2022 Report to the General Assembly

Review of the Budget and Structure of the Office of Drinking Water as required in Item 296 of the 2022 Appropriation Act

Office of Drinking Water
Virginia Department of Health

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Executive Summary

Safe and adequate drinking water influences community health and economic prosperity. The Virginia Department of Health's Office of Drinking Water (ODW) ensures the safety of drinking water by regulating the 2,864 waterworks serving nearly eight million Virginians. ODW protects the Commonwealth's water 24 hours a day, 365 days a year, including when it is threatened by hazards ranging from hurricanes to pandemics. Through its six field offices and nine technical programs, ODW collaborates with owners, operators, and stakeholders to protect public health and the environment while ensuring compliance with applicable laws and regulations. ODW's program has high compliance rates with water quality standards, and its effectiveness has been acknowledged by the United States Environmental Protection Agency.

ODW accomplishes its mission through funds provided by three primary sources: regulant fees, federal grants, and general fund dollars. Regulant fees are capped per the Code of Virginia and the Appropriation Act. Federal grants require a state match and, like general fund dollars, have remained relatively flat over the past decade. As expenditures increase due to inflation and office improvement initiatives, ODW's operational budget is often strained. It has been particularly strained, however, since experiencing a budget shortfall starting in FY22.

A system of weak internal controls led to the budget shortfall. Numerous interrelated factors included: the hiring of a new director who did not have adequate budgetary training, experience, or support; removal of ODW's experienced business manager; reorganization and turnover of leads of supporting business units; miscommunication among programmatic and business staff, in part due to the COVID-19 pandemic; and inadequate quality assurance/quality control to prevent such a budget error. With this environment of weak internal controls, a budget analyst mistakenly advised that certain nongeneral fund balances in 2018 should be spent down or risk being lost. The error went uncorrected for approximately two years as ODW faced recurring, increased costs and relatively flat revenue.

The 2022 Virginia General Assembly appropriated funds to support ODW and avoid layoffs that would otherwise have been enacted in response to the budget shortfall and directed the Department of Health and the Department of Planning and Budget to study ODW operations, the reason for its budget shortfall, and options to reduce ODW costs and potentially enhance ODW revenues. ODW has undertaken recent, ongoing efficiencies to further mitigate the deficit. These include streamlining business processes, reducing rental costs, and modernizing databases. ODW continues to explore new opportunities for efficiency, including enhancing collaboration with local health departments and strengthening centralized delivery of services. Other efficiencies, such as office mergers, remain hindered by federal funding sources and emergency responsibilities.

In addition to existing challenges, emerging issues threaten ODW. Federal grant funds have recently been reduced, and a shortage of staff has been identified by an EPA strategic consulting firm. Additional funding is needed to sustain loans, monitoring, and oversight for the Commonwealth's aging drinking water infrastructure. Other recommendations to support ODW and ensure another shortfall is prevented include reestablishing its business manager position, initiating a budget training program, and enhancing internal controls.

Definitions

- "Community waterworks" means a waterworks that serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.
- "Consumer" means any person who drinks or uses water from a waterworks for human consumption.
- "Consumer Price Index" or "CPI" means a measure of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services. For the purpose of this report, the Minneapolis Federal Reserve's inflation calculator is used to compare the buying power of past and present dollars (Federal Reserve Bank of Minneapolis, 2022).
- "FY" means fiscal year, which commences the first day of July and ends the thirtieth day of June per the Code of Virginia § 2.2-805.
- "Maximum contaminant level" or "MCL" means the maximum permissible level of a contaminant in pure water that is delivered to any user of a waterworks. MCLs are set as close to EPA's maximum contaminant level goals as feasible using the best available treatment technology. MCLs may be either "primary" (PMCL), meaning based on health considerations, or "secondary" (SMCL) meaning based on aesthetic considerations.
- "Nontransient noncommunity waterworks" or "NTNC" means a waterworks that is not a community waterworks and that regularly serves at least 25 of the same persons over six months out of the year. Schools, factories, and long-term health care facilities that operate their own waterworks are examples of NTNC waterworks."Service connection" means the point of delivery of water to a customer's building service line. as follows:
    i. If a meter is installed, the service connection is the downstream side of the meter;
    ii. If a meter is not installed, the service connection is the point of connection to the waterworks;
    iii. When the waterworks owner is also the building owner, the service connection is the entry point to the building.
- "Small waterworks" means a waterworks that serves 3,300 persons or fewer.
- "Transient noncommunity waterworks" or "TNC" means a noncommunity waterworks that is not a nontransient noncommunity waterworks. A TNC serves at least 25 persons daily for at least 60 days out of the year. Restaurants, campgrounds, and marinas that operate their own waterworks are examples of TNC waterworks.
- "Waterworks" means a system that serves piped water for human consumption to at least 15 service connections or 25 or more individuals for at least 60 days out of the year and includes all structures, equipment, and appurtenances used in the storage, collection, purification, treatment, and distribution of pure water except the piping and fixtures inside the building where such water is delivered.
- "Wholesale waterworks" are waterworks that treat water and sell it ("finished water") to other waterworks, which in turn distribute it to their customers

Background

Legislative Context

The 2021 General Assembly's House Joint Resolution 538 recognizes that access to clean, potable, and affordable water is a necessary human right (see Appendix A). Federally, the Safe Drinking Water Act (SDWA) requires the United States Environmental Protection Agency (EPA) to establish and enforce standards that waterworks in Virginia must follow, including the following: i) maximum contaminant levels (MCL) or treatment techniques (TT), and ii) sampling, monitoring, and reporting requirements. Congress passed the SDWA in 1974, authorizing EPA to promulgate the National Primary Drinking Water Regulations (NPDWR). The NPDWR set forth uniform, nationwide standards for drinking water to protect the public against adverse health effects from exposure to naturally occurring and man-made contaminants. Congress amended and reauthorized the SDWA in 1986, 1996, 2005, 2011, 2015, 2016, and 2018.

In addition to setting drinking water standards and treatment techniques, the SDWA allows EPA to delegate primary enforcement responsibility (i.e., "primacy") for public water systems (PWS) to states and Indian Tribes if they meet certain requirements. The Virginia Department of Health (VDH) has been delegated the primacy of implementing the SDWA in Virginia since 1977. ODW is specifically responsible for implementing the drinking water program within VDH. To maintain primacy, Virginia promulgated the Waterworks Regulations (12VAC5-590), which may be no less stringent than the federal requirements in the SDWA and NPDWR. In 2022, EPA's annual primacy review of the Public Water System Supervision (PWSS) program concluded that ODW continues to implement an effective drinking water program (Environmental Protection Agency, 2022).

Code of Virginia (Va. Code) §§ 32.1-167 through 32.1-176, known as the Public Water Supplies law (PWSL), establishes the drinking water program for the Commonwealth, setting forth the duties and responsibilities of the State Board of Health (Board), State Health Commissioner (Commissioner), and VDH. The PWSL gives the Board authority for "general supervision and control over all drinking water supplies and waterworks in the Commonwealth insofar as the bacteriological, chemical, radiological, and physical quality of waters furnished for human consumption may affect public health and welfare…" (Va. Code § 32.1-169). The PWSL is broader than the Safe Drinking Water Act (SDWA) in that it authorizes VDH to regulate not just drinking water standards and treatment practices, but also waterworks construction, operation, maintenance, permitting, enforcement, and receivership.

Natural and man-made hazards can occur at any time and threaten the public drinking water supply. ODW plays a vital role in mitigating the effects of such events by providing assistance to waterworks owners and operators. Waterworks owners and operators are most familiar with the waterworks' design and operation, condition of infrastructure, and system capabilities, while ODW typically provides technical assistance, supports compliance, and elevates resource needs that might develop during response and recovery. Most incidents involve water main breaks, equipment failures, pressure loss, or boil water notices, but other emergency responses include responding to chemical spills from train derailments or truck accidents,

harmful algal blooms, flooding, hurricane preparation, and—most recently—support to ensure the availability of drinking water during the SARS-CoV-2 pandemic.

As the Commonwealth's Emergency Support Function 3 (ESF-3) lead, ODW manages emergency response 24/7 for water, wastewater, and dam safety. ODW monitors on average 5-15 events every day of the year: including train derailments, tanker truck and chemical spills, flooding, power outages, and other natural and man-made disasters. ODW monitors such hazards with partners from the EPA, the Virginia Department of Emergency Management, and the Department of Environmental Quality. In addition to the host of supportive services that ODW provides in response to a threat to the public drinking water, the Commissioner, pursuant to Va. Code § 32.1-175, is empowered by the PWSL to issue emergency orders "where there is an imminent danger to the public health and welfare resulting from the operation of any waterworks or the source of a water supply."

2022 Appropriation Act

In 2022, the Virginia General Assembly appropriated an additional $1,833,505 from indirect cost recoveries in FY23 and $1,833,505 from the General Fund in FY24 to cover unmet operational costs of ODW. This funding allowed for the cancellation of 14 planned layoffs that would otherwise have been enacted in response to ODW's budget shortfall. The additional state funding came at a critical time when many important tasks lie ahead, such as responding to aging infrastructure and water loss with significant new funding, lead service line replacements, monitoring lead in drinking water at schools and childcare centers, and removing emerging contaminants (e.g., PFAS, Chromium VI, 1,4 Dioxane).

The General Assembly, per Item 296 #F.2. of the 2022 Appropriation Act, also directed VDH and the Department of Planning and Budget (DPB) to evaluate ODW's budget deficit and:

i. determine the reasons for ODW's budget shortfall beginning in fiscal year 2022;
ii. identify and explore funding to maximize nongeneral fund sources for ODW expenses;
iii. analyze ODW's budget for cost efficiencies, including considering a merger with another appropriate office within VDH to achieve cost savings; and
iv. report findings and recommendations to the Governor and the Chairs of the House Appropriations and Senate Finance and Appropriations Committees by October 15, 2022. VDH and DPB formed a collaborative team to implement the General Assembly's directive to draft the following report.

Office Oversight

ODW comprises five central office divisions: i) Enforcement/Compliance; ii) Training & Capacity Development and Outreach (internal and external); iii) Emergency Preparedness & Response; iv) Technical Services (which includes sanitary survey and permit programs, data management, source water protection, and laboratory coordination); and v) Financial Construction & Assistance (which includes implementation of the Drinking Water State Revolving Fund [DWSRF] program). The central office establishes statewide drinking water policy and procedures, monitors and responds to legislative needs during the General Assembly

sessions, completes required reports to the EPA, ensures proper grant management and oversight, implements funding from the Bipartisan Infrastructure Law (BIL) and the American Rescue Plan Act (ARPA), and collaborates with stakeholders on all programmatic needs.

ODW has six regional field offices that implement the following technical programs: i) Lead and Copper Rule, ii) Revised Total Coliform Rule, iii) Groundwater Rule, iv) Groundwater Under the Direct Influence of Surface Water Rule, v) sampling, vi) complaint investigations, vii) sanitary survey and inspections, viii) issuance of notices of alleged violation, and ix) general outreach and technical assistance. Reporting directly to the ODW Office Director, ODW's Deputy Office Director supervises the six field offices and the Division of Technical Services. Field offices work directly with waterworks owners, operators, and consultants to review construction plans, draft and issue permits, inspect waterworks for compliance, and provide technical and operational assistance. The field offices evaluate monthly and quarterly operation reports to ensure waterworks are providing adequate water quality and quantity, flag potential compliance issues, and help waterworks return to compliance when there are violations of the Waterworks Regulations.

As of August 22, 2022, ODW regulates 2,864 waterworks serving over 7.6 million Virginians. These waterworks are divided into 1,097 community waterworks, 516 NTNCs, and 1,251 TNCs. ODW protects public health from "source to tap" by assessing the vulnerability of water sources and preparing communities for resilient response to natural and manmade hazards. Core metrics for the drinking water program include the percentage of waterworks with an unresolved health-based violation (less than 2%), the percentage of waterworks that sample on time (greater than 98%), and the percentage of waterworks inspected on time (greater than 99%).

ODW receives approximately 110,000 water quality samples per year, and monthly operating reports from about 1,100 community water systems. The office annually receives and responds to approximately 6,000 assistance requests from waterworks owners and operators. ODW offers or helps develop over 25 training courses per year to improve knowledge, skills, and abilities for Virginia's estimated 2,123 waterworks operators. ODW performs an average of 1,110 site visits and inspections of waterworks per year and processes about 25 planning and design grant applications per year. In 2022, ODW received 131 applications for infrastructure funding needs that totaled over $1 billion. With ARPA and BIL, ODW has the ability to access over $125 million per year in funding through 2025 to help waterworks with infrastructure funding needs. Without ARPA and BIL, ODW would typically have about $30 million per year in DWSRF funds to help waterworks with infrastructure funding needs.

If a waterworks violates a water quality standard or other public health requirement, ODW's priority is to return the waterworks to compliance. ODW issues notices of alleged violation to inform the waterworks what must be done to return to compliance. If the waterworks is unwilling or unable to address the violation in a timely and appropriate manner, enforcement becomes necessary. Enforcement can include informal letters and meetings, or formal administrative orders requiring compliance actions to be taken by the waterworks.

ODW staff also provide additional technical, managerial, and financial capacity assistance to waterworks in violation. Waterworks with health-based violations are reported to

the EPA's Enforcement Targeting Tool, which weighs violations based on the history of noncompliance and the potential for harm to human health. If agency services are not performed at the required service level, the EPA could assume control of the program and no longer approve the Commonwealth as a primacy state. This action would likely eliminate two grants (the PWSS and DWSRF grants), totaling about $20 million per year, which the Commonwealth currently utilizes to perform federally required duties.

During the SARS-CoV-2 pandemic, ODW actively monitored and assisted waterworks, particularly community waterworks. ODW promoted water shut-off moratoriums to ensure that Virginians had access to drinking water. ODW also collaborated with stakeholders and established guidance to ensure that essential staff, such as licensed operators and maintenance workers, remained available and adequately trained to protect drinking water. Additionally, ODW helped resolve supply chain disruptions.

Funding Structure and Sources

Administration and operations of ODW (e.g., staff salaries and fringe benefits) have been historically funded by three primary sources: regulant fees, federal grants with state match, and general fund dollars.

Regulant fees, approximately $4.8 million per year, are capped for all waterworks at $160,000 per year, and at $3.00 per service connection for community waterworks, per Va. Code § 32.1-171.1 and the Appropriation Act, respectively. The 12 largest waterworks in Virginia each pay $160,000 based on this cap, which has been essentially static since the legislature established the fee program in 1992. ODW charges $90 for NTNC systems (e.g., factories, daycares, and adult care homes). There is no fee for TNC systems (e.g., restaurants and gas stations). ODW is currently attempting to update the Fee Regulations (12VAC5-600), which could add about $100,000 to $150,000 in new revenue, but it will take two to three years to move the proposals through the regulatory process. Any change to the Fee Regulations would not affect the $160,000 per waterworks or $3.00 per community waterworks connection annual caps, as those are contained in statute.

The EPA's PWSS grant provides ODW with about $2 million per year, with a 25% state match. This funding has remained flat for over a decade. The PWSS grant primarily funds staffing needs to oversee waterworks.

Amendments to the SDWA in 1996 established the DWSRF Program. DWSRF funds are awarded to eligible states through an EPA capitalization grant. ODW administers the capitalization grant for DWSRF and associated state funds. ODW must provide the EPA with an annual Intended Use Plan (IUP), which describes how the capitalization grant will be expended. Awarded DWSRF funds are grouped into two categories: i) funds for construction projects at waterworks, and ii) non-project funds, or "set-asides." Virginia must provide a 20% match for DWSRF funds, and they must be deposited into a dedicated state loan fund on or before the date the state receives the federal grant payments. Approximately five years ago, EPA increased DWSRF funding from about $15 million per year to about $18 million per year. However, the Commonwealth did not increase its required 20% match until FY23. Also in FY23, the EPA has

reduced the DWSRF grant funding to $11.4 million. This funding level is also expected for FY24.

Combined with interest and principal repayments, ODW is able to offer approximately $30 million per year to support waterworks infrastructure funding in small and disadvantaged communities. ODW offers construction loans at below private market rates and oftentimes provides funding when a small or disadvantaged community cannot get funding in the private marketplace. In addition, research suggests that each $1 of DWSRF investment in water infrastructure provides almost $3 in economic benefit (Krop et al., 2008). Adding one job in the water sector also creates an estimated 3.68 jobs in the local economy to support that job.

Up to 31% of DWSRF funds are permitted to go towards set-aside programs. As regulant fees and PWSS funds have remained flat for years, ODW has increasingly relied on the DWSRF set-asides to support staff positions and operations. DWSRF "set-asides" have reduced from about $17.9 million in FY22 to $11.4 million in FY23, which is expected to remain the same in FY24. The grant reduction will directly impact the program's ability to rely on the DWSRF set-asides to support funding of positions. ODW currently uses the set-asides to support 51 full-time employees (FTEs).

The Virginia Water Supply Revolving Fund (VWSRF) is Virginia's dedicated state loan fund (see Va. Code § 62.1-233 et seq.). Under this state law, and in conjunction with ODW, the Virginia Resources Authority (VRA) has been tasked by the General Assembly with the financial management of the VWSRF. Activities include the following: i) the disbursement and collection of DWSRF grant funds, ii) verifying the credit worthiness of potential borrowers, and iii) managing program assets through investments in securities or obligations.

ODW's operational budget is composed of 80% salary and benefits; 15% for Virginia Information Technology Agency (VITA) expenses; and 5% for rental space, travel, and administrative expenditures. All of these areas continue to be strained by inflation. ODW has made numerous efforts to mitigate this strain, however, including ceasing certain grant program efforts, not renewing rental space, eliminating travel, keeping positions vacant, and limiting staff to one phone and one computer device. These efficiencies are described in further detail in the respective section of this report.

Findings

Causes of the Office of Drinking Water's FY22 Budget Shortfall

Numerous interrelated factors contributed to ODW's FY22 budget shortfall. These included the onboarding of a new director who did not at the time have adequate budgetary training, experience, or support; removal of the office's experienced business manager; reorganization of supporting business units that redirected attention; turnover of leads for those supporting business units; miscommunication among programmatic and business staff, in part due to redirected staff attention caused by the COVID-19 pandemic and the business support unit's reorganization; and inadequate internal controls and quality assurance/quality control (QA/QC) to prevent such a budget error.

A mistaken interpretation of certain nongeneral fund balances in 2018 by a budget analyst went uncorrected for approximately two years. A budget analyst suggested a more than $1 million recurring surplus in ODW's budget existed and that it needed to be spent down or lost. ODW and the business support unit accepted the business analyst's representation. ODW instituted a spend-down plan incorporating office improvements recommended by both a Virginia Commonwealth University Performance Management Group (PMG) report and Governor Northam's June 20, 2019 letter on pay equality. Unfortunately, the surplus was not recurring as initially believed, and the funds were expended on recurring cost items. Recurring costs, e.g., pay increases, persisted after the surplus was spent, and ODW's budget went into a deficit.

This multifactorial cause was determined through historical document review and independent, corroborating interviews with VDH staff who were involved with the relevant VDH offices over the past five years. The cause is outlined chronologically below, and assurances regarding how a similar budget shortfall will not reoccur are contained in the recommendations section of the report.

2018

In December 2017, a new ODW office director (ODW Director) was hired. At the time of his hire, there had been recent and significant agency-wide organizational changes in the oversight of business, human resources (HR), and budget functions. These included the elimination of an ODW business manager position, who had previously reported directly to the ODW Director. Agency leaders eliminated this position under the assumption that if office directors within the agency were able to focus on programmatic activities rather than administrative, HR, and budget matters, consistency and accountability would be improved across the work units. Consequently, ODW, the Office of Environmental Health Services (OEHS), and the Office of Radiological Health (ORH) began to receive their business, HR, and administrative support from an "Environmental Offices Shared Administrative Services" (EOSAS) work unit. The director of the newly created EOSAS unit began in January 2018. Although this individual came from the Office of Emergency Medical Services (OEMS) as its business manager, he did not have extensive knowledge about ODW, including its budget.

As EOSAS positions became filled and led by personnel who did not specifically understand ODW's unique funding structure, miscommunication and conflict developed between EOSAS staff and the Drinking Water State Revolving Fund (DWSRF) program staff. EOSAS staff focused on grant management, human resource management, procurement, budget oversight, processing payments, and reporting such data, while the ODW Director focused on programmatic needs to improve drinking water business processes. The relationship between EOSAS and ODW became specifically contentious as roles and responsibilities shifted from the DWSRF program to EOSAS. The controversies, misunderstandings, and disagreements revolved around which tasks and activities were considered "financial" versus "programmatic." Meanwhile, the Office of Financial Management (OFM) experienced significant turnover in budget analyst positions, causing ODW to work with numerous budget analysts during a very short period of time. EOSAS completed the ODW budget, but communications continued to wane. The normal budget process starts in August of each year; hence, the new ODW Director did not receive or review ODW's budget information from EOSAS until August 2018, about nine months after he started.

Approximately ten months into 2018, the EOSAS director left the position, and a former program manager with EOSAS and OEMS accepted the vacant role. During this transition, a temporary OFM budget analyst was assigned to ODW. This individual (who is no longer with the agency) identified a significant budget surplus and suggested to ODW and EOSAS that ODW risked losing up to $1 million per year in funding without a spend-down plan. The surplus was within fund 02480 cash balances. ODW viewed these cash balances as being a part of the agency's operating fund 02480 account, which derives revenue from permitting fees, as total available operating resources. These balances were able to grow because Va. Code § 32.1-171.1 established fund 02480 as a non-reverting fund, stating, "[n]o part of the Fund, either principal or interest earned thereon, shall revert to the general fund of the state treasury" at year-end. ODW immediately began exploring and discussing options with agency leadership. Many of the potential options stemmed from a report conducted by PMG.

Earlier in 2018, the ODW Director had conducted a listening tour with staff. As a result, he hired PMG to help ODW develop a strategic plan. PMG completed its study by the end of 2018 after surveying, conducting focus groups, and interviewing ODW employees and stakeholders. The resulting recommendations included: i) keeping the existing field office model rather than relocating or moving field office locations; ii) adding a sixth field office, which would require four new positions; iii) improving communication across the field offices to address inconsistencies; and iv) reducing the program's heavy dependence on paper processes. PMG additionally observed that staff reported feeling overworked, underpaid, and concerned about centralized oversight of their jobs. These findings and recommendations would become potential options for the spend-down plan.

2019

Based on the OFM budget analyst's surplus discovery (made in error) and EOSAS's concurrence that ODW could support proposed spending, in 2019 the ODW Director approved implementation of the VCU PMG's recommendation to create a sixth field office as well as start a pay equity initiative based on Governor Northam's announcement on June 20, 2019, which

revised the State Compensation Policy to support fair and equitable pay. The Deputy Commissioner for Public Health and Preparedness and his executive advisor granted final approval to the proposed spending plan based on EOSAS's support and OFM's representations. The spending plan included the following actions (and associated costs where known):

- Implementing 55 in-band pay-equity adjustments ($456,875).
- Hiring four new FTEs to form a sixth field office ($388,940).
- Repurposing a training coordinator position to a sustainability coordinator position (no cost).
- On-boarding "Drinking Water Watch" to reduce FOIA requests for information, which required a new server and new IT maintenance costs (~$75,000/year).
- Based on a review and recommendation from the Office of Information Management (OIM), repurposing an FTE who was working on the outdated Access databases, and hiring a technology company to onboard proprietary Oracle databases and decommission the Access databases (~$250,000/year). One-time Oracle software costs were paid using the DWSRF grant "banked" (unused) set-aside funding.
- Combining the Division of Data Management with the Division of Technical Services (no cost).
- Eliminating an unnecessary Central Office paper filing system and on-boarding an electronic document management system. This involved hiring a company to begin scanning paper files to create an electronic system and providing tablets to staff for electronic inspections (~$75,000/year).
- Requiring private labs to use an electronic website interface to submit lab sampling results. This efficiency eliminated six wage positions who took paper lab results and performed data entry into ODW's database (estimated savings of $180,000/year).
- Beginning a stakeholder process to update the Waterworks Regulations, 12VAC5-590, which included new options for the regulated community to reduce its frequency of inspection (no cost).
- Combining hundreds of old working memos into six technical manuals (no cost).
- Starting an "auto-dialer" system to proactively and electronically call public water systems about sampling needs to reduce staff time in making calls. This ultimately reduced staff time with enforcement needs and increased compliance among the regulated community (~$800/yr in new costs with over $67,500 in estimated savings).

In December 2019, and as part of an agency-wide initiative, EOSAS expanded and reorganized into Shared Business Services (SBS). From this reorganization, the EOSAS director was replaced with an SBS Director for Public Health and Preparedness, an office that subsumed ODW, the Office of Radiological Health (ORH), the Office of Emergency Medical Services (OEMS), and the Office of Environmental Health Services (OEHS). This individual (who is no longer with the agency) instituted a process to more closely include office directors in the budget development process, which was a divergence from EOSAS's previous strategy and separation of duties between program and budget.

2020

Following the 2020 General Assembly session, VDH was one of numerous agencies that had previously-appropriated funds reduced (unallotted) due to the COVID-19 pandemic. For

FY21, $632,400 of the ODW budget was reduced ($150,000 for the Oracle database maintenance costs and $482,400 for a required DWSRF match). For FY22, $732,400 of the ODW budget was reduced ($250,000 for the Oracle database management and $482,400 in the DWSRF state match). Although these funds were eventually restored in FY23, to help offset the at-the-time reduced funding, ODW increased the community waterworks fee per connection from $2.95 to $3.00 as allowed by the Appropriation Act. This generated an estimated $45,500 in additional fees to support the program. This change in fee per connection was the maximum increase possible because the Appropriation Act caps fees at $3.00 per connection for community waterworks. Va. Code § 32.1-171.1 additionally caps maximum fees at $160,000 per waterworks annually, so the fees paid by the largest waterworks (i.e., those with more than 53,333 connections, of which there are 12 in Virginia) remained the same. Consequently, ODW received increased revenue of only about $45,500 per year from the revised connection fee.

Between August and September 2020, the ODW Director received draft budgets from an SBS budget analyst on temporary assignment from the Office of Epidemiology. It was then that the ODW Director first observed a deficit in the 02480 account and asked SBS to review and update the draft. On September 27, 2020, the SBS director for Public Health and Preparedness informed the ODW Director of a significant budget shortfall that appeared to be more than $2 million per year.

In response to the budget shortfall, ODW immediately took several actions, including:

- Shifted the funding source of 12 positions from the deficit 02480 account to the DWSRF set-aside accounts by working with EPA to allow changes to the DWSRF grant's work plan. ODW estimates about $1 million per year in expenditures was transferred from the 02480 account to the DWSRF set aside accounts.
- Required staff to have one computer/tablet and one phone device (preferably a cell phone, which would eliminate the need for a desk phone). This resulted in an estimated savings of $100,000 per year.
- Eliminated about $95,000 in future costs via a reduced rental footprint at the Madison building in Richmond. ODW vacated the upper basement by encouraging and approving telework.

2021

Despite best efforts to reduce the budget deficit by holding positions vacant, reducing the office's rental footprint, and shifting costs from the 02480 account to the DWSRF set-asides, ODW continued to have a significant budget shortfall. The agency decided on a layoff plan from the options considered. Strategic opportunities from the layoff plan were offered in December 2021. The plan was to eliminate an engineering manager and administrative support person for each of six field office work units (11 total FTEs, along with three wage staff). When Governor Northam learned of this plan, he overrode the agency's decision and directed VDH to identify within the agency funding sources that would cover the shortfall without dependence on layoffs. Between December 2021 and January 2022, Community Health Services (CHS), which oversees local health districts within VDH, transferred $850,000 to cover the budget shortfall for FY22.

Summary

From this analysis, the root causes of the ODW budget shortfall are primarily as follows:

- The newly onboarded ODW Director did not have adequate budget support, or training and experience with ODW's budget, and he needed to learn it over time—without support from a dedicated business manager either in ODW or EOSAS.
- The creation of EOSAS/SBS and multiple turnovers in that work unit's leadership (i.e., three role changes in two years), particularly when those leaders similarly did not have historical understanding of ODW's sources of funding, altered perceptions of "ownership" for the budget and led to a lack of communication and accountability among business and programmatic staff. The COVID-19 pandemic additionally diverted staff attention.
- In 2018, an OFM budget analyst reported that the 02480 account had a significant surplus and recommended a spend-down plan without realizing that it was a "one-time" balance. Staff interpreted OFM's advice to mean a spend-down plan of $1 million per year was necessary at the time of OFM's observation. The budget draft that included the spend-down plan was approved at various levels of the agency.
- ODW faced recurring costs from the implementation of PMG recommendations, salary increases for existing staff and newly hired vacant positions from the pay equity initiative, institution of new software databases, and payment of increased VITA costs.
- With nongeneral fund revenue remaining flat and the mistake made concerning available nongeneral fund cash balances, the increase in ongoing spending resulted in a funding shortfall for ODW and the need to initiate spending reductions for the office.

Funding Opportunities

Grant, general fund, and regulant fees have remained relatively static for several years. In contrast, expenditures are increasing. ODW has maximized non-general fund sources to support the drinking water program. VDH has initiated a regulatory process to amend the Waterworks Operation Fee regulations (12VAC5-600) so that fees would more accurately reflect the benefits members of the regulated community receive from the agency's technical and regulatory assistance. Due to the limits on fees established by the Appropriation Act and the Code of Virginia, most of this effort has focused on creating new fees for TNCs, NTNCs, and wholesale waterworks or community systems with just a few connections. This regulatory update will likely take up to two years to complete and will potentially increase programmatic revenue from TNCs and NTNCs by less than $125,000 per year.

Community and NTNC waterworks pay a yearly fee to support Virginia's public drinking water program. This yearly "Technical Assistance Fee" provides ODW with resources to provide technical assistance, perform inspections, maintain compliance and enforcement oversight, track core programmatic metrics, help with emergency preparedness and response, ensure that EPA understands infrastructure funding needs, and maintain federal primacy under the SDWA. Currently, NTNCs pay a flat rate of $90 per year, while community waterworks pay $3.00 per

service connection (pursuant to the Appropriation Act) up to a maximum of $160,000 per year (pursuant to Va. Code § 32.1-171.1). See Table 1 below for a fee history, including effect of inflation.

Table 1
Waterworks Operation Fee History

Year	TNC	NTNC	Charge per Connection	Cap*	CPI	Effect of Inflation with 1992 Baseline
1992-1993	$ -	$ 60.00	$ 1.50	$ 160,000	140	$ 1.00
1993-1994	$ -	$ 90.00	$ 2.05	$ 160,000	145	$ 0.97
1994-1995	$ -	$ 90.00	$ 2.05	$ 160,000	148	$ 0.95
1995-1996	$ -	$ 70.00	$ 1.60	$ 160,000	152	$ 0.92
1996-1997	$ -	$ 70.00	$ 1.60	$ 160,000	157	$ 0.89
1997-1998	$ -	$ 70.00	$ 1.60	$ 160,000	161	$ 0.87
1998-1999	$ -	$ 81.00	$ 1.85	$ 160,000	163	$ 0.86
1999-2000	$ -	$ 81.00	$ 1.85	$ 160,000	167	$ 0.84
2000-2001	$ -	$ 81.00	$ 1.85	$ 160,000	172	$ 0.81
2002-2003	$ -	$ 81.00	$ 1.85	$ 160,000	177	$ 0.79
2003-2004	$ -	$ 81.00	$ 1.85	$ 160,000	180	$ 0.78
2004-2005	$ -	$ 81.00	$ 1.85	$ 160,000	184	$ 0.76
2005-2006	$ -	$ 81.00	$ 1.85	$ 160,000	189	$ 0.74
2006-2007	$ -	$ 81.00	$ 1.85	$ 160,000	195	$ 0.72
2007-2008	$ -	$ 90.00	$ 2.05	$ 160,000	202	$ 0.70
2008-2009	$ -	$ 90.00	$ 2.05	$ 160,000	207	$ 0.68
2009-2010	$ -	$ 90.00	$ 2.05	$ 160,000	215	$ 0.65
2010-2011	$ -	$ 90.00	$ 2.05	$ 160,000	215	$ 0.65
2011-2012	$ -	$ 90.00	$ 2.05	$ 160,000	218	$ 0.64
2012-2013	$ -	$ 90.00	$ 2.95	$ 160,000	225	$ 0.62
2013-2014	$ -	$ 90.00	$ 2.95	$ 160,000	230	$ 0.61
2014-2015	$ -	$ 90.00	$ 2.95	$ 160,000	233	$ 0.60
2015-2016	$ -	$ 90.00	$ 2.95	$ 160,000	237	$ 0.59
2016-2017	$ -	$ 90.00	$ 2.95	$ 160,000	237	$ 0.59
2017-2018	$ -	$ 90.00	$ 2.95	$ 160,000	240	$ 0.58
2018-2021	$ -	$ 90.00	$ 2.95	$ 160,000	245	$ 0.57
2022	$ -	$ 90.00	$3.00	$ 160,000	296.28	$ 0.47

*$160,000 in 1992 represents 47% percent in today's dollars, i.e., $75,200 in 2022
Note. Inflation data source is the Federal Reserve

NTNCs, wholesale waterworks, and community waterworks with fewer than 30 service connections pay lower Technical Assistance Fees than most community waterworks serving localities. TNC waterworks currently pay no Technical Assistance Fees. Despite paying lesser or zero fees, TNCs, NTNC, and very small community waterworks (defined by EPA as serving 500 or fewer persons) require more technical assistance and compliance oversight to maintain

compliance with drinking water and operational standards in Virginia's Waterworks Regulations as compared to larger community waterworks and wholesale waterworks.

ODW collects about $4.7 million per year from NTNCs and community waterworks. There are 1,097 community waterworks and 516 NTNCs that pay a fee contributing to this total. There are 1,251 TNCs that do not pay any fee. Twelve community waterworks with more than 53,333 service connections pay the statutory maximum of $160,000 per year. There are 493 community waterworks that have over 100 service connections, and their fees range from $300 per year to $160,000 per year. If a wholesale or community waterworks has one service connection, it pays an operation fee of $3. Community and wholesale waterworks with 10 service connections pay a fee of $30, etc. In 2021, there were 287 community waterworks with fewer than 30 service connections–meaning they were each billed less than $90 for operation fees. Furthermore, at least 15 of those were wholesale providers serving a substantial number of customers through a single connection, and either not paying a fee or only paying $3 per year.

While the largest waterworks (by number of service connections) pay the highest fees, smaller waterworks, particularly TNCs and those serving fewer than 500 persons, tend to consume the most ODW resources in terms of staff time (e.g., technical assistance, reminders to monitor, training, inspections, and enforcement). TNCs and NTNCs require far more technical assistance and enforcement oversight because many of these waterworks lack the technical, managerial, and financial capacity to operate within the regulations. For many TNC owners, the water provision is also not their primary business purpose. They may primarily operate a marina, campground, restaurant, hotel, gas station, or some other business and simply need water to serve their customers. As a result, the monitoring and reporting that is required–usually monthly or quarterly samples to check for bacterial contamination, and annual samples to check for nitrate/nitrite contamination–is viewed by the owner as a distraction and not a high priority since it is not the main purpose of their business. Furthermore, unlike NTNC and community waterworks, TNCs are not required to employ a licensed waterworks operator, which means that many TNCs do not have support of a professional operator who is familiar with the requirements of the Waterworks Regulations. VDH staff must therefore train owners to take samples, remind them to collect and submit samples, and take enforcement action whenever they do not comply with applicable regulations.

ODW has historically sent a waterworks owner who owns multiple waterworks one bill aggregating all of the fees for all of his or her waterworks. In doing so, ODW applied the cap of $160,000 to the owner and not the regulated, distinct waterworks facilities. This practice has reduced the fee paid by these owners because they had, in total, enough connections such that the cap applied. If the cap had instead been applied based on the number of connections at each waterworks facility, the cap would not have been met. So, if ODW billed each waterworks separately for its connections, and did not combine billing as a practice, then seven waterworks owners in Virginia would pay an estimated $177,405 in additional fees (see Table 2 below).

Table 2
Underbilling of Technical Assistance Fee Due to $160,000 Cap Applied by Owner Instead of Regulated Waterworks

Waterworks	Estimated Additional Fees
Virginia American Water	$ 16,580.00
Fairfax County Water Authority	$ 972.00
Prince William County Service Authority	$ 107,378.00
City of Chesapeake	$ 38,747.00
City of Newport News	$ 1,782.00
Loudoun Water	$ 5,841.00
Western Virginia Water Authority	$ 6,105.00
Total	**$ 177,405.00**

If the fee cap of $160,000 per year were removed, then the following waterworks would cumulatively pay an estimated $1.929 million more per year (see Table 3 below).

Table 3
Potential Billing of Technical Assistance Fee with $160,000 Cap Removed

Waterworks	Calculated New Billing	Current Bill	Billing With Cap Removed
Henrico County	$287,448.00	$160,000	$127,448
Virginia American Water	$176,580.00	$160,000	$16,580
Fairfax County Water Authority	$859,185.00	$160,000	$699,185
Prince William Co. Service Auth.	$267,378.00	$160,000	$107,378
Chesapeake	$198,747.00	$160,000	$38,747
Newport News	$404,316.00	$160,000	$244,316
Norfolk	$209,061.00	$160,000	$49,061
Virginia Beach	$471,840.00	$160,000	$311,840
Chesterfield Co. Utilities Dept.	$351,669.00	$160,000	$191,669
Richmond, City of	$187,038.00	$160,000	$27,038
Loudoun Water	$237,702.00	$160,000	$77,702
Western Virginia Water Authority	$198,105.00	$160,000	$38,105
Total	**$3,849,069**	**$1,920,000**	**$1,929,069**

If the $160,000 cap remained in effect, then additional revenue could be realized by changing the fee per connection from $3.00 to $5.13, affecting the following waterworks as indicated in Table 4 below, resulting in nearly $765,000 in additional annual revenue.

Table 4

Potential Impacts to Billing of Technical Assistance Fee with Adjustments to $160,000 Cap and per Connection Fee (Top 29 Largest Waterworks in Virginia Only)

Waterworks	Estimated Connections (conn.)	Calculated Bill, FY23 at $3/conn.	FY23 Billing at $3/conn., $160K cap	Future Bill w/ Fee of $5.13/conn., No Annual Cap	Future bill w/ Fee of $5.13/conn., $160K Annual Cap	Increase to Waterworks
Fairfax County Water Authority	286,395	$859,185	$160,000	$1,469,206	$160,000	$0
Virginia Beach	157,280	$471,840	$160,000	$806,846	$160,000	$0
Newport News	134,772	$404,316	$160,000	$691,380	$160,000	$0
Chesterfield Co. Utilities Dept.	117,223	$351,669	$160,000	$601,354	$160,000	$0
Henrico County	95,816	$287,448	$160,000	$491,536	$160,000	$0
Prince William Co. Service Auth.	89,126	$267,378	$160,000	$457,216	$160,000	$0
Loudoun Water	79,234	$237,702	$160,000	$406,470	$160,000	$0
Norfolk	69,687	$209,061	$160,000	$357,494	$160,000	$0
Chesapeake	66,249	$198,747	$160,000	$339,857	$160,000	$0
Western Virginia Water Authority	66,035	$198,105	$160,000	$338,760	$160,000	$0
Richmond, City of	62,346	$187,038	$160,000	$319,835	$160,000	$0
Virginia American Water	58,860	$176,580	$160,000	$301,952	$160,000	$0
Stafford County	39,217	$117,651	$117,651	$201,183	$160,000	$42,349
Arlington Co. Government	37,609	$112,827	$112,827	$192,934	$160,000	$47,173
Spotsylvania Utilities	32,790	$98,370	$98,370	$168,213	$160,000	$61,630
Portsmouth	32,380	$97,140	$97,140	$166,109	$160,000	$62,860
Aqua Virginia, Inc.	25,753	$77,259	$77,259	$132,113	$132,113	$54,854
Suffolk Dept. Public Utilities	25,674	$77,022	$77,022	$131,708	$131,708	$54,686
James City Service Authority	23,440	$70,320	$70,320	$120,247	$120,247	$49,927
Lynchburg	23,214	$69,642	$69,642	$119,088	$119,088	$49,446
Hanover Co. Dept. of Pub. Utils.	22,025	$66,075	$66,075	$112,988	$112,988	$46,913
Albemarle Co. Service Authority	21,204	$63,612	$63,612	$108,777	$108,777	$45,165

Waterworks	Estimated Connections (conn.)	Calculated Bill, FY23 at $3/conn.	FY23 Billing at $3/conn., $160K cap	Future Bill w/ Fee of $5.13/conn., No Annual Cap	Future bill w/ Fee of $5.13/conn., $160K Annual Cap	Increase to Waterworks
Washington County Service Authority	21,143	$63,429	$63,429	$108,041	$108,041	$44,612
Danville	17,511	$52,533	$52,533	$89,481	$89,481	$36,948
Frederick Water	17,361	$52,083	$52,083	$88,715	$88,715	$36,632
Leesburg	16,511	$49,533	$49,533	$84,371	$84,371	$34,838
Harrisonburg	16,349	$49,047	$49,047	$83,543	$83,543	$34,496
Augusta Co. Service Authority	14,903	$44,709	$44,709	$76,154	$76,154	$31,445
Charlottesville	14,660	$43,980	$43,980	$74,913	$74,913	$30,933
Total		$5,054,301	$3,167,581	$8,640,486	$3,890,139	$764,906

Many different possibilities exist between increasing the cap, eliminating the cap, and charging a different fee per connection. Table 5 shows the potential impact of eliminating the $160,000 cap and increasing the fees per connection by $1.00, $2.00, and $3.00.

Table 5

Potential Impacts to Bill of Technical Assistance Fee with Removal of $160,000 Cap and Increases of $1, $2, and $3 to the per Connection Fee

Waterworks	Current calculated bill FY2023 $3.00/connection	Future calculated bill with raised fee $4.00/connection	Future calculated bill with raised fee $5.00/connection	Future calculated bill with raised fee $6.00/connection
FAIRFAX COUNTY WATER AUTHORITY	859,185	1,145,580	1,431,975	1,718,370
VIRGINIA BEACH	471,840	629,120	786,400	943,680
NEWPORT NEWS	404,316	539,088	673,860	808,632
CHESTERFIELD	351,669	468,892	586,115	703,338
HENRICO COUNTY	287,448	383,264	479,080	574,896
PRINCE WILLIAM COUNTY	267,378	356,504	445,630	534,756
LOUDOUN WATER	237,702	316,936	396,170	475,404
NORFOLK	209,061	278,748	348,435	418,122
CHESAPEAKE	198,747	264,996	331,245	397,494
WESTERN VIRGINIA WATER AUTHORITY	198,105	264,140	330,175	396,210
RICHMOND	187,038	249,384	311,730	374,076
VIRGINIA AMERICAN WATER	176,580	235,440	294,300	353,160
STAFFORD COUNTY	117,651	156,868	196,085	235,302
ARLINGTON CO GOVERNMENT	112,827	150,436	188,045	225,654
Spotsylvania COUNTY	98,370	131,160	163,950	196,740
PORTSMOUTH	97,140	129,520	161,900	194,280
AQUA VIRGINIA, INC	77,259	103,012	128,765	154,518
SUFFOLK DEPT PUBLIC UTILITIES	77,022	102,696	128,370	154,044
JAMES CITY SERVICE AUTHORITY	70,320	93,760	117,200	140,640
LYNCHBURG	69,642	92,856	116,070	139,284
HANOVER CO-DEPT OF PUB UTILS	66,075	88,100	110,125	132,150
ALBEMARLE CO SERVICE AUTHORITY	63,612	84,816	106,020	127,224
WASHINGTON COUNTY SERVICE AUTH	63,429	84,572	105,715	126,858
DANVILLE	52,533	70,044	87,555	105,066
FREDERICK WATER	52,083	69,444	86,805	104,166
LEESBURG	49,533	66,044	82,555	99,066
HARRISONBURG	49,047	65,396	81,745	98,094
AUGUSTA CO SERVICE AUTHORITY	44,709	59,612	74,515	89,418
CHARLOTTESVILLE	43,980	58,640	73,300	87,960
TOTAL	**5,054,301**	**6,739,068**	**8,423,835**	**10,108,602**

Cost Efficiencies and Merger Potential

Upon completing an organizational and managerial review of ODW in 2018, PMG offered several recommendations to improve efficiencies, many of which ODW undertook. In the final report, PMG wrote:

> *Overall, ODW employees work well together within their groups and support ODW's public health mission. However, ODW is currently experiencing a large workload that appears to be caused by an increase of Transient Non-Community (TNC) waterworks, a high employee turnover rate, and cumbersome paper-based processes used by ODW. Employees and external stakeholders report delays in completing work that could be solved with effective employee recruitment and retention, strategic use of current technology, and utilization of streamlined processes. Employees report experiencing low morale overall due to high work volume, high employee turnover, office silos preventing the spread of necessary information, few advancement opportunities, and longtime salary compression.*

ODW subsequently developed aspirational goals to "become a paperless organization," to ensure waterworks had "no health-based violations," and to "streamline and simplify business processes." ODW viewed streamlining and business process improvements as the best way to reduce workload and improve morale given ODW's budget constraints. These three themes continue today. ODW is currently decommissioning old, outdated, and unsecure technologies (e.g., Access databases) while on-boarding proprietary Oracle-based software packages. ODW regularly monitors key metrics, such as the percentage of systems with a health-based violation. Processes and resources are additionally becoming more "centralized" to ensure that service delivery is more focused and consistent throughout the Commonwealth.

ODW's efforts to reduce or eliminate antiquated paper-based processes were dramatically hampered after the budget shortfall developed, as many technology-based solutions to reduce paperwork required new IT infrastructure and additional operational and maintenance costs. Nevertheless, the budget shortfall had a positive impact since staff became forced to streamline operations as part of a cost-reduction exercise.

Using ARPA funding, ODW is currently engaged in an office-wide digitization project. By 2023, ODW expects to fully digitize its filing system, provide an electronic document management system that will allow mobile staff to access files while performing inspections and field work, and enable staff to complete sanitary surveys and inspections using electronic tablets. ODW is also updating its processes to send documents via email, further reducing paper, copying, and mailing costs. In total, these changes are expected to realize a savings of at least $200,000 per year.

While embracing new technologies, ODW simultaneously eliminated, to the extent possible extraneous computer and phone costs from 2018 through 2021, saving the program an estimated $100,000 per year. Program staff spent considerable effort reviewing VITA's bills and ODW's budget looking for cost savings. In doing so, they uncovered numerous billing inaccuracies: including (but not limited to) bills for computers assigned to employees outside

ODW, computers no longer in the possession of ODW, software services for employees outside ODW, and telecommunications services that had been discontinued when ODW closed the East Central Field Office in 2018.

ODW eventually discovered that SBS had not performed detailed reviews of VITA bills for accuracy; it had merely processed payments. This observation provided yet another example of how VDH's ongoing organizational changes can create confusion about specific roles and responsibilities. Thorough bill review had been housed with the business manager in ODW, but after that position was eliminated in 2017, neither SBS nor ODW program staff took on that responsibility until the budget shortfall developed. SBS additionally looked to program staff to submit their own procurement requests for supplies—another function the business manager in ODW had previously performed.

Working through SBS, ODW has diligently sought to control costs related to telecommunications, computers, and computer software. In December 2021, ODW requested that unneeded telephone lines be disconnected, communicated inaccuracies in the VITA bills, and corrected data shared with VITA for billing purposes. ODW now actively monitors billing to ensure accurate and timely corrections to the extent possible. ODW estimates a realized savings of $50,000 per year from its diligence in monitoring billing and reporting errors to SBS.

One of ODW's major cost efficiencies over the past three years is related to proprietary, back-end software and programming that help staff enter data into the EPA's "Safe Drinking Water Information System" (SDWIS). The EPA monitors Virginia's primacy program through SDWIS, which collects about 110,000 sample results per year. SDWIS also tracks compliance and enforcement deadlines, sampling schedules, and routine monitoring. A companion database, the "Compliance Monitoring Data Portal" (CMDP) accepts waterworks compliance monitoring sample results electronically directly from the labs throughout the Commonwealth. ODW had historically accepted sampling data via email, fax, and other paper processes using six part-time wage staff who would enter by hand data from paper into SDWIS. ODW eliminated the wage positions after spending several months training labs to use CMDP, and then ultimately requiring labs to only submit data through CMDP. This specific effort has an estimated annual savings of $180,000.

In 2018, ODW began piloting and implementing an "auto-dialer" system that is now saving significant staff time. ODW estimates that there is about $87,600 per year in savings (see Table 5 for details). Historically, staff would send emails and make phone calls to waterworks (mostly TNCs) to remind them about upcoming compliance sampling needs. Staff now use an automatic dialing and reminder system to notify waterworks owners of pending sampling needs. This has resulted in fewer violations, thereby saving the subsequent time that had been previously required for field staff to generate, log, follow up on, and resolve monitoring violations.

Another significant change by ODW is centralized plan review. In the recent past, ODW's six field offices would have multiple engineering staff review plans. This historical process involved at least 12 to 15 engineers (up to three staff in each field office) to review and comment on engineering plans. After initiating a pilot, staff learned that the review process could

be streamlined by focusing reviews with specific "checklists" and having central office staff supervise and complete the review. This has not only led to faster processing of engineering plans (by as much as 45 days), it has also made the reviews more consistent throughout the Commonwealth. Having fewer staff involved and a more focused plan review process will likely save over $250,000 per year. Tables 5 and 6 below comprise additional efficiencies that ODW has undertaken, or is still developing, since the PMG report (2019-present).

Table 6

Historical and Ongoing Efficiencies

Category	Timeline	Efficiency	Status	Savings
Receiving sample results from labs	Initiated 02/2019. Full-scale implementation by private labs by 12/2020	Implement the EPA's Compliance Monitoring Data Portal (CMDP) to eliminate manual entry of sample results by ODW staff.	DCLS will transition by 12/2022. DCLS submits data electronically via Excel.	Eliminated 6 wage positions. Estimated savings $180,000/yr.
Evaluating and transmitting sample results	Initiated 05/2019. In progress, expected completion by 9/2022.	Implement Safe Drinking Water Information System (SDWIS)compliance reports to replace manual evaluation of sample results. Implement Drinking Water Viewer software to replace email or printed transmission of sample results.	SDWIS compliance reports have been piloted for 1.5 years. Completing development of an oversight system and data quality checks to prevent errors are the remaining activities required for implementation. Expected completion late 2022. Drinking Water Viewer procured and development is near complete.	Approximately 2,000-4,000 hr/yr/total staff time. No data entry, and automatically transmit results to waterworks. Estimated savings: $60,000/yr.
Centralized plan review process	Initiated 11/2021. In progress, expected completion by 10/2022.	Implement a fully electronic and centralized plan review program utilizing a certification statement and checklists to reduce ODW review time and improve permit issuance time. Reduces time to complete plan review, on average, from 72 days to 12.5 days.	Pilot program in effect since 4/2022. Pilot results presented to the Waterworks Advisory Committee (WAC) on 7/19/22. WAC endorsed. Full implementation late 2022. Unique and innovative aspect is that the field offices will perform QA/QC of central office reviews.	Saves about 2,000 hr/yr/total staff time. Est savings: $250,000/yr.

Category	Timeline	Efficiency	Status	Savings
Electronic sanitary surveys and inspections	Initiated 04/2019. In progress, expected completion by 9/2022.	Optimized inspection scheduling to provide more attention to problem systems while maintaining the federally required frequency for well performing systems. Implement electronic sanitary surveys to reduce time spent compiling data for inspections, writing inspection reports, and manually updating data systems. Included Capacity Development "Triennial Assessment" questions into the routine sanitary surveys to save time and effort for gathering and compiling the data as a separate effort.	Schedule optimization completed 3/2022. Electronic sanitary surveys for groundwater and consecutive water systems implemented 3/2022 and staff are accustomed to the software. Electronic sanitary surveys for all other water systems expected to be implemented by 12/2022.	Approximately 6,000-7,000 hr/yr/total staff time. Est savings: $260,000/yr.
Synthetic Organic Compound (SOC) waiver application processing	Initiated 01/2022. Full implementation by 1/2025.	Replace a manual process of mailing paper applications, manually evaluating applications, and mailing approval/disapproval letters with an automated system using an online portal for applications and a data system to perform consistent evaluations as an automated process that develops email responses to send to applicants.	Several features were implemented for the 2022 evaluation cycle. Full implementation planned for the next cycle in 2025.	Approximately 1,500 hrs every 3 years. Est savings: $25,000/yr/total staff time.
FOIA responses– Drinking Water Watch	Initiated 03/2018. Completed 5/2019.	ODW used to receive dozens of requests each month for sampling results and enforcement actions. Staff had to manually query the database to respond to each request.	Onboarded EPA tool to give public real time data via the website, reducing the estimated number of FOIA requests to less than 1 FOIA request per month. Improved customer service and ability for the public to see data in real time.	Approximately 30 hrs/month of total staff time. Est server cost: $40,000/yr. Est savings: $25,000/yr.

Category	Timeline	Efficiency	Status	Savings
Data sharing Drinking Water Viewer	Initiated 02/2021. In progress, expected completion by 9/2022.	Drinking Water Viewer replaces Drinking Water Watch and is a more robust public facing data query for the public to pull "real time" drinking water data from the website.	Software vendor shared the "final" version for review in 7/2022. Final version expected by 12/2022. This is also a cloud-based capable set-up that can decommission server.	Est server cost: $40,000/yr. Est savings: $25,000/yr.
Consumer Confidence Report (CCR) writing and review	Initiated 02/2019. In progress, expected completion by 10/2022.	Implement automated consumer confidence report (CCR) writing tool to replace manual writing of CCRs as a technical assistance to waterworks, and to substantially reduce staff effort required to evaluate CCRs submitted to ODW.	From the success of Drinking Water Watch, customers asked for several revisions, such as pulling sampling schedules from the website. Software vendor will develop this tool into "Drinking Water Viewer."	Approximately 1,500/hr/yr/total staff time. Est savings: $60,000/yr/total staff time.
Monthly Operating Report (MOR) review	Initiated 6/2021. In progress, expected completion by 2024.	Implement a monthly operation permit (MOR) web portal to eliminate manual data entry, manual tracking of MORs, and manual evaluation of MORs.	The software vendor plans to develop a suitable product in 2023 (available with purchase). Implementation would likely occur in 2024.	Approximately 8,000-12,000 hr/yr/total staff time. Est savings: $400,000/yr/total staff time.
Auto-dialer	Initiated 5/2018. In progress, expected completion by 12/22.	To avoid missed samples, which cause a sampling violation, staff would routinely call the waterworks owner to remind them about upcoming sampling events. The "auto dialer" pushes out text and phone messages to customers about pending sampling events, saving staff time and improving the "samples received on-time" metric. This also saves approximately 3 hours of staff time per violation since staff does not have to issue, track, follow up on, and close out each violation. Since implementation, the average number of monitoring violations has dropped from approximately 1,550 per year (2019-2020) to 950 per year (2020-2021).	In progress, staff must routinely update phone numbers and email addresses for all waterworks. Another efficiency is to connect the database to the auto-dialer to avoid manual upkeep of the auto-dialer system. Auto-dialer can also be improved to remind waterworks of sampling schedules and other important events. It is currently focused on small systems, but could expand to larger systems for additional savings.	The vendor costs about $800/yr. Saves about 360 hours per year of staff time making routine reminder phone calls and emails. Saves about 1,800 hours per year of staff time due to the decrease in the number of violations. Est savings: $87,600/yr/staff time.
Electronic data management system	Initiated 3/2018.	ODW had several starts and stops on this project since 2018 as OIM changed its advice.	OIM hired SharePoint programmers and the Deloitte team is working with vendors to	Estimated saving unknown but adds better coverage

Category	Timeline	Efficiency	Status	Savings
	In progress, expected completion 2023.	Initially ODW had to wait on an agency wide roll-out for a vendor. Currently, all ODW paper files are being scanned and put into SharePoint using ARPA funding.	scan all ODW files. This will allow staff from different regions of the Commonwealth to cover all areas of Virginia. Right now, staff must use a paper filing system.	and resiliency to the program.
Reduce the number of devices per employee	Initiated 3/2018. In progress, mostly completed by 12/2021.	ODW leads Emergency Support Function 3 for the Commonwealth (water, wastewater, dam, and infrastructure). For hurricanes and emergency events, staff with desktop computers could not participate in work needs remotely. ODW began requiring all staff to convert to laptop or tablet as computers were refreshed over time. Also, ODW required all staff to use only one phone device and one computer device per person.	Many employees had a desk phone and work cell phone; others had laptop and tablet. Because of a lack of cell phone signal in some offices, some work locations continue to have desk phone and cell phone use.	Est savings: $100,000/yr.
Reduce rental footprint at the Madison Building	Initiated and completed in 2020.	Staff was located in the upper basement and complained of "musty" odors and lack of light (no windows). Given the budget challenges, and with permission from agency leadership, ODW eliminated use of this space in 2020.		Est savings: $95,000.
Transition of Richmond Field Office (RFO) vehicle needs to central fleet management	Initiated and completed by 2018.	With relocation of the field office to Madison Building, vehicle needs were transitioned to central fleet management instead of maintaining its own fleet of vehicles.		
ODW paperless initiative (email instead of posting letters)	Pilot initiated in 2020. In progress, mostly completed by 12/2023.	ODW sends letters and other forms of communication to the water systems and other stakeholders on a regular basis. With paperless initiative, most of these letters are shared with the stakeholders in emails thus reducing postal expenses.	Some of the communication will still occur via postal mail. However, once this project is complete, ODW expects a reduction in the use of paper and expenses (time and money) associated with postal mail.	Est savings: $20,000/yr.
Transition Total Coliform Repeat Kits Responsibility to DCLS	Completed by 2023.	ODW sends total coliform repeat kits to the Division of Consolidated Laboratory Services' (DCLS) customers. DCLS will take over responsibility for this activity.	DCLS taking over this activity.	Est savings: $75,000/yr.

Table 7

Other Streamlining, Program Simplification, and Process Improvements

<table>
<tr><th>Category</th><th>Timeline</th><th>Status</th></tr>
<tr><td>Changed process and ownership of permit issuance</td><td>Before 2018, the ODW Director signed every operation permit across the Commonwealth. Work units did not have authority. Authority for operation permit issuance shifted to the Field Director and field office team, speeding up the time for ODW to issue operation permits. The Division of Technical Services performs regular audits of permitting activities of the field offices.</td><td>Initiated and completed in 2018.</td></tr>
<tr><td>Created metrics for the program</td><td>Before 2018, ODW did not have metrics for program activities. Metrics now include: the percentage of systems inspected on time, the percentage of systems that sampled on time, the percentage of systems with a health-based violation, the percentage of systems with an up-to-date permit, and the time to complete plan review.</td><td>Initiated in 2018 and started monthly monitoring of metrics in 2018.</td></tr>
<tr><td>Organize dozens of working memos into technical manuals so program processes are easily found, understood and identified</td><td>Technical manuals associated working memos described below:

<table><tr><th>Manual Title</th><th>Related Working Memos</th></tr><tr><td>Administration (may not need this one)</td><td>396, 571, 630, 667, 705, 771, 781, 793, 800, 806, 815, 822, 825, 838, 860, 863, 864, 873, 881, 882, 887, 888, 889, 890, 903, 916</td></tr><tr><td>Permit</td><td>259, 547, 574, 657, 680, 746, 769, 782, 784, 802, 810, 813, 817, 839, 845, 869, 880, 884, 896, 897, 899, 902, 906</td></tr><tr><td>Sampling</td><td>886, 894, 895, 898, 909, 910, 912, 914, 915, 917, 918</td></tr><tr><td>Enforcement</td><td>327, 529, 704, 740, 747, 764, 801, 834, 835, 844, 859, 908</td></tr><tr><td>Training & Orientation</td><td>535, 595, 733, 738, 821, 841, 842, 911</td></tr><tr><td>Source Water</td><td>777, 840, 852</td></tr><tr><td>Communication</td><td>200, 276, 298, 310, 328, 513, 526, 878</td></tr><tr><td>Field</td><td>743, 850, 851, 900</td></tr><tr><td>Data Management</td><td>823, 824</td></tr></table></td><td>Initiated in 2019. In-progress, not completed.

To date, the Sampling Manual, Enforcement Manual, Training Manual, Source Water, and Permit Manual are updated. Most of the administrative working memos were dissolved since they implemented other agency procedures. The Permit, Field, Sampling and Enforcement Manuals are being revised again and should be re-issued by early 2023.</td></tr>
<tr><td>Revised the Waterworks Regulations</td><td>Before 2018, ODW had unsuccessfully tried to update the Waterworks Regulations at least three times. ODW initiated a regulatory process in 2018 and completed it in 2021. The regulations reduced prescriptive rules, added performance requirements, and created more design flexibility for the engineer.</td><td>Initiated in 2018 and completed in 2021.</td></tr>
<tr><td>Redistributed workload</td><td>From the VCU Performance Management Group recommendations, ODW created a sixth field office and redistributed workloads. Prior to 2016, ODW had six field offices, but because of budget cuts, laid off staff and eliminated a field office. The subsequently formed “support office” had a staff of 10 people located in Richmond, Virginia, who were supervised by staff in Culpeper and Norfolk.</td><td>Initiated in 2020 and completed in 2021.</td></tr>
<tr><td>Require monthly 1:1 meetings</td><td>In 2019, ODW started expecting supervisors and managers to hold at least monthly meetings with direct reports. Specific agenda items for the 1:1 should be set by the direct report. It is not for simple work status updates but does include “Progress toward goals” as a standing agenda item.</td><td>Initiated in 2019 and completed by 2020. Requires monitoring as staff enter the workforce and leave.</td></tr>
</table>

Category	Timeline	Status
Anonymous staff comment box	In 2019, ODW initiated an anonymous comment/suggestion box for staff to express concerns directly to the ODW Director that they might be uncomfortable sharing with their name attached to the feedback. Since inception, ODW Director Roadcap has reviewed and responded to several suggestions and comments. Comments have included concerns about equity and use of terminology, pay, safety and security, distribution of work, metrics, etc.	Initiated and completed in 2019. Requires ongoing reminders to staff.
Training team Committee	Before 2018, ODW had inconsistent on-boarding of new employees and inconsistent training in different work units for the same position. ODW started a training work group that has formalized a roadmap for on-boarding new employees and created checklists and procedures to streamline and make consistent training of similar positions in different geographic locations of the Commonwealth.	Initiated in 2020 and continues to be a work in progress. The training team meets quarterly, on average.
Weekly tracking of work activities by each work unit	Every week, each work unit must report activities and accomplishments. This accounting is shared with the entire ODW team to improve communication and transparency.	Initiated in 2018 and continues to the present day.
Initiated Desk Books to improve understanding of job duties and on-boarding	To date, ODW has created a resource "desk book" for the engineer and emergency coordinator position. The desk book is an overview of the position's duties, "how-to's," and what a new employee must understand to be successful.	Initiated in 2018. In-progress.
Review and updating of Waterworks Business Operation Plans	The Waterworks Business Operation Plan (WBOP) forms and program are being updated and revised.	Initiated in 2021. In-progress. Expected completion by December 2022.
Review and update to the Waterworks Operation Fee Regulations	The Waterworks Operation Fee Regulations have not changed since 1997. The fee revenue could be increased by requiring all classes of waterworks to pay a fee.	Initiated in 2021, NOIRA completed in February 2022. Stakeholders group formed in March 2022. Draft regulations are currently being prepared for review.
Webinar courses	Operator Certification Program staff are eliminating or changing certain Virginia Tech contracted training classes to webinars and eliminating redundant or low attendance courses. The pandemic identified courses that appear just as impactful as webinar-based when compared to in-person. Webinar-based training has lower cost.	Initiated in 2021. In-progress. Expected completion in 2023.
Asset management	Revised the Capacity Development Strategy as required by America's Water Infrastructure Act of 2018 (a federal law that requires reporting on resilience and emergency preparedness), and shifted all Asset Management Plan review and follow-up to Capacity Development staff.	Started in 2020; completed in 2022.
Found TNC procedures	ODW's Training, Capacity Development and Outreach Division staff led a committee that developed, revised, updated and streamlined "found TNC" procedures, including developing a "Welcome Packet" of essential information for waterworks owners and operators of TNC systems.	Started in 2019, awaiting issuance of policy and procedure. Expected completion by 2023.

Additional Efficiencies to Explore

ODW has additional opportunities to streamline services and improve business processes. Specifically, ODW should explore collaborating more with local health departments while strengthening centralized delivery of services. These opportunities are described in further detail below.

1) Pilot a deeper collaboration with the local health departments in order to implement recommendations from the Office of the State Inspector General.

In 2002, VDH moved oversight, responsibility, and enforcement of applicable regulations of TNC waterworks from the local health departments (LHDs) to the Office of Drinking Water. In most cases, LHDs regulate the business activity (e.g., restaurant, hotel, motel, marina, campground, pool, sewage system), while ODW regulates the public water system (PWS). Thus, there is a division in oversight. Since many TNCs hold multiple permits from the local health department and ODW, and EPA includes a condition to Virginia's PWSS grant that requires accountability for administering an appropriate TNC program in Virginia, LHDs and ODW should strive for closer, more collaborative coordination to ensure effective customer service, maintenance of primacy, and protection of public health.

Additionally, in 2021 the Office of the State Inspector General (OSIG) issued a report noting that ODW should develop a water quality sampling verification program. OSIG observed that ODW relied on the regulated community to submit water quality samples, and there was no quality assurance/quality control (QA/QC) program to ensure that waterworks were collecting samples at the right time, at the correct locations, and with the proper procedures. In response to OSIG's findings, the 2022 General Assembly funded a new program to provide sampling QA/QC. ODW receives about 110,000 water quality samples per year in its program. With the additional funding and the current, ongoing development of a new sampling verification program, new opportunities exist for the LHDs and ODW to collaborate and become more efficient. ODW should pilot with an LHD how to implement new TNC inspection and oversight procedures given the new program. This may require the development of a cost allocation plan for such personnel.

2) Strengthen centralized delivery of services.

ODW has implemented several initiatives to centralize and streamline performed work, including plan review, compliance and enforcement, monitoring metrics, sampling submission, and a new program for lead monitoring of drinking water at schools and childcare centers. OSIG recommended additional centralization of compliance and enforcement. ODW should therefore continue centralizing services and managerial oversight of work units. For example, ODW has successfully shown that an Engineering Manager II role can provide effective oversight of more than one geographical region. These efficiencies should improve consistency as OSIG suggested, empower staff to make decisions and be accountable to them, and ensure adequate oversight of the work unit performance through established metrics.

Office Merger Analysis

On March 3, 2003, State Health Commissioner Dr. Robert B. Stroube announced that the Division of Drinking Water within the Office of Environmental Health Services (OEHS) would be elevated to an office level program within VDH. Dr. Stroube wrote:

> *I am pleased to announce that the Division of Drinking Water has been elevated to the Office of Drinking Water. The regulation of drinking water is one of the most critical public health functions and has been the subject of much legislative and media interest in part because of water shortages across the state. Consequently, we have made the decision to elevate this key program in recognition of its importance to the public's health and to VDH…*

Many of the original reasons to move the drinking water program to an agency-level office remain valid today. As an all-hazards response program (ESF-3 lead for the Commonwealth), ODW works to improve cybersecurity, emergency response, resilience, and sustainability at waterworks throughout the Commonwealth. ODW implements a federal program and must implement the baseline federal drinking water regulations and requirements. Drinking water concerns and issues routinely appear in national and statewide media, most recently evident in Jackson, Mississippi, Roanoke, Virginia, and Baltimore, Maryland. Drinking water has a direct effect on public health, and the public is often keenly interested in the health effects from chemical spills, harmful algal blooms, legionella, droughts, lead in drinking water at schools and childcare centers, PFAS, and other emerging contaminants.

In addition to its significance in protecting public health, ODW has significant work volume, which is best managed as an independent office. ODW reviews about 110,000 water sampling events per year, including hundreds of operation reports from waterworks each month. ODW provides thousands of contacts for technical assistance each year to the regulated community. ODW accomplishes this work through a staff of 129 FTEs and is likely understaffed at this level based upon a preliminary review from US EPA (see the Emerging Issues section of this report for more information).

The work volume of OEHS is just as robust as of ODW. For instance, working through local health departments, OEHS helps local health districts regulate about a million onsite sewage systems and two million private wells. OEHS, mostly funded by the Commonwealth, implements state programs pertaining to restaurants, shellfish sanitation, hotels, motels, marinas, campgrounds, summer camps, onsite sewage systems, private wells, migrant labor camps, bedding and upholstery, recreational water, pools, and other general environmental needs. OEHS has a staff of 20 administering the shellfish and waterborne hazards programs, and a remaining staff of 35 involved in other programs.

Combining the two offices would not alleviate or reduce the level of effort required for their many independent programs or the significant volume of work performed in each work unit. Possibly, there could be an opportunity to reduce supervisory or management level positions through an office merger; but even then, the volume of work would strain program implementation without careful evaluation of the possible efficiencies from shared supervisory

duties of certain programs. Neither OEHS nor ODW reports excess staffing for program implementation. In fact, this report highlights a preliminary finding that ODW is understaffed by 20 to 25 positions over the next three years.

Notwithstanding the volume of work and technical nature of response needs, ODW is substantially funded by federal grants, which limits ODW's activities to implementation of the national drinking water program. This means that if ODW were to perform work for OEHS programs (and outside of the national drinking water requirements and grant activities), then state funding would be necessary to cover costs for that non-grant work. A full-time employee (FTE) funded 50% by the grant and 50% from state funding is possible; however, it leads to questions about tracking time and making sure that the federal grant is not paying for state programs. Also, the unused grant funding, in this example, 50%, would be redirected to another grant purpose and not used to cover salary and benefits for the FTE. As such, the Commonwealth would need to provide for the additional 50% of salary and benefits instead of relying on the federal grant.

OEHS, already funded by state general funds, could assist ODW with its work if OEHS had additional bandwidth to take on the additional ODW work, or additional efficiencies could be found to allow such merging. However, just like ODW, OEHS is only resourced to perform the work that they currently perform for multiple state programs.

There are several areas where ODW and OEHS collaborate and share resources when the national (grant) activities within ODW connect with OEHS's statewide programs. The Public Health Toxicology Program within OEHS is staffed with two toxicologists who assess hazards (primarily chemicals) in the environment and their impact on health. ODW uses the program as subject matter experts in the field of toxicology and support at community meetings. Most recently, the OEHS toxicologists assisted with PFAS contamination in drinking water by serving on a working group and providing guidance on harmful algal bloom toxin standards for surface water and municipal water supplies. ODW uses its federal grant to pay for the toxicology resources in assisting the federal program.

OEHS offers orientation for all new hires in environmental health. This orientation is attended by ODW, OEHS, and local health district staff so they may learn what each program and office within the agency does, who the program staff are, and how each program impacts Virginians' health. Emergency preparedness and response is also cross-collaborative. ODW's Emergency Preparedness Coordinator position has been a vital member in both harmful algal bloom and PFAS response, most recently on a PFAS response that impacted public and private wells. OEHS does not have an Emergency Preparedness Coordinator position and has benefitted from that position's expertise in incident and unified command. ODW, OEHS, and local health districts frequently work together on emergency response, including training on water emergencies. ODW is in the process of shifting costs for the Emergency Coordinator position to general funds so that there can be easier cross-collaboration with OEHS and fewer questions about the position being used to support state programs with federal dollars. OEHS, ODW, and the local health districts often collaborate and respond to boil water advisories affecting communities from water line breaks too.

While OEHS and ODW have a few similar divisions or personnel (e.g., Hearing/Legal Affairs, Training Coordinator, Data Management), combining these services into one shared work unit would have limited value beyond current collaboration given the volume of work, the differences in technical programs, and the funding sources for the programs. While both programs have data management needs, ODW's effort is directly associated with a standard national program for reporting to the US EPA. OEHS's efforts are specific to state requirements and unrelated to the national drinking water program. Data management needs are significantly different and not easily merged. The volume of work and the technical differences do not easily deliver cost savings.

Similarly, while both programs have enforcement and compliance work, ODW's program is directly associated with a national program dictated by federal requirements while OEHS's work is for multiple state programs with different needs and considerations. Again, cost savings are not easily identified given the volume of work and the differences between implementing a federal program as compared to multiple state programs.

Training effort within ODW is mostly directed toward licensed operators of waterworks (external focus). In contrast, OEHS's training helps with internal staff development for implementing multiple statewide environmental programs. Given the volume of work in both programs, recognizing that ODW is understaffed given its work volume, and knowing OEHS is staffed for current service delivery, merging the offices is best explored through shared supervisory duties. Deeper collaboration and shared supervision across the multiple programmatic areas remains constrained by the federal grant requirements associated with the national drinking water program as well as the volume of work and technical program differences.

Emerging Issues

Upon learning about the anticipated layoffs in the drinking water program in December 2021, the EPA initiated a conversation with ODW on evaluating workload and resource needs to accomplish program mandates, sustain Virginia's drinking water program, and maintain state primacy. The EPA used a strategic consulting firm, the Cadmus Group LLC, to perform a workload analysis using a nationwide model developed for such purposes. The model, initially developed by the Association of State Drinking Water Administrators, and known as the Costs of States' Transactions Study (CoSTS), utilizes baseline data to evaluate workload needs. The CoSTS workload model develops baseline and minimum resource needs to implement required state rules and programs, including i) program administration, technical assistance, sanitary surveys, enforcement, compliance monitoring, and developing future regulations; ii) emergency response and preparedness; iii) capacity development; iv) operator certification; v) the public notice rule; vi) the groundwater and surface water treatment rules; vii) the Lead and Copper Rule; viii) Consumer Confidence Reports; ix) radionuclides, volatile organic compounds, and synthetic organic compound requirements; x) the disinfection by-products rule; xi) the revised total coliform rule; and xii) state specific programs directed by the Virginia General Assembly. The model recommends a 1:7 ratio of technical positions to a supervisory position.

CADMUS started its evaluation in July 2022 and offered preliminary observations and findings on August 23, 2022. CADMUS plans to finalize its evaluation and analysis in a report by December 2022. CADMUS's preliminary workload analysis, using the national estimates and not yet adjusted for Virginia's programs, indicates a significant gap between resources currently available to ODW and the projected resources needed to effectively implement Virginia's drinking water program by 2025.

Specifically, the preliminary analysis suggests a resource need of between 150 and 175 FTEs. ODW currently has 129 FTEs available, suggesting that at least 21 to 46 additional staff are needed to implement all of the required programs, regulations, and rules. Estimating an expected total cost of $90,000 to $110,000 per year per FTE (which includes salary, benefits, travel, computer/phone/software, and other routine costs), the preliminary workload analysis suggests that as much at least $2.5 million in additional revenue is needed by 2025 to adequately sustain the drinking water program. CADMUS will continue to work with ODW and EPA to refine the estimates and produce a 10-year workload projection and gap analysis.

In addition to engaging in the EPA workload analysis, which did not consider funding sources, ODW took additional actions to stabilize its budget and avoid layoffs. ODW shifted the funding of 12 positions to the Drinking Water State Revolving Fund (DWSRF) program in FY20 due to the ongoing budget shortfall, with an estimated cost shifting of about $1 million per year. EPA recently announced a significant reduction to the DWSRF program, from approximately $17.9 million per year to $11.4 million. Hence, the DWSRF grant is unlikely to support the 12 positions over the long term, and more positions might not be supported by the reduced funding level. ODW's budget is currently under review to determine impacts.

Reduced federal funding, though, while likely temporary, means the Commonwealth does not need to provide the historical 20% match required for the $17.9 million in FY23. In other words, the Commonwealth could reduce its 20% match support by $1.3 million. The US EPA recently observed a need for the Commonwealth to return up to $1.1 million in federal funding. The temporary over-match could be used for that purpose or to redirect the funding of the 12 positions shifted in FY20, both of which would ensure ODW's budget is protected against a shortfall. Presently, the overmatch is directed to help small and disadvantaged communities with drinking water infrastructure needs. Over the long-term, ODW's budget is likely to need additional funding to sustain loans, monitoring, and oversight for aging infrastructure.

ARPA and BIL injected significant new work into the DWSRF program. ARPA provided $100 million in new funding, and BIL is offering an additional $87 million to $100 million each year for the next five years. ODW will need to work with waterworks owners, meet with engineering firms, perform additional plan reviews, and issue required permits. New hires must be trained before taking on responsibilities with this new work.

The Virginia General Assembly recently passed legislation related to the creation of drinking water programs from the ground-up. One of these, which ODW is in the process of developing, is a lead-in-drinking-water program specific to impacts at schools and childcare centers. The other, approved by the 2022 General Assembly, is a funding program for "Equal Access to Drinking Water," which will help small and disadvantaged communities to consolidate

and regionalize. The 2022 General Assembly additionally approved PFAS legislation, anticipating the need for future regulation and work with a stakeholder committee. ODW continues this work.

Conclusion and Recommendations

The ODW budget deficit resulted from numerous factors, including the following:

- Inadequate internal controls, QA/QC, or checks and balances that could have discovered the budget error before ODW implemented a pay equity initiative and onboarded a sixth field office.
- VDH's organizational change, which led to a misunderstanding of roles/responsibilities and ultimately a lack of communication regarding the budget;
- ODW's hiring of an office director with insufficient budget support, and who initially lacked understanding of complicated budget and funding streams;
- Turnover in agency-wide critical positions that supported budget decisions and budget monitoring; and

ODW moved forward with a pay equity initiative for underpaid staff and created a sixth field office to improve workloads, which led to the agency using a non-recurring (one-time) surplus to resolve a recurring budget need. Checks and balances within VDH failed to catch or prevent the mistake.

The following corrective actions are recommended, and each is described in further detail below:

1. Return a business manager resource to the program.
2. Initiate a training program for Office and Health Directors and those new to positions that offer advice on budget matters.
3. Develop new and better internal controls.

VDH will implement these recommendations to ensure adequate internal controls and prevent this type of budget error from reoccurring.

1) Return a seasoned business manager to ODW who is fully dedicated to the program.

VDH has some work units and health districts with a dedicated business manager and others without one. VDH is working with a management consultant to determine best practices and needs for offices and health districts. A business manager dedicated to ODW would improve communication, budget monitoring, and expenditure oversight for the office. This position would ensure that ODW's budget is completed and ready within a reasonable period. Historically, budget development and finalizing a budget has taken VDH several months to complete. The budget would likely be completed much faster with a dedicated business manager.

A business manager fully dedicated to the drinking water program would create a direct, daily communication link between program staff and business operations, including grant

expenditure monitoring, procurements through the Office of Purchasing and General Services (OPGS), and budget needs with the Office of Financial Management (OFM). This would ensure that the ODW Director and the program's grant managers better control and monitor budget decisions directly with OFM, thus better influencing decisions regarding the budget and grant activity.

After implementation of the SBS, the ODW Director and ODW grant managers had weekly to monthly communication on a few select issues, rather than daily communication on all budget topics. ODW's office director, grant managers, and other program staff could more closely monitor grant eligibility determinations and expenditures, procurements, and Requests for Approval to Purchase (RAPs) with a business manager dedicated to the program. The change would also give the ODW Director, business manager, and ODW program staff an opportunity to more routinely meet (and have more impromptu conversations) about program needs and timelines to better connect expenditures with budget priorities.

The business manager remains a crucial role for ODW, and the decision to remove it from the office, particularly just as a new ODW Director arrived, had unintended and negative consequences. Hiring one administrator to oversee multiple budgets of the agency's offices diverted attention away from budget oversight to onboarding new staff, creating a new work unit, and developing new processes and procedures. Furthermore, this critical budget leadership position, which supported multiple offices, changed at least three times over a short period of time (two years), including another organizational change of that business unit just before the COVID-19 pandemic began.

The agency changed processes such that program and financial decisions were separated, which created confusion on responsibilities. The SBS (and previously EOSAS) changed supervisory oversight of staff who performed grant support functions within ODW, stopped performing certain program services that were historically provided, and changed the employee work profiles of program staff. An example of an employee work profile (EWP) change is outlined in Table 8 below.

Table 8

Example of EWP Differences from VDH's Organizational Change

Program Support Tech Sr (ODW Program)	Fiscal Tech Senior (converted SBS work profile)
Independently performs technical office/fiscal tasks. An expert contact and information resource. Performs complex eligibility determinations. Advises and trains others, researches and processes claims; collects and prepares reports; gathers data; helps with memorandums of agreement, requests for proposal (RFPs), contracts and determines bid processes.	Performs complex financial and some analytical services associated with bookkeeping, payroll, or other accounting-related duties, requiring analysis of financial data, processing transactions, reconciliation of discrepancies, development of financial reports, processing accounts receivable, accounts payable and/or payroll actions.

As compared to the SBS position, ODW's previous position drafted correspondence for loan closings, prepared documentation to award funds to grant/loan recipients, coordinated with program staff and agency procurement/fiscal staff, scheduled meetings and background materials for loans with the DWSRF staff, and produced reports and specialized documents derived from the Drinking Water National Information Management System (DWNIMS) database. The position additionally reviewed and entered DWSRF loan/grant application information into the DWNIMS database, prepared quarterly and annual reporting data for EPA, created technical guidance for the DWSRF program, responded to loan recipient questions related to regulations and policy, and handled travel needs.

Similarly, many of the business manager duties performed within ODW were not performed by SBS, such as monitoring billing and keeping the ODW Director (the position's supervisor) routinely and frequently involved in financial decisions. Instead, program staff approached SBS directly and did not necessarily think that they needed to run financial decisions through the ODW Director. Eventually, communication flowed from staff within ODW to SBS, which then communicated needs to the ODW Director. After the ODW Director responded, SBS communicated with OFM. These circuitous paths of communication contributed to the decisions that led to the budget shortfall.

Another complication of the organizational change related to priorities. SBS, having to work with multiple offices, prioritized its work in a manner that caused delays with program decision-making. A business manager reporting to the ODW Director would ensure ODW's priorities are met and not competing with needs from other offices. A dedicated business manager would have more time to focus on ODW's funding streams and grants. Reestablishing a position specifically to ODW's business needs would prevent gaps, miscues, and overlap of effort by creating a single point of contact for staff regarding day-to-day operations. The position would also help with monitoring bills and invoices, which program staff are now doing.

To implement this recommendation, VDH dissolved the SBS and is in the process of starting a financial management transformation to replace the old business model that failed. The transformation will change core administrative systems and processes to support a digitally enabled department, provide more efficient delivery of services, increase department agility to support the mission, and provide internal systems that deliver consistent and responsive support. The transformation will establish the financial management function at VDH as a strategic partner among VDH offices and local health districts to support their planning and operations. The guiding principles of the transformation include becoming customer service oriented, empowering offices and local health districts, clear accountability, controls, decision-making authority, and standard processes resulting in compliance and transparency. VDH has not identified a funding source to support a new full-time employee to act as a business manager. Sufficient funding is necessary to implement this recommendation.

2) Initiate a training program for Office and Health Directors and those new to positions that offer advice on budget and grant management.

While ideally made available to the entire agency, budget-specific training is particularly needed for ODW, and especially for the office's supervisors and grant managers. Such training

would improve understanding and accountability for financial decisions and help ensure that decisions are made using the agency-approved processes. One critical defect that caused the budget shortfall is that no such experienced person was involved when VDH funded the pay equity initiative and sixth field office.

If the newly hired persons who made and monitored ODW's budget and expenditures had received adequate training and on-boarding, then the budget shortfall might have been avoided despite the organizational change's negative impacts to ODW. The ODW Director did not have a financial or accounting background when hired, and consequently did not know the agency's chart of accounts or budget tracking methods. This is not unusual, as the agency's other office and local health department directors typically have varying levels of administrative, policy, legislative, regulatory, budget, and subject matter expertise, but not an accounting or budget analyst background.

The ODW Director must rely on experts in accounting and budget when making financial decisions. If the ODW Director supervised a business manager who provided advice on the budget in a more routine fashion, or if he had received adequate budget training and better understood recurring funds versus one-time surplus funding, then he might not have recommended approval of the pay equity initiative or the onboarding of a sixth field office to the Chief Deputy Commissioner, which caused the budget shortfall.

Similarly, if others with budget decision authority (e.g., the SBS Director, the Deputy Commissioner, the Deputy Commissioner's Executive Advisor, and the Budget Analyst assigned to ODW) had specific training on ODW's budget, then more accountability and better decisions might have occurred. Instead, many of those decision makers were inadequately informed regarding the budget process and ODW's budget limitations. This lack of understanding caused the few subject matter experts in SBS and OFM to become more heavily relied upon.

To implement this recommendation, OFM will review, revise, establish, and execute policies, procedures, and internal controls regarding grants and budget management. The guidance will include the process for compiling backup documentation of fiscal expenditures within a specified period, a method for the reconciliation of expenditures, a process for the preparation of any required report, and a method for documenting all draw transactions for audit purposes.

Additionally, OFM staff will complete appropriate and mandatory training to better understand the complexities of grant management. Working with OFM and DPB, VDH will identify appropriate training for the ODW Office Director and ODW grant management staff. VDH will include these training courses into staff's required development plan for budget oversight and grant management. Various training vendors offer courses such as the "Accounting Crash Course for Non-financial Managers." VDH will determine appropriate training for staff, which will improve knowledge, skills and abilities for those with budget authority, persons who monitor grants, and those who make grant eligibility determinations. There is no current training program available. Any training program would require design and implementation. Future training could be proprietary, in-house, or a combination of the two. VDH would need additional funding to implement this recommendation.

3) Develop new and better internal controls.

If the agency had instituted better internal methods to verify and perform quality assurance/quality control (QA/QC) for OFM and SBS processes and advice, then the ODW Director would not have received a recommendation that ODW had the financial means to initiate a pay equity initiative or a new field office. The ODW Director had to rely on OFM and SBS and could not perform QA/QC of those work units. Establishing a QA/QC program for financial management would help verify and validate budget decisions and recommendations.

To implement this recommendation, VDH dissolved SBS and initiated a new business model evaluation. A new operational division within OFM leads budget development and grant management for ODW and other offices. VDH will collaborate with office and health directors to finalize its overall budget development and monitoring strategies, new internal controls, and QA/QC programs. The change management process will develop understanding and buy-in from agency leaders. VDH has sufficient resources to implement this recommendation.

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Appendix A: House Joint Resolution No. 538

Recognizing that access to clean, potable, and affordable water is a necessary human right

Agreed to by the House of Delegates, January 26, 2021
Agreed to be the Senate, February 23, 2021

WHEREAS, water is a public good that is held by the Commonwealth as a public trust, not as a commodity, but many Virginians have been and continue to be locked out of equitable water sources due to affordability challenges; and

WHEREAS, United Nations standards suggest that total expenditures on water and sanitation services, together with any needed alternative source of clean water, should not exceed three to five percent of household income; and

WHEREAS, the lack of access to drinking water and water-related illnesses disproportionately impact low-income communities and communities of color, and all efforts must be made to ensure public access to and affordability of water for private use by all residents of the Commonwealth; and

WHEREAS, the realities of the COVID-19 pandemic have exacerbated and amplified the critical importance of water as a quality of life issue; in some cases, access to safe water may be the difference between sickness and health or life and death; and

WHEREAS, in addition, climate change has resulted in challenges to accessibility and affordability of water, with freshwater and groundwater increasingly threatened by storm surges, sea level rise, and drought; and

WHEREAS, the Commonwealth has a responsibility to promote and protect all human rights, which are universal, indivisible, interdependent, and interrelated, and must be treated in a fair and equal manner, on the same footing and with the same emphasis; and

WHEREAS, equitable access to safe drinking water and sanitation is an integral component of the realization of all human rights; the Commonwealth must protect its water resources and ensure the ability of its residents to access and afford water for growing food, cooking, bathing, and drinking; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That the General Assembly recognize that:

1. Access to clean, potable water in amounts that will ensure an acceptable standard of living is a necessary human right;

2. The use of water for personal and domestic uses, such as drinking, sanitation, and food preparation, should be prioritized over the use of water by commercial or industrial entities;

3. Effective strategies should be used by state agencies to limit contamination of water by residents, but most importantly to ensure the reduction of pollution by commercial or industrial entities, and mitigate the impact of climate change on the Commonwealth's freshwater resources;

4. Direct or indirect costs to connect, deliver, and provide water should not be a hindrance to the access of water, and the costs of access to water should not compromise the ability to pay for other essential items, such as food, housing, and health care, so that no one is deprived of water because of inability to pay;

5. Access to water for schools currently without adequate safe drinking water should be addressed as a matter of urgency;

6. Relevant state agencies shall consider that water is a human right when revising, adopting, or establishing policies and regulations, especially when those policies are pertinent to personal and domestic uses;

7. A statewide water affordability program would ensure that every household can afford to pay its water, wastewater, and stormwater bills based on the household's income through percentage of income payment plans with arrears management;

8. Water service disconnections for nonpayment are contrary to promoting public welfare and public health, and the Commonwealth must protect vulnerable populations, including seniors, youths, and medically compromised individuals, from water service disconnections; and

9. The act of unauthorized reconnections of water services that were disconnected for an inability to pay should be decriminalized; and, be it

RESOLVED FURTHER, That the Clerk of the House of Delegates transmit copies of this resolution to Virginia Interfaith Power & Light and Food & Water Watch, requesting that the organizations further disseminate copies of this resolution to their respective constituents so that they may be apprised of the sense of the General Assembly of Virginia in this matter.