



Talking Points for Sue McCormick
June 25/26 Rain Event Update New Conference
July 2, 2021

Hello. My name is Sue McCormick, and I am the Chief Executive Officer for the Great Lakes Water Authority.

We are here today so that we can provide an update on GLWA's operational response to the rain event that occurred last week. Also joining me this afternoon are Navid Mehram, our Chief Operating Officer for Wastewater Operating Services and Suzanne Coffey, our Chief Planning Officer.

Before I go into our detailed update, I want to acknowledge the significant impact this rain event has had on the lives of so many throughout our community. And, I want to thank Governor Whitmer, our Congressional Delegation and all of the local officials who have worked so hard to address the serious issues created by this rain event, and for their work to bring FEMA to the table to provide financial assistance to those affected.

I also want to take the opportunity to thank all of the GLWA team members who worked tirelessly throughout this rain event, and throughout the entire year, to maintain our operations.

I am going to go through my remarks in sections in order to make the details as clear as possible. I will start with a brief recap of the rain event and then give some background on critical operational elements of the regional collection system, and then outline our response.

First, background on the rain event

As you all know, on Friday, June 25th and continuing into Saturday, June 26th, southeast Michigan experienced an unprecedented rainfall event, delivering seven to eight inches of rain over a period of less than 19 hours. Not only did we receive a large volume of precipitation, but it also fell in very intense bursts. The highest intensity was a three-hour burst that occurred just before and after midnight.

You should know that GLWA maintains a network of precipitation gauges within the city of Detroit and a review of the gauge data indicated that the rain event was far beyond our design standard.

GLWA is held to a design standard of conveying a "10-year, one-hour storm." That translates to an event that would statistically occur once every 10 years. Many gauges registered rain intensities beyond a 100-year event and three gauges in the city registered a 1000-year event. This translates to an intensity that was statistically predicted to occur one time every 1000 years.

In plainer terms, the flooding was caused by the amount and the intensity of the rain, which was more than typically falls in the month of June, overwhelming the system. It was not caused by any single pumping station or any single element within the regional system. The Conners Creek Pump Station did not fail.

The current system functioned at its capacity in the circumstance we had.

Now some background on the regional system's wastewater pump stations

Wastewater pump stations lift wastewater, and when necessary, excess storm water, to the Water Resource Recovery Facility for processing and treatment. Most of the wastewater collection system is gravity fed, but in low-lying areas, pump stations are necessary to lift wastewater to higher elevations to then flow by gravity to downstream infrastructure.

There are 5 sewage pump stations in the regional wastewater collection system and 4 within Detroit's local system. GLWA operates all 9 of these pump stations.

Despite widespread flooding throughout southeast Michigan, specific attention has been focused on the Conners Creek and Freud Pump Stations. In large wet weather events these two pump stations work together to convey flow from Detroit's eastside, Grosse Pointe Park, Grosse Pointe Farms, Grosse Pointe and the Southeast Macomb Sanitary District.

That is where I will focus my operational update, first talking about Freud and then Conners Creek.

FREUD

The Freud Pump Station consists of a pump house, wet well, and transformer enclosure area. All wastewater flow to the Freud Pump Station is combined sanitary sewage. However, through the complex sewer network that is operated for the East Side Wastewater Collection System, the Freud pump station provides redundancy through overflow structures for the Conners Creek Pump Station. During normal dry weather flow, the facility is in standby.

During wet weather, six 3,000 Hp stormwater pumps (290 MGD each) discharge combined wastewater to the Conner Creek CSO.

CONNERS CREEK

The Conners Creek Pump Station is required because the elevation of the system's relief sewers is too low to allow the sewage to continue to flow by gravity for treatment. During normal dry weather flow, wastewater is discharged to the Detroit River Interceptor (DRI).

During wet weather, the wastewater is discharged to the Conner Creek CSO. This pump station consists of a sanitary pump house, stormwater pump house, switch house, and backwater gates.

During normal dry weather flow, wastewater is discharged from the Conners Creek Pump Station by four sanitary pumps (two 71 MGD pumps, one 48 MGD pump, and one 38 MGD pump) to the DRI. During wet weather, six stormwater pumps with horsepower (Hp) ranging from 2,225 to 2,300 Hp (318 MGD each) discharge combined wastewater to the Conner Creek CSO. These stormwater pumps are in addition to the four sanitary pumps.

Operations During the Rain Event

I will now move onto operations during the rain event, beginning with operations at the Freud Pump Station.

Moving into the technical details, I will reference levels of the wastewater in the pump stations. Know that 100 feet elevation is approximately ground level at these pump stations. For example, when I say 64 feet that is 36 feet below the ground. As flow from the Rain Event began to enter the Freud Pump Station, one pump was placed in service online, at approximately 4:54 p.m. on Friday, when the wet well level reached 64 feet. It should be noted that 64 feet is the minimum level required to start a pump.

At 5:07 p.m., GLWA's Systems Control Center attempted to start a second pump; however, it experienced several trips as the start attempt was being made. Systems Control was able to successfully energize the second pump after several attempts while maintaining wet well levels at approximately 64 feet.

By 7:52 p.m., the flows in the wet well receded to 40 feet and the Pump Station returned to standby status. Shortly thereafter, the wet well began to rise to above 64 feet, which triggered a pump start. Systems Control successfully energized one pump by 9:20 p.m., and the second pump by 9:25 p.m. The two pumps were able to sustain the wet well levels at approximately 70 feet. This is 30 feet below ground level.

Systems Control, anticipating increased flows, attempted to start a third pump. The third pump failed to start and on one occasion de-energized the first and second pumps for 2 minutes.

The brief de-energization did not impact the wet well levels. Systems Control was able to energize the third pump by 2:21 a.m. Although the Pump Station had 6 pumps available for operation, it was limited to operating 3 pumps. I'll get more into this operational challenge shortly.

The Freud Pump Station recently underwent control upgrades that allow the facility to be started remotely from the Systems Control Center. This upgrade, which came out of observations learned from the July 2016 rain event, allows us to place pumps online as quickly as possible.

However, it is standard practice for Systems Control Operators to place pumps online 3 to 4 minutes apart to avoid power interruptions during startup because the power demand for these pumps is so high.

For some perspective, the 2,225-2,300 HP motors on the pumps are equivalent to powering approximately 1,430 homes.

Freud Pump Station Operational Challenges

The Freud Pump Station experienced two operational challenges during this Rain Event. The first challenge was the electrical trips on starting the third pump. The cause of the trips is unknown, but it will be investigated. Given the wet well levels, the system would have been providing normal service.

The second challenge was the power supply was interrupted. On Friday at 6:52 a.m., GLWA was informed by its service provider that the Ludden Substation, which feeds power into the pump station, was damaged and out of service. At the time of notification, our service provider indicated it was working to correct the issue, but the issue was not resolved before the Rain Event.

By way of background, the Freud Pump Station's electrical configuration is divided into three transformers and each transformer can carry a load for 3 pumps. One transformer is serviced by the Porter Substation and the other 2 transformers are serviced by the Ludden Substation. Although, the Pump Station has emergency generators on-site, it is configured to provide redundancy to the Porter Substation feed only. It should be noted that generator power can support only 2 pumps. Running three pumps on the external feed was the maximum capacity available and that was achieved and sustained.

I'll move onto operations at the Conners Creek Pump Station.

As the flow from the Rain Event began to enter the Conners Creek Pump Station, the levels in the wet well, which indicate the levels in the system, increased very rapidly. The system rose 9 feet in less than 25 minutes.

Additionally, the station has a complex vacuum priming system that takes approximately 5-6 minutes to start each pump and the wet well must reach 68 feet prior to starting the first pump. Systems Control, in coordination with the Conner Creek CSO Basin team, started the first pump at 12:36 a.m. Saturday after levels exceeded 68 feet, and a second pump at 12:44 a.m.

Shortly thereafter the Pump Station lost "house power" (building lights, access gates, control system, etc.).

An electrician assigned to the Conners Creek Pump Station during the storm had assisted on site at Freud and was returned to Conners when this occurred. Upon arrival, the electrician confirmed that the first and second pumps were operational, and the circuit breaker was reset for the house power. After the breaker reset, the third pump went online at 1:41 a.m., the fourth pump at 1:44 a.m. and the fifth pump at 1:53 a.m. Systems Control attempted to bring the sixth pump online; but multiple faults were experienced. Concerned with disrupting the five running pumps, Systems Controls stopped after three attempts.

As with the Freud Pump Station, the Conners Creek Pump Station faced operational challenges, but I want to reiterate that it did not fail.

The Conners Creek Pump Station experienced a house power outage from a leaking vacuum priming pump that sprayed water on the circuit breaker within the Pump Station.

Again, this did not impact the power to the first and second pumps. However, it delayed the start of the remaining pumps.

Additionally, as I previously indicated, Systems Control attempted to start the sixth pump however it failed to start after 3 attempts.

Over the last several years GLWA has been evaluating options for improvements of both Freud and Conners. We have invested more than \$10M in design, construction and improvements to these stations in recent years.

Most importantly, we have initiated design and begun property acquisition for a significant upgrade to both stations. The large upgrade project concept was evaluated in collaboration with our Member Partners. Specifically, Detroit and Wayne County technical representatives were deeply involved in developing the concept and working through a value engineering phase of the project. The design of the Freud upgrades will be complete this year and we expect to be out for bid for construction next year. As for Conners, we are still in design working through some options but have determined that we will build entirely new sanitary and storm pumping stations. The cost estimate for the improvements to both pump stations is \$250M and we anticipate it taking us another 8 years to complete construction.

Because the project is currently in the design phase we can and will use our observations from this rain event and its impact on the pump stations to reassess the proposed design and consider potential performance enhancements.

Staffing of the Pump Stations

There have been some questions raised about the level at staffing at these two pumps stations. I want to address that.

The Conners Creek Pump Station was staffed. In anticipation of the 1-1.5 inches of rain predicted, one operator, one electrician and one maintenance technician were detailed. This staffing level was based on the predicted weather conditions, which we now understand were several inches off from the actual rainfall totals.

The Freud Pump Station is operated remotely.

Given the close proximity between the two pump stations, the Conners Creek Pump Station on-site team members can address an operational issue at the Freud Pump Station. This occurred during the Rain Event.

When Systems Control detected a pump trip at the Freud Pump Station, the Conners Creek Pump Station electrician was dispatched to the Freud Pump Station. It took the electrician 3 minutes to get from the Conners Creek Pump Station to Freud Pump Station.

Upon notification of the house power outage at the Conners Creek Pump Station, it took 15 minutes to return to the Conners Creek Pump Station due to street flooding.

Next Steps

As a technical organization, GLWA relies on hard data. What I have described above are our initial observations and do not represent exact cause and effect. For this, GLWA will conduct a thorough internal investigation, as we do after any major event.

And, given the magnitude of this event and the public's interest regarding its impact, GLWA has recommended to its Board of Directors that it consider retaining an independent engineering expert to examine the system's performance and GLWA's response. We believe that having the Board use an independent expert will help to ensure public faith in the transparency of the process and ultimately, its result.

Additional Considerations

Having provided you with an operational update, I wanted to address a few final points.

First, infrastructure across this country is in need of major upgrades overall, but within that process we must look at our options to be resilient in the face of these weather pattern changes.

I believe we cannot lose sight of the long view, which is the fact that climate change is having a significant impact on the increased number and intensity of major storms which are overwhelming our current infrastructure, as well as that of cities across the country. As a regional authority, we have the unique ability to pivot our attention to look at both short-term demands like we have seen this week, but also how do we best prepare for the long-term.

We've seen the emphasis at the local, regional and national level. In southeast Michigan, we need to continue to work together, across county lines, as one water system, to address the most urgent needs to protect public health and property.