
LOUDOUN WATER LETS GOOSE CREEK RUN DRY

April 14, 2016

By the Hon. John P. Flannery, II, Special Counsel,
Director, Loudoun Soil and Water Conservation District

I. EXECUTIVE SUMMARY

The Loudoun County Soil and Water Conservation District Board passed a resolution, appointing the undersigned as Special Counsel, to inquire into whether Loudoun Water had failed to pump water into the Goose Creek Reservoir and whether, because of that failure, Goose Creek ran dry; otherwise, the assignment was to suggest what recommendations, if any, might cure this failure going forward.

Having conducted interviews, reviewed various relevant documents and materials, attended several meetings, and having visited the site at the two relevant reservoirs (Beaverdam and Goose Creek), there is no question that Loudoun Water let Goose Creek run dry late last summer of 2015 and into September (as exhibited in the following photograph). (This photograph is a view perpendicular across the creek where the concrete dam is fully exposed).



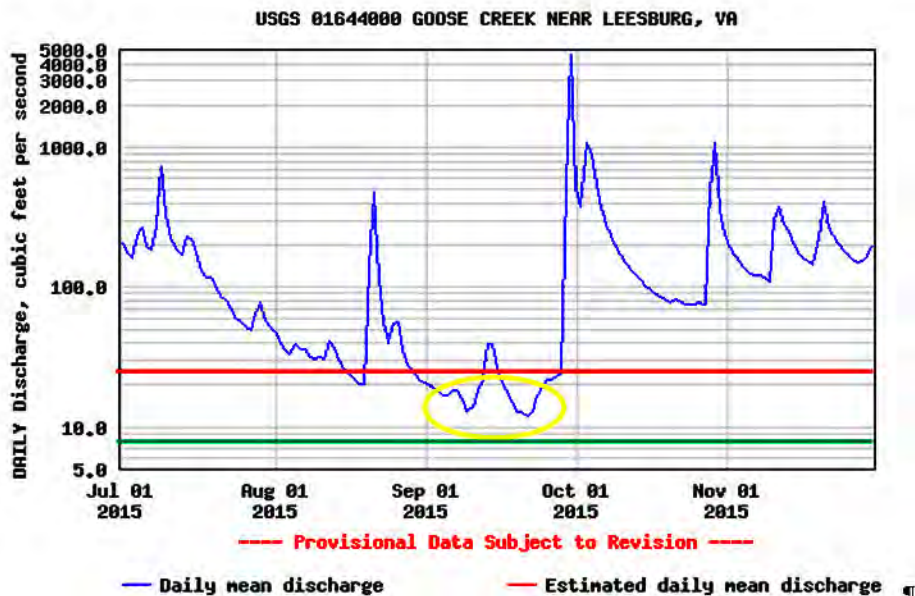
Goose Creek Reservoir – dry last summer and into September 2015.

More precisely, based on observations and existing measuring methods, we can say that, on September 9th and again on September 27th, no water passed over the Goose Creek dam downstream.

The Green line on the chart below is “average” 5.1 MGD (8 cubic feet per second or cfs)) pumped to the Goose Creek drinking water plant.

The Red line is the estimated active pumping (25 cfs when dam overflow ceases).

Normally Beaverdam Reservoir control valves are opened in late summer to augment low flow conditions in Goose Creek, however, the procedure which the City of Fairfax followed for decades was not followed. No water was released from the Beaverdam Reservoir to avoid this failed condition, that is, the Goose Creek running dry.



This begs the question how Loudoun Water let this happen and what steps we may recommend to avoid it from happening again.

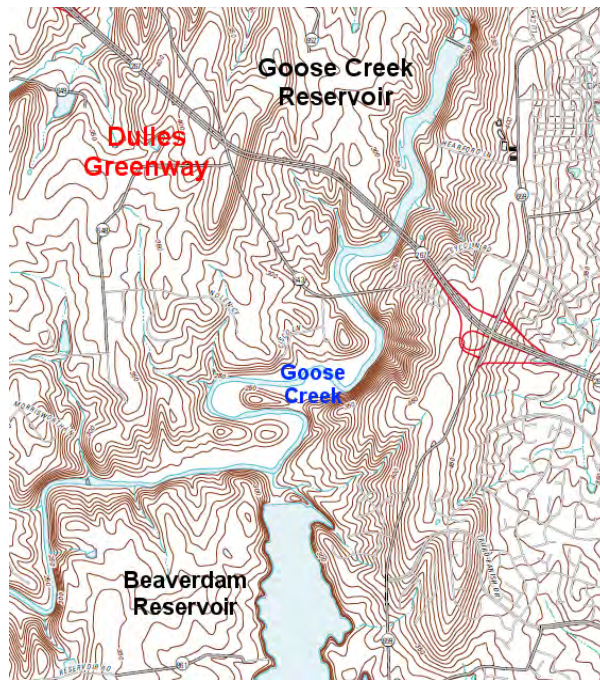
The most obvious recommendations have to do with modifying practices that appear to have caused this condition, and by requiring that certain standards be met as follows:

1. Operate the Beaverdam Reservoir as it was operated in the past (when operated by the City of Fairfax), namely, to release water from the Beaverdam Reservoir in late Summer and Fall so that Goose Creek does not run dry again.
2. Moderate the Goose Creek Reservoir’s pumping so that it is a more steady withdrawal rate from Goose Creek to avoid the “tidal” impact within the Goose Creek Reservoir;

more precisely, this means that because Loudoun Water switched from a 24 hour pumping to a 12 hour pumping cycle, this change in method, to the shorter shift, caused a sloshing “tide” of several feet.

3. Require Loudoun Water to obtain a withdrawal permit (VWP) from DEQ,¹ or require that Loudoun Water comply with the standards requisite for a withdrawal permit, specifically by developing minimum flow-by through controlled releases from Beaverdam Reservoir.
4. Forward this Report to the Loudoun County Board of Supervisors as the overseers of Loudoun Water, who have the authority to require these or other recommendations as they may deem fit and necessary, with a recommendation to the Board of Supervisors that this Report and the other recommendations contained herein be first referred by the Board to a Committee with the expertise to inform the Board’s discretion, and, in this regard, we recommend a referral to the County’s appointed Water Resources Technical Advisory Committee (WRTAC), to confirm, supplement or amend these findings and recommendations.

II. DISCUSSION



¹ VA DEQ requires a discharge permit if average daily withdrawal during any single month exceeds 10,000 gallons per day. 9 VAC25-200-30. However, Beaverdam Reservoir insists that the permitting requirements do not apply to them, as they were “grand-fathered;” and thus our recommendation that the Beaverdam Reservoir be required to comply with those DEQ standards nevertheless – presuming there is any basis for the distinction that they insist applies to Beaverdam.

A. OVERVIEW OF THE RESERVOIRS AND DAMS.

Goose Creek Reservoir is an in-line dam on Goose Creek. It has no flow controls.

Water should always be flowing over the top of the 500 foot spillway under “normal” and during “flood” conditions as pictured below.



Goose Creek Dam – water flowing

The only reason for water not to flow over the dam is when Loudoun Water pumps water from Goose Creek Reservoir at a rate that is greater than the upstream flow rate in Goose Creek.

This is what happened in the late summer and September of 2015; as we have already mentioned; the water did not flow over the dam.

To prevent this from happening, Beaverdam Reservoir (an offline dam on Beaverdam Creek) was constructed and its gate valves should be opened partially in late summer to add to the normal low flow in Goose Creek.

But that didn't happen, the valves didn't open, and so Goose Creek went dry.

Beaverdam Reservoir levels are controlled by the release valve in the northwest corner of the reservoir.



The release valve (left of center and a close up)

In the spring when Goose Creek flows are high, a portion of the streamflow is pumped from Goose Creek into Beaverdam Reservoir to “top it off”.

Below is the diesel powered pump sitting in the floodplain which replaced the old defunct electric pump that the City of Fairfax installed.



The diesel pump (at a distance and the original that was replaced)

Loudoun Water has continued a practice of withdrawing more water out of Goose Creek than is flowing down the river in low-flow situations.

It is unfortunate to say that there have been efforts in the past to remedy this directly with Loudoun Water and the Goose Creek Scenic River Advisory Committee (a state appointed committee).

But there was an interlocking relationship as the Executive Director for the Advisory Committee was also the Executive Vice President at Loudoun Water.

B. HISTORICAL REVIEW

Looking back over the history of these dams, there was a 20-ft high dam built in 1961 on Goose Creek and that creates what is referred to as the Goose Creek Reservoir.²

The Goose Creek Reservoir was designed to store 325 million gallons, but siltation soon reduced its capacity.

At the same time, customer demand - and the need for the City of Fairfax to have a greater water supply - was projected to climb as the number of customers increased.

After the mid-1960's drought, the City decided to expand its water supply by building a second reservoir. Unfortunately, there was not a second stream nearby with a steady flow that could fill a reservoir reliably.

Beaverdam Creek Reservoir was completed in 1972, adding 1,340,000 million gallons of raw water storage. Since the watershed of Beaverdam Creek was only 6 square miles, Fairfax City included the capability to pump excess water from Goose Creek (with a drainage area of 347 square miles) to fill the new reservoir during times when Goose Creek streamflow exceeded 215 cubic feet/second.

² The Town of Fairfax was created in 1800. Residents initially dug individual wells to provide water for their personal use. In 1931, the town created a public water system using groundwater. A well drilled to 305 feet provided 60 gallons per minute to a single water tower located on Judicial Drive. A network of pipes distributed water by gravity to houses and 42 fire hydrants. By 2013, the city relied upon three water towers to supply nearly 12,000 customers and 500 fire hydrants. Tanks holding 4 million gallons each had been built near George Mason University at University Drive and Patriot Circle, and adjacent to Lyndhurst Drive. A smaller tank holding 0.9 million gallons was located near William Place. In 1956, the Town of Fairfax (which became an independent city in 1961) decided to augment its 12 wells supplying the municipal system. It built a pipeline to connect with the City of Falls Church system, ensuring access to Potomac River water supplied by the US Army Corps of Engineers. It also decided to dam Goose Creek and build a 22-mile pipeline along the Washington and Old Dominion Railroad to Hunter Mill Road, and then via Route 123/Route 50 into the city. City of Fairfax dammed Goose Creek and Beaverdam Creek in Loudoun County to establish the city's water supply. Source: US Geological Survey (USGS), [Leesburg 7.5 x7.5 topographic map](#) (2011). Loudoun County supervisors and the "Keep the Goose Creek for Loudoun Committee" opposed the Goose Creek project as a water grab that would limit future development in the county. However, the water-short Town of Leesburg signed a contract to purchase water from the Town of Fairfax. After the Virginia Supreme Court ruled that Loudoun County zoning could not block construction, the county supervisors settled their lawsuits and the system went into operation in 1961.

The Beaverdam Reservoir was planned to provide a one-time supplement to the water supply for at least 120 days (assuming a drought equal to the record in 1930-31); the new reservoir was not expected to re-fill during a drought.

The Beaverdam Reservoir is upstream of the intake and was built to be the backup water supply when the Goose Creek River got low.

Up until last year, the Beaverdam Reservoir was always released to keep Goose Creek flowing in low flow situations during drought years and during the annual low flow period in August through September.

First and foremost, this is an issue specific to Loudoun Water.

The City of Fairfax operated the two reservoirs for more than 50 years with the basic rule of making sure there was always "some" water going over the Goose Creek dam for the river below.

That changed last year when the new owner/operator, Loudoun Water, encountered their first dry season.

On information and belief, and as a result of conversations with principals who observed this first hand, Loudoun Water was informed last year before the low flow occurred.

But the cautionary instruction was ignored.

Fairfax City had used a 24-hour shift so they withdrew water at a lower rate, but over a longer period than Loudoun Water, which had switched to a 12-hour shift.

The end result was that Loudoun Water, when it changed to a 12-hour shift, was withdrawing more water over a shorter period of time and the intake was taking out more water than Goose Creek could supply.

While Fairfax City was very conscientious about making sure Goose Creek remained a healthy waterway, Loudoun Water had the river below the dam becoming almost tidal in nature with big swings (measured in feet).

The precise difficulty is that Beaverdam Reservoir wasn't being released to keep the river flowing. Loudoun Water has reportedly said that they could legally cut off the water from Goose Creek. We will discuss the significance of Goose Creek below.

But that is why the past conduct is more alarming. Loudoun Water, it appears, may believe they have license to run the Creek dry.

Loudoun Water insists that Beaverdam Reservoir is a storage supply of drinking water, not as a back-up water supply to augment the flow of Goose Creek.

Beaverdam Reservoir was drawn down for repairs on the release-tower gates late in late 2014 and early 2015 and was pumped back to full via large pumps from Goose Creek as shown previously.

Normally, any summer draw down is replenished naturally without supplemental pumping.

The drought years in the late 90's may have had to have some supplemental pumping from Goose Creek to refill, but it is not normal.

It does not make sense that Loudoun Water put in place a big permanent pump below Beaverdam for refilling purposes when they aren't releasing Beaverdam in the first place.

There is no question that the development in the area has created pressure on Loudoun Water, as reflected by the drawdown when Loudoun Water conducted its repairs on the Beaverdam Reservoir.

But that is only another constraint to be navigated, not a rationale for compromising an historic scenic river.

C. GOOSE CREEK IS AN HISTORIC SCENIC RIVER

Section 10.1-411 of the Virginia Code designates the Goose Creek as a “State Scenic River.”

The River is described in the designation “from bank to bank in Fauquier and Loudoun Counties from the confluence of the North and South Prongs of Goose Creek approximately 0.22 mile downstream of the crossing of the Appalachian Trail in Fauquier County to its junction with the Potomac River in Loudoun County, a distance of approximately 48 river miles...”

The statute also states that “[n]o new dam or other structure or enlargement of an existing dam or other structure that impedes the natural flow of Goose Creek shall be constructed, operated or maintained within the section of Goose Creek designated as a Scenic River by this legislation unless specifically authorized by an act of the General Assembly (underscoring supplied).”

The statute further explains what is mean by the words “dam or other structure,” and it is “any structure extending from bank to bank of Goose Creek that will interfere with the normal movement of waterborne traffic, interfere with the normal movement of fish or wildlife, or raise the water level on the upstream side of the structure or lower the water level on the downstream side of the structure.”³

It is an inferential “hop” to conclude that stopping water flowing downstream affects the “normal movement” of “fish or wildlife.”

³ That said, the statute also says that this provision does not “preclude the continued use, operation, and maintenance of the existing Fairfax City water impoundment, or the installation of new water intake facilities in the existing reservoir located within the designated section of Goose Creek.”

We have serious concerns therefore about violations of the Scenic River Act and several other provisions that appear to be violations as well:

1. Apparent violation of Scenic River Act

First, it may fairly be said that the withdrawal of water at Goose Creek Reservoir to serve the Goose Creek Water Treatment plant is another “structure” that plainly impedes the natural flow of Goose Creek under conditions where water is not concurrently being discharged from Beaverdam Reservoir.

On the face of the statute, this may fairly be understood to mean that Loudoun Water, operating both facilities, appears to be violating the Virginia Scenic River Act.

2. Apparent failure to acquire permits for water withdrawal

Second, Loudoun Water may very well also be operating two pump stations without the proper VWP Permit. See - <http://www.deq.virginia.gov/Programs/Water/WetlandsStreams.aspx>

This would constitute a violation of the VA Code. See - <http://law.lis.virginia.gov/vacode/title62.1/chapter24/section62.1-248/>.⁴

⁴ The Code reads as follows: *Any permit issued by the Board shall include a flow requirement appropriate for the protection of beneficial instream uses. In determining the level of flow in need of protection, the Board shall consider, among other things, recreational and aesthetic factors and the potential for substantial and long-term adverse impact on fish and wildlife found in that particular surface water management area. Should this determination indicate a need to restrict water withdrawal, the Board shall consider, among other things, the availability of alternative water supplies, the feasibility of water storage or other mitigation measures, and the socioeconomic impacts of such restrictions on the potentially affected water users and on the citizens of the Commonwealth in general.*

In its permit decision, the Board shall attempt to balance offstream and instream water uses so that the welfare of the citizens of the Commonwealth is maximized without imposing unreasonable burdens on any individual water user or water-using group. The decision to implement this balance may consist of approval of withdrawal without restriction, approval subject to conditions designed to protect instream uses from unacceptable adverse effects, or disapproval of the withdrawal.

Of course, to be absolutely fair, and give every benefit of the doubt to Loudoun Water, while this is a salutary policy, and the violation we’ve noted here give us the *raison d’etre* for following and applying this provision to Loudoun Water and others similarly situated, another provision suggest that Loudoun Water may just be exempt. <http://law.lis.virginia.gov/admincode/title9/agency25/chapter210/section60/>

Consider the following language:

B. The following surface water withdrawals are excluded from VWP permit requirements. Activities, other than the surface water withdrawal, which are contained in 9VAC25-210-50 and are associated with the construction and operation of the surface water withdrawal, are subject to VWP permit requirements unless excluded by subsection A of this section. Other permits under state and federal law may be required.

3. There may be a failure to report “ water withdrawal”

Third, Loudoun Water may not be reporting water withdrawal from either (a) Goose Creek to serve Beaverdam Reservoir, or (b) from Goose Creek Reservoir.

But we were unable to confirm or deny if this is the case – as a matter of fact – that Loudoun Water is failing to report water withdrawal. See - <http://law.lis.virginia.gov/admincode/title9/agency25/chapter200/>


4. There appears also to be a Loudoun County Zoning Violation

Fourth, the pump on Goose Creek and the diesel storage tank are in the major floodplain. This appears to constitute a Loudoun County zoning violation. See - Section 4-1500 FOD - Floodplain Overlay District.⁵

III. ACTION RECOMMENDED

Based on the findings herein, and the serious questions raised, it is recommended that the Loudoun County Soil and Water Conservation Board commend these findings and recommendations, and thus this “Report,” to the Board of Supervisor for their review and further action as they may find merited upon their own review.

Respectfully submitted,

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1. Any surface water withdrawal in existence on July 1, 1989; however, a permit shall be required if a new § 401 certification is required to increase a withdrawal. To qualify for this exclusion, the surface water withdrawal shall be deemed to be in existence on July 1, 1989, if there was an actual withdrawal on or before that date that has not been abandoned.

⁵ 4-1503 Definitions.

(z) Structure. An assembly of materials forming a construction for occupancy or use including, among others, buildings, stadiums, gospel and circus tents, platforms, stagings, observation towers, telecommunications towers, radio and TV broadcasting towers, water tanks, trestles, piers, open sheds, coal bins, shelters, walls, power line towers, pipelines, railroad tracks, manufactured homes, and gas or liquid storage tanks that are principally above ground. See - <https://www.loudoun.gov/DocumentCenter/View/99645>