Analysis of Maryland's Drinking Water Program Resources and Needs

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Prepared for:

Maryland Department of the Environment (MDE) and the U.S. Environmental Protection Agency (EPA) Region 3

CADMUS

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Acronyms

ASDWA	Association of State Drinking Water Administrators
CPE	Comprehensive Performance Evaluation
DWSRF	Drinking Water State Revolving Fund
EPA	U.S. Environmental Protection Agency
FTE	Full-time Employee
LCR	Lead and Copper Rule
LCRR	Lead and Copper Rule Revisions
MDE	Maryland Department of the Environment
PFAS	Per- and Polyfluoroalkyl Substances
PWSS	Public Water System Supervision
SDWA	Safe Drinking Water Act
WSP	Water Supply Program

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Executive Summary

Maryland's Water Supply Program (WSP), implemented by the Maryland Department of the Environment (MDE), oversees approximately 3,300 public drinking water systems in the state and serves a vital role in upholding public health protection. The core of state drinking water program work is preventative. MDE's WSP ensures that public water systems are in compliance with the Safe Drinking Water Act (SDWA) and are delivering safe drinking water to customers. It also attempts to avert public health crises like the dangerously high lead levels in Flint, Michigan, which doubled the incidence of elevated blood levels in children throughout the city.

For this project, Cadmus was contracted by U.S. Environmental Protection Agency (EPA) Region 3, to conduct a state-specific workload analysis for Maryland. MDE's WSP takes action on several issues that are beyond the SDWA requirements. One recent example is Maryland's program for lead testing in schools, which was established by state regulation. Ultimately, these activities are inherent to the drinking water program's comprehensive goal to ensure safe drinking water and protect public health in a holistic way.

The results of this workload analysis show that there is a severe gap between resources currently available to MDE's WSP and projected resources needed to implement the drinking water program. Figure 1 includes the gap in full-time employees (FTEs) and the gap in funding from 2020 to 2029. There are two gaps related to FTEs: FTE Gap (Available) refers to the difference between available FTEs, including vacant positions, and projected FTEs; and FTE Gap (Staffed) refers to the difference between currently staffed FTEs, excluding vacant positions, and projected FTEs. In 2021, MDE **needs approximately 78 percent more FTEs than currently available, 187 percent more FTEs than currently staffed, and 93 percent more funding than currently available** to effectively implement the program and ensure safe drinking water for the public.

Figure 1: Gap in MDE Resources (2020-2029)

Year	FTE Gap (Available)	FTE Gap (Staffed)	Funding Gap
2020	-50.1	-77.1	-$6,916,773
2021	-55.4	-82.4	-$7,565,212
2022	-53.8	-80.8	-$7,369,986
2023	-63.8	-90.8	-$8,594,103
2024	-70.2	-97.2	-$9,381,871
2025	-75.8	-102.8	-$10,066,889
2026	-72.7	-99.7	-$9,685,094
2027	-72.5	-99.5	-$9,669,113
2028	-74.6	-101.6	-$9,923,738
2029	-76.6	-103.6	-$10,172,975

There are important underlying trends related to MDE's resource need:

- Over the past several years, MDE's WSP has experienced a decline in FTEs dedicated to its operation resulting from the elimination of positions after retirements, ongoing vacancies, and hiring freezes. The WSP has also seen an increase in state workload, from additional resources required to appropriately implement and oversee the current drinking water regulations to addressing state-specific concerns. Workload will continue to increase in the future due to new regulations including emerging contaminants

such as per- and polyfluoroalkyl substances (PFAS), *Legionella*, and harmful algal blooms (HABs) as well as the addition of approximately 350 new consecutive public water systems to Maryland's water system inventory. MDE's WSP has been adapting to declining resources and increasing demands by prioritizing threats to public health and implementing efficiency measures, but their ability to meet all demands and requirements is greatly compromised.

- At one time, MDE had a robust drinking water program and was able to go above and beyond the minimum federal requirements of program oversight, implementation, and enforcement. Due to declining resources, increasing demands, and the need to make cutbacks in areas considered lower-priority, MDE may not be able to meet the minimum requirements needed to maintain primary enforcement responsibility (or primacy) and risks losing primacy of the federal drinking water regulations in Maryland.

Figure 2 includes minimal short term and long term actions that Maryland should take to address immediate and projected resource gaps. These actions came out of discussions among MDE's WSP, EPA Region 3, and Cadmus.

Figure 2: Recommendations to Address Projected Resource Gaps

Recommendation	Description
Fill existing vacancies	MDE's WSP should immediately fill the 27 vacancies to raise staffing levels to the existing approved allocation of 71 FTEs.
Develop a resource investment plan with EPA Region 3	MDE's WSP should negotiate with EPA Region 3 a resource investment plan that would result in the hiring of additional FTEs at an expedited and achievable pace.
Utilize the four percent Drinking Water State Revolving Fund (DWSRF) set-aside	MDE's WSP should consider taking advantage of the DWSRF Administration and Technical Assistance set-aside, which allows states to use up to four percent of the DWSRF capitalization grant to fund state activities. This set-aside can be used to cover costs associated with administering and implementing the state's DWSRF program and providing technical assistance to public water systems of all sizes.
Increase state investment in MDE's WSP via the general fund	Maryland should consider increasing the state investment in implementing the drinking water program by increasing the state general fund contribution. MDE's WSP currently relies more heavily on federal funding sources (88 percent of total funding) than on state funding sources (12 percent of total funding). Increasing state funding will help counter this over-reliance.
Create a fee system	Maryland should consider creating a fee system similar to Pennsylvania or Virginia. Funds generated by a fee program would provide dedicated and predictable funding to ensure drinking water program integrity. A fee of less than $1.50 per public water system user could cover work that MDE's WSP does to support public water systems.

More attention and consideration must be paid by the state to its drinking water program if it intends to maintain its primacy and avoid any potential public health emergencies due to the lack of oversight as a result of staffing shortage. The state must recognize the dynamic and ever-growing workload of MDE's WSP and the importance of the core preventative work, which is to uphold public health protection, the program was created to provide.

Introduction

Why is a state-specific workload analysis important?

The SDWA requires EPA to establish and enforce standards that public drinking water systems must follow. EPA then delegates the primary enforcement responsibility (or primacy) to state or territorial governments. States and territories have established Public Water System Supervision (PWSS) programs that meet the standards set by EPA to support drinking water systems, ensure that drinking water systems consistently provide a safe and adequate supply of water to consumers, and ultimately protect public health. In Maryland, the PWSS program is administered by MDE's WSP. MDE's WSP oversees approximately 3,300 public water systems in the state.

Cadmus has worked with the Association of State Drinking Water Administrators (ASDWA) and EPA in recent decades to conduct several national analyses of the resources needed to effectively run state drinking water programs. Analyses were conducted in 1989, 1993, 1999, 2001, 2011, and 2019. Taken together, the analyses demonstrate that nationally state workload has increased substantially over the years with the promulgation of each new drinking water regulation and statutory requirement, even as PWSS program resources remained stagnant.

The Maryland workload analysis was based on the 2019 national analysis of resource needs conducted by ASDWA and Cadmus and included all activities related to drinking water program implementation, including implementation activities that are not specifically defined in federal regulations and activities to address emerging issues. Maryland has had to take action on several issues that are not required by federal regulations. One recent example is Maryland's program for lead testing in schools, which was established by state regulation. Ultimately, these activities are inherent to the drinking water program's goal to ensure safe drinking water and protect public health. The 2019 analysis presents a more realistic view of state drinking water program workload and shows that nationally state workload will continue to grow.

This analysis will support MDE's resource planning efforts and help to ensure the drinking water program is implemented effectively. MDE once had a drinking water program that exceeded primacy requirements and was able to perform activities that enhanced the program, making it rather robust. MDE is currently in a situation where the drinking water program is maintaining primacy by meeting the minimum requirements. MDE's WSP has seen a decline in staffing resources over the past several years particularly due to retirements, ongoing vacancies, and hiring freezes. MDE's WSP has also seen an increase in workload and will continue to see an increase in the future due to new regulations and the expansion of the number of water systems by regulating an additional 350 new consecutive water systems. MDE's WSP has addressed increasing demand and diminishing resources by prioritizing activities that are more protective of public health (e.g., activities related to lead in drinking water), which takes resources away from other necessary drinking water program responsibilities (e.g., emergency response). This is not a sustainable approach. If MDE's WSP is not able to acquire additional staff and resources, public health will be greatly compromised, and Maryland will risk losing primacy.

For this project, Cadmus was contracted by EPA Region 3, under EPA Contract No. EP-C-15-022, Work Assignment 5-04, to conduct a state-specific workload analysis for Maryland. Cadmus conducted interviews with MDE's WSP and EPA Region 3 to understand Maryland's drinking water program and develop workload estimates specific to Maryland that were then used to generate projected need (in staff and funding) for 2020-2029. This workload analysis tailored to MDE's WSP is intended to provide a comprehensive view of workload and a more accurate

estimate of resources needed. The results of this analysis can help in future planning to ensure MDE's drinking water program is adequately and effectively implemented.

Methods

How was the workload analysis conducted?

To conduct the state-specific workload analysis, Cadmus consulted with both MDE's WSP staff and EPA Region 3 to:

1. Understand resources currently available to MDE's drinking water program and
2. Estimate resources needed to adequately run MDE's WSP and associated drinking water activities.

To gather information on MDE's WSP available resources, MDE's WSP completed a survey, which asked for the number of current FTEs and funding dedicated to the drinking water program. This survey was originally used for the 2019 national workload analysis and was tailored to the Maryland-specific analysis. Cadmus met with MDE's WSP and EPA Region 3 to discuss the responses.

To estimate resources necessary to run MDE's WSP and implement associated drinking water activities effectively, Cadmus used the 2019 national workload model from the 2019 ASDWA workload analysis and tailored it to MDE's WSP. The 2019 national workload model refers to the Microsoft Access database built to calculate projected staffing needs for 55 state and territorial drinking water programs. The workload model includes 14 different categories, which are briefly described in Figure 3, with approximately 80 line items representing drinking water program activities.

Figure 3: Workload Model Categories

Category	Description
Program Administration	Components of a drinking water program that are necessary for it to function (e.g., data management, engineering reviews) and additional state-specific programs (e.g., lead testing in schools and PFAS).
Enforcement Response Policy	Policy that encompasses what drinking water programs must do to address drinking water systems that are not in compliance with the SDWA.
Capacity Development	Strategy to assist drinking water systems in acquiring and maintaining technical, managerial, and financial capacity.
Operator Certification	Minimum professional standards for the operation and maintenance of drinking water systems that are implemented through certification programs.
Suite of Surface Water Treatment Rules	Regulations that improve public health protection through the control of microbial contaminants, including viruses, *Giardia lamblia*, and *Cryptosporidium*, in surface water sources; and prevents significant increases from microbial risk that might occur when surface drinking water systems implement Disinfectants and Disinfection Byproducts Rules.
Ground Water Rule	Regulation that reduces the risk of illness caused by microbial contamination in ground water systems.
Revised Total Coliform Rule	Regulation that improves public health protection by reducing fecal pathogens through the control of total coliform and *E. coli*.
Disinfectants and Disinfection Byproducts Rules (Stage 1 & 2)	Regulations that improve public health protection by reducing exposure to disinfectants and disinfection byproducts.

Category	Description
Lead and Copper Rule	Regulation that protects public health by minimizing lead and copper levels in drinking water; this includes the Lead and Copper Rule Revisions.
Chemical Contaminant Rules	Regulations that enhance public health protection by setting limits on several chemical contaminants, including nitrate and arsenic.
Radionuclides Rule	Regulation that reduces exposure to radionuclides.
Consumer Confidence Report Rule	Regulation that improves public health protection by providing educational materials to allow consumers to make educated decisions regarding any potential health risks pertaining to the quality, treatment, and management of their drinking water system.
Public Notification Rule	Regulation that requires water systems to notify the public of drinking water violations or other situations that may pose a health risk.
Future Regulations	Revised versions of current regulations or new regulations to address new contaminants or issues.

The national workload model was originally built as part of the 2011 workload analysis. The 2011 model estimated workload associated with program activities specifically mandated by the SDWA or an associated EPA primacy requirement. For the 2019 national analysis, the structure of the workload model remained the same, with the addition of some new line items. The model inputs (i.e., burden estimates) were updated to reflect a more realistic estimate of workload, considering additional activities state programs may conduct. For more information about the design of the workload model and line items included in the model, see the 2019 ASDWA report.[1]

Through a series of meetings, Cadmus conducted interviews with MDE's WSP and EPA Region 3 to:

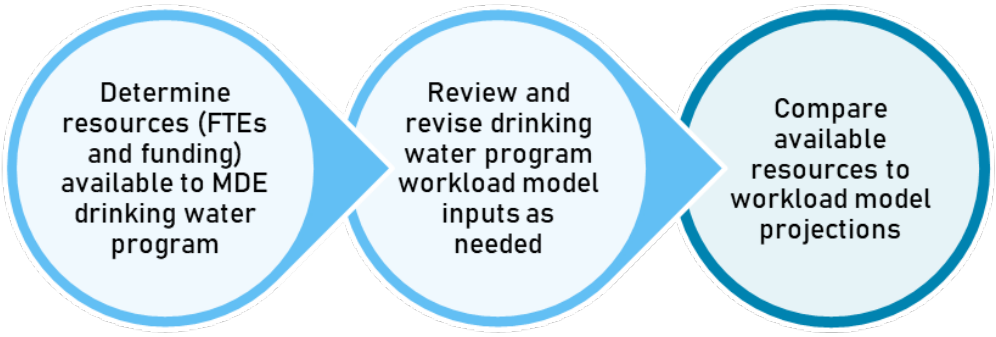
1. Review and revise model inputs for each line item to reflect realistic workload estimates specific to MDE's WSP,
2. Understand drivers for any resource gaps, and
3. Identify possible approaches to close the resource gap.

"Realistic" workload estimates refer to the amount of time required to adequately implement and oversee MDE's WSP, which is often different than the amount of time staff currently dedicate to the activity. Cadmus staff used their best professional judgment and knowledge of national state drinking water programs to ensure the estimates did not overstate the workload. In addition, new line items were added to the model to cover state-specific activities in Maryland, such as water appropriation permitting and lead testing in schools.

MDE's WSP workload projections from the updated model were compared to MDE's WSP available resources to determine if there was a deficit in resources. Figure 4 summarizes the approach used to develop MDE's resource needs analysis.

[1] ASDWA. 2020. 2019 Analysis of State Drinking Water Programs' Resources and Needs: Addressing Emerging Issues and State Specificity in Program Implementation. https://www.asdwa.org/wp-content/uploads/2020/07/2019-Analysis-of-State-Drinking-Water-Programs-Resources-and-Needs.pdf.

Figure 4: Approach for Maryland Resource Needs Analysis



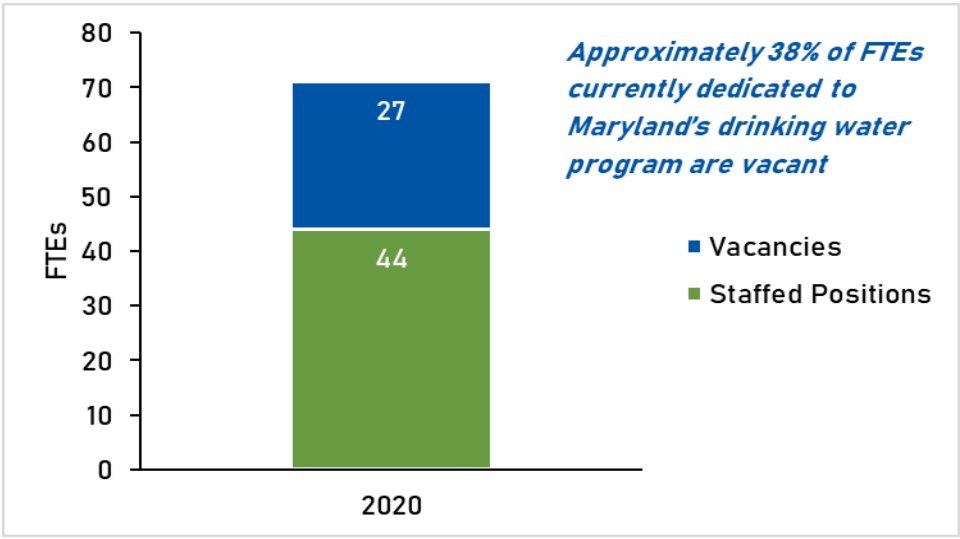
Available Resources

What resources are currently available to Maryland's drinking water program?

FTEs

Maryland currently has **71 FTEs** dedicated to the drinking water program. This includes technical FTEs, managerial FTEs, administrative FTEs, and FTEs dedicated to state-specific activities (e.g., lead testing in schools). Of the 71 FTEs, 27 (or approximately 38 percent) are vacant positions, which include technical FTEs and FTEs dedicated to state-specific activities. See Figure 5 below for a comparison between staffed and vacant positions. Furthermore, nine of the FTEs are contractual positions and therefore are more likely to see turnover than permanent positions, meaning they are less valuable for building program capacity.

Figure 5: Current FTEs – Staffed and Vacancies



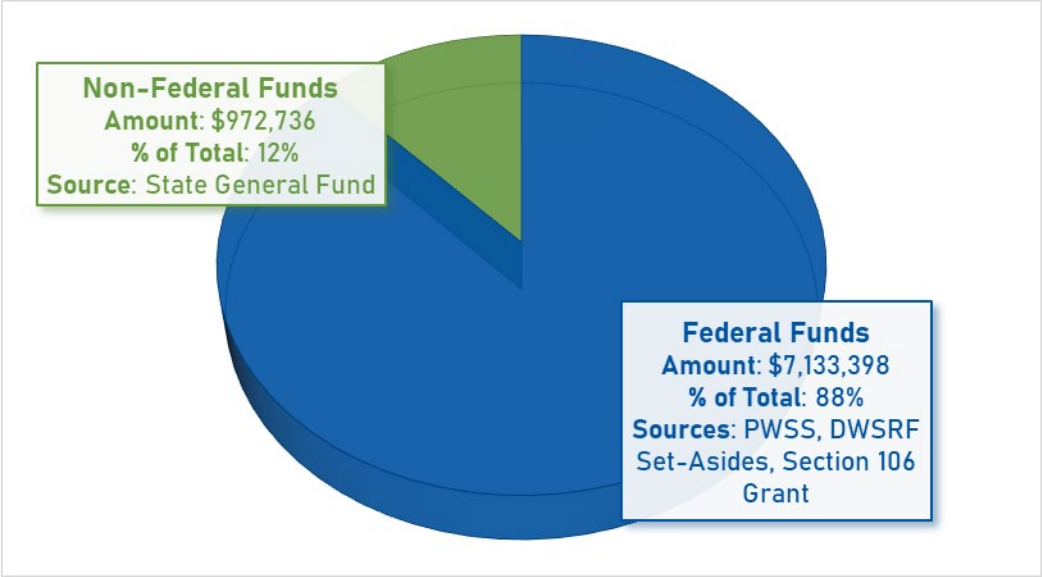
MDE has seen a downward trend in dedicated drinking water program staff over the past several years. In the 2011 national resource needs analysis, MDE reported that they had 50.6 FTEs dedicated to federally required activities, and it was estimated that MDE had approximately 61.6 FTEs dedicated to the whole drinking water

program.[2] In 2016, staffing was at 47 FTEs and fell to 34 FTEs by the end of 2018.[3] MDE's WSP currently has 44 fully staffed positions, though most of the increase since 2016 was due to the transfer of the environmental boards and lab certification divisions into the program. Despite the long-term decline in staffed positions, MDE's WSP staff have taken on substantial new responsibilities related to lead testing in schools and conducting sanitary surveys for 900 additional transient non-community water systems, a role that had been implemented by county governments.[4]

Funding

Based on 2020 funding data, MDE's WSP currently has approximately $8.1 million in annual funding. This includes funding from both federal and non-federal sources. Federal funding sources include the Drinking Water State Revolving Fund (DWSRF) set-asides, the PWSS grant, the state match to the PWSS grant, and water pollution control (or section 106) grants that are used to fund source water protection activities. For the DWSRF set-asides, MDE's WSP does not routinely use the four percent set-aside, and it is not included in the $8.1 million budget. The four percent set-aside is intended for administration and implementation of the DWSRF program and providing assistance to water systems. Instead, Maryland chooses to use those funds as additional funding for water system infrastructure improvement projects. Non-federal sources include funding from Maryland's General Fund. Figure 6 presents current funding for MDE's drinking water program broken down by federal and non-federal funding sources.

Figure 6: Current Funding (Federal vs. Non-Federal Sources)



Nationally, according to information gathered from 36 states for the 2019 national workload analysis, state drinking water programs are funded by a more balanced funding mix. Collectively, the 36 state drinking water programs surveyed received 42 percent of their funds from non-federal sources (i.e., state general funds and fee

[2] Information collected by ASDWA and Cadmus for the 2011 resource needs analysis.

[3] EPA Region 3. 2019. Annual Review of the Public Water Supply Supervision Program for the State of Maryland: January 1, 2018 – December 31, 2018.

[4] Ibid.

programs), and the other 58 percent of funding is received from federal sources (i.e., DWSRF set-asides and PWSS grants). Comparatively, MDE's WSP funding depends more heavily on federal sources (88 percent of total funding) than on state funding (12 percent of total funding). In the past to address the over reliance on limited federal and state funding, MDE's WSP attempted to provide a more balanced and sustainable program funding mechanism through the introduction of a fee program. This effort was unsuccessful. A fee program could include fees for state services, such as issuing drinking water system permits or drinking water system user fees based on the volume of water used or on the number of service connections at a water system.

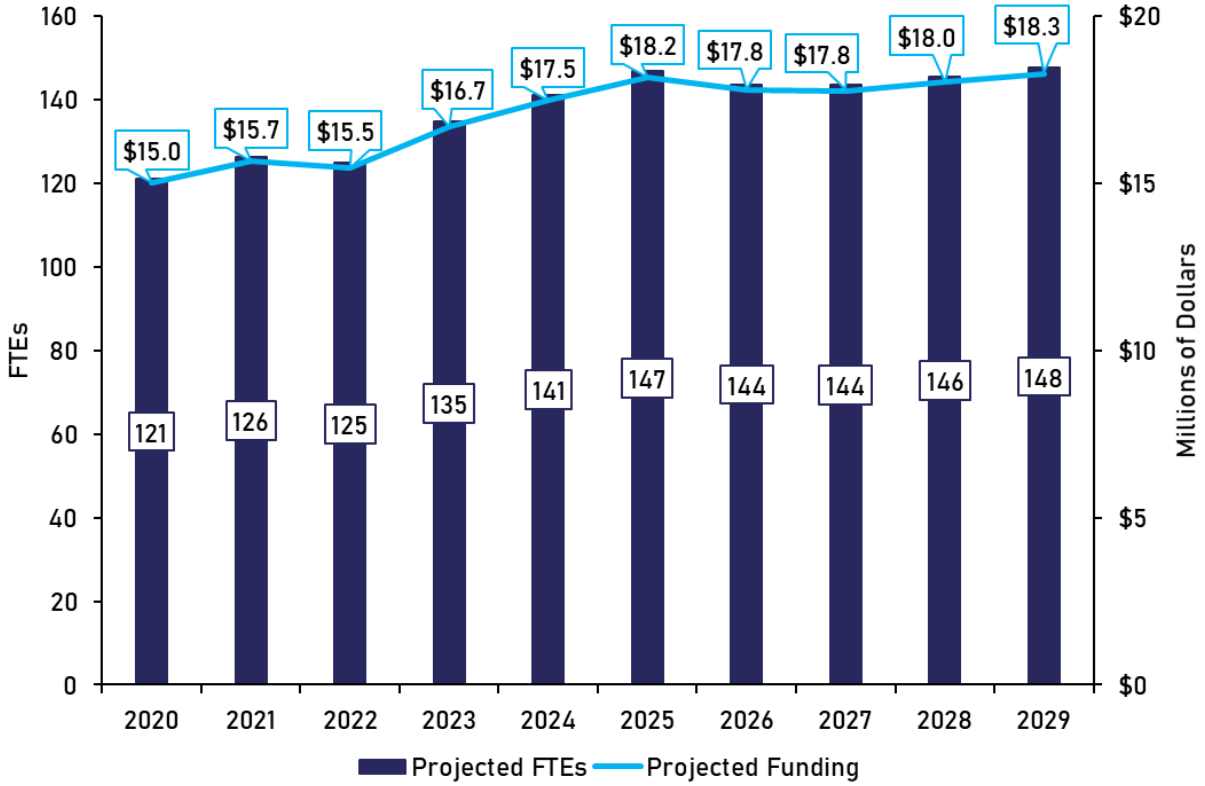
Projected Resources

What are the workload model projections for Maryland?

The projected number of FTEs and funding required to run Maryland's drinking water program from 2020 through 2029 are presented in Figure 7 and Figure 8. The workload model estimates the annual number of FTEs needed to address the categories discussed in Figure 3. Annual funding amounts are calculated by multiplying the projected number of FTEs by the average salary per FTE determined for MDE's WSP ($122,792). The average salary per FTE includes employee salary plus benefits and indirect costs for MDE's WSP, at a rate of 24.04 percent. Indirect costs include costs such as equipment, travel, and office space.

As shown in Figure 7, it is estimated that MDE's WSP **needs 126 FTEs and approximately $15.7 million** in funding to carry out current program responsibilities, implement drinking water regulations, and uphold public health protection in 2021. The greatest need is in 2029 when it is estimated that Maryland will **need 148 FTEs and $18.3 million** to run its drinking water program.

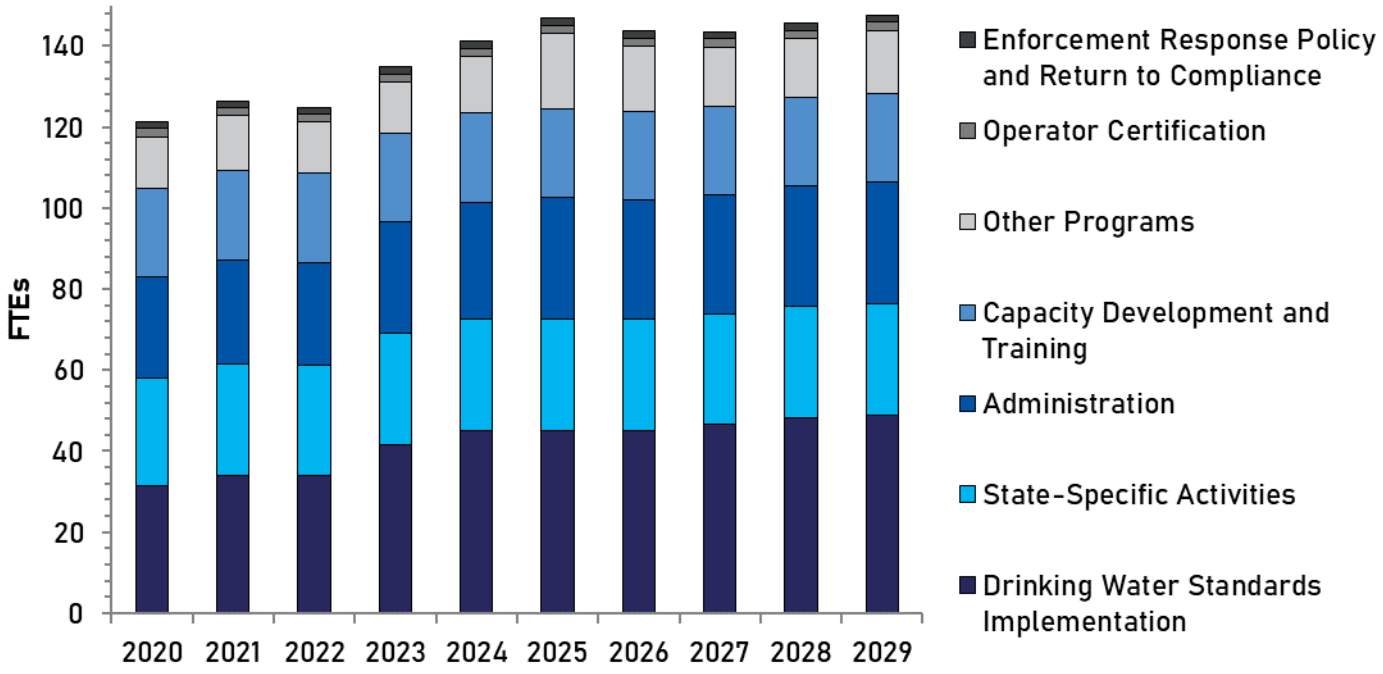
Figure 7: Projected FTEs and Funding Needed by Year (2020-2029)



The distribution of projected FTEs needed across different areas of Maryland's drinking water program is presented in Figure 8. The categories included in Figure 8 are broad, but they include all of the more specific categories from Figure 3. In 2021, it is estimated that MDE's WSP will need the following:

- 34.1 FTEs for drinking water standards implementation,
- 27.3 FTEs for state-specific programs (e.g., PFAS, *Legionella,* lead in schools, emergency response planning, the fourth Unregulated Contaminant Monitoring Rule, water appropriations and use permitting, and county water and sewer planning),
- 25.9 FTEs for administration and supervision,
- 21.9 FTEs for capacity development and training,
- 13.8 FTEs for other programs (e.g., engineering plan reviews, DWSRF related requirements, and data management),
- 2.0 FTEs for operator certification, and
- 1.5 FTEs for enforcement.

Figure 8: Breakdown of Projected FTEs Needed



The projections in Figure 7 and Figure 8 show several spikes in needed resources between 2020 and 2029. These increases are due to a few different activities. However, they can mainly be attributed to the newly published Lead and Copper Rule Revisions (LCRR) and the approximately 350 additional consecutive public water systems MDE's WSP will add to its inventory by 2023. These situations are discussed in detail in the next two sections.

Lead and Copper

The LCR was published in 1991 to protect public health by reducing exposure to lead and copper in drinking water. In 2000, the Minor Revisions were published to address implementation issues. In 2007, the Short-Term Revisions were published to improve implementation for monitoring, treatment, public education, and lead service line replacement requirements. States, including Maryland, continue to be strained by the workload required to properly implement the rule and to address new and ongoing implementation challenges.

The public health crisis related to lead in drinking water in Flint, Michigan resulted in increased scrutiny from the EPA and the general public on state drinking water programs. The EPA Assistant Administrator for Water issued letters and memorandums that urged states to increase their attention on LCR and re-evaluate how the rule was implemented in their states. As a result, state drinking water programs increased drinking water system oversight as part of LCR implementation. Despite decreasing resources, Maryland has invested greatly in implementation of the LCR and related lead programs. According to the 2018 annual PWSS program review conducted by EPA Region 3, the LCR was the drinking water regulation with the most health-based violations in Maryland in 2018.[5] Due to the complexity of the rule and staff turnover at water systems, MDE's WSP staff spend a great deal of time on drinking water system oversight and compliance assistance activities, especially with smaller water systems.

Figure 9 shows the total number of annual FTEs needed for implementation of lead-related regulations in Maryland from 2020 to 2029. The gray bar (numbers are in gray boxes) represents the total number of FTEs required, and the lines with markers are the number of FTEs for the different categories included in the total. The green line with square markers represents the number of annual FTEs to implement current LCR requirements. **To implement the current LCR requirements, it is estimated that Maryland needs up to 3.6 FTEs.** Note that there is a slight increase in burden related to the current LCR from 2022 to 2023. This is due to the addition of 350 consecutive public water systems to Maryland's inventory, which will be discussed in *Consecutive Systems*.

In 2020, the total projected number of FTEs needed by MDE's WSP to implement current lead-related federal and state regulations was estimated to be 11.1 FTEs.

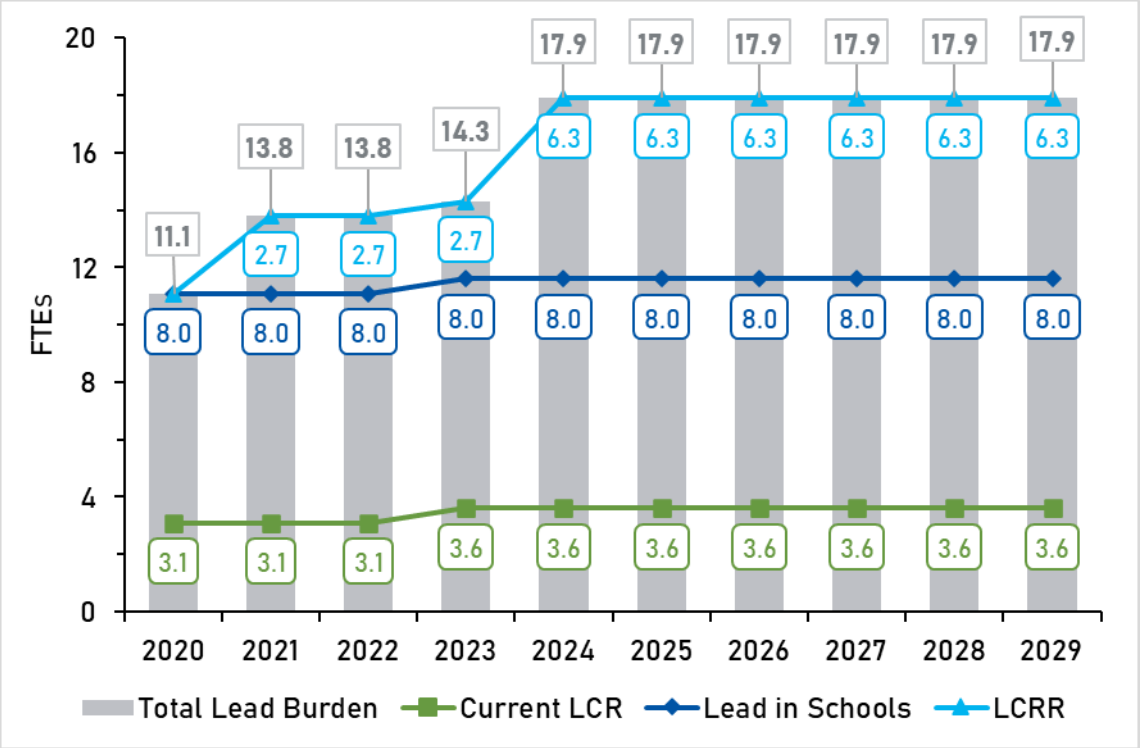
In addition to burden directly related to the LCR, MDE's WSP initiated a robust lead testing in schools program in 2017. Testing for lead in drinking water in schools is not a federal requirement under the current LCR (unless a school is a public water system). Maryland's lead testing in schools program was established by state law and requires all public and non-public schools (prekindergarten to grade 12) to test for lead in all drinking water outlets.[6] MDE's WSP has worked with the Maryland State Department of Education, but MDE's WSP staff have taken on most of the burden in implementing the lead testing in schools program. Burden for the lead testing in schools program is represented by the darker blue line with diamond markers in Figure 9. **It is estimated that**

[5] EPA Region 3. 2019. Annual Review of the Public Water Supply Supervision Program for the State of Maryland: January 1, 2018 – December 31, 2018.

[6] MDE. Testing for Lead in Drinking Water - Public and Nonpublic Schools. https://mde.maryland.gov/programs/Water/water_supply/Pages/Testing-For-Lead-In-Drinking-Water-Public-and-Nonpublic-Schools.aspx#:~:text=Maryland%20law%20(Chapter%20386%2C%202017,in%20all%20drinking%20water%20outlets

MDE will need approximately 8 FTEs to implement and oversee the state's lead testing in schools program, which will be expanded to child care facilities.[7]

Figure 9: Annual FTEs for Lead-Related Workload



The LCRR was published in the *Federal Register* on January 15, 2021. The LCRR will place substantial burden on state drinking water programs in addition to ongoing work under the current LCR. The intent of the revised rule is to strengthen public health protection by continuing to reduce exposure to lead and copper and to improve implementation of the lead and copper standards. A line item was added to the 2019 national workload model for additional burden related to LCRR implementation. The burden estimate for this new line item was developed for the 2019 national workload model using ASDWA's Costs of States' Transactions Study submitted as part of the public comment process for the proposed rule.[8] This estimate was revised for Maryland's workload analysis to remove burden related to testing for lead in schools and child care facilities, as that is covered under the 8 FTEs reported above.

LCRR burden is represented by the lighter blue line with triangle markers in Figure 9. Underlying assumptions related to when LCRR burden will be incurred from the 2019 national workload model were applied to Maryland's workload model. LCRR burden begins in 2021. From 2021 to 2023, LCRR implementation activities include obtaining primacy, conducting other start-up activities (e.g., learn the rule and conduct rule training sessions for state drinking water staff and public water systems), and working with public water systems to develop

[7] Maryland is expanding this program to test for lead in drinking water at child care facilities and will use Water Infrastructure Improvements in the Nation (WIIN) Act grant funds from EPA.

[8] ASDWA. 2020. Comments on the Proposed LCRR. https://www.asdwa.org/wp-content/uploads/2020/02/ASDWA-Cover-Letter_Comments_CoSTS-on-Proposed-LCRR-Final.pdf.

inventories of lead services lines connected to the water systems' distribution systems. This amounts to 2.7 FTEs. Figure 9 shows that in 2021 MDE will need 2.7 FTEs for LCRR implementation activities in addition to the 11.1 FTEs already needed for ongoing LCR implementation and lead testing in schools for a total of 13.8 FTEs (represented by the gray bar). The LCRR is expected take effect in 2024, and LCRR burden is expected to increase to 6.3 FTEs in addition to the 11.6 FTEs for ongoing LCR implementation and lead testing in schools. Therefore, the projected number of FTEs to fully oversee compliance with the lead and copper standards and state-specific lead testing in schools regulation (which will also by this time be required under the LCRR) will increase to 17.9 FTEs in 2024 and remain at 17.9 FTEs through 2029.

Workload related to lead in drinking water reveals two important points about Maryland's drinking water program, which apply to most state drinking water programs:

1. Not too long ago, the LCR was considered a "steady state" regulation, meaning that workload related to the LCR was assumed to be static. The lead crisis in Flint, Michigan drew attention to the LCR, requiring states to invest more resources into implementation. Workload has increased over the past few years and will continue to increase well into the future with the promulgation of the LCRR. This shows how dynamic state drinking water program workload can be, even for "steady state" regulations and programs.

2. Maryland has successfully implemented a lead testing in schools program, which was established through a state-specific regulation. State drinking water programs continue to experience increased demands related to both federal regulations and priorities within the state. In recent years, Maryland's drinking water program has experienced a decrease in dedicated staff. When new responsibilities are placed on the drinking water program, often sufficient resources are not provided, and state programs are forced to take staff away from other areas of the program.

Essentially, Maryland's drinking water program has been addressing increased burden related to the current LCR and the state's lead testing in schools program without enough additional resources. MDE will continue to face increasing workload with the LCRR and can only do "more with less" for so long.

Consecutive Systems

Maryland is currently working to have treatment for *Legionella* installed at approximately 350 hospitals and health care centers in the state. *Legionella* can grow in building water systems. If exposed to *Legionella*, it can cause a serious type of pneumonia, which is called Legionnaires' disease. According to the U.S. Centers for Disease Control and Prevention, large or complex water systems (like those found in hospitals) are often associated with outbreaks of Legionnaires' disease.[9]

With the installation of treatment, these 350 hospitals and health care centers will become public water systems that must be overseen by MDE's WSP. MDE's WSP, in partnership with the Maryland Department of Health, is helping to familiarize these health care facilities with the regulatory, design, and permitting requirements of installing treatment at their buildings. Once these hospitals install treatment, they become public water systems in accordance with the SDWA, and the regulatory burden for overseeing them as consecutive water systems and ensuring the treatment is operated correctly will solely fall on MDE's WSP. Workload related to oversight of these

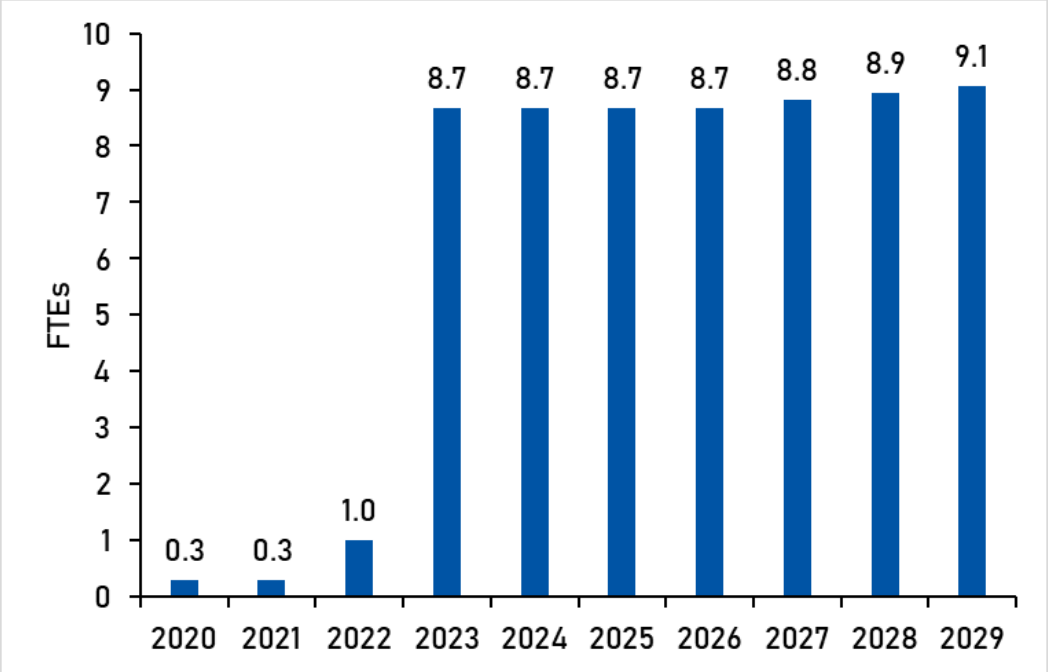
[9] U.S. Department of Health and Human Services Centers for Disease Control and Prevention. 2016. Legionnaires' Disease. https://www.cdc.gov/legionella/downloads/fs-legionnaires.pdf

consecutive systems is included in Figure 10. MDE's WSP is currently working with these prospective public water systems and reviewing engineering plans for installing treatment. For this workload analysis, it was assumed that the 350 systems would be added to Maryland's public water system inventory by 2023 when MDE's WSP would start incurring burden related to regulatory oversight for these systems. These consecutive systems would be subject to consecutive system requirements in the following rules:

- Suite of Surface Water Treatment Rules
- Ground Water Rule
- Revised Total Coliform Rule
- Disinfectants and Disinfection Byproducts Rules (Stage 1 & 2)
- Lead and Copper Rule
- Consumer Confidence Report Rule
- Public Notification Rule
- Future Regulations

In addition to the regulations listed above, MDE will also incur burden for any enforcement actions concerning these new systems. Figure 10 shows that MDE's WSP will incur substantial burden for overseeing these new systems. From 2023 through 2029, it is estimated that MDE's WSP will need approximately 9 additional FTEs. The slight increase in burden from 2027 through 2029 is related to potential future regulations.

Figure 10: Annual FTEs for New Consecutive Systems



Resource Deficit

What is the gap between available resources and projected resources?

The workload model estimates that the resources needed to implement MDE's WSP far exceed available resources. Figure 11 shows the projected number of FTEs and funding generated by the workload model against the FTEs and funding available to MDE's WSP. It was assumed that MDE's WSP will have the same number of FTEs and funding available from 2021 to 2029 as was reported in 2020. As a result, it was estimated that MDE's WSP has 71 FTEs available from 2020 through 2029. For funding, MDE's WSP will have approximately $8.1 million available from 2020 to 2029.

> **Reminder:** Of the 71 FTEs, 27 (or approximately 38 percent) are vacant positions, which include technical FTEs and FTEs dedicated to state-specific activities.

As shown in Figure 11, the workload model estimates that MDE's WSP needs 126 FTEs in 2021 and $15.7 million in funding. In other words, MDE's WSP **needs approximately 78 percent more FTEs and 93 percent more funding** than is currently available to effectively implement the program and ensure safe drinking water for the public in 2021. As work progresses, workload is projected to peak in 2029 when MDE's WSP will need 148 FTEs (i.e., **approximately 108 percent more than available FTEs**) and $18.3 million (i.e., **approximately 125 percent more than currently available funding**).

Figure 11: Projected Funding and Staffing Needs Compared to MDE Available Funding and Staffing

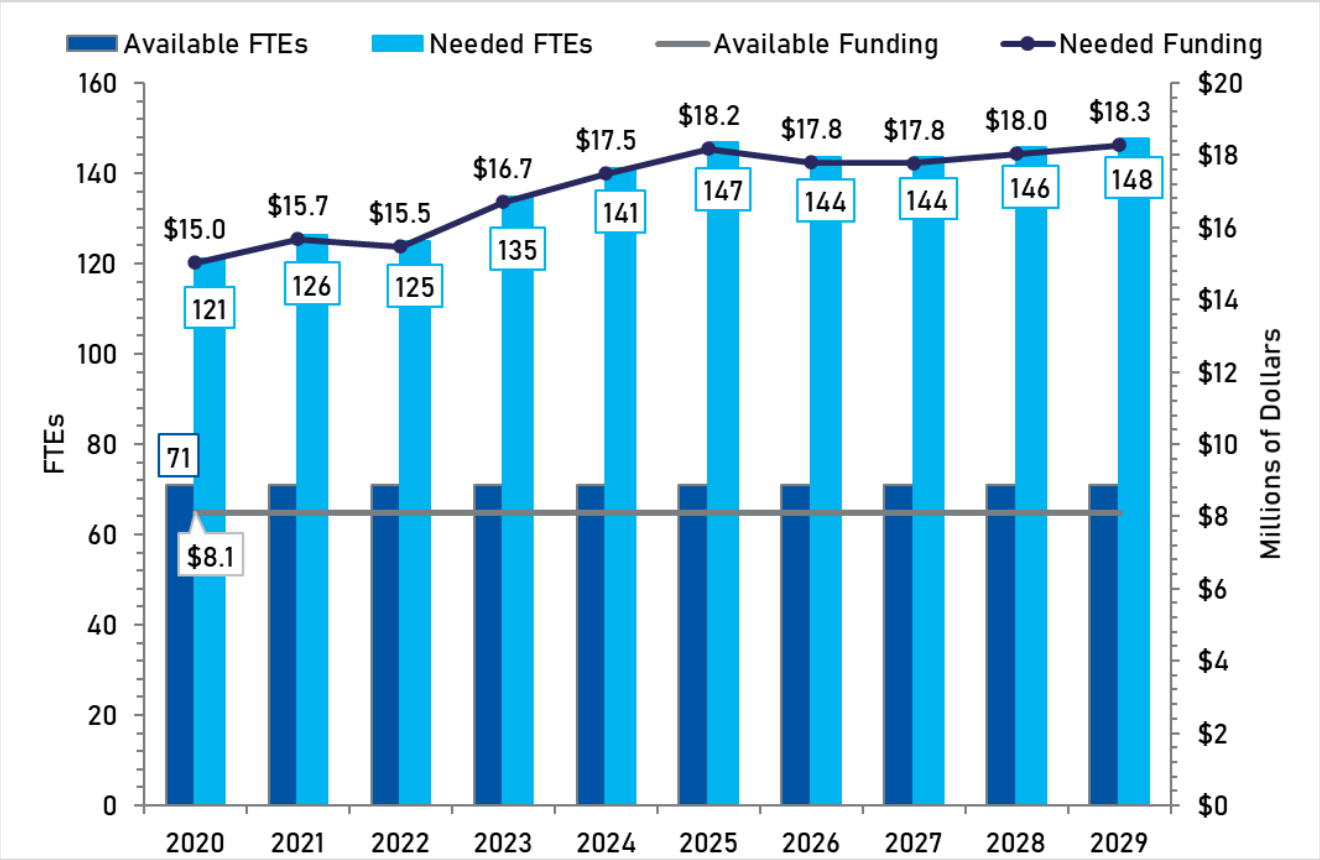
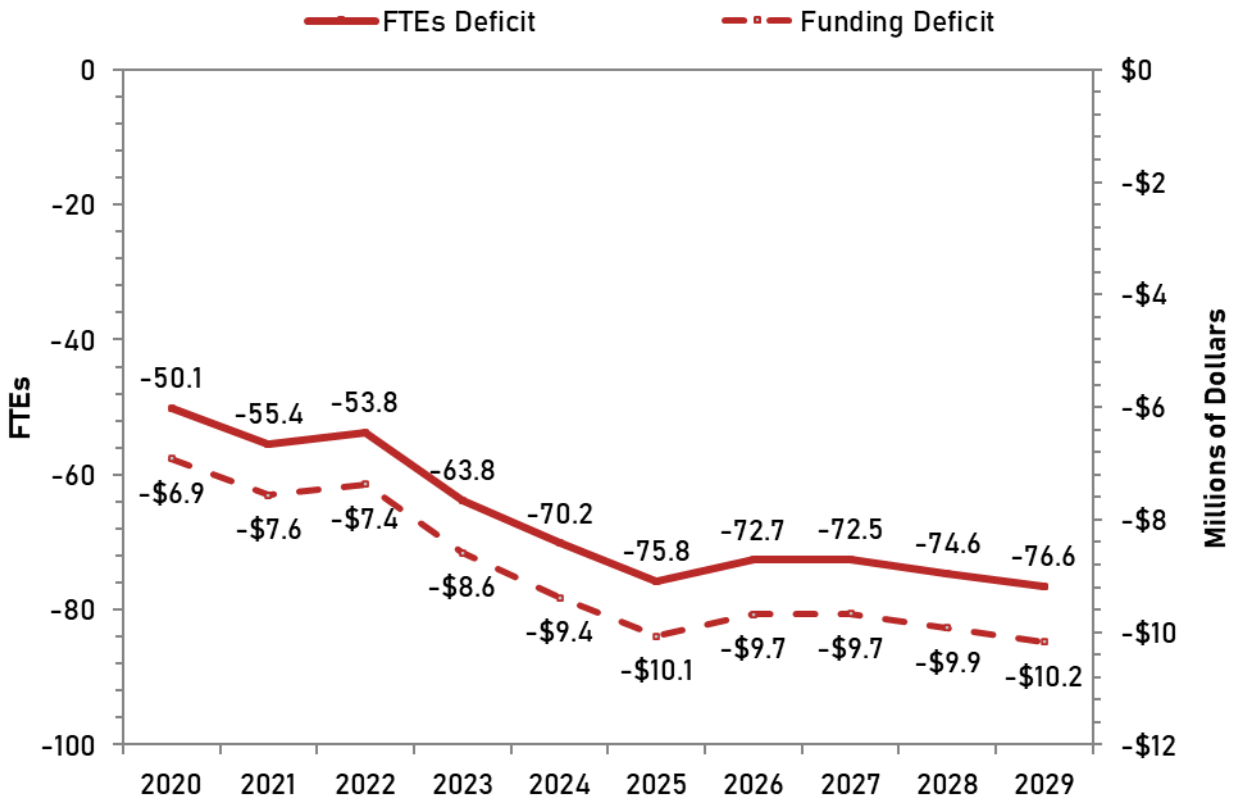


Figure 12 lists the resource deficits projected through 2029. The numbers in this figure represent the staffing and funding MDE's WSP needs in addition to available resources. In 2021, there is a gap of 55 FTEs (difference between 71 FTEs and 126 FTEs) and $7.6 million (difference between $8.1 million and $15.7 million). The largest gap is observed in 2029 when there is a gap of 77 FTEs (difference between 71 FTEs and 148 FTEs) and $10.2 million (difference between $8.1 million and $18.3 million).

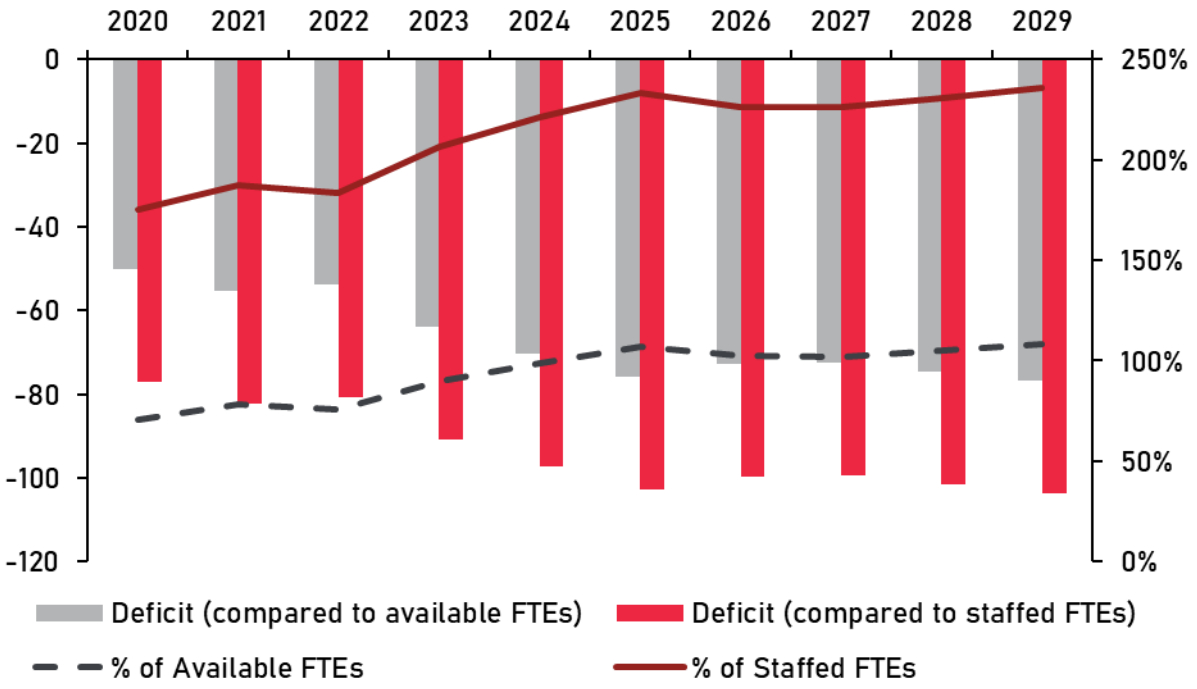
Figure 12: Total FTE and Funding Deficits



In 2021, MDE's WSP needs 126 FTEs but has 71 FTEs currently funded. Additionally, out of those 71 FTEs, only 44 positions are currently staffed. The remaining 27 positions are vacant. In other words, in 2021 MDE's WSP needs **approximately 78 percent more FTEs than currently available and 187 percent more FTEs than currently staffed**. Figure 13 displays how the current vacancies affect MDE's WSP staffing needs. Figure 13 graphs the following:

- FTE deficit calculated by subtracting the projected FTEs from the available FTEs (71), which include vacant positions (gray bar),
- FTE deficit as a percentage of available FTEs (dark gray dashed line),
- FTE deficit calculated by subtracting the projected FTEs from the staffed FTEs (44), which do not include vacant positions (red bar), and
- FTE deficit as a percentage of staffed FTEs (dark red solid line).

Figure 13: FTE Deficits – Available FTEs vs. Staffed FTEs



Understanding the Results

What do the results of this workload analysis mean for Maryland's drinking water program?

The results of this analysis show MDE's WSP does not have enough resources to effectively implement the drinking water program. This is exacerbated by increasing federal and state regulations and demands placed on the state drinking water program. MDE's WSP also faces internal barriers to accessing needed resources, including retirements, a decreasing number of FTEs available to the program, and competing priorities within MDE, which are all closely related.

The MDE's WSP has seen a spate of retirements recently, and the declining number of staff has been coupled with a loss of institutional knowledge that was invaluable to the program. Furthermore, the state has abolished several of these positions instead of hiring replacements. MDE's WSP estimates that approximately 12 FTE positions have been abolished after retirements.

MDE's WSP has also experienced difficulty in filling vacant positions. Currently, 38 percent of Maryland's FTE positions dedicated to the drinking water program are vacant. These vacancies have been difficult to fill due to a hiring freeze, which has been in place for years. Gaining approval to hire can take up to eight months, and any recruitments must compete with the priorities of MDE as a whole. Although drinking water protection has its roots in public health, other environmentally-driven activities at MDE, such as Clean Water Act activities related to the Chesapeake Bay, are often more visible and prioritized over SDWA activities.

Despite the declining resources, MDE's WSP has had to assume additional responsibilities, including the lead testing in schools program and oversight of transient non-community water systems. Such responsibilities will continue to increase workload in the future. Maryland has historically delegated authority to county health departments for oversight of transient non-community water systems. In recent years, the state has seen a trend of counties relinquishing their delegated authority back to MDE's WSP because of additional burdens from new rules (e.g., the Ground Water Rule) and budgetary pressures at the local level. Since 2016, four additional counties have returned their delegated authority back to MDE's WSP for a total of seven counties without a delegation agreement. MDE's WSP currently has one FTE who was transferred from enforcement to work full time on oversight of transient non-community water systems. Two former staff left MDE's WSP due to the unmanageable workload. MDE's WSP currently provides $375,000 annually to counties with delegation agreements. If additional counties opt-out in the future, this will place addition strain on MDE's WSP already limited staff and could increase MDE's WSP FTE needs. This is just one example of a challenge that is being felt across the program.

The decreasing number of FTEs available to MDE's WSP means that the currently staffed FTEs (44 FTEs) are often working extra hours and have to prioritize certain activities at the expense of other activities. In assuming additional responsibilities without adequate additional resources, MDE's WSP has had to reduce workload in the

following areas: source water protection, capacity development, water conservation, water security and emergency response, research, climate change, water reuse, and data management. The partial disinvestment in these areas may impact MDE's WSP ability to adequately respond to emergencies, implement new regulations (e.g., LCRR), provide adequate support to small drinking water systems, and maintain adequate levels of compliance with the drinking water regulations. Ultimately, MDE's ability to protect public health is compromised.

In addition, MDE's ability to effectively implement and oversee the SDWA has greatly decreased over the years. An example of this can be seen in MDE's WSP capacity development program. Maryland was once considered a national leader in comprehensive performance evaluations (CPEs), which identify areas of potential improvement in the operation, maintenance, and administration of drinking water treatment plants, and was one of the first states to implement a program. CPEs provide important evaluation and assistance to water systems, but due to lack of resources, the CPE program was discontinued in 2015.[10]

If MDE's WSP can hire more staff, more funding could be mobilized via federal sources. For example, the four percent DWSRF set-aside could be re-directed toward the program, resulting in the addition of almost $1 million. Even with that in place, funding would still be a concern given the projected funding gap of $7.6 million in 2021. As discussed in *Funding*, MDE's WSP tried to supplement state sources of funding by instating a fee program. Fees to support safe drinking water are a common feature of state drinking water programs across the country. Neighboring states in the Mid-Atlantic region, like Pennsylvania and Virginia, have instituted fee programs to support state drinking water program oversight. Pennsylvania established an annual fee structure in 2018, for all public water systems, in order to cover a $7.5 million funding gap. The fees range from $50, for systems with under 100 customers, to $40,000, for systems with over 100,000 customers. In Virginia, the fees have been in place for decades and may be up to $3.00 per customer, but no more than $160,000 per public water system. These funding models have the benefit of creating a dedicated fund, paid for by public water systems, in order to support adequate oversight from the state drinking water primacy agency. Maryland's public water systems currently serves about 5.4 million people. A fee system to support the additional staff would equate to less than $1.50 per year per person, in line with what is being collected in Pennsylvania and Virginia. In comparison, Maryland's Bay Restoration Fund, a fee for wastewater and septic users, established in 2004, collects $60 per household per year. While attempts by MDE's WSP to adopt water system fees in the past have been met with resistance, this should still be seen as a viable option for building state capacity.

Conclusion and Recommendations

Maryland's drinking water program is significantly understaffed and underfunded. In the upcoming decade, the program will accumulate additional responsibilities based on new regulations and program changes, adding further stress to the organization. At some point, with workload increasing from both state and federal requirements and MDE's staffing remaining constant or potentially decreasing, MDE's WSP will no longer be able to fulfill its primary enforcement responsibility (or primacy) under the SDWA. Loss of primacy will result in the loss of more than $20 million in annual allocation to the DWSRF program and approximately $1.5 million in annual allocation to the PWSS program in Maryland.

[10] EPA Region 3. 2019. Annual Review of the Public Water Supply Supervision Program for the State of Maryland: January 1, 2018 – December 31, 2018.

Based upon discussions with MDE's WSP, EPA Region 3, and Cadmus, the following are minimal short term and long term actions that Maryland should take to address immediate and projected resource gaps:

- **Fill existing vacancies:** MDE's WSP should immediately fill the 27 vacancies to raise staffing levels to the existing approved allocation of 71 FTEs.
- **Develop a resource investment plan with EPA Region 3:** MDE's WSP should negotiate with EPA Region 3 a resource investment plan that would result in the hiring of additional FTEs at an expedited and achievable pace. The workload model projected MDE's WSP needs a total of 126 FTEs in 2021.
- **Utilize the four percent DWSRF set-aside:** MDE's WSP should consider taking advantage of the DWSRF Administration and Technical Assistance set-aside, which allows states to use up to four percent of the DWSRF capitalization grant, $400,000, or 1/5th percent of the current valuation of the fund (whichever is greater) to fund state activities. This set-aside can be used to cover costs associated with administering and implementing the state's DWSRF program and providing technical assistance to public water systems of all sizes.
- **Increase state investment in MDE's WSP via the general fund:** Maryland should consider increasing the state investment in implementing the drinking water program by increasing the state general fund contribution. MDE's WSP currently relies more heavily on federal funding sources (88 percent of total funding) than on state funding sources (12 percent of total funding). Increasing state funding will help counter this over-reliance.
- **Create a fee system:** Maryland should consider creating a fee system similar to Pennsylvania or Virginia. Funds generated by a fee program would provide dedicated and predictable funding to ensure drinking water program integrity. A fee of less than $1.50 per public water system user could cover work that MDE's WSP does to support public water systems, from conducting sanitary surveys and providing technical support to the guaranteeing of qualified laboratories to handle drinking water analyses.

At one time, MDE had a strong and robust drinking water program, often surpassing primacy requirements. In 2021, MDE is struggling to meet the minimum requirements and risks losing primacy. More attention must be paid by the state to its drinking water program to ensure that Maryland has a dynamic program that is well situated to meet the growing state and federal workload while engaging in the core preventive and emergency response work necessary to deliver safe and dependable drinking water to the citizens of Maryland.