

City Eyes Big Water Project

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HARRISONBURG — When Thomas Harrison founded Harrisonburg in the late 1700s, residents had no problem getting fresh water from the springhouse at Court Square, fed by a tributary of the Shenandoah River.

Fast-forward 300 years, and city staff are working to tap the Shenandoah again and ensure a ready supply of fresh water is as easily available as it was in Harrison's days.

And that not only requires some planning, but also the properly timed investment of millions of dollars to build facilities just when they are needed.

Old Site, New Capability

Mike Collins, Harrisonburg's director of public utilities, asked City Council in January for approval to speed up work on a project to take raw water from the South Fork of the Shenandoah River.

The Power Dam Road pump station sits about 11 miles east of the city, near Lynnwood, on the site of an old hydroelectric dam that used to generate power for the city.

He said much of the original station was wiped out by Hurricane Hazel in 1954, but the concrete structure remained, creating a safety hazard for canoers on the river and pedestrians walking the grounds.

"[The old structure] just laid in the river until six or seven years ago when we built the intake there," he said. "We retrofitted it into this pump station and turned a liability into an asset."

Water from the South Fork is channeled to a collection pool at the intake station by two 24-inch waterlines. The pool has a few small outlets, sending some water into a side stream that flows back into the river.

Collins said the city has invested nearly \$12 million into the South Fork project, which began when water demand was high in the early 2000s.

However, when water demand began to slow, so did the project.

Collins said the project, when complete, will consist of nearly 90,000 feet of pipe. Much of the line will run through farms, along existing roads, he said.

When complete, the project will be able to pump up to 8 million gallons of water through the system per day. The treatment plant can process up to 15 mgd, but the city's current water sources can only draw a maximum of 10 mgd.

Permit Problems

But Harrisonburg has a problem moving forward: The Virginia Department of Environmental Quality wants to reduce the amount of water the city can take from the river, which could put extra strain on the water system.

The city's permit to draw water from the South Fork is up for renewal by DEQ this year.

"Right now, in the dry months, we're dependent on reserves at Switzer Dam not running out," Collins said. "I'm not sure that's a hand we want to keep playing."

According to Scott Kudlas, DEQ water program director, one reason the department is reviewing what the city takes is that it didn't withdraw any water under the current permit.

"It's not uncommon for permits that haven't been used to withdraw water to be reviewed and potentially reduced," Kudlas said.

"A potential new user has just as much right to the river as the old users," he said. "We're trying to balance that and make sure everyone gets what they need."

Not including the South Fork, which is not yet online, Harrisonburg has three other raw water sources: the Dry River and Switzer Dam, the North River, and Silver Lake in Dayton.

Dry River / Switzer Dam

According to the plan, most of the city's raw water comes from the pump station on the Dry River in Rawley Springs, west of the city. The Dry River station can pull in up to 4 million gallons a day.

Collins said the Dry River source, which provides the best-quality water, is prone to near-complete drying out during drought conditions.

"We have seasonal limits on the intake at the Dry River," he said. "The water from there goes away unless we can release some reserve water from Switzer Dam."

The Switzer Dam reservoir sits about five miles upstream of the Dry River intake. Switzer was designed as a flood-control dam, but the city added drinking-water controls in the 1970s, according to water-management plan documents.

The water in the Switzer Dam reserves, Collins said, can last from 90 to 130 days during a drought. The city, however, does not have a contingency plan in place if it runs dry.

North River

The city's pumping station on the North River in Bridgewater can pull up to 7.6 million gallons of raw water into the treatment system per day.

But environmental concerns, Collins said, prevent the city from taking the full amount.

"We were never required or forced to but we only take about 5.5 million gallons from that river," he said. "There has been a lot of environmental stress on that source over the years."

While the Dry River system is gravity-fed, and getting the water to the treatment plant requires no energy, drawing water from the North River requires a substantial amount of power.

According to the management plan, the Bridgewater pump station accounted for 63 percent of the total water system electricity usage in fiscal 2014.

Silver Lake

Harrisonburg also owns and has "first rights" access to Silver Lake in Dayton, but it can only draw water from the lake with temporary pumps because the permanent pump station is considered unsalvageable.

Collins said the small yield from the lake doesn't justify the amount of work it takes to get the water to Harrisonburg's plant.

According to the town of Dayton, Silver Lake is its primary water source, something of which Collins said the city tries to be conscientious.

Silver Lake is listed in the report as the city's emergency water source.

South Fork Project

The project to draw water from the city's potential fourth water source, the South Fork, is far from complete.

The raw water report describes the water from the South Fork as of lower quality than the water from either the Dry or North rivers, requiring more and different treatment at the plant.

Another concern is the amount of energy required to pull water from the river.

The intake site sits near Lynnwood, in the river's lower watershed. Collins said that led his department to build a second pump station on Goods Mill Road, halfway between the Power Dam Road station and Harrisonburg.

The water must be pumped about 500 feet higher than the river to get it to the treatment plant, he said.

"If you try to do that with one pump, the pressure would be way too high," Collins said.

The intake also is downstream of the Harrisonburg-Rockingham Regional Sewer Authority in Mount Crawford, which pumps treated and purified water into the river.

Collins said that's one of the issues he had with the DEQ's recommendation to reduce the city's water intake from that river.

"I don't think [the DEQ] realizes that for every 10 gallons of water we take out, 7 gallons gets pumped back in from the plant," he said.

"There's actually more water in the river between the sewer authority and the intake site because of that."

Kudlas, however, said the DEQ did take that into consideration when making its recommendation.

"When the permit application was originally submitted, all of the intakes and outputs were considered, including the sewer authority," he said.

Collins said he will look at negotiating the reissuance of the permit, with conditions more favorable to the city, something Kudlas says the agency is open to.

"When we first received this permit, the recommendations were in line with our long-term plan, but in this draft, they aren't," Collins said. "I'm not saying we can't get there, but we're going to have to work on it."

He also wants Harrisonburg to create a more concrete timeline for completion of the South Fork project, which would increase the amount of water available.

While the city hasn't run out of water in the last 20 years, Collins said it has come close a number of times.

He said Harrisonburg's water needs peaked in the early 2000s and the supply ran low more than once. That trend quickly reversed and demand flattened, which he said was due to a loss in large industrial water users.

Since then, while the city's population has increased, water usage actually went down. Collins attributed that to the loss of large industrial plants, which were replaced by less-thirsty residential and commercial users.

Now, Collins said, it's trending back up as Harrisonburg population has exceeded 50,000 residents and continues to grow. In five to 10 years, he said, demand will rise again to the level of the early 2000s peak.

"We want to have this project in place and cemented and know we have it if we need it," he said. "I think the South Fork is really the city's ultimate long-term solution."

Kudlas said the DEQ is always aware of the water needs of each locality, and would make sure that no one gets left without water.

"While everyone might not get exactly what they want," he said, "we try to make sure everyone gets what they need."

Harrisonburg Councilman Abe Shearer said he supports completing the South Fork project to ensure the city has enough water well into the future.

"This is possibly the greatest decision [City Council] will make for some time," Shearer said. "I think by taking action now and securing this water source, we'll be well taken care of into the future, and possibly forever."

However, Collins said, another big hurdle blocks the project's completion.

According to a memorandum sent to city staff, the completion of the South Fork project would require an additional \$21 million in funding, on top of the \$12 million already invested. The memo states that water rates could increase by as much as 53 cents per 1,000 gallons, or up to 20 percent, to help pay off the project.

Collins said there's recent precedent for an increase in rates of that size. After the sewer authority's North River Wastewater Treatment Facility completed a mandated \$90 million environmental upgrade five years ago, authority members' sewer rates went up by 40 percent in some cases.

"The question becomes, 'Do we wait until we have an increase in water sales so we can fund it under the current structure?' Because if we do that, there will be less to distribute among our existing customers," he said. "If we wait, we risk higher interest rates and continuing to depend on Switzer, or we could raise water rates."

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• Caption: Charley Dove (foreground), superintendent of the city's water treatment plant, and Dennis McGuffin, a water plant operator, walk by the intake pool Friday at the raw water infrastructure on Power Dam Road after taking samples of the South Fork of the Shenandoah River. Plans call for the raw water to be moved to Harrisonburg using two pumping stations, one at Goods Mill and one at Power Dam, because there is a 500-foot elevation gain to get to the treatment plant. (Photo by Nikki Fox)

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