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Groundwater drain a big-dollar dilemma

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Thirsty? The Virginia Peninsula may be headed that way

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Some of the water that tens of thousands of people in Hampton Roads drink is 40,000 years old — and it is running low.

Coping with that is going to cost hundreds of millions of dollars.

And it could set the stage for some intense political battles over water and money — with the first rumblings already sounding in James City and Isle of Wight counties.

The trigger was a move by the obscure state office that monitors groundwater — basically, the rain that soaks deep into the Earth — to begin cutting the amounts that the region's biggest water users can pull from their wells.

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Virginia averages more than 40 inches of rain a year, but only somewhere between 1/10th of an inch to one inch soaks into a huge wedge of sand that supplies all of the water for 21,000 homes and businesses in James City City. That same sediment is where everyone in Smithfield, Franklin and West Point gets their water, and is a major source for Gloucester County. It supplies thousands of private wells in the region. And it is what the rest of the Peninsula relies on in case of drought.

"If you are thinking about 100 million gallons per day coming out of the aquifer and about a tenth of an inch coming in every year, it doesn't balance out," said Scott Kudlas, director of the state Department of Environmental Quality's office of water supply.

Groundwater levels in some parts of eastern Virginia have dropped 200 feet or more over the past century. If they fall much farther — the critical point is a layer of clay that lies about 300 feet below the Peninsula — parts of the Potomac aquifer that feed wells in the region could start running dry.

And it's not really a question of "if."

"It's a question of when," said Kurt Stephenson, a water resources specialist at Virginia Tech.

That's why DEQ wants to cut big users' permits, some of them by huge amounts. The proposal for James City's water utility, for instance, would cut the draw from its wells to an amount far below what county residents and businesses use now.

That means the county has to find water — something on the order of 1.5 million gallons a day now and more in the future — somewhere else.

That's where the big money and the big politics come in.

Politics ... and money

For James City County, the choices are pretty much to buy from Newport News Waterworks and spend the tens of millions of dollars necessary to build pipes and pumps to connect with the waterworks system, or find river water to tap, treat and pipe into the county.

Either way, the county is talking about a \$120 million bill that comes due in about five years.

That's the money.

The politics could come in as the county nails down rights to water.

One path might be to draw water from either the Chickahominy or York rivers. But that could open the door to arguments about water rights that Newport News already has to the Chickahominy. It also raises concerns about the effect on sport fishing — concerns that so far have killed the notion of letting the region's biggest single groundwater user, the West Point paper mill, tap water from the Pamunkey just upstream from where it flows into the York.

Another path could be to renegotiate a 2008 agreement under which the county has paid Newport News Waterworks \$25 million for the right to buy water and would have to pay another \$25 million in 2019 to continue to have that right — a right to buy water at a price nearly 50 percent more than the county's groundwater now costs.

That's not easy politically, since a hefty chunk of the waterworks' revenue goes into Newport News' own coffers. The \$87 million-a-year waterworks operation, which serves Hampton, Poquoson, much of York and parts of southern James City County in addition to the city, is scheduled to pay \$12.4 million into the city's general fund this fiscal year.

"We don't do that," said James City Supervisor Jim Kennedy. "That is a way for them to fund their city. For us to be one of their customers, it's awfully difficult for me to say to James City taxpayers, 'We want for you to pay Newport News' bills.'"

South of the James

Water has been a political sore point south of the James River, too.

The \$2.75 million that Isle of Wight County will have spent by the end of this fiscal year under a 40-year contract with Norfolk that has yet to deliver a single drop of water has angered many county residents, especially after the county raised real estate taxes and water and sewer fees in large part to cover the cost of the deal.

The squabble between the Isle of Wight Board of Supervisors and Smithfield's Town Council over who will supply water to the pricey Gatling Pointe subdivision puts at stake nearly a quarter of the town's water revenue — more than \$260,000 a year.

"Losing that revenue would hurt," Smithfield Vice Mayor Andrew Gregory said. "But I understand. Everybody's got to look out for their constituents."

For the county, which now buys town water and resells it to Gatling Pointe residents, a new pipeline means it can tap a less expensive source of water, opening the possibility of a bigger markup and more revenue.

Smithfield, like James City County, is completely dependent on groundwater. It invested \$5 million in a new water treatment plant in 2010, not long after Isle of Wight signed the Norfolk deal — or after the county quoted a price for supplying its surplus water to the town that was 90 percent higher than the town's own charge to its customers.

Smithfield was one of the first water systems to see its permit cut by the DEQ, a move that reduced the amount it is allowed to draw from 1.8 million gallons a day to 1.27 million.

That's well above the 850,000 gallons a day Smithfield now uses, but depending on how fast the town grows and whether its recent successes in cutting residents' average water use stick, it could face a squeeze in a couple of decades. If the town bounces back up to using the water the way it did a decade ago, that squeeze could come as early as 2020, a consultant's report to the DEQ says.

"We know there's going to come a time where we will have to purchase a good part of the water we use. Groundwater isn't going to last forever, we get that," Gregory said. "But to say, 'Well after you've invested \$5 million, you can't use your groundwater' — that'd be a tough pill to swallow."

The deepest cuts

DEQ isn't saying exactly that to Smithfield, but it has told James City County that it may cut the county's permit to between 3.8 million and 4 million gallons a day, which is below current consumption of 5.6 million.

When losses from treatment are considered, a cut that deep means the James City supply of drinkable water could be as low as 3 million to 3.2 million gallons a day, County Administrator Bryan Hill said.

He figures the county needs to nail down a secure source for 12 million gallons a day to cover its needs through the end of the century.

Whether that will come in part from Newport News Waterworks, the biggest water utility on the Peninsula, or entirely from facilities the county itself would build is where the hard bargaining will come — and Hill isn't saying which way he is leaning.

How much of James City's future water needs Newport News Waterworks can cover is another issue.

The Newport News utility gets almost all its water from five reservoirs that drain the creeks and streams from 80 square miles and hold nearly 13.5 billion gallons, as well as from the Chickahominy River. An average of 180 million gallons a day flow down the Chickahominy.

But it also invested \$16 million in a plant that can treat 7 million gallons of groundwater a day, basically a backstop in case of drought. Waterworks now processes about 1.5 million gallons a day of groundwater, mostly to keep the plant in readiness, since idling and restarting it is costlier than keeping it chugging along.

"We have plenty of water," director Kofi Boateng said.

But a study prepared for DEQ by Virginia Tech's Stephenson and the consulting firm Abt Associates says cutting the DEQ permit that currently allows Waterworks to tap 3.4 million gallons of groundwater a day could make it hard for the utility to meet future demand, including its commitments to James City County and the city of Williamsburg.

Based on per capita water consumption since 2008 and projections of population growth in its territory, the waterworks would have to supply 47 million to 49.7 million gallons of water a day by 2040.

That could mean a challenge, the Stephenson/Abt study suggests. Taking its estimates for the waterworks' ability to deliver treated water, and adjusting for the cut in the waterworks' groundwater permit means the utility would be able to deliver less than 49 million gallons a day.

The study also assumes that the sharp drop in consumption that began during the Great Recession will continue. Going back to pre-recession water use could leave the waterworks unable to meet its 6 million-gallon-a-day commitment to James City and Williamsburg as early as 2030, the study says.

"You always want to have some extra — what if a computer chip maker or somebody else that uses a lot of water wants to come?" Stephenson said. "Industrial use is the real wild card."

The paper mill

DEQ is also telling the region's biggest groundwater user, WestRock Co.'s West Point mill, to expect a big cut in its permit.

The mill uses 20 million gallons a day, almost four times the amount that James City County uses. That heavy draw on the aquifer, plus a similarly large draw formerly made by the old International Paper mill in Franklin, have created miles-wide, 200-plus-foot-deep, cone-shaped valleys in water levels.

DEQ has proposed cutting the mill's permit to between 9 million and 10 million gallons a day.

Would that threaten the viability of a plant that employs more than 500 people?

Nina Butler, WestRock's chief sustainability officer, said the mill is a critically important asset to the giant packaging firm.

Thanks to the company's efforts to conserve and recycle water, it already uses less water per ton than most paper mills, Butler said, and its continuing efforts should mean more reductions.

She said she's confident that working with DEQ and a new Eastern Virginia Groundwater Management Advisory Committee will result in the right mix of a permitted groundwater draw and use of alternative sources of water to meet the plant's needs.

Alternatives?

Alternatives to groundwater aren't just the rivers that James City's Hill is eyeing or the reservoirs that Newport News Waterworks locked up by 1978 when it set up its newest one, at Little Creek, located in a in a steep valley in northern James City County.

One key could be conservation. In addition to the West Point paper mill's efforts, Anheuser Busch cut its use from 5 million gallons a day to 2 million, which had a major effect on reducing the total amount of water Newport News Waterworks treats and delivers.

The Hampton Roads Sanitation District has been studying a project to treat the region's wastewater so that it meets drinking water health standards, then pumping it back into the ground, general manager Ted Henifin said.

There's more research to do, but the work the district and its consultants have done so far show that recycling could reverse the drop in water levels and ensure that the aquifer doesn't start an irreversible decline, he said.

Henifin estimates the cost at \$1 billion for the wastewater treatment facilities and injection wells required, and a running cost in the \$20 million to \$40 million a year range. The benefits, he said, would be felt across eastern Virginia.

Going that way, and deciding who pays, would involve a different kind of politics. The actors include the district, a group that serves the region with a board appointed by the governor, as well as the localities it serves and the Environmental Protection Agency.

To make the idea work, people who aren't already customers of the sanitary district might have to pay some of the cost, Henifin notes.

If the district can convince the EPA that recycling wastewater is worth doing sooner rather than later — which would reduce the flow of pollutants into the Chesapeake Bay and help address the regional problem of land subsidence — it could give the sanitary district and the localities it serves some breathing room to meet tough federal regulations on stormwater runoff and sewer overflows.

Proposals to recycle water in order to ease demand on limited drinking-water supplies usually focus on using treated wastewater for irrigation or industrial processes. But Virginia is a leader in reusing wastewater: The Upper Occuquan Service Authority has a three-decade-plus track record of treating wastewater so that it is safe enough to put back into the Occuquan Reservoir, which provides drinking water to Fairfax County.

"Supply is not so much the issue as storage. You can store water in the aquifer or you can store it in a reservoir," Stephenson said. "But you have to store it somewhere."

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