



Virginia Department of Planning and Budget **Economic Impact Analysis**

9 VAC 25-210 Virginia Water Protection Permit Regulation

9 VAC 25-610 Groundwater Withdrawal Regulations

Department of Environmental Quality

Town Hall Action/Stage: 5816 / 9871

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The Department of Planning and Budget (DPB) has analyzed the economic impact of this proposed regulation in accordance with § 2.2-4007.04 of the Code of Virginia (Code) and Executive Order 19. The analysis presented below represents DPB's best estimate of these economic impacts.¹

Summary of the Proposed Amendments to Regulation

Pursuant to Chapter 100 of the 2021 Special Session I Acts of Assembly,² the State Water Control Board (Board) proposes to require applications for groundwater and surface water withdrawal permits to include (i) a water audit plan and (ii) a leak detection and repair plan.

Background

This action applies to new and renewing groundwater and surface water withdrawal permits. The types of entities and uses involved with such permits include municipalities (e.g., drinking water), agricultural (e.g., water for feedstock, plant irrigation), commercial/industrial/mining (e.g., pulp and paper manufacturing), and hydro/fossil fuel/nuclear power generation (e.g., reactor cooling).

¹ Code § 2.2-4007.04 requires that such economic impact analyses determine the public benefits and costs of the proposed amendments. Further the analysis should include but not be limited to: (1) the projected number of businesses or other entities to whom the proposed regulatory action would apply, (2) the identity of any localities and types of businesses or other entities particularly affected, (3) the projected number of persons and employment positions to be affected, (4) the projected costs to affected businesses or entities to implement or comply with the regulation, and (5) the impact on the use and value of private property.

² <https://lis.virginia.gov/cgi-bin/legp604.exe?212+ful+CHAP0100>

According to the Department of Environmental Quality (DEQ), Virginia's water resources are under increasing pressure because of population growth, economic development, and climate change. In 2017, significant groundwater withdrawal permit reductions were made in order to maintain a long-term supply of coastal groundwater. Both surface water and groundwater resources are constrained in various locations around the Commonwealth, and a number of executive and legislative reports have recommended additional actions to be taken including addressing preventable water losses.

The American Water Works Association (AWWA) is the primary national water supplier's organization. At the time of these recommendations relating to water losses were made, they developed a manual for members on best practices for addressing water loss that set a standard of no more than a ten-percent loss in public or private water supply systems. Over the intervening years, the manual was updated and revised because of the diversity of water supply systems and a concern related to a one-size fits all standard. Though the ten-percent standard does not fit well into all types of water systems, DEQ believes that it is a reasonable aspirational goal because any loss represents water resource waste, lost revenue for the water producer, unrealized economic development, and reduced pollution assimilation capacity.

However, DEQ reports that data in local water supply plans indicates that many localities are not achieving industry standards for water loss. Some localities could not account for as much as twenty-five percent of their treated potable water supply. This loss represents unrealized local revenue and can be due to leaks in the distribution system, within the individual customer's system, or a problem with metering. In addition to wasting money to treat water that never reaches a beneficial use or a paying customer, inefficient use of water strains limited natural resources for other economic uses.

In order to promote overall water efficiency by minimizing water losses, Chapter 100 of the 2021 Special Session I Acts of the Assembly directs the Board to establish requirements in regulation for groundwater and surface water withdrawal permit holders to submit (i) a water audit plan and (ii) a leak detection and repair plan. A water audit is simply a review of records and data that traces the flow of water from its withdrawal through distribution and application to the beneficial use. The water audit identifies if a user has a water loss problem. A leak detection and repair plan describes how a system will identify the location of leaks over time and how they

intend to address them. The regulation does not require that all identified leaks be repaired during the permit term. The legislation further directs that once approved both plans be incorporated by reference as a condition of the permit.

Currently, the *Groundwater Withdrawal Regulation* (9VAC25-610) contains an application requirement to submit a water conservation and management plan that includes a water loss reduction program. Similarly, the *Virginia Water Protection Permit Program Regulation* (9VAC25-210), which applies to permitted surface water withdrawals, currently contains requirements to provide information on existing water conservation measures and projected demand with and without conservation measures. The mandated audit plan and leak detection and repair plan would be supplemental and bolster these existing requirements.

Estimated Benefits and Costs

The water loss audit and leak detection and repair plans are required when a permit application is submitted for a new permit or one that is due for renewal, and the data collected pursuant to the plans are to be reported every three years. Generally, the term of the water withdrawal permits is fifteen years absent unique circumstances. Thus, the incorporation of the plans into every single permit would likely take many years to implement.

The AWWA water loss audit software is the audit methodology recommended by DEQ and is free to use. According to DEQ, input provided by the members of the regulatory advisory panel indicated that the estimated cost for agricultural, municipal, and power generation users to conduct a water loss audit every three years and submit a report of the results of the audits is about \$5,000 (every three years) for agricultural use permits, about \$75,000 for municipal permits (total over a 15-year permit term), and potentially as much as \$200,000 for a nuclear power plant (total over a 15-year permit term). These costs include the initial development of the plan, data collection, installing meters if needed, periodic plan updates, and reporting of the results. Moreover, if a municipality hires an outside entity such as a consultant, the cost estimate is about \$20,000/year in such cases. Similarly, DEQ provided a rough estimate for the leak detection and repair plan of \$5,000 (every three years) for agricultural use permits, about \$40,000-\$50,000 (total over a 15-year permit term) for municipal permits, and potentially as much as \$300,000 for a nuclear power provider (total over a 15-year permit term). Based on these estimates, the annualized (i.e., per permit per year) cost by type of entity are \$8,333-\$9,000

for municipalities that use in-house resources, \$28,000-\$28,667 for municipalities that hire an outside consultant, \$3,334 for agricultural users, and \$33,333 for power providers. The cost estimates for other uses such as commercial and industrial are not available.³

However, these costs are relatively small compared to the value of water being processed by users. For example, withdrawals reported to DEQ in 2021 averaged approximately 4.809 Million Gallons per Day (MGD) per facility, as calculated based on total reported withdrawals of 5.66 Billion Gallons per Day (BGD) divided by 1,177 reporting facilities. This total volume includes cooling water withdrawals at nuclear and fossil fuel power generation facilities, which make up 77% of the total, and are largely non-consumptive use. Excluding power generation, reported withdrawals in 2021 averaged approximately 1.101 MGD per facility, as calculated based on total withdrawals of 1.27 BGD divided by 1,153 reporting facilities. According to a survey,⁴ 2021 residential rates ranged from \$0.00759 – \$0.013357 per gallon. Therefore, assuming 1 MGD withdrawal priced at \$0.01 per gallon, the total economic value of residential use would be approximately \$3.7 million per facility per year in 2021 dollars.⁵ This example illustrates the relative magnitude, but is not intended to suggest that municipal water customers are only residential. In fact, many of the larger municipal systems also have significant business customers in addition to their residential customers and assess a variety of rates. These systems set rates based on the cost of withdrawing, treating, pumping, and maintaining all the necessary infrastructure, which are the primary drivers of the rates per gallon. Perhaps because the compliance costs of this mandate are relatively small, DEQ anticipates implementation of the requirement to include water audit plans and leak detection and repair plans in applications for water withdrawal permits would have a minimal economic impact on affected entities.

With the above calculations in mind, DEQ notes that the legislation directed the Board to require that water audit plans and leak detection and repair plans be incorporated in water conservation and management plans, which are a required to be submitted to obtain a groundwater withdrawal permit. As currently written, for each type of entity, water conservation

³ There are currently approximately 370 active groundwater withdrawal permits: 165 municipal, 72 agricultural, 68 commercial, 27 industrial, 33 irrigation, and 5 power generation. There are currently approximately 114 surface water withdrawal permits: 55 municipal, 6 agricultural, 26 commercial, 8 industrial, and 19 power generation. For groundwater, the irrigation component represents watering of common areas mostly in an institutional setting, high school and college ball fields, landscaping in residential areas, parks, etc.

⁴ <https://daa.com/wp-content/uploads/2021/11/2021-Water-and-Wastewater-Report-1.pdf>

⁵ $\$0.01 \times 1,000,000 \text{ gallons} \times 365 \text{ days} = \$3,650,000$.

and management plans require a water loss reduction program which includes requirements for an audit of the total amount of groundwater used in the system and implementation of a leak detection and repair program within one year of permit issuance. The proposed amendments to the groundwater withdrawal regulations revise the water conservation and management plan water audit and leak detection and repair requirements to be consistent with the amendments to the surface water regulation. Current groundwater permittees should already have some form of water audit and leak detection repair plan in place as part of their water conservation and management plans. Thus, DEQ anticipates that this fact will result in reduced costs to these permittees, but the amount is likely to be specific to each permittee.

In addition to the costs noted above, DEQ would be expending its administrative resources to review submitted plans, updates, and results. The General Assembly did not provide funding for these additional responsibilities. Thus, such administrative costs would be absorbed within DEQ's existing resources. Moreover, additional compliance costs for permittees include performing the needed repairs once leaks are identified. However, the plan does not have to show that all identified leaks be repaired during the permit term. Depending on the characteristics and the timing of the leaks, the magnitude of such costs may vary greatly and could be imminent or may be years into the future.

It is worth noting that this regulation involves water usage directly and electric generation indirectly, both of whose demand properties exhibit a unique characteristic. Generally, studies in the United States indicate that demand for fresh water is relatively insensitive to changes in price or rate, and thus consumption does not respond to changes in prices or rates to the same degree as less sensitive goods or services.⁶ The price insensitive demand is a characteristic associated with essential goods as opposed to non-essential or luxury goods. This suggests households do not vary their consumption of municipal water by much in response to changes in rates. Similarly, demand for water for agricultural, manufacturing, industrial, and power generation uses are relatively price insensitive. For example, an existing nuclear power generator has to have access to water for cooling regardless of the cost. Thus, the likely response from the affected permittees is to incur additional compliance costs and continue operations rather than cease their activities at least in the short term. Further, in markets that exhibit such a

⁶ <https://naes.agnt.unr.edu/PMS/Pubs/2018-3559.pdf>

characteristic, it is usually easier for a supplier to pass on costs to its customers. Therefore, it is likely that most of the additional compliance costs associated with the mandated plans would be passed on to the end users by the affected municipal water treatment plants (to the extent that value of water saved is less than the cost of repairs) and electric power generators.^{7 8} In contrast, the ability of farmers, manufacturers, and commercial/industrial corporations to pass on the additional costs to their customers would depend on the consumer demand characteristics of their own products, and how sensitive they are to changes in prices or rates.

On the other hand, several benefits could be expected from the mandated plans. The benefits to permittees and their customers include: reduced waste (avoiding costs of treatment and pumping costs that for water that does not reach the end user); improved operational efficiency; lowered water system operational costs; reduced potential for contamination, extended life of facilities; reduced potential property damage and water system liability; reduced water outage events, etc. The broader benefits include: increased knowledge about the distribution system which can be used to respond more quickly to emergencies; increased firefighting capability; more efficient use of existing capacity and delayed capacity expansion; long-term conservation and sustainability of finite water resources; helping identify needs for infrastructure upgrades before catastrophic leaks occur; and enhancing local and regional water supply planning efforts, etc.

Of special note is the fact that while the water audit plan and the leak detection and repair plan would introduce costs to the permittees and other entities involved as discussed above, this regulatory action is explicitly required by the second enactment clause of Chapter 100 of the 2021 Special Session I Acts of Assembly. Thus, the costs and benefits discussed above cannot be directly attributed to the regulation.

Businesses and Other Entities Affected

This regulation primarily applies to groundwater and surface water withdrawal permittees. Out of approximately 370 active groundwater withdrawal permits, there are 165 municipal, 72 agricultural, 68 commercial, 24 industrial, 33 irrigation, 3 manufacturing, 1 nuclear power, and 4 fossil fuel plant permittees. Out of approximately 114 active Virginia water

⁷ Studies also show that demand for electricity is insensitive to price changes in the short run. See for example <https://www.iaee.org/en/publications/init2.aspx?id=0>

⁸ Electricity rates are regulated in Virginia, but production costs are a factor in rate adjustments.

protection surface water withdrawal permits, there are 55 municipal, 2 agricultural, 26 commercial, 9 fossil fuel power, 8 hydropower, 4 irrigation, 1 manufacturing, 7 mining, and 2 nuclear power permittees. Included in these entities are four state entities: the Department of Corrections' facilities and State Parks (Department of Conservation and Recreation) have active water withdrawal permits; the Department of Veterans Services and the Virginia Institute of Marine Sciences also currently have water withdrawal permits.

The Code of Virginia requires DPB to assess whether an adverse impact may result from the proposed regulation.⁹ An adverse impact is indicated if there is any increase in net cost or reduction in net revenue for any entity, even if the benefits exceed the costs for all entities combined. As noted above, the proposal to require a water audit plan and a leak detection and repair plan is mandated by the legislation. This regulation by itself does not create the compliance costs associated with the mandated plans. Thus, no adverse impact from the regulation itself is indicated.

Small Businesses¹⁰ Affected:¹¹

DEQ believes that majority of the permittees likely are not small businesses. In addition, the proposed amendments are driven by legislation and therefore the proposed regulatory changes by themselves do not appear to adversely affect small businesses.

⁹ Pursuant to Code § 2.2-4007.04(D): In the event this economic impact analysis reveals that the proposed regulation would have an adverse economic impact on businesses or would impose a significant adverse economic impact on a locality, business, or entity particularly affected, the Department of Planning and Budget shall advise the Joint Commission on Administrative Rules, the House Committee on Appropriations, and the Senate Committee on Finance. Statute does not define "adverse impact," state whether only Virginia entities should be considered, nor indicate whether an adverse impact results from regulatory requirements mandated by legislation.

¹⁰ Pursuant to § 2.2-4007.04 of the Code of Virginia, small business is defined as "a business entity, including its affiliates, that (i) is independently owned and operated and (ii) employs fewer than 500 full-time employees or has gross annual sales of less than \$6 million."

¹¹ If the proposed regulatory action may have an adverse effect on small businesses, Code § 2.2-4007.04 requires that such economic impact analyses include: (1) an identification and estimate of the number of small businesses subject to the proposed regulation, (2) the projected reporting, recordkeeping, and other administrative costs required for small businesses to comply with the proposed regulation, including the type of professional skills necessary for preparing required reports and other documents, (3) a statement of the probable effect of the proposed regulation on affected small businesses, and (4) a description of any less intrusive or less costly alternative methods of achieving the purpose of the proposed regulation. Additionally, pursuant to Code § 2.2-4007.1, if there is a finding that a proposed regulation may have an adverse impact on small business, the Joint Commission on Administrative Rules shall be notified.

Localities¹² Affected¹³

Some permit holders are counties, cities, and incorporated towns. Out of approximately 370 active groundwater withdrawal permits, there are 165 municipal permittees. Out of approximately 114 active Virginia water protection surface water withdrawal permits, there are 55 municipal permittees. However, the compliance costs associated with the required plans cannot be directly attributed to this regulation as they are mandated by the legislation. Thus, the proposed regulatory changes do not introduce costs for local governments.

Projected Impact on Employment

The proposed amendments are legislatively driven. Thus, the proposed changes do not appear to affect total employment by themselves.

Effects on the Use and Value of Private Property

Similarly, no effect on the use and value of private property or the real estate development costs from changes in regulatory requirements are expected because the changes are mandated by statute.

¹² “Locality” can refer to either local governments or the locations in the Commonwealth where the activities relevant to the regulatory change are most likely to occur.

¹³ § 2.2-4007.04 defines “particularly affected” as bearing disproportionate material impact.