

The Flood of '06:

Operator's Firsthand Account of "Sludge Puppy Blues"

by Tom Schofield

The Village of Endicott is a small town in the southern tier of New York. The wastewater treatment plant's (WWTP) capacity is approximately seven-to-10 mgd (million gallons per day). That is during normal flow and, as we know, the flows were not normal at the end of June 2006.

When it started to rain on Tuesday, June 27, our flows increased dramatically because we have an "infiltration and inflow" problem just like every other plant in the world. When the rain didn't stop coming down, we knew this was going to be a problem like we had never seen before.

Having worked at the Endicott Wastewater Treatment Plant for over 21 years and being the chief operator for the last five, I have never seen the water come up so quickly before this. Our receiving stream is the Susquehanna River, and its flood stage is 18 feet. It is not uncommon for the river levels to reach 20 to 25 feet. In fact, it is quite manageable at those levels.

Wednesday: The Second Day

By the second day of the heavy rainfall, every raw wastewater pump we own was running at full speed and not able to keep up with the flow. Everyone at the plant was trying to remain calm despite the impending sense of doom that we all felt. I may have even detected some nervousness in the voice of my Department of Environmental Conservation (DEC) regional water engineer. After some strategic flow diversions (we don't use the "B" word), it seemed as if we might

be able to handle the excessive flow. However, as you know by now, it did not end there.

I need to preface this next statement by telling you that I have 12 of the best wastewater plant employees in the business. A funny thing happens to seasoned wastewater plant employees when they are looking at such an uncontrollable flow. No matter what procedures are written down, no matter how many times one has trained for such situations, no matter the experience or knowledge has been gained in the many decades of dealing with high flow, all of that stuff you said you would do in this situation goes right out the window and you act on gut feelings. If my "poop camp" (operator's certification course) instructor from Morrisville had been here, he would have sung, "The Sludge Puppy Blues." It was no less than unsettling.

Meanwhile, back at the plant the water was still coming up. The river was rising at an alarming rate. The most disturbing sight of all was water starting to overtake the road leading to the plant. We were literally becoming an island. It was time to stop thinking about what to do and start acting very fast.

We started pulling motors that were in buildings below grade. We decided to start pulling the motors in reverse order – starting at the compost facility and working our way back to the dewatering process into the digester building and so forth. We did get a chance to pull most of the motors that weren't connected to big gearboxes and get them to high ground. The next thing we needed to do was move as much equipment as we could to high ground. It looked like a tiny

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Photo by Tom Schofield

The Endicott plant's second clarifier threatened by rising water

Photo by Tom Schofield

Portable trash pump brought out to be used to thwart flood waters

Inundated road leading to Endicott's WWTP during the June 2006 flood

Photo by Sandra Lizans, NYSDEC Region 7

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municipal parade with front-end loaders, pickup trucks, skid steers, forklifts, and wet employees.

At this point, I took a can of spray paint from the shop and painted the proverbial “line of death” next to our power transformers. I told myself once the water hit that line we would call the Endicott Municipal Light Department and have them unhook us from the pole. In the meantime, my staff and I were putting together worst-case scenarios. We came up with a problem with the back-up power generator that could power the plant under normal load. We thought we might need it when the water went down. The fill cap to that generator is only about two feet off the ground. We decided to silicone all of the lower lying fill caps to the gasoline, diesel and heating oil tanks to prevent contamination from floodwater.

Feeling somewhat confident now, I’m thinking we may have a little time, so I went and checked my “line of death.” We had what looked to be about 20 feet to go before the water hit the line, so I thought I had time for a cup of coffee. Remember, I am a civil servant and we run on coffee, but a funny thing happened to me on my way to the break room. As I was making my way through the main control floor, I heard rushing water. I can’t describe the feeling in the pit of my stomach as I saw water rushing out of the bottom of our live 480-volt power panels on the main floor. After running through all of those worst-case scenarios, I had forgotten about the power and signal lines running underground throughout the plant. The entire conduit was full of water and draining to the main panels as well as filling up the dry well. I knew at this point that it was time to cut the power and evacuate the plant.



The visitor parking fence as seen from the plant building as waters rise dramatically



Plant personnel evacuated after safeguarding equipment and turning the power off.

Photos by Tom Schofield

After a panicked call to our municipal light department asking them to come down and unhook us from the pole, my head mechanic cut the main breaker to the plant cutting power to all equipment. “Wow,” I thought, “we were dead in the water, and there was nothing we could do about it!” I don’t know about you, but we’ve never had to evacuate the treatment plant before. What do you save as you’re standing in your office with a plastic bag: your computer, payroll records, your DMRs (discharge monitoring reports) or the picture of the family and the dog?

As I was standing on the only dry spot left in the plant waiting for the front-end loader to pick me up and get me to high ground, I was trying to assess the damage to the equipment and come up with a plan to get the plant back on line within a reasonable time. I couldn’t come up with anything that made any sense at that time. All I could do was meet with the staff, do a head count, and send them home. I went to the municipal building to report our situation to the mayor. Pumps, motors, variable speed drive units – it was almost too much to wrap my head around. That was Wednesday.

Thursday: The Third Day

Thursday was a different story. The water was still so far up the road we could not enter the plant. That’s when my regional DEC water engineer showed up to see the damage. This may sound like I’m sucking up to the DEC and, well, maybe I am, but I have to take this opportunity to thank those at the DEC for their good suggestions and a level of understanding that was truly appreciated.

Curiosity got the best of me and I did something that I know I should not have. I put on my neoprene chest waders and opened the gate to check out the plant. The water on the grounds of the plant was about hip deep and I was very mindful of manhole covers that may have come off. By the way, anyone who knows me knows that I can’t fit down a manhole, but I sure could have hurt myself if I stepped into one. By the time I reached the main building of the plant, it was quite apparent that we had a huge job ahead of us. It was mud, mud, mud, all over the place. As I stepped into my office, I started killing tadpoles swimming around on my carpet. I think what I noticed the most was the smell and, if this is what a 21-year veteran of wastewater notices, it must have been bad.

The main control floor was probably the most disturbing sight. The main pump motors and the variable speed drives were still under water. The papers floating and the furniture, and that smell; I found the rest of the buildings to be in similar condition. I thought to myself, this is insurmountable; it’s going to take us months to recover from this. The only thing I can do at this stage of the game is to walk out and lock the gate behind me, go home, call the DEC to inform them of the situation, and try to come up with a plan for Friday.

Friday: The Fourth Day

Now on Friday morning, we have a full crew in a flooded plant. What to do first? Every building that has a pump well or anything below grade was flooded to the top of the steps. The first thing we needed to do was pump all the water out. Apparently, sump pumps don’t work well with no power and under water. We had to use portable trash pumps and anything else we could get our hands on.

As we started the pumping, we had the municipal light department come down and evaluate the transformers to possibly gain limited power, such as lights and receptacles. That meant taking the covers off of every receptacle, draining water from all the conduits and hoping nothing would pop as we turned limited power back on.

Fortunately for us, the utility people cleaned up our transformers and switchgear to the point where they felt it could be powered back up. It was time to try to regain minimal power. Now I’m a pump and bacteria guy, not an electrician. My colleagues got quite a kick out of watching me turn things on with my head turned around, hoping not to get shocked enough for my hair to stand on end. As the process of trying to power things back up begins, it must be done slowly and thoughtfully.

I was starting to feel a little overwhelmed with the amount of decisions I had to make rather quickly. Should I try to turn these main

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pump motors on, should I try to test them out, or should I just pull them and have them cleaned and baked? That was just the motors. We still had cleanup and a mountain of FEMA paperwork looming in the next couple of weeks. (I wished I were on vacation – not too far away, North Carolina maybe, on the beach with a frozen margarita.) One of the best suggestions I received from the DEC was to call an engineer to help with the preliminary damage estimates. Again, anyone who knows me knows what I think about engineers, but this was actually a good idea. Let them handle the paperwork and the legwork of cost estimates for replacement or repair while you can concentrate on equipment and getting things back on line.

Post Flood Thoughts

Here are just a few things that I learned the hard way through this event.

- Submersible pumps are not always submersible.
- Sometimes meteorologists are correct.
- Have a written plan and stick to it in case of disaster.
- Acquire, exercise and maintain portable equipment such as trash pumps and hoses.
- Don't think it's never going to happen here.

After a couple of days of pumping and fiddling with electrical components, we had lights and most of the receptacles back on line. We had also reinstalled the motors that we had pulled before the flood-water overtook the plant. Once we got some equipment in working order, it seemed as if I'd gone back in time to when I started at the plant over 21 years ago. There were no variable speed drives, soft starts, or SCADA systems back then and they were all damaged now.

Earlier, I told you about the plant's 12 guys being some of the best wastewater treatment people in the business, and this is where they proved that fact to me. Some of them had flooded basements at home or some other family members needing them to help, but I had a hard

time keeping them out of the plant because of their dedication. Some of them worked 18 hours shifts until we could resume treating the normal flow. Let's just say I'm very proud of them. As politicians from the local to the state level drove through the plant, my people kept their noses down and kept working without being distracted.

As things started to dry up, we started turning things back on, such as sump pumps, blowers, and sludge pumps. A few of these pumps popped as we turn them on. Our rule was, grease and oil everything then bump the pump to see if it moves freely. If it sounded too rough, we would pull it, ship it out or replace it to minimize damage to the equipment. This tends to be a slow process and sometimes you end up damaging pumps that probably could have been repaired but you're working against the clock and need to get back within compliance. You keep telling yourself FEMA will be reimbursing you, but the funny thing is, FEMA is not there pulling the pumps or working on them, that's all up to you.

Exactly one week and two hours after we had evacuated the Endicott wastewater treatment plant, we were back to treating 100 percent of the flow. We still have a lot of things rigged up and not working to specifications, but we're treating all of the flow. Once in a while something will pop such as a sump pump or hydraulic unit and we just put that on the FEMA list. A couple of our outlying pump stations needed substantial work, but we had rigged them to handle the flow in the meantime. A couple of the guys have started calling me "Les Nessman," because I have no walls in my office, but that will be repaired soon.

Thankfully, no one was hurt during this disaster and the equipment can always be replaced. We will be more prepared next time – God willing, and the creeks don't rise! (No pun intended.)

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Nearby Town of Union's Frey Avenue pump station under water

Photo by Sandra Litous, NYSDEC Region 7