

TAPPED OUT

The dirty water secret: What you don't know can hurt you

Wallace McKelvey wmckelvey@pennlive.com

In Pittsburgh, a 2-by-4 is an essential part of the water workers' tool kit because they risk electrocution each time they work on the city's century-old pump stations.

The mains beneath Harrisburg are so corroded that storm water and human waste in some parts of the city come into contact with the soil.

Residents of Stockton No. 8, a coal-mining village outside Hazleton, found a deer carcass in the reservoir that fed them untreated drinking water. It wasn't clear how long it floated there.

Budget cuts gutted the state Department of Environmental Protection, the agency responsible for ensuring safe drinking water for some 10 million residents. Private wells, which supply water to another 3.5 million, go unregulated.

That's only half the story.

Many water systems themselves function under what one operator called a "fix as fail mentality" — in other words a perpetual state of triage, responding to one crisis after another.

For decades, the public took clean, plentiful drinking water for granted as the utilities allowed infrastructure to disintegrate. In some cases, local politicians and private operators purposefully cut corners. In others, mounting debt and unfunded liabilities overwhelm smaller or lower-income communities.

"You get the water you can afford," said Marc Edwards, the Virginia Tech engineering professor who helped blow the whistle on the water crisis in Flint, Michigan. "If your town can't afford good water, that's your tough luck."

The dirty secret in many cash-strapped communities, according to Edwards, is that residents believe their water is safe when it is not.

The vast majority of Pennsylvania's 8,500 public water systems, like Stockton No. 8, serve fewer than 3,300 customers. Those systems seldom have the expertise or financial wherewithal to shoulder the cost of upgrading their infrastructure or connecting to a larger system.

The most recent EPA assessment showed that Pennsylvania's drinking water systems would need \$16.8 billion in infrastructure upgrades over the next 20 years. That figure doesn't include billions more for sewer systems and to replace pipes and water mains made of toxic lead.

The bill has only started to come due.

Harrisburg and Steelton are just two examples.

The municipalities are connected in myriad ways, right down to their water.

The two systems are linked by proximity. Harrisburg releases its treated (and, sometimes, untreated) wastewater into the Susquehanna River. Steelton sources its drinking water from the middle of the Susquehanna, although utility officials insist the two streams don't mingle.

Each also faces significant infrastructure challenges. For Harrisburg, it's a combined sewer system in which storm runoff and waste flushed down the toilet go to the treatment plant through the same pipes. For Steelton, it's a water system plagued in recent years by inadequate treatment, data tampering and a succession of boil water advisories.

Combined sewer systems like Harrisburg's are fairly common, many of them holdovers from an era when planners were ignorant of the consequences. According to the EPA, they can be found in 213 cities with populations greater than 50,000. That's nearly a third of all such cities nationwide.

During dry weather, combined systems function adequately. When it rains, however, treatment plants can quickly be overwhelmed by a surge of water carrying debris. Workers at Harrisburg's treatment plant, for example, routinely remove soda cans that block screens and impede the flow of water.

When systems are overwhelmed, wastewater may flow untreated into nearby waterways or back up in sewer mains and residential basements.

It can also create havoc for downstream drinking water systems that rely on surface water sources like the Susquehanna, forcing them to adjust their treatment for increased levels of bacteria, nitrates and other harmful contaminants.

Capital Region Water, which took over Harrisburg's water systems in 2013 from the financially distressed city, is planning \$315 million in improvements over the next two decades to comply with a consent decree handed down by the EPA. The sheer magnitude of the problem and the fiscal reality on the ground mean that much of the sewer system will remain combined. Much of the money spent, which will lead to increased water and sewer bills for ratepayers, will go toward fixing aging infrastructure and diverting storm runoff via curbside vegetation and rain gardens.

Utility spokesman Andrew Bliss said nearly half of the system's underground sewers must be replaced.

"In order to fix these water quality issues," he said, "we first must have a system that's functioning well."

Dave Stewart, the utility's engineering director, said fully separating storm runoff from waste water would have cost roughly \$1.2 billion. That simply isn't feasible, he said, given the costs that would need to be shouldered by ratepayers. According to U.S. Census data, nearly a third of all Harrisburg residents live at or below the poverty line.

In preparation for what the utility calls its City Beautiful plan, made public earlier this year, the utility worked to create an inventory of its infrastructure, sending cameras down into the sewers and cleaning out decades worth of silt and debris, including bumpers and car axles.

When Capital Region Water took over the system, it had no such inventory. Like many older systems, it was essentially flying blind when it came to understanding the water infrastructure beneath Harrisburg. Today, it has a detailed GIS map.

In some areas, Stewart said, utility workers found sewers that were so severely degraded that the steel reinforcement was exposed. That left the pipes at increased risk of structural failure. Parts of the Paxton intercept, for example, had no bottom whatsoever.

"Once you've got a hole that's been created over a period of years," he said, "with water flowing through, it tends to get bigger."

A sewer with no bottom is a major problem because it means that wastewater is leaching into the soil and will reach the water table, the same groundwater used as a source of drinking water. (Capital Region Water's primary source is the DeHart Reservoir in northern Dauphin County, although it does use the Susquehanna as an emergency source.)

Repairing the Paxton Intercept, which was completed in 1904, will cost \$8.7 million and is expected to be completed by the end of this year. The larger plan would roll out over the next two decades if approved by the EPA. The additional infrastructure costs represent more than 2 percent of residents' current income.

In neighboring Steelton, the DEP found that the treatment plant failed to adequately treat for giardia, a parasite that can cause diarrhea and other ailments, as well as elevated levels of trihalomethanes, byproducts of chlorine treatment linked to increased cancer risk.

The plant's former chief operator, Daniel P. Scheitrum, received a year of probation and paid \$4,460 in fines for charges of tampering with public records and willful neglect of safe drinking water regulations. A DEP inspection found that a sensor at the plant didn't jibe with submitted treatment reports.



"You get the water you can afford. If your town can't afford good water, that's your tough luck."

Marc Edwards, the Virginia Tech engineering professor who helped blow the whistle on the water crisis in Flint, Michigan.



Steelton also paid a \$55,200 fine after entering into a consent decree with state regulators.

The plant received a \$2.7 million loan through the Pennsylvania Infrastructure Investment Authority (PennVEST) to build a 260,000-gallon tank that will ensure water drawn from the river is properly treated with chlorine after being disinfected for other impurities.

In essence, the new tank slows down the process, avoiding a buildup of harmful disinfectant byproducts.

Steelton's infrastructure woes are much smaller than Harrisburg's, in relative terms, but so is the base of ratepayers they can spread costs across. And more than a quarter of its roughly 6,000 residents live at or below the poverty line.

Borough Manager Doug Brown said the system has an operating budget of \$2.5 million and a roughly \$1.5 million fund balance.

That's enough to weather most financial troubles but the debt service for past infrastructure improvements is about \$9 million. That's a difficult debt load for a small water system to shoulder.

"Even when you're operating at 100 percent," Brown said, "if you don't make capital upgrades, that puts a lot of pressure on you."

A recent engineering report only brought more bad news. The system will face several double-digit rate increases in order to offset debt and a looming \$14 million upgrade to its treatment plant, built in 1973, that will be necessary within a decade.

And that report didn't account for the possibility of a further downturn or outright closure at the ArcelorMittal steel mill, which Brown said accounts for roughly two-thirds of the system's water usage.

Last year, Brown said the plant the plant fixed a number of leaks in its system. That improved efficiency for them but it resulted in the loss of \$400,000 worth of billable water for the borough system.

The resulting deficit led Steelton to put off other infrastructure projects and to spend \$250,000 from its reserves.

"It's a perfect storm," Brown said.

Earlier this year, the borough sought bids from private companies interested in taking over the system. Three large private operators responded with offers the Borough Council will consider this summer.

Mark Handley, the plant's chief operator since March 2014, said he's trying to rebuild Steelton residents' trust in their water supply.

Handley said he can only offer his promise to assure the mistakes of the past don't happen again. But any problem with the borough's water would impact his own family, who lives in the borough and drinks tap water.

"I know that it'll get found out at one point," he said. "I'm not going to jeopardize my life or my career because a number didn't look right to me."

But, for many Steelton residents, the damage has already been done.

Many residents report improved water quality in the last year but they still don't trust the system. Bottled water and Brita pitchers are a part of life for people like Joyce Culppepper, a 64-year-old local school board member who lives with her daughter and granddaughter.

Around the time of Steelton's violations, Culppepper found yellow gunk in her pitcher filter. Now she changes her filter every month, like clockwork, even though the instructions call for it once every three.

And the possibility of a private takeover won't set her mind at ease.

"We have no guarantee they're going to run it better," she said. "This is the plight of America. It gets too costly for this community even though, if I'm getting good water, I don't mind paying for it."