see if an emergency committee is or should be established.
- Have a plan for communicating when cell and landline phones are down, such as two-way radios for communication between treatment plant and pump station repair personnel.

Additional Tips for Communications

- Get to know the key staff at your electric utility and understand which power lines supply your critical operations. When possible, have face-to-face meetings.
- Get your facility on the priority list for power restoration.
  - Ask your electric utility who manages the power-restoration prioritization list.
  - Ask the agency or individual managing the list about your utility's prioritization status.
  - Inform the agency or individual managing the list of your "storm-ready" capabilities and be sure they understand the consequences to critical infrastructure (i.e. hospitals) and the community resulting from wastewater service disruptions.
  - Inform the agency or individual responsible for the list of the critical assets at your utility that rely on grid power.
- Ensure that your community's emergency manager has your contact information in his or her cell phone so when you call, your name will be recognized.

Review flood insurance rate maps and other flood studies to determine what infrastructure is in high- and medium-risk flood-hazard areas, and what infrastructure may be inaccessible during periods of flooding.

- Update your standard operating procedure with additional details and lessons learned after each event. Your facility emergency response plan should be an evolving document that is constantly updated. Staff members should be familiar with the document and be part of the

updating process.
- Repeated discussion and implementation of steps previously described contribute to more experience for the entire crew. Open discussions among the staff, prior to the potential event, work very well.
- Have a wet-weather operating plan in place. This plan should describe protocols to be followed when responding to high flows, putting pumps on line, using spare tanks, and monitoring effluent quality, and steps to follow if bypassing a process is required for long-term viability. The plan should identify and map system resources, and catalog their condition. Staff members should be aware of plan.

Lessons from Others/ Retrofit Efforts

- We installed a tide-flex valve to limit river backflow, along with a system to discharge above ground.
- We installed a sealed lid on the pump station and relocated critical components to higher ground.
- We added generators to pump stations that do not have them.
- We evaluated locations and elevated programmable logic controller components, electrical components, mechanical systems, and underground electrical wires above flood levels as much as possible to minimize damage and continue plant and collection system operations.
- We moved critical components in vulnerable pumping stations from below grade to grade, and electrical controls above grade if possible.
- We evaluated raising pump-station control panels or build stations that either are sump pumps or self-prime so that flooding a deep dry pit is not a concern. Also, think about hardening at the vulnerable pump stations, installation of water tight doors and manhole covers, additional standby power at pump stations, or any flood-proofing measures.

- Be prepared. Review the response plans at least annually. Make sure all staff members have a copy of the plans or know where the plans are located in case one person is unavailable.
- Recommended procedures for preparing for extreme storms:
  - Top-off all emergency generators that use diesel fuel.
  - Check all pump systems and level indicators.
  - Clear facilities of all loose items and tarps. Make sure outdoor trash cans are secured so they don't smash through windows during a flood.
  - Remove hazardous materials from flood-prone areas.
  - Clear preliminary treatment systems, such as screens and grinders at head works.
  - Empty primary treatment systems of solids. If possible drain at least one unit to be used as a surge buffer.
  - Check all inlet and outlet gates and valves for operational function.
  - Initiate pre-event communication and operational procedures with staff, local emergency responders, and appropriate state officials.

C. Training

- Maintain chain-of-command and organizational charts implemented during emergencies; as outlined in event planning.
- Written procedures for emergency events should be placed in every building. Train the staff on emergency responses, participate in drills, and regularly attend safety meetings.

D. Vulnerability Assessment

- Search for and utilize any existing local or regional climate-related modeling tools or studies.
- Review necessary infiltration-and-inflow repairs within the collection system.
- Federal documents, such as those from the Federal Emergency Management Agency, can be cumbersome and time-consuming. Start working on them prior to an event and have someone from your local emergency management agency (EMA) work with you on them. Contact your state EMA to learn about new grants/opportunities, and timelines.

E. More Information

U.S. EPA Preparedness, Response and Recovery Resources: Water Security Division

EPA's Water Security Division has developed a variety of guidance documents and other informative resources to support drinking water and wastewater utility preparedness, response and recovery. This site gathers all of the tools mentioned below in one location and offers a wide variety of other information to help improve the security and resilience of drinking water and wastewater facilities.

http://water.epa.gov/infrastructure/watersecurity/

Climate Ready Water Utilities (CRWU)

EPA's Climate Ready Water Utilities initiative assists the water sector, which includes drinking water, wastewater, and stormwater utilities, to prepare for climate-change impacts. EPA promotes a clear understanding of climate science and adaptation options by publishing practical and easy-to-use tools to translate complex climate projections into accessible formats. This information helps utility owners and operators better prepare their systems for the impacts of climate change.

The Climate Ready Water Utilities Initiative has developed the Climate Resilience Evaluation and Awareness Tool (CREAT), the Adaptation Strategies Guide, and two mapping tools. The tools can be used separately or together.

http://water.epa.gov/infrastructure/watersecurity/climate/

Climate Resilience Evaluation and Awareness Tool (CREAT)

This software tool aids drinking-water and wastewater utility owners and operators in understanding potential climate-change threats and in assessing the related risks at their individual utilities. CREAT provides users with access to the most-recent national assessment of climate change impacts for use in considering how these changes will affect utility operations and missions.

http://water.epa.gov/infrastructure/watersecurity/climate/creat.cfm

EPA Adaptation Strategies Guide for Water Utilities

The Adaptation Strategies Guide provides drinking-water and wastewater utilities with a basic understanding of how climate change can impact utility operations and examples of different actions utilities can take to prepare for these impacts.

http://water.epa.gov/infrastructure/watersecurity/upload/epa817k15001.pdf

Scenario-Based Projected Changes Map

This online map provides easy access to localized scenarios of projected changes in annual total precipitation, precipitation intensity, annual average temperature, 100-year storm events, and sea-level rise from CREAT. To explore local climate-change-projection data across the United States, simply zoom in on a location of interest or type a location into the search field of the map. Climate change projection data within this map is provided by grid cell, illustrated as a square grid with 1/2-degree resolution, approximately 32 x 32 miles.

http://water.epa.gov/infrastructure/watersecurity/climate/scenario.cfm

Storm Surge Inundation Map

This interactive map illustrates the current worst-case storm-surge and inundation scenarios on the American Gulf and Atlantic coasts, including Puerto Rico and the U.S. Virgin Islands. The map combines data layers from FEMA 100- and 500-year flood maps as well as NOAA's Sea, Lake, and Overland Surge from Hurricanes (SLOSH) and the National Hurricane Center's coastal county hurricane strike maps.

http://water.epa.gov/infrastructure/watersecurity/climate/stormsurge.cfm

Preparation

Once an extreme weather event is in the forecast, there are a number of preparation steps that should be implemented, especially in regard to moving materials from low-lying areas and taking steps to be ready to continue operating off the power grid.

A. Coordinate with All Staff Members

- Before every extreme weather event, the staff should meet as early as possible and establish a series of meetings over the days leading up to the storm, Meetings should discuss areas and hierarchy of focus, responsibilities and contingencies. Anticipate problems, make sure equipment and personnel are available. Preparations could include exercising emergency generators or stockpiling appropriate accommodations (food, cots, etc.) for a potential "all-nighter."

B. Generators

- Standby power should be available for all the pump stations and facility performance should be evaluated under emergency power.
- Take advantage of the Army Corps of Engineers' Emergency Power Facilities Assessment Tool, which is free. The Army Corps checks power needs in different scenarios and can mobilize generators from different parts of the country prior to a storm. It is critical to understand the process of leveraging FEMA/Army Corp of Engineers generator assets well before any potential need arises.
- Generators should be exercised and checked for fuel as appropriate (weekly, monthly, etc.) so they work when you need them.

Generator Use Tips

- For large scale "notice" incidents, such as category 3 and above hurricanes, go off the grid and use your generators in anticipation of a power outage. This can prevent operational disruptions and protect electric equipment.
- Go off the grid and switch to generators if there is poor power quality. Power fluctuations can damage equipment.
- Identify three-phase requirements. When power is restored, not all three phases may be available, which can damage three-phase equipment.
- Determine the need for protection against equipment failure caused by undervoltage or overvoltage.
- Conduct a facility-specific generator needs assessment. This can significantly reduce response time during an emergency.
- Keep smaller generators on trailers for emergencies. The generators can be safeguarded during the incident, but easily transported to sites without power when needed.
- Keep basic maintenance supplies on hand (e.g., coolant, belts, oil, fuel filters) to get a generator back in service quickly if there is a breakdown.
- Plan for a "backup" to your backup power. One option is to reserve a portable generator from a rental pool during storm season.
- Conduct manual operation drills in case your Supervisory Control and Data Acquisition system goes down during both a power and/or generator outage.

- Generators should be located at every facility and tested weekly under load. Evaluate generator and automatic transfer-switching equipment for improved maintenance schedules or replacement.
- Evaluate what areas of the facility lack emergency power and identify potential sources of portable generators prior to an event (e.g. state environmental and emergency management agencies, FEMA, Army Corps).

C. Fuel for Emergency Operations

- Operators should make sure all fuel tanks (generators, vehicles, etc.) are filled and generators tested before the storm. It is important to evaluate how long your facility will be able to operate with your generators and available fuel supply.
- Facility should be prepared for the potential of fuel distributors not being able to reach the

Additional Emergency Power Tips

- It is important to know in advance the anticipated length of time a facility can run without grid power or refueling.
- Many private vendors sell or rent generators. If you plan to rent a generator, set up a contract with a vendor, since many people may need to rent generators during a power outage. Know where you stand in terms of priority with your generator vendor.
- Another option is to reserve a portable generator from a rental pool during storm season.
- Join your state's Water/Wastewater Agency Response Network (WARN) to make it easier to borrow a generator and other resources during a regional emergency.
- Investigate what your state water-sector associations and local emergency management agencies can offer to help. A good working relationship with your local emergency manager will be critical to accessing state or federally provided generators.
- Transfer switches allow you to easily switch back and forth between commercial and on-site generator power sources. These switches can be manual or automatic.
- You can install transfer switches ahead of time to decrease the time needed to connect a generator during an emergency.
- Install generator hook-ups at eye level to make them easier to connect in an emergency under poor weather and lighting conditions.
- Consider installing a cement pad to provide a stable surface for a portable generator during an outage.
- Use weatherproof enclosures to protect generators.
- Get an enclosure large enough to provide easy access to the generator's radiator, fuel tanks, air and oil filters, and charging system.
- Cover a generator with a roof to increase its life expectancy, or position the generator pad so that a roof can be added later.
- Maintain three or four feet of clear space on all sides of the generator for adequate ventilation.
- Buy or rent a generator built with acoustical steel and sound insulation if it will be located in a residential area.
- Regularly run generators under required load for extended periods to test for any problems.
- Test the generator under load each time after it is serviced.
- Perform additional maintenance on a generator if it could be used for 10 days or longer.
- Record all maintenance activities to assess performance and operating costs and inform future buying decisions.
- When you change the oil in your generator, consider sending a sample to be tested for the presence of metals. Metals could indicate engine wear, which may indicate that other repairs are needed.

Additional Tips Regarding Fuel Supply

- Determine in advance if your refueling supply chain is resilient to extreme weather disruptions.
- Check fuel-storage requirements because regulations vary from state to state.
- Add fuel management into your generator-maintenance schedule to ensure availability of clean, reliable fuel.
- Clean all fuel tanks at least every five years to avoid sludge build up.
- Use gel and fuel additives to reduce biological activity that produces fuel sludge.
- Use a portable fuel polishing unit.
- Refill fuel tanks before they are empty to avoid drawing up any fuel sludge accumulation.
- Have multiple vendors from different regions under contract so that you can maintain supplies if one vendor cannot deliver.
- Ask your vendor to store additional fuel for your utility during storm months.
- Be aware of limits on who can refuel leased fuel storage tanks. You can purchase your own tanks if necessary.
- Have filters (at least one complete filter set per generator) on hand because they will not be readily available during an emergency.
- Have a 1,000-gallon tank available and a truck on-site for local deliveries.
- Be prepared to move your own fuel without contractors; but be aware of hazardous material placard requirements when moving fuel by vehicle.
- Reduce your energy consumption while using generators to make the most of the available fuel.

facility before, during or after the storm. The fuel-delivery system and fuel plans must be considered beforehand. It is beneficial to have additional fuel storage on site or have a plan for it to be brought in if necessary.

- Pump stations can also become difficult to access if surrounded by water or storm debris.

D. Dispersal of Equipment and Materials

- Evaluate other areas of the plant or community (higher-ground, open spaces, etc.) that could be utilized for storage of equipment, vehicles, and materials. Placing materials that may need to

One Facility's Experience:

"Our efforts to remove stored material were flawed, but we learned from them."

- The way we stored material did not permit for quick access and handling.
- We should have begun to move the smaller items and materials to higher locations sooner. Our concern for the major components of our operation did not permit sufficient time for us to relocate those items.
- Possible major flooding was forecast when Tropical Storm Sandy was approaching, so we removed many of the smaller items and material to higher elevations within the treatment plant (areas not affected by the 2012 event).
- Now, moving materials to higher elevations is one of the first things we do in advance of possible major flooding.
- We are now permanently locating high-value or sensitive functions that are often found on the ground floor of critical facilities (e.g., offices, records, libraries, and computer laboratories) to higher floors or elevated additions.
- We have planned actions to move high-value contents from the lower floors to higher floors when a flood warning is issued.

be moved on pallets so they can be more easily handled and moved.

- Important paper documents and plans should be located in a place that will not be flooded. Review the location of computers, other electronics, and hazardous chemicals that may be in vulnerable areas and develop a plan on how they will be moved or located during an event. Important electronic documents should be saved to a cloud-based server. Relocation can be as simple as moving critical pieces of equipment and vehicles to a non-affected area of the facility. If needed, a full-scale removal and relocation entails shifting equipment and materials to areas of the community that will not be affected by floodwaters.

E. More Information

Flood Resilience—A Basic Guide for Water and Wastewater Utilities

With a user-friendly layout, embedded videos, and flood maps, EPA's Flood Resilience Guide is a one-stop resource for small and medium utilities to learn about flooding threats and identify practical mitigation options to protect critical assets.

http://water.epa.gov/infrastructure/watersecurity/emerplan/upload/epa817b14006.pdf

Flood Incident Action Checklist

"Rip and run" with this checklist to understand the potential impacts and what actions can be taken immediately before, during, and after a flood.

http://water.epa.gov/infrastructure/watersecurity/emerplan/upload/epa817f15005.pdf

Additional Incident-Action Checklists

Extreme Cold and Winter Storms Incident Action Checklist
http://water.epa.gov/infrastructure/watersecurity/emerplan/upload/epa817f15003.pdf

Hurricane Incident Action Checklist
http://water.epa.gov/infrastructure/watersecurity/emerplan/upload/epa817f15006.pdf

Tornado Incident Action Checklist
http://water.epa.gov/infrastructure/watersecurity/emerplan/upload/epa817f15007.pdf

Action and Implementation

In the midst of an extreme weather event and immediately afterwards there are a number of potential disruptions that must be considered.

A. Staffing

- Make sure you have enough staff to handle an emergency and to keep running the plant over a longer term than three days. This is part of the Water/Wastewater Agency Response Network (WARN) program.

B. Power

- Shut electrical controls off well before they are inundated.

C. Emergency Communication

- Communication plans must consider contingencies for internet and telephone service interruptions during and after a storm. For instance, disabled telephone lines could be unable to send alarm signals from the pumping stations to the treatment plant.
- The supervisory control and data acquisition (SCADA) system can be vulnerable to loss of internet service lines.
- One example: the treatment plant had laptop computers that were removed from the plant prior to the flood. Their use was limited by battery life and ability to locate an electrical source. Cell phones carried by plant personnel were able to be charged but service was spotty due to issues with power outages at the cell towers.

D. More Information

EPA Water Utility Response on the Go

EPA has developed a tool that can be used from a smart phone or tablet to track severe weather, contact response partners, take notes and record damages, and inform incident command. The tool can be used for any of the following incidents: drought, earthquakes, winter storms, extreme heat, flooding, hurricanes, tornadoes, tsunamis, and wildfire.

https://watersgeo.epa.gov/responseotg/

Restoration

Once a storm has passed, it is very important to return to normal operations as soon as possible. However, there may be many unforeseen storm-related consequences to address first.

A. Access

- Coordinate access to storm impacted areas with local and regional law-enforcement agencies, via the state or regional emergency-management agencies.
- Downed trees and utility poles may interrupt access to facilities.
- One Example: Access to the facility may become difficult or impossible. Floodwaters from rain and melting snow washed out road leading to our treatment plant. Had to go off-road and through the woods. The pump stations couldn't run and the roads were blocked with trees and wires so we couldn't get a pump truck in.

Additional Tips for Access

- Whenever possible, critical facilities should have two unique access routes.
- Survey existing landscape elements to ensure that if damaged they will not block access to critical facilities.
- Trees with trunks larger than 6 inches in diameter, poles (e.g., light fixture poles, flagpoles, and power poles), or towers (e.g., electrical transmission and large communication towers) should not be placed near buildings.
- Falling trees, poles, and towers can severely damage a critical facility and injure the occupants.
- Large trees can crash through pre-engineered metal buildings and wood frame construction. Falling trees can also rupture roof membranes and break windows.

B. Treatment Processes

Shared Experiences:

- We were impacted by the loss of our standby generator at the major pump station on the north side of the river. It was permanently mounted and submerged while running. While we were able to locate standby power for that pump station and the others we had not considered the possible long term and village wide loss of power and the need for back up. The major pump station on the north side of the river now has a towable standby generator so it can be moved out of harm's way if necessary and brought back in to provide power after the event.
- We wanted to maintain primary and disinfection at a minimum. Keep an ability to bypass the secondary treatment system. At our facility, primary effluent can be directed to a wet weather chlorine contact tank that discharges to the Connecticut River during wet weather events. This can also be used to protect the secondary treatment process as needed. Don't flush biology out, bugs in secondary keep your biological treatment, it would take weeks to build up again.
- Our treatment plant was impacted by high flows and by pumping salt water collected in the system due to flooding in collection areas adjacent to the Bay. We estimate about 30% of the active biology in the plant's biological nitrogen reduction process died as a result of pumping ocean water into the plant.
- At our facility, we have a flow bottleneck between the secondary clarifiers and the tertiary plant. We used sump pumps to help bypass the bottleneck and increase flow through the plant. Now we put plugs in the scum box pipe

to the sludge tanks and let the flow build in the aeration tanks and clarifiers to push the flow through.

- Although our treatment plant only experienced a power outage (we have back up power), we had three pumping stations get flooded and severely damaged. All electrical equipment, including pumps and controls, had to be replaced at all three stations. Those three stations were down for 24–36 hours after the storm until we were able to get them working in a very limited manner. They were not fully back to 100% for about six months after the storm.

C. Improve for Next Time

- Assess vulnerability by discussing the event after the storm. As new situations arise, incorporate any new activities and planning into the community's planning-and/preparation process.

D. More Information

Containment and Disposal of Large Amounts of Contaminated Water

This guide is intended for events involving contamination at water utilities. Utilities will find key information that may be useful in addressing containment, treatment, and disposal of water contaminated with a chemical, biological or radiological agent within any part of a drinking water, wastewater, or stormwater system resulting from a contamination event.

https://www.epa.gov/sites/production/files/2015-06/documents/comntainmentanddisposal.pdf

Financing Restoration And Improvement

Once storm damages are assessed, repair and replacement of equipment will commence. There are a number of avenues to seek funding for damages and upgrades.

A. Method of finance

Shared Experiences:

- Upgrades are being funded via loan from the SRF. We did apply for FEMA grant for one project but regardless of the eventual decision on the grant, we are moving ahead with improvements.
- We are trying to obtain funding to stormproof the three pumping stations and the administration building that are in the AE and VE Flood Zones. We have started preparing a Disaster Preparedness and Recovery Plan but needs professional expertise to continue the project, funding is being sought in this area also.
- Funding is being sought to dike the pumping stations, raise transformer, relocate emergency generator at the administration building and waterproof doors. Elevation certificates were prepared by the staff engineer.
- Upgrades and greater protection are being looked into with various grants.
- Work with FEMA to not only replace from the storm, but also improve.

B. More Information

Overview of Federal Disaster Funding Opportunities for Water and Wastewater Utilities

Below are short descriptions of funding programs from the U.S. Department of Agriculture (USDA), Federal Emergency Management Agency (FEMA), U.S. Environmental Protection Agency (EPA), U.S. Department of Housing and Urban Development (HUD) and U.S. Small Business Administration (SBA).

FEMA Public Assistance (PA) Grant Program

Following a presidentially declared disaster, FEMA's Public Assistance Grant Program provides grant assistance for emergency work (to address immediate threat to life) and for permanent work (to restore a damaged facility). The program applies to publicly owned water and wastewater utilities or private nonprofit utilities (e.g., cooperatives). The PA program is routinely used to repair facilities damages by presidentially declared disasters. A component of the PA that is not sufficiently utilized is Section 406 hazard mitigation funding. Section 406 resources allows funding of additional cost effective mitigation work that will reduce the potential for damage from a future disaster event.

FEMA Hazard Mitigation Grant Program (HMGP)

FEMA's Hazard Mitigation Assistance (HMA) grants reduce disaster losses and protect life and property from future disasters. Mitigation includes community risk reduction, improved resilience of critical infrastructure, risk reduction for vulnerabilities from natural hazards and climate change, and initiatives to reduce future risks. Projects must provide a long-term solution. HMGP funding is available on a competitive basis within each state. In most instances, a 25% non-federal match is required.

EPA Hazard Mitigation for Natural Disasters

Water and wastewater utilities are vulnerable to a variety of hazards including earthquakes, flooding, drought, tornadoes, and wildfires. Use EPA's new Hazard Mitigation Guide to identify cost-effective projects that will increase your utility's resilience to natural disasters.

USDA Rural Development Emergency Community Water Assistance Grants (ECWAG)

The Department of Agriculture provides from $150,000 to $500,000 to assist a rural community that has experienced a significant decline in quantity or quality of drinking water due to an emergency. Grants cover projects to obtain or maintain adequate quantities of water that meet the standards set by the Safe Drinking Water Act. Eligible emergencies include drought, earthquake, flood, tornado, hurricane, disease outbreak or chemical spill, leakage, or seepage.

EPA Drinking Water State Revolving Fund (DWSRF)

EPA provides grants to states under the Drinking Water State Revolving Fund. States make low-interest loans to water systems to protect public health and ensure compliance with the Safe Drinking Water Act. States may also set aside money for technical assistance to help utilities assess damages, purchase backup generators, install physical flood barriers and relocate wells. Funds have been used in flood and drought situations.

EPA Clean Water State Revolving Fund (CWSRF)

EPA provides grants to states under the Clean Water State Revolving Fund. States make low-interest loans or other assistance to publicly owned wastewater collection and treatment systems, stormwater systems and nonpoint source pollution control and estuary management projects.

HUD CDBG and Section 108 Guaranteed Loans

HUD Community Development Block Grants (CDBGs) are for entitlement communities. CDBGs may also go to states to distribute to non-entitlement communities. Communities must spend at least 70% of these funds for activities that benefit low- and moderate-income persons. Utilities have used these block grants to develop new water sources, improve treatment and replace distribution system pipes.

SBA Disaster Loans

Through its Office of Disaster Assistance, the U.S. Small Business Administration (SBA) can provide low-interest, long term loans to businesses and private nonprofits of all sizes following a disaster. This includes infrastructure assistance to private for-profit (PFP) and private nonprofit (PNP) utilities to restore them to their pre-disaster operability.

Be Prepared
Be Aware
Be Ready

Appendix A:
Reference and Additional Resources

1) U.S. EPA Preparedness, Response and Recovery Resources

EPA has developed a variety of guidance documents and other informative resources to support drinking water and wastewater utility preparedness, response and recovery. Below are the descriptions and links to this information.

Adaptive Response Framework for Drinking Water and Wastewater Utilities

The Adaptive Response Framework describes approaches for water utilities seeking to become more "climate ready." This framework supports and guides utilities as they learn about and pursue management techniques and adaptive actions that can be implemented to build climate readiness. The framework is described in the "Climate Ready Water Utilities Report," developed by the National Drinking Water Advisory Council and submitted to the EPA Administrator in January 2011.

http://water.epa.gov/infrastructure/watersecurity/climate/upload/epa817f12009.pdf

Climate Ready Water Utilities (CRWU) Overview, Tools and Resources, and Training Information

EPA's Climate Ready Water Utilities (CRWU) initiative assists the water sector, which includes drinking water, wastewater, and stormwater utilities, in addressing climate change impacts. Through the development of practical and easy-to-use tools, EPA promotes a clear understanding of climate science and adaptation options by translating complex climate projections into accessible formats. This information helps utility owners and operators better prepare their systems for the impacts of climate change.

Extreme weather events, sea level rise, shifting precipitation patterns, and temperature variability, all intensified by climate change, have significant implications for the sustainability of the water sector. By planning for, assessing and adapting to these challenges, the water sector can fulfill its public-health and environmental missions and begin the process of becoming climate ready.

http://water.epa.gov/infrastructure/watersecurity/climate/index.cfm

Climate Resilience Evaluation and Awareness Tool (CREAT)

EPA has developed CREAT, a software tool to assist drinking water and wastewater utility owners and operators in understanding potential climate change threats and in assessing the related risks at their individual utilities. CREAT provides users with access to the most recent national assessment of climate change impacts for use in considering how these changes will impact utility operations and missions. Version 3.0 is now available for download free of charge.

CREAT allows users to evaluate potential impacts of climate change on their utility and to evaluate adaptation options to address these impacts using both traditional risk assessment and scenario-based decision making. CREAT provides libraries of drinking water and wastewater utility assets (e.g., water resources, treatment plants, pump stations) that could be impacted by climate change, possible climate change-related threats (e.g., flooding, drought, water quality), and adaptive measures that can be implemented to reduce the impacts of climate change. The tool guides users through identifying threats based on regional differences in climate change projections and designing adaptation plans based on the types of threats being considered. CREAT provides a series of risk reduction

and cost reports that will allow the user to evaluate various adaptation options as part of long-term planning.

http://water.epa.gov/infrastructure/watersecurity/climate/creat.cfm

Flood Resilience—A Basic Guide for Water and Wastewater Utilities
http://water.epa.gov/infrastructure/watersecurity/emerplan/upload/epa817b14006.pdf

EPA Hazard Mitigation for Natural Disasters

Water and wastewater utilities are vulnerable to a variety of hazards including earthquakes, flooding, drought, tornadoes, and wildfires. Use EPA's new Hazard Mitigation Guide to identify cost-effective projects that will increase your utility's resilience to natural disasters.

https://www.epa.gov/sites/production/files/2016-08/documents/160815-hazardmitigationfornaturaldisasters.pdf

2) Federal Emergency Management Agency
(https://www.fema.gov/)

About FEMA:
https://www.fema.gov/about-agency

FEMA's mission is to support our citizens and first responders to ensure that as a nation we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards.

The Robert T. Stafford Disaster Relief and Emergency Assistance Act gives FEMA the responsibility for coordinating government-wide relief efforts. It is designed to bring an orderly and systemic means of federal natural disaster assistance for state and local governments in carrying out their responsibilities to aid citizens.

Congress's intention was to encourage states and localities to develop comprehensive disaster preparedness plans, prepare for better intergovernmental coordination in the face of a disaster, encourage the use of insurance coverage, and provide federal assistance programs for losses due to a disaster. This Act constitutes the statutory authority for most federal disaster response activities especially as they pertain to FEMA and FEMA programs.

Plan, Prepare and Mitigate
https://www.fema.gov/plan-prepare-mitigate

There are actions that should be taken before, during, and after an event that are unique to each hazard. Identify the hazards that have happened or could happen in your area and plan for the unique actions for each. Local emergency management offices can help identify the hazards in your area and outline the local plans and recommendations for each. Share the hazard-specific information with family members and include pertinent materials in your family disaster plan.

State Emergency Agencies:

- Massachusetts Emergency Management Agency: *http://www.mass.gov/eopss/agencies/mema/*
- Maine Emergency Management Agency: *http://www.maine.gov/mema/*
- Vermont Division of Emergency Management and Homeland Security: *http://vem.vermont.gov/*
- New Hampshire Homeland Security and Emergency Management: *http://www.nh.gov/safety/divisions/hsem/*
- New York State Office of Emergency Management: http://www.dhses.ny.gov/oem/
- Connecticut Department of Emergency Management and Homeland Security: http://www.ct.gov/demhs/site/default.asp
- Rhode Island Emergency Management Agency: http://www.riema.ri.gov/

3) Water/Wastewater Agency Response Network (WARN)

Uncertainty about reimbursement, liability, and worker's compensation frequently discourage utilities from acting quickly when another utility is threatened by a natural or human-caused emergency. Mutual-aid and assistance programs remove those barriers by establishing resource-sharing protocols before disaster strikes. Each of NEIWPCC's member states has such a program.

Connecticut, Maine, Massachusetts, New York, Rhode Island, and Vermont each have a water/wastewater agency response network (WARN), which is an intrastate network of public and private utilities that have signed a mutual aid and assistance agreement. Membership is voluntary, free, and does not obligate members to share resources.

Each WARN program's standard mutual aid and assistance agreement and associate operational plan states that utilities responding to an aid request may seek reimbursement from the requesting utility for all personnel costs, including salaries or hourly wages, costs for fringe benefits, and indirect costs. In addition, a utility that loans equipment may charge a rental rate. The rate must be mutually agreed upon prior to dispatch of the equipment if it deviates from the Federal Emergency Management Agency (FEMA) Schedule of Equipment Rates.

WARN agreements make clear that a responding utility's employees are covered at all times by the worker's compensation policy of their home utility. Moreover, the agreements say that a requesting utility will hold a responding utility harmless and not file any damage claims against it. All of these assurances afford member utilities not only increased freedom to assist other utilities, but also a massive safety net for their own communities.

Members have access to a database of other utilities in the network, including a contact person's name and information, and a list of resources they may be able to share. WARN aid is available without an emergency declaration, so members can request aid even for small scale events.

WARN agreements are designed to be consistent with the interstate Emergency Management Assistance Compact (EMAC) and the National Incident Management System (NIMS). In the case of a federally declared emergency, membership qualifies utilities to receive FEMA reimbursement for eligible expenses.

Finally, New Hampshire also has mutual-aid and assistance network, but instead of utilities, its members are municipalities. Its agreement and operational plan are very similar to WARN agreements and plans. In New Hampshire's network, each member town or city pays an annual fee of $25.

Why Join WARN?

- A mutual-aid agreement and process for sharing emergency resources statewide.
- A mutual-assistance program consistent with other statewide mutual aid and assistance programs and the National Incident Management System.
- The resources to respond and recover more quickly from a natural or human caused disaster.
- A forum for developing and maintaining emergency contacts and relationships.
- There is no cost or commitment to join WARN, and assistance is strictly voluntary.
- Being a member of WARN will make you eligible for FEMA disaster reimbursement in a federally declared disaster.
- Access to a database of utilities and resources.

WARN Resources:

- Water and Wastewater Agency Response Network Background: *http://www.awwa.org/resources-tools/water-knowledge/emergency-preparedness/warn-resources.aspx*
- WARN FAQs: *http://www.awwa.org/Portals/0/files/resources/water%20knowledge/rc%20emergency%20prep/rc%20warn%20resources%20pdf/WARN-FAQ-20100505.pdf*
- Connecticut WARN: *http://www.ctwarn.org/*
- Maine WARN: *http://www.mewarn.org/*
- Massachusetts WARN: *http://www.mawarn.org/*

- New Hampshire WARN: *http://www.t2.unh.edu/ma/*
- New York WARN: *http://www.nywarn.org/*
- Rhode Island WARN: *http://www.riwarn.org/*
- Vermont WARN: *http://www.vtwarn.org/*

4) Hazard Mitigation Planning

Tight budgets frequently deter wastewater utilities from proactively renovating their facilities to withstand destructive natural forces like floods and high winds, but that need not be the case. Hazard Mitigation Grant Program (HMGP) grants from the Federal Emergency Management Agency (FEMA) cover as much as 75% of costs for projects like elevating electrical equipment above 100-year flood levels and re-roofing public works buildings. In order to be eligible to compete for these grants, the local community or county responsible for the wastewater utility must have a hazard mitigation plan (HMP), or be included on one. HMPs document essential services and critical facilities, describe potential hazards (such as hurricanes and nor'easters), and identify feasible projects and policies that will make the assets less vulnerable. In addition, damaged assets that have been listed as vulnerable in an HMP are more-likely to be eligible for FEMA post-disaster aid.

For many utilities, it makes sense to be included in a municipal or multiple-jurisdictional HMP. Municipalities and groups of municipalities often have HMPs that include not only water and wastewater facilities, but also other assets, such as fire stations, hospitals, and evacuation routes.

A good first step for a utility is to contact its state hazard mitigation officer to find out whether there is an existing local or regional HMP, and if so, whether the utility is included in it. If the local community has not created an HMP, or is not part of a regional HMP, a utility can lobby its local emergency management officials to develop one. A utility can join an HMP only during the HMP's original development or when the community (or multi-jurisdictional group) revisits it every five years, as required by FEMA. A utility may choose to develop its own HMP if the next opportunity to be added to a local or regional HMP is years away. A utility can apply for a FEMA grant for help with the cost of developing an HMP.

Once an HMP is in place, the utility can work with the state hazard mitigation officer to apply for free technical assistance with design and engineering work, and for mitigation funding. Regardless of whether a utility joins an HMP or creates its own, the process of hazard mitigation planning has the benefit of prompting a utility to focus on risks and plan facility upgrades.

Importance of Hazard Mitigation Planning

By being included in the state, local, or county hazard mitigation plan your facility will:

- Be eligible for certain funding sources available to implement the mitigation initiatives. These funds would not be available were the plan not in place. Funding sources include the Hazard Mitigation Grant Program for post-disaster projects and FEMA's Pre-Disaster Mitigation Assistance program, which provides limited funds for projects annually. Hazard Mitigation Grant Program (HMGP) funds are made available after every presidentially declared disaster anyplace in the state. The state emergency management office prioritizes the use of the funds.
- Support effective pre- and post-disaster decision-making efforts. Mitigation is directly related to disaster recovery. This plan emphasizes actions to be taken now to reduce or prevent future disaster damages. If the actions identified in these plans are implemented, the damage left in the aftermath of future events will be minimized, thereby easing recovery and reducing the cost of repairs and reconstruction. Additionally, mitigation planning improves the region's ability to implement post-disaster recovery by establishing improved emergency response within and among communities, reducing social, emotional, and economic disruption following a disaster event, reducing damage to public and private facilities, and identifying projects ready for funding.

- Ease the receipt of post-disaster state and federal funding because the list of mitigation initiatives is already identified.
- Reduce vulnerability to disasters by focusing limited financial resources to specifically identified needs.
- Connect hazard-mitigation planning to community planning where possible.
- Enhance and preserve natural-resource systems, thus providing benefits that will be felt regardless of the occurrence of a disaster.
- Provide a framework for addressing climate change, by considering projected climate change impacts on existing hazards in our region under the risk and vulnerability assessment. As better climate-change data become available, such as LiDAR data to better estimate sea-level rise impacts, the MHM Plan's risk and vulnerability assessment is an appropriate place for this information to reside.

Benefits of Hazard Mitigation Planning

States, local and tribal governments benefit from mitigation planning by:

- identifying cost effective actions for risk reduction that are agreed upon by stakeholders and the public
- focusing resources on the greatest risks and vulnerabilities
- building partnerships by involving people, organizations, and businesses
- increasing education and awareness of hazards and risk
- communicating priorities to state and federal officials
- aligning risk reduction with other community objectives

Hazard Mitigation Planning Resources:

- FEMA Multi-Hazard Mitigation Planning: *http://www.fema.gov/multi-hazard-mitigation-planning*
- FEMA Hazard Mitigation Assistance Funding: *https://www.fema.gov/hazard-mitigation-assistance*
- FEMA Hazard Mitigation Planning Resources: *http://www.fema.gov/plan/mitplanning/resources.shtm*
- FEMA Mitigation Planning Overview: *http://www.fema.gov/hazard-mitigation-planning-process*
- Massachusetts Hazard Mitigation Planning Resources: *http://www.mass.gov/eopss/agencies/mema/resources/mitigation/mitigation-planning/*
- Disaster Mitigation Act of 2000: *https://www.fema.gov/media-library/assets/documents/4596*
- FEMA State and Local Mitigation Guide on Getting Started: *http://hazardmitigation.calema.ca.gov/docs/howto1_Getting_Started.pdf*

5) Asset Management Plans

A facility-specific asset-management plan (AMP) helps avoid unexpected failures of worn-out machinery, tools, and structures. An AMP is a long term strategy for maintaining and replacing assets. It may be developed exclusively by utility staff or with help from community members and consultants. With an AMP, a utility can focus time and money on the most critical components and stagger costly replacements over time.

The five steps of a thorough asset management process are as follows:

1) Conduct an asset inventory, assessing the condition and criticality of each asset.
2) Prioritize assets based on remaining life, redundancy, and importance.
3) Develop an annual budget, including funds reserved for upkeep of assets.
4) Implement the AMP.
5) Review and revise the AMP.

Benefits of the AMP process include the following:

- Identifying priority replacements.
- Reducing system down-time and the number of emergency repairs.

- Prolonging useful life of assets.
- Providing time to research cost-effective replacement options.
- Minimizing steep rate increases.
- Showing investors and the public that you are using their money efficiently.

Asset Management Plan Resources:

- U.S. EPA Asset Management Overview: *http://water.epa.gov/infrastructure/sustain/asset_management.cfm*

- U.S. EPA Asset Management Resources: *http://water.epa.gov/infrastructure/sustain/am_resources.cfm*

- Multisector Asset Management Case Studies prepared by U.S. EPA: *http://water.epa.gov/aboutow/owm/upload/2009_05_07_assetmanages_msamcs_final.pdf*

- U.S. EPA Asset Management: A Best Practices Guide: *http://water.epa.gov/type/watersheds/wastewater/upload/guide_smallsystems_assetmanagement_bestpractices.pdf*

- Asset Management: A Guide For Water and Wastewater Systems prepared by Environmental Finance Center New Mexico Tech: *http://www.nmenv.state.nm.us/dwb/assistance/documents/AssetManagementGuide.pdf*

6) Wet Weather Operating Plan

In both combined sewer systems (sewage and stormwater) and separate sanitary sewer systems, the collection and treatment of waste can be severely compromised by heavy precipitation. (Although separate sanitary sewer systems are not designed to carry stormwater, precipitation enters collection systems through infiltration and illicit inflows.) High volumes can not only overwhelm the capacity of pipes and pumps, the increased volume means greater grit and debris in a system, which create additional strains. Pipe bursts, backups, and bypassed treatment are only a few of the many potential resulting problems.

Utilities are strongly encouraged to protect collection systems and treatment works by developing facility-specific wet-weather operating plans that contain detailed procedures to be followed before, during, and after a wet-weather event. In developing these plans, utility staff document vulnerable system components and list actions that will minimize permit violations and major damage.

Ideally, a wet-weather operating plan is written by a team of operation-and-maintenance staff members representing variety of roles. The plan can be a means of transferring knowledge from experienced operators to new and future operators. New data, such as samples of effluent during high flows, and new analyses, such as correlations between influent flow and precipitation, may be needed supplement existing information.

Wet Weather Operating Plan Resources:

- NYSDEC's Wet Weather Operating Practices for POTWs: *http://www.dec.ny.gov/docs/water_pdf/wwtechtran.pdf*

- NYSDEC Wet Weather Training Materials: *http://www.dec.ny.gov/chemical/8713.html*

- Metropolitan Syracuse (Metro) Wastewater Treatment Plant Wet Weather Operating Plan: *http://static.ongov.net/WEP/Metro_WWTP/Metro_WWOP_Approved_Final_04162014.pdf*

- Town of Ticonderoga Wet Weather Operating Plan: *http://www.dec.ny.gov/docs/water_pdf/tiwetweather.pdf*

7) Emergency Response Plans

In an emergency, a facility-specific emergency response plan (ERP) can save time and save lives. An ERP contains maps, detailed emergency protocols, and contact information. It also lists the roles staff will play in various emergency scenarios. For example, facility managers may designate someone to be a stairwell monitor on an evacuation route. Other positions include members of a

medical response team, a person to direct staff to a tornado shelter, and someone to issue warnings over a public address system. An ERP may also list staff appointed protect valuable equipment when severe weather or flooding is forecast.

Facility managers must take time before an emergency to develop an ERP, share it with their staff, and stage practice drills.

Emergency Response Plan Resources:

- Ready Overview: *http://www.ready.gov/business/implementation/emergency*
- Ready ERP Template: *http://www.ready.gov/sites/default/files/documents/files/EmergencyResponsePlan.pdf*
- FEMA Overview: *https://www.fema.gov/media-library/assets/documents/89518*
- Occupational Safety and Health Administration Emergency Preparedness and Response: *https://www.osha.gov/SLTC/emergencypreparedness/index.html*

8) National Incident Management System (NIMS)

Natural disasters often force cooperation between people who have never met. Prepare to collaborate with strangers by learning the common language and common set of protocols that the federal government recommends in the National Incident Management System. NIMS comprises guidelines for every aspect of an emergency response, from classifying resources, to establishing a chain of command, to reporting a situation. All utility staff are encouraged to become familiar with NIMS before a disaster through free online trainings. Utility managers are urged to enroll in advanced, in-person NIMS workshops. Managers also are encouraged to revise standard operating procedures to include as many NIMS components as possible.

Examples of NIMS Components

Planning

- Check that your emergency response plan (ERP) describes specific actions for responding to a major incident. The ERP should be consistent with your municipality's ERP. (See Section 1.x.x.)
- Join a Wastewater Agency Response Network (WARN). (See Section 1.x.x.)
- Practice responding to an emergency by regularly staging practice drills or participating in drills put on by a nearby organization.

Resource

- Classify your utility's resources, including personnel, equipment, supplies, and materials, according to AWWA's Resource Typing Manual.
- Purchase interoperable equipment, such as radios, to communicate with first responders outside of your utility.

Communication

- Use NIMS terminology. For example, the person with overall responsibility for managing the incident is the Incident Commander.
- Use tools that promote a common operating picture, such as Situation Reports (SitRep).

Chain of Command

- Find out whether your area has a multi-agency coordination system based out of a fixed facility (emergency operations center or EOC), and if so find out where it is and how to contact it. The EOC can help coordinate activities above the field level and prioritize demands for competing resources.
- Use the Incident Command System to manage all incidents. (See Section 1.x.x.)

Incident Command System (ICS)

In an incident response, a clear chain of command reduces the potential for duplicated efforts and miscommunications. To rapidly select and form a temporary command hierarchy during an incident response, responders can follow the NIMS Incident Command System protocols. ICS protocols are derived from best management practices that have been tested in emergency and nonemergency situations more than 30 years. They are regularly used by many federal and state agencies, and they are increasingly implemented by municipal governments, businesses, and nongovernmental organizations. To prepare to collaborate with other responders during a large-scale incident, utility staff can become familiar with ICS protocols and practice applying them during small-scale incidents.

To select an Incident Commander, who has overall authority of the response, responders identify the person who is most qualified to be in charge of several core tasks. The core tasks include collecting incident intelligence, determining realistic objectives, supervising operations, and obtaining essential equipment and supplies. If an incident becomes more or less complex, or a more qualified person arrives, command may change.

In a small-scale incident, the Incident Commander may be the only responder with an assigned role. In larger incidents, the Incident Commander delegates authority for certain activities to other responders. He or she will add positions only as needed. For example, the Incident Commander may choose whether or not to create a Planning Unit, and if the Incident Commander creates a Planning Unit, he or she may appoint an individual or multiple people to the unit.

National Incident Management System (NIMS) Resources:

- National Incident Management System FEMA Overview: *https://www.fema.gov/national-incident-management-system*
- Emergency Management Institute NIMS Training: *https://training.fema.gov/IS/NIMS.aspx*
- U.S. EPA Emergency/Incident Planning: *http://water.epa.gov/infrastructure/watersecurity/emerplan/#pp5*
- U.S. EPA "What Does National Incident Management System (NIMS) Compliance Mean for Drinking Water and Wastewater Systems?" *https://www.michigan.gov/documents/deq/deq-wws-wb-NIMS_272924_7.pdf*
- FEMA "NIMS Training Program FAQs" *http://www.fema.gov/emergency/nims/nims_training.shtm*
- U.S. EPA's Water and Wastewater Emergency Response Tabletop Exercises tool at *http://www.epa.gov/safewater/watersecurity/tools/trainingcd/*

9) Emergency Power Facility Assessment Tool (EPFAT)

Utility managers can position their facilities for efficient acquisition of emergency power by assessing a facility's emergency power needs before an incident and entering the specifications in the U.S. Army Corps of Engineers' (USACE) web-based Emergency Power Facility Assessment Tool. EPFAT is a secure repository of facility-specific information such as the type and size of generator that would be needed to provide adequate backup power. Emergency responders and municipal officials can use the tool to view the emergency power profiles of facilities in their jurisdictions. Facilities without electrical specialists on staff may choose to have an electrical contractor conduct the emergency power assessment or arrange for an assessment by their electricity provider, municipal department of public works, or a USACE engineer.

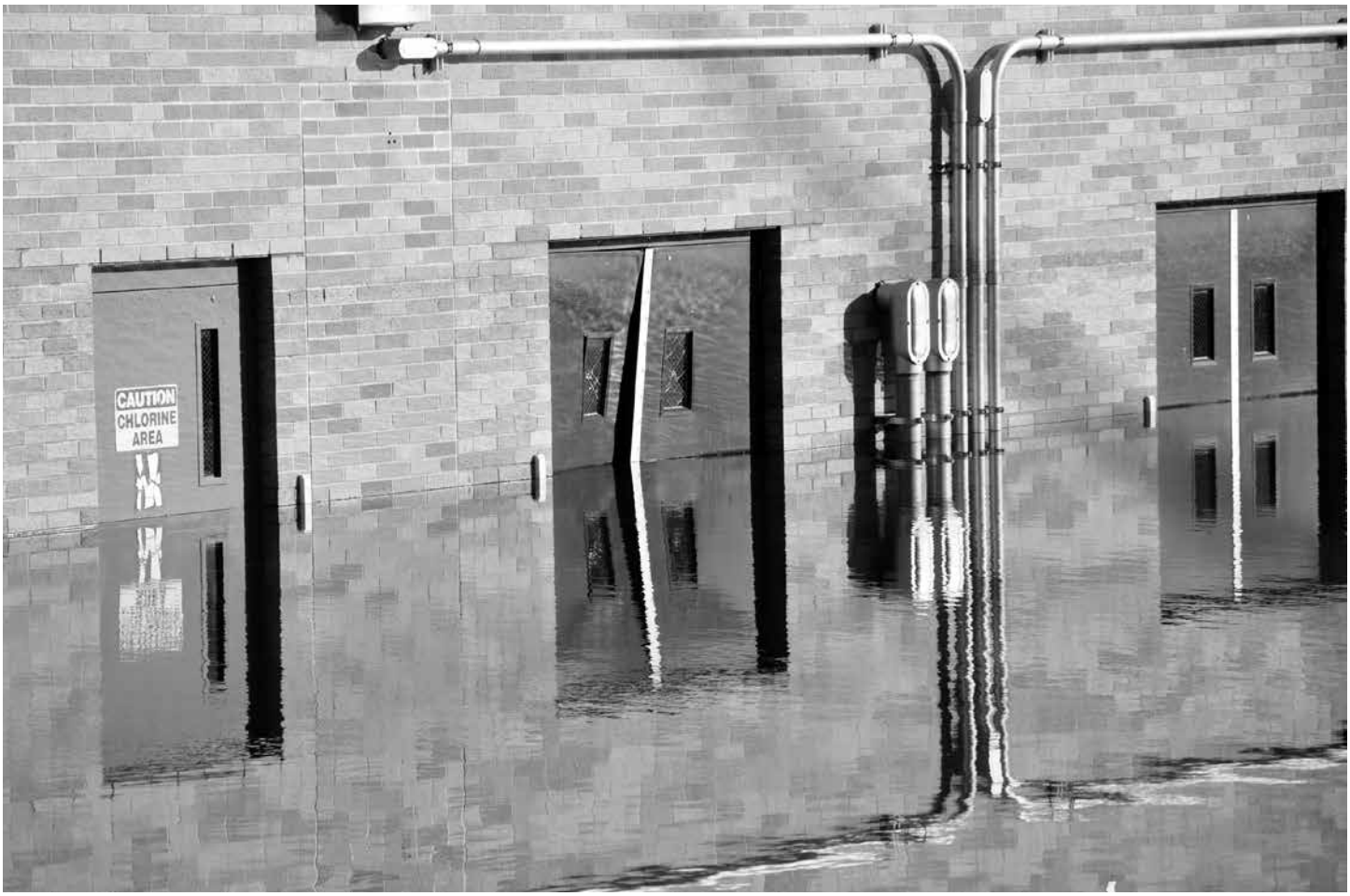
US Army Corps of Engineers Emergency Power Facility Assessment Tool Resources:

- Emergency Power Facility Assessment Tool Website: *https://epfat.swf.usace.army.mil/Welcome.aspx*
- An EPFAT Tutorial Video: *http://youtu.be/kq2CaSSRYV8*
- Overview of the Temporary Power mission: *http://youtu.be/vHCe7_4Nw5Y*

Table of Available Programs

	Join	Develop	Learn, practice	Use before an incident	Use during an emergency	Use to maintain or restore operations
Wastewater Agency Response Network	✔					✔
Hazard Mitigation Plan		✔		✔		
National Incident Management System, including the Incident Command System			✔		✔	✔
Wet Weather Operating Plan		✔		✔		✔
Emergency Response Plan		✔	✔		✔	
Asset Management Plan		✔				✔
US Army Corps of Engineers Emergency Power Facility Assessment Tool	✔				✔	

Joel Burke, former superintendent, Warwick Sewer Authority



Flooded disinfection building, Warwick, R.I.

Designing For Resiliency

NEIWPCC's core wastewater design manual now incorporations planning for extreme weather.

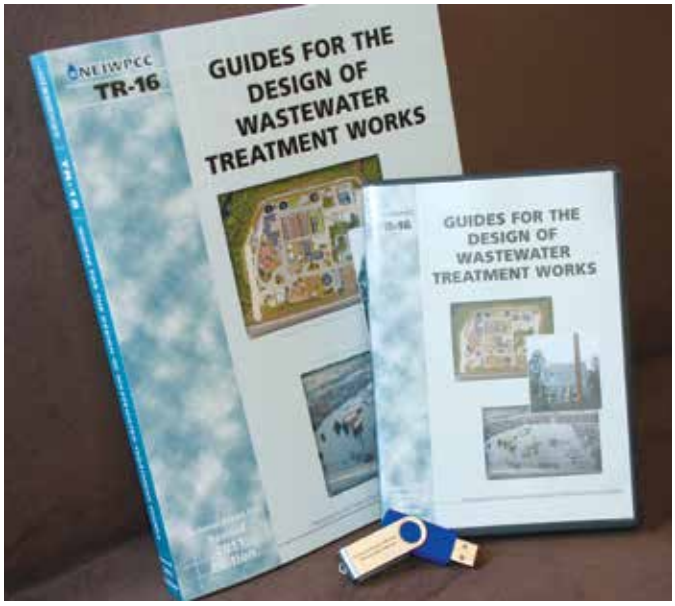
Technical Report (TR) 16, Guides for the Design of Wastewater Treatment Works, now reflects the need for facilities to recover from and operate during flooding, power outages, and other extreme-weather emergencies.

The handbook is revised to define critical equipment and offer guidance on backup-power, on floodelevation and related design considerations, and on levels of protection for new equipment.

It now includes new and revised design considerations and expanded discussions of flooding as an emergency condition and as a factor when siting wastewater-treatment facilities.

The additions were ordered by NEIWPCC's governing Commission in 2014 in the wake of Hurricanes Sandy and Irene and the February, 2013, northeaster storm.

The revisions affect several chapters to the fourth (2011) edition. The scope of the changes is not as comprehensive as in 2011, when NEIWPCC reworked the entire manual. The new version, published last May, is the Revised 2011 Edition.



The revised handbook can be ordered from NEIWPCC for $95 (printed copy); an electronic-only version is $25. Readers who own the original 2011 edition may download "What's New in the New Edition," which includes all new and revised material, at no charge.

To order, or to download "What's New," please visit neiwpcc.org/tr16guides.asp, or call the Commission's Lowell office, (978) 323-7929.

New England Interstate Water
Pollution Control Commission

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