

Dealing with Disasters: An Overview of Impact and Response during the June Floods

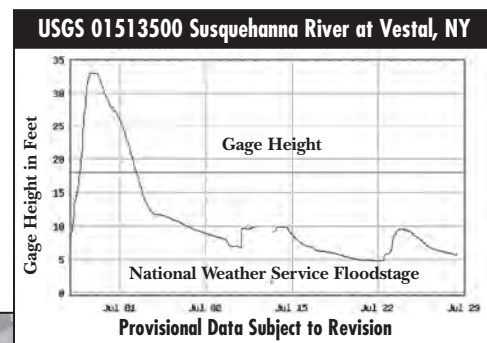
by Sandra Lizlovs

The theme for this issue of *Clearwaters* is “Disaster Preparedness.” With this starting point, the NYWEA’s Publications Committee hopes to provide members some guidance on how to plan for a disaster, what to do during one, as well as what happens afterwards. Thus, this issue contains excerpts from FEMA’s publications, articles on how to prepare your plant for an emergency, as well as some real-life experiences from operators who lived through a major disaster. This article overviews these critical topics using the June 2006 flood event in New York’s southern tier as a backdrop.

Facing a 100-Year Flood Event

Monday, June 26, 2006, started out rather rainy and wet in upstate New York. Many NYWEA members were disappointed that morning when the Central Chapter’s Memorial Scholarship fundraising event, the Gary Gleason Classic golf tournament, was postponed due to rain. No one was expecting a disaster to occur. River levels throughout the area were at summertime low flow levels, with the United States Geological Survey (USGS) stream gage in Vestal, NY indicating that the Susquehanna River was at 4.5 feet of depth and stream flow

was about 7000 cubic feet per second (cfs). The following day, the National Weather Service issued a flood warning for the Susquehanna River in Broome and Tioga counties. Severe flooding was also expected on the Delaware River. By the evening of Wednesday, June 28, the Susquehanna River had crested at a record level of over 33 feet in Vestal, over three feet higher than recorded in 1936 and over 15 feet above flood stage. The stream flow was well over 103,000 cfs. Rainfall amounts varied over the basins, with the Susquehanna Basin receiving up to eight inches of rain during the event, while parts up the Delaware River basin received over 13 inches.



This United States Geological Survey graph shows the Susquehanna River’s peak flood stage of over 30 feet that occurred in late June.



This aerial photo shows the extent of flooding around the Binghamton-Johnson City Joint Sewage Treatment Plant.

Photo courtesy of C&S Companies, Inc.

Impact on Wastewater Treatment

With all of this water, what was the impact on the wastewater treatment plants? Most plants are located at the lowest point in the community to allow for gravity flow. Plants also tend to be near receiving streams. While the NY Department of Environmental Conservation (DEC) requires wastewater treatment facilities to be protected to the 100-year flood, this flood event was far greater than that level. By the time the river crested, several sewage treatment plants had been shut down and were evacuated due to rising waters. Many pump stations were bypassing 100 percent of flows. Some operators had spent the morning of June 28 moving whatever plant equipment and records they could to higher ground, where they hoped they could save them, sometimes climbing stairs as water poured in behind them through electrical conduits. Time was short, with the river rising at a rate of one foot per hour.

By Friday, June 30, plant staff were able to return to their plants to survey damage. In some cases, they returned to find equipment destroyed. In others, basement areas still needed to be pumped out before any damages could be assessed. For safety reasons, some plants disconnected electrical power. Travel in certain locations was difficult as major highways and roads were impassable as a result of flooding or washouts. In some cases, not only were treatment plant facilities affected, but plant staff had also suffered damage to their homes.

The July 4th weekend was celebrated in the southern tier by plant operators trying to dry out and temporarily repair electrical motors and circuits. By July 5, most of the plants were taking wastewater through and providing at least primary treatment – quite a testament to the dedication of plant staff!

In the aftermath, DEC staff met with Federal Emergency Management Agency (FEMA) and State Emergency Management Office (SEMO) representatives, and began working with the various communities. It was quite a learning experience for all involved. All of us learned that documentation of damages, and time and money spent on repairs were key issues.

In the wake of this, what did we learn? What mistakes were made? What things were done well?

Communications: One thing that all of us learned was the necessity for clear communications. While the National Weather Service had issued a flood warning predicting record river levels on Tuesday afternoon, many plant operators were unaware of this. As a result, when they realized the following morning what was coming, attempts to protect plant equipment became chaotic and rushed.

On the positive side, plant staff kept DEC staff well informed of the situation including when they needed to shut down the power supply to the plant and evacuate. Similarly, DEC staff were made aware of the extent of damages and estimated repair timelines after the water receded. This proved to be valuable information. It was also helpful that some DEC Region 7 staff were already in the Binghamton area to patrol the flood control structures, and were able to see firsthand the situation.

Operator Safety: In most cases, plant staff ensured that when they evacuated the building, they could safely re-enter it. However, in one case, the power was left on. At this plant, the control building had three feet of water in it during the height of the flood. When the

Photo by Sandra Lizio, NYSEDEC Region 7



A view of control boxes for Johnson City's combined sewer overflows. In the background is the AES Power Plant in Westover, NY.

operators were able to return, the power was still on creating a potentially dangerous situation.

Operators were also removing equipment in basement areas that were filling with floodwaters. Again, a potentially dangerous situation could have arisen. The lesson learned here: plant staff need to establish ahead of time when they will evacuate and what risks they will take. Plant staff also need to determine what equipment can be removed, and set up a system to easily disconnect these items and lift them to safety.

Another safety issue revolves around the quality of the floodwaters. By their nature, floodwaters sweep away everything in their path. That was certainly true in the June flood when waters raced through rail yards, industries, homes, and elsewhere. Operators need to be cognizant that the water and the leftover sediment may contain bacteria, petroleum, and other contaminants.

Repairs: In many cases, operators baked out motors and restarted them. However, as the circuits and wiring dried, the insulation failed, causing the motor to stop working. Lesson learned here: short term fixes work, however, be prepared to replace a lot more, especially if wiring and controllers are damaged.

On the positive side, operators at one plant had enough spare parts on hand to replace damaged flights, motors, and drives in half of their primary clarifiers. While it took two months to get all of the primaries operational, they were able to re-establish some level of treatment within a few days.

Damaged electrical equipment was not the only problem. Mud, silt and debris removal was another common occurrence at the plants. With clarifiers submerged, anything and everything that could float down the river was trapped in the tanks. One plant removed a 55-gallon drum, a television set and a fuel oil tank from their final clarifier!

Travel: During the flood event, many major highways and roads were submerged. The DEC staff maintaining flood control projects found, in one instance, that they needed to travel over 60 miles out of their way for what would normally be about a 10-mile drive by highway. In other cases, roads were washed out, creating detours. The lesson here: you might not be able to get to your plant or pump station to inspect it. Operators should think about this possibility, and develop an access plan for inspecting plants and pump stations.

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Photo by Sandra Lizlous, NYSDEC Region 7

The flood destroyed the sludge drying beds at the sewage treatment plant in Deposit, NY.

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FEMA/SEMO: After the event, FEMA and SEMO staff began meeting with the DEC and municipalities. All of us had a lot of learning to do as DEC and municipalities learned about FEMA funding programs and how to apply for reimbursement monies, while FEMA and SEMO staff learned about the plants. In this issue, we've reprinted sections of FEMA's publications to help other communities in the future understand what some of the requirements are and what happens post-disaster.

What to Do the Next Time:

- As outlined in Doug Robertson's article, "Critical Incident Preparedness," prepare an emergency response plan that works for your plant. Have a plan in place on what steps you will take to protect plant equipment. Know what steps you will take to protect the health and safety of staff.
- Have a good communications structure. Have phone numbers available. During the event, make sure that you communicate with your employees as well as the regulatory agencies. Make sure your county Emergency Management Office keeps you in the loop.
- For weather related events, keep track of warnings posted by the National Weather Service. In the case of flooding, the NWS posts river forecasts on their web page: find the one that is applicable to your facility and keep track of it.
- Make sure that you have spare parts for repairs and your generator is maintained and operational. Mike Ver Dow's article, "Maintaining Generator Health," has several suggestions.
- Document damages and get a cost estimate for repairs. Keep good logs of time and materials used in the emergency. If you contracted for outside services, keep track of that. Realize that you might get something to run right away, but that it may stop working a few days or weeks later. FEMA will be asking for this information when they meet with you.

Disasters are more than just flood events. Power blackouts, earthquakes, ice and snow storms, and hurricanes can all hit with little or no notice. Keeping up infrastructure is a critical item in these situations. Having a plan in place, and knowing what information you will need after the event goes a long way in dealing with the situation. It is our hope that readers of this issue will take some of the suggestions and apply them to their facilities.

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Photo by Sandra Lizlous, NYSDEC Region 7

The Binghamton-Johnson City Joint Sewage Treatment Plant's primary clarifiers submerged from Susquehanna floodwaters