A REPORT TO

THE HONORABLE GLENN YOUNGKIN, GOVERNOR,

AND

THE GENERAL ASSEMBLY OF VIRGINIA

Commonwealth of Virginia Wastewater Infrastructure Needs Assessment – 2023

December 2023

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Executive Summary

The 2023 Commonwealth Wastewater Infrastructure Needs Assessment (the Assessment) is an estimate of the amount of wastewater infrastructure funding that is necessary to implement the Commonwealth's Wastewater Infrastructure Policy established in § 62.1-223.1 of the Code of Virginia. Authored by the Department of Environmental Quality (DEQ), in partnership with the Virginia Department of Health (VDH) and other stakeholders, the Assessment reports that the total wastewater infrastructure need over a 20-year period (2022-2042) in Virginia is approximately $15.8 billion and excludes projects that have already commenced.

The total estimated need is split into two categories: community wastewater infrastructure needs ($10.8 billion), and onsite wastewater infrastructure needs ($5 billion). Community wastewater infrastructure needs represent needs that are centralized in a community and are typically funded primarily by locality sewer user fee revenue (local) with some funding from federal and state sources. Onsite wastewater infrastructure needs represent wastewater treatment that is decentralized, otherwise known as onsite sewage or septic systems, and are typically funded by private homeowners with limited funding from local, state, or federal sources.

DEQ coordinated the data collection for community wastewater infrastructure needs using the same data collection efforts for the Environmental Protection Agency's Clean Watersheds Needs Survey (CWNS), a national effort to perform a comprehensive assessment of capital costs to meet the water quality goals of the federal Clean Water Act. Outreach efforts to owners of wastewater collection and treatment systems, including counties, cities, towns, service authorities, sanitation districts, and school systems yielded needs data and documentation to substantiate approximately $10.8 billion in community wastewater infrastructure needs. This value is consistent with past estimates when adjusted for inflation. The 2012 CWNS reported Virginia's previous funding needs at $6.5 billion, when adjusted for inflation seen in this industry, this value increases to approximately $9.0 billion. Therefore, the current estimate of $10.8 Billion is very similar considering the continued increase in requirements to treat to higher standards as well as the influx of new categories of pollutants. Historically, funding for community wastewater infrastructure across the United States has come from sewer user fee revenues (approximately 85 percent), Federal funds (10 percent), and State funds (5 percent). Virginia does not vary significantly from these trends. Approximately $539 million in additional funding is needed than has historically been provided on an annual basis, $458 million from local sources, $54 million from federal sources, and $27 million from state sources. It should be noted, though, that there continues to be a push towards lower amounts of local funding as more communities develop affordability issues due to more costly requirements.

VDH's assessment of onsite wastewater infrastructure needs used existing permitting data, population density analysis, and data mapping tools to estimate the number of onsite sewage system needs in five categories. Those estimates multiplied by real septic project costs for conventional and alternative systems provided a total of $5.05 billion for onsite wastewater infrastructure needs.

Purpose and Background

Legislation enacted during the 2021 General Assembly session established and codified the Commonwealth's Wastewater Infrastructure Policy at § 62.1-223.1 of the Code of Virginia. This legislation, Chapter 382 of the 2021 Special Session I of the Acts of Assembly: 1) established the state policy as to community and onsite wastewater treatment, 2) established the Wastewater Infrastructure Policy Working Group, and 3) established a requirement to conduct this Wastewater Infrastructure Needs Assessment every four years.

Section 62.1-223.1 of the Code of Virginia provides that:

> It is the policy of the Commonwealth to prioritize universal access to wastewater treatment that protects public health and the environment and supports local economic growth and stability. To further this policy, the Commonwealth endorses (i) public education about the importance of adequate wastewater treatment; (ii) collaboration among local, state, and federal government entities, including consistent collaboration and coordination of grant requirements and timelines; (iii) the prioritized, focused, and innovative use of state and federal funding to address needs determined pursuant to § 62.1-223.3; (iv) a preference for community-based and regional projects as opposed to cumulative and repetitive site-by-site individual solutions; (v) the use of integrated solutions across sewer and onsite wastewater treatment systems; and (vi) the incorporation of the effects of climate change into wastewater treatment regulatory and funding programs.

Section 62.1-223.3 of the Code of Virginia provides that:

> The Department of Environmental Quality (the Department), in partnership with the Virginia Department of Health and in consultation with stakeholders, including representatives of the Department of Housing and Community Development, the Virginia Resources Authority, the U.S. Department of Agriculture Rural Development, the Virginia Onsite Wastewater Recycling Association, the Center for Coastal Resources Management at the Virginia Institute of Marine Science, the Virginia Association of Municipal Wastewater Agencies, the Virginia Rural Water Association, SERCAP, Inc., local governments, and conservation organizations, shall determine every four years an estimate of the amount of wastewater infrastructure funding that is (i) necessary to implement the policy of the Commonwealth articulated in § 62.1-223.1, and (ii) not eligible to be covered by grant funding pursuant to the Virginia Water Quality Improvement Act of 1997 (§ 10.1-2117 et seq.). The Department shall report such estimate to the Governor and the General Assembly no later than July 1, 2023, and no later than July 1 every four years thereafter.

DEQ, with VDH, has completed its estimate of wastewater infrastructure funding and prepared the following report. The Summary of Results presents the total estimated funding that may be needed in two categories: Community Wastewater Infrastructure Needs, which refers to wastewater

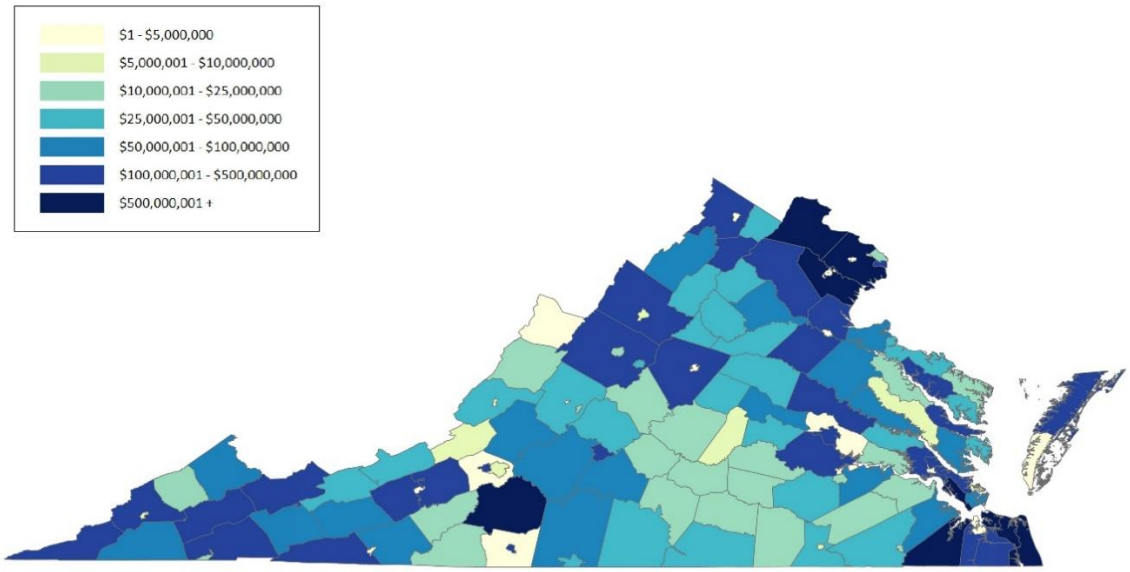
treatment that is centralized in a community, and Onsite Wastewater Infrastructure Needs, which refers to wastewater treatment that is decentralized, otherwise known as onsite sewage or septic systems.

Summary of Results

An estimate of approximately $15.8 billion in wastewater infrastructure funding, including $10.76 billion in community wastewater infrastructure and $5.05 billion in onsite wastewater infrastructure may be needed to implement the policy articulated in § 62.1-223.1 of the Code of Virginia (see Table 1). Figure 1 depicts the combined wastewater needs in Virginia's counties and cities. A full list of the total community and onsite wastewater infrastructure needs is included in Attachment 1.

Table 1: Commonwealth Wastewater Infrastructure Needs	
Community Wastewater Infrastructure Needs	$10,760,000,000
Onsite Wastewater Infrastructure Needs	$5,050,000,000
Total Wastewater Infrastructure Needs	**$15,810,000,000**

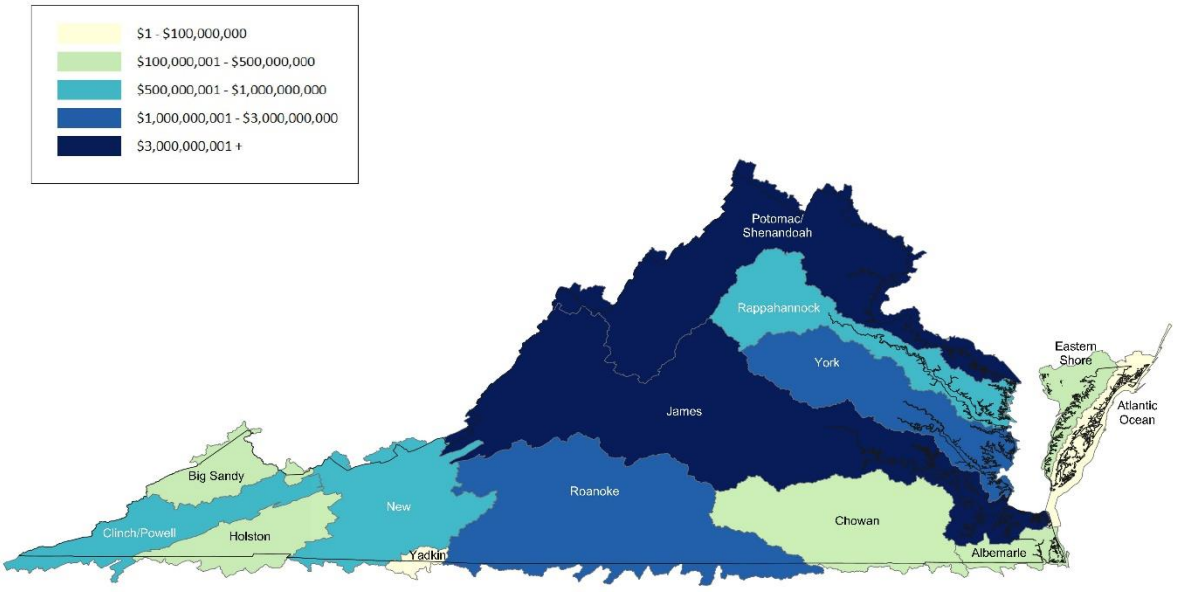
Figure 1 - Combined Wastewater Needs in Virginia Counties and Cities



Of the total combined wastewater infrastructure need amount, approximately $11.58 billion in needs are identified for localities located in the Chesapeake Bay watershed and $4.23 billion in needs are identified for localities that are located outside of the Bay watershed (see Table 2). Figure 2 depicts the combined wastewater infrastructure needs in Virginia's river basins.

Table 2: Combined Wastewater Needs by River Basin		
Chesapeake Bay Watershed	Potomac/Shenandoah	$4,657,000,000
	Rappahannock	$617,000,000
	York	$1,145,000,000
	James	$5,149,000,000
	Eastern Shore	$109,000,000
Total	**$11,677,000,000**	
Non-Chesapeake Bay Watershed	Albemarle	$432,000,000
	Chowan	$304,000,000
	Roanoke	$1,329,000,000
	New	$678,000,000
	Yadkin	$48,000,000
	Holston	$388,000,000
	Clinch/Powell	$767,000,000
	Big Sandy	$221,000,000
	Atlantic Ocean	$64,000,000
Total	**$4,231,000,000**	

Figure 2 - Combined Wastewater Needs in Virginia River Basins



Methodology

DEQ, in partnership with VDH, and in consultation with the stakeholders listed in section § 62.1-223.3 of the Code of Virginia established the data collection methods utilized for estimating the amount of wastewater infrastructure needed. DEQ performed data collection for the Community Wastewater Infrastructure Needs, and VDH performed data collection for the Onsite Wastewater Infrastructure Needs. The methodology for each data collection effort is described in the following sections.

Community Wastewater Infrastructure Needs

In 2022, DEQ was tasked with participating in the Environmental Protection Agency's (EPA) Clean Watersheds Needs Survey (CWNS), a national effort to perform a comprehensive assessment of capital costs to meet the water quality goals of the Clean Water Act. Specifically, the CWNS data reported is intended to assess the capital improvement needs for all projects eligible for funding from the states' water pollution control revolving funds anticipated to begin construction within a 20-year period (2022-2042). As the wastewater infrastructure point-source needs collected for EPA's CWNS are identical to the Commonwealth's Community Wastewater Infrastructure Needs, DEQ used a single data collection process via surveys to satisfy both assessments. DEQ also reported needs for decentralized wastewater infrastructure for the EPA's CWNS; however, this assessment includes additional project and state-specific cost information for decentralized systems that were ineligible for CWNS reporting.

DEQ has grouped the community wastewater infrastructure needs into two main categories for this collection effort: i.) wastewater treatment facility needs, and ii.) sewer collection system needs. In preparation for the data collection effort, DEQ created a list of all Virginia Pollutant Discharge Elimination System (VPDES) permitted facilities eligible for needs collection and identified collection systems not captured through the list of VPDES permitted facilities. Generally, the facilities with VPDES permits were grouped into the wastewater treatment facilities needs category and the collection systems identified without VPDES permits were grouped into the sewer collection system needs category.

DEQ also prepared a list of acceptable documentation, as required by EPA, for needs submitted by localities (*e.g.*, capital improvement plans, preliminary engineering reports, loan or grant applications, facility plans). At a minimum, acceptable documentation had to contain a project description, project cost, date, and author.

The outreach effort to communicate the needs collection to local governments and the public began with DEQ emailing localities and publishing a webpage specific to needs assessments. As EPA's documentation requirements varied depending on the size of the community's reporting needs, DEQ's team prepared and held two webinars outlining the data collection process, one webinar targeting large and medium sized communities and one webinar for small communities.[1]

[1] Needs Assessment, Department Environmental Quality, 2023. https://www.deq.virginia.gov/water/clean-water-financing/needs-assessment.

After the webinars, DEQ contacted localities to request needs information and documentation to substantiate the needs. The team scheduled calls and meetings with localities to collect data, as well as conducted independent searches of publicly available information from localities, such as capital improvement plans, to find needs data to report. Additionally, the team collected needs and facility information from Virginia Clean Water Revolving Loan Fund (VCWRLF) and American Rescue Plan Act (ARPA) applications that were not already accounted for through locality contacts.

Once DEQ received documentation, the team completed a data survey form for each facility with needs. This data entry form allowed DEQ to manageably collect the data and served as a quality assurance and control measure to ensure DEQ obtained all information required by EPA. A blank version of the data survey form is provided as Attachment 2.

While the team conducted outreach statewide, DEQ utilized a contract with the three Planning District Commissions (PDCs) in Southwest Virginia to collect community wastewater infrastructure needs in conjunction with its efforts to prepare the Southwest Virginia Regional Wastewater Study. This study was originally undertaken in 2005 and was updated in 2022 and finalized in February 2023 as a part of this data collection effort.

DEQ entered all locality needs and facility information from data entry forms and associated documentation into EPA's CWNS data entry portal. DEQ participated in data review and audits completed by EPA of the needs entered into the data entry portal. Because the Commonwealth Wastewater Needs Assessment is a concurrent effort with the EPA CWNS, not all data has been federally reviewed and accepted as of the date of this report. In some cases, localities were not responsive to the team's outreach or they did not provide documentation acceptable to EPA to substantiate needs. As a result, those needs were not included in this needs assessment report. Additionally, EPA automatically adjusts each needs entry with an inflation factor to ensure data collected in different years with different inflation scenarios are evaluated consistently.

Once all needs with acceptable documentation were entered into the data entry portal, DEQ extracted the data to compile and analyze for use in this report. As required by § 62.1-223.3 of the Code of Virginia, this report only includes needs that are not eligible to be covered by grant funding pursuant to the Virginia Water Quality Improvement Act of 1997. DEQ reduced the amount of needs provided that are eligible to be covered by Water Quality Improvement Fund (WQIF) grant funding utilizing data provided in the 2022 WQIF needs assessment report from this Assessment.

Onsite Wastewater Infrastructure Needs

VDH's assessment of onsite wastewater infrastructure needs used existing permitting data, population density analysis, and data mapping tools to estimate the number of onsite sewage system needs in five categories needed between 2022 and 2042. The five main needs categories for this collection effort are: i.) public sewer connections in lieu of repairs, ii.) conventional onsite sewage system (COSS) repairs, iii.) alternative onsite sewage system (AOSS) and alternative discharging system repairs, iv.) COSS operation and maintenance, and v.) AOSS operation and maintenance.

The needs estimates for the five categories are based on permitting data from the VDH's Environmental Health Database (EHD) specific to each category combined with other data sources

as explained below. For the needs estimation of the first three categories, VDH began the analysis with a subset of EHD data for all permits for onsite sewage system repairs over a five-year period between 2017 and 2021 by locality. Then VDH divided the total of the repair permits per locality by five years to provide an average annual number of permits per year for that locality, which was then multiplied by 20 to get the total repair need for the 20-year period. See Table 3 for a sample depiction of the calculation for total permits over 20 years by locality.

Table 3: Sample of Average Annual Number of Septic Permits Per Year by Locality			
Locality	**Total of repair permits between 2017-2021**	**Annual average of permits per year**	**Total permits over 20 years**
Locality 1	300	60	1,200
Locality 2	400	100	2,000
Locality 3	600	120	2,400
Locality 4	200	40	800

To estimate the need for public sewer connections in lieu of repairs (category 1), VDH used the number of onsite sewage systems located within a public sewer service area to estimate the percent of existing onsite systems that may be eligible for connection to public sewer by locality.[2] In urban and suburban localities the availability of public sewer to repair failing onsite sewage systems can reach nearly 100 percent. VDH assumed all estimated number of onsite sewage systems within public sewer service areas in need of repair within each locality would connect to public sewer within the next 20 years.[3] The total of this number across all localities is the total need for public sewer connections in lieu of repairs.

For COSS and AOSS repairs (categories 2 and 3), VDH's analysis began by using the number of total permits over 20 years estimates in each locality and removed the percentage of those repair permits that VDH anticipates would connect to public sewer in lieu of repairs. The remaining number were COSS and AOSS repairs; however, due to the significant difference in cost for repair projects for COSS versus AOSS, VDH did further analysis to determine the likelihood that a repair permit within a given locality would be COSS versus AOSS.

Using all the onsite sewage system permit applications in the EHD, VDH determined the percentage of applications that were for AOSS within each locality. The percentage of AOSS varied widely across the Commonwealth, from near 0% to more than 30% in several localities.[4] VDH applied the locality-specific percentage of COSS versus AOSS repairs to the average annual number of permits per year for each locality, multiplied by 20 years, to determine the total needs for the second and third categories, respectively. See Table 4 for a sample depiction of the calculation for total COSS and AOSS repair permits over 20 years by locality.

[2] Public sewer availability data came from a mapping tool developed by VDH under an Environmental Health Capacity Grant from the Center for Disease Control and Prevention. Source: CDC Environmental Health Capacity Grant - Environmental Health (Virginia.gov)

[3] In most instances, owners seeking to repair an existing onsite sewage system will need to install a new replacement system.

[4] VDH combined both AOSS and single-family alternative discharging sewage systems to determine this percentage as they have similar installation cost. Single family alternative discharging systems are permitted jointly by VDH and DEQ when no other onsite wastewater solution is available. The analysis assumes that the remaining percentage of onsite sewage system repairs were COSS repairs.

The fourth and fifth categories of onsite sewage systems estimated the total number of COSS and

Table 4: Sample of Percentage of Applications for COSS versus AOSS by Locality					
Locality	**Total permits over 20 years**	**% of AOSS**	**% of COSS**	**Total of AOSS repair permits over 20 years**	**Total of COSS repair permits over 20 years**
Locality 1	1,200	10%	90%	120	1,080
Locality 2	2,000	5%	95%	100	1,900
Locality 3	2,400	20%	80%	480	1,920
Locality 4	800	5%	95%	40	760

AOSS in use in each locality to determine the total operations and maintenance needs for these systems. Activities related to the operations and maintenance for onsite sewage systems is a priority for achieving adequate wastewater treatment and thus those needs are included in this Assessment. As operations and maintenance activities do not usually require a VDH permit, VDH used a population density analysis that estimated a total of onsite sewage systems in the Commonwealth and then assigned an appropriate portion of that total to each locality. This calculation resulted in an estimated number of onsite sewage systems in use in each locality, to which VDH applied the locality-specific percentage of COSS versus AOSS to determine the total of COSS and AOSS operations and maintenance needs.

To quantify the cost of each of the five categories, VDH used real onsite sewage system project costs from its Septic and Well Assistance Program (SWAP) and an estimate from the Department of Planning and Budget (DPB).[5] Via SWAP, VDH has contracted directly with onsite sewage system repair and installation companies for more than 60 onsite sewage system projects since early 2022, including four of the five categories for onsite wastewater infrastructure needs. As a result, VDH averaged the SWAP costs for those need categories to provide cost estimates.[6]

The estimate for AOSS operation and maintenance is based on a 2011 DPB estimate of between $330 to $680 annually, which when adjusted for inflation brings the estimate range to $443.51 to $913.90, the average of which is $679. These cost estimates are summarized by onsite sewage system category in Table 5.

[5] In 2021, the General Assembly allocated $11.5 million in ARPA funding to VDH to use the funds to help homeowners with income at or below 200 percent of the federal poverty guidelines to repair their failing onsite sewage systems or private wells. Between January 2022 and September 2022, VDH allocated funding to 308 projects for direct assistance.

[6] The cost of COSS and AOSS repairs includes the installation of pumps, where necessary, and site clearing and preparation cost.

Table 5: Estimated Costs by Onsite Sewage System Category		
Category Number	**Category**	**Cost**
1	Connection to public sewer in lieu of repair	$25,000 per connection
2	COSS repair	$19,650 per repair
3	AOSS & alternative discharge system repair	$34,800 per repair
4	COSS operation & maintenance	$430 per pump out
5	AOSS operation & maintenance	$679 per pump out

With respect to COSS maintenance, VDH assumed that the acceptable standard of maintenance for each onsite sewage system is for the system to be pumped out once every five years over a 20-year timeframe.[7] Costs for AOSS maintenance are based on the minimum operation and maintenance requirements contained in the Regulations for Alternative Onsite Sewage Systems (VAC Title 12 Chapter, Agency 5, Chapter 613 - §§ 12VAC5-613). The rest of the needs are estimated to occur once every 20 years for their respective categories.

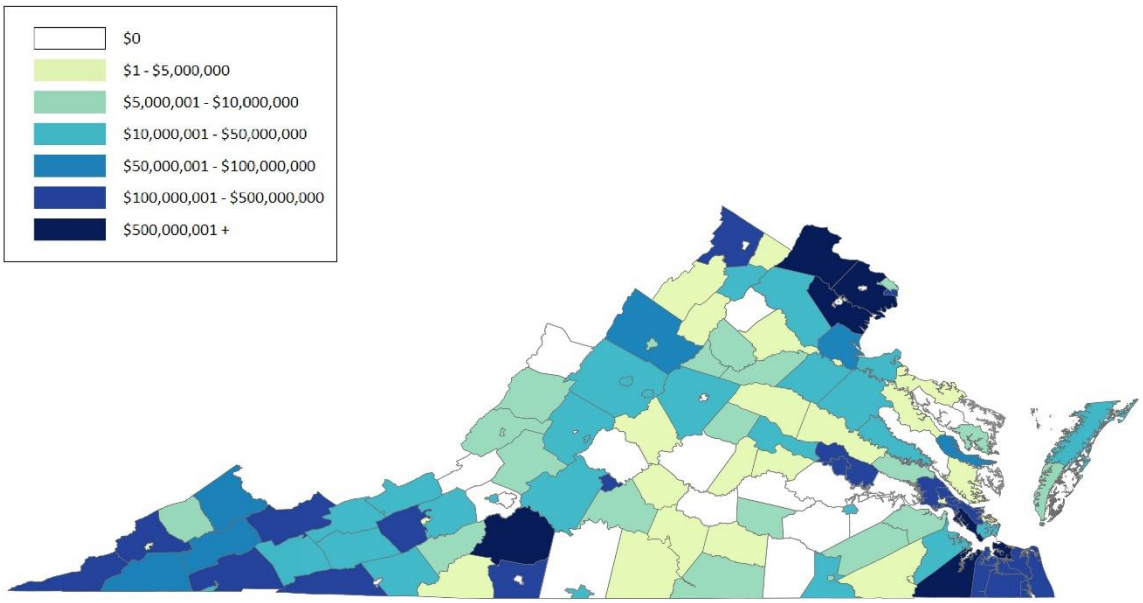
[7] VDH recommends that homeowners pump out their septic tank once every three to five years to keep solids, fats, oils, and greases from existing in the tank and impacting the drainfield. The Chesapeake Bay Preservation Act (CBPA) requires all onsite sewage systems within the areas regulated by the CBPA to be pumped out every five years. Under the CBPA, homeowners can also install effluent filters or have their system inspected in lieu of a pump out.

Results

Community Wastewater Infrastructure Needs

DEQ collected community wastewater infrastructure needs directly from owners of wastewater collection and treatment systems including counties, cities, towns, service authorities, sanitation districts, and school systems. For reporting purposes, the team compiled the needs data within each county or city into a total locality need amount. Out of a total of 133 localities in the Commonwealth, needs were provided for 104 localities, see Attachment 3, totaling approximately $10.76 billion. Figure 3 depicts community wastewater needs totals in Virginia's counties and cities.

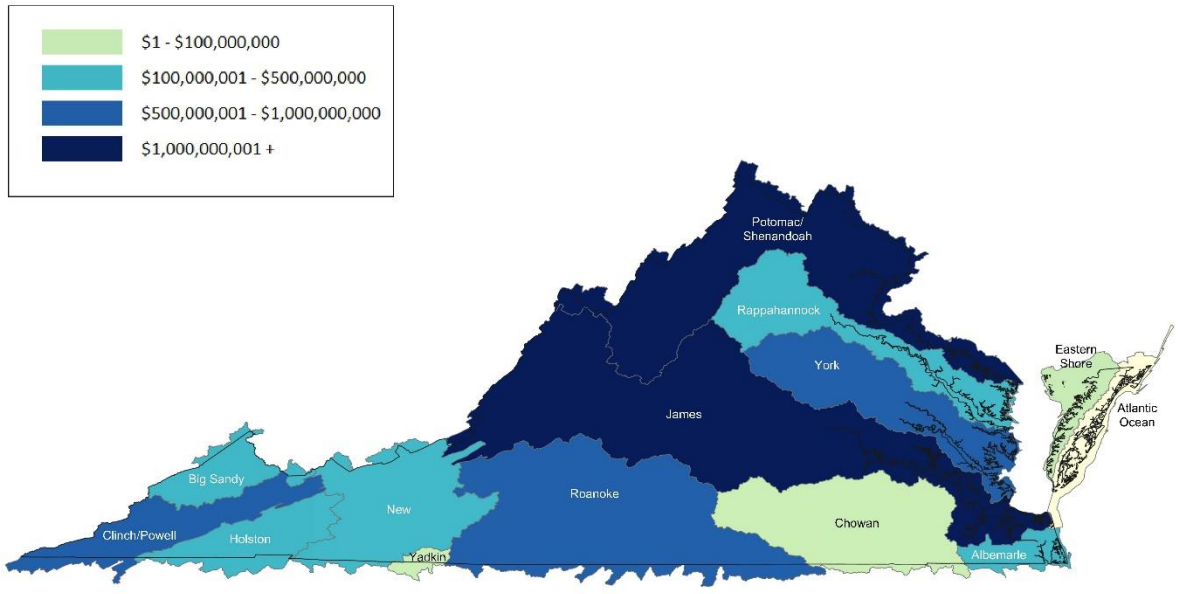
Figure 3 - Community Wastewater Needs in Virginia Counties and Cities



Of the total reported community wastewater infrastructure need amount, approximately $8.12 billion in needs are identified for localities located in the Chesapeake Bay watershed and $2.64 billion in needs are identified for localities that are located outside of the Bay. The breakdown by River Basin is found in Table 6 and depicted in Figure 4.

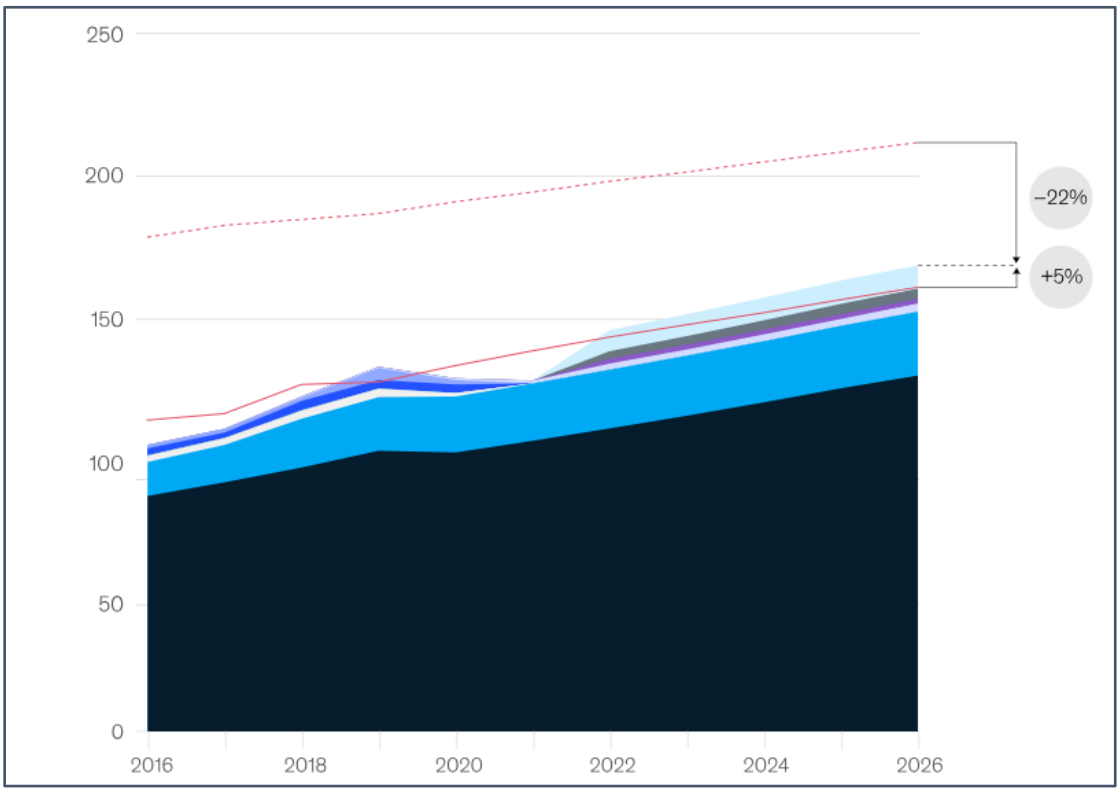
Table 6: Community Wastewater Needs by River Basin		
Chesapeake Bay Watershed	Potomac/Shenandoah	$3,309,000,000
	Rappahannock	$215,000,000
	York	$503,000,000
	James	$4,045,000,000
	Eastern Shore	$47,000,000
Total	**$8,119,000,000**	
Non-Chesapeake Bay Watershed	Albemarle	$222,000,000
	Chowan	$52,000,000
	Roanoke	$718,000,000
	New	$472,000,000
	Yadkin	$42,000,000
	Holston	$288,000,000
	Clinch/Powell	$675,000,000
	Big Sandy	$169,000,000
Total	**$2,638,000,000**	

Figure 4 - Community Wastewater Needs in Virginia River Basins



Below is a graphical representation of the historical and projected funding and the cost split for wastewater infrastructure across the United States, Virginia does not vary significantly from these trends. Funding sources vary significantly from year to year with a majority of funding coming from sewer user fee revenue.

Figure 5 – Wastewater Infrastructure Costs in the United States



Retrieved from https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/us-water-infrastructure-making-funding-count

While the data provided in this report indicates significant community wastewater infrastructure needs across the Commonwealth, there are several limitations to this assessment. Additional resources to complete this assessment were not provided to DEQ by the 2021 General Assembly, resulting in utilization of existing staff from DEQ's Clean Water Financing and Assistance Program (CWFAP) to undertake the assessment.

As previously noted, DEQ utilized the same data collection efforts and standards prescribed by the EPA CWNS, which required a significant level and amount of documentation to substantiate needs. The time and effort needed to meet those documentation requirements not only limited the needs that could be collected, but also discouraged some localities from participating.

Another limitation to this assessment is the reliance on locality input. Several localities were not responsive to information requests and repeated follow-up phone calls were made and emails sent. Localities have their own resource constraints and may not have time to collect and provide the data for an assessment of this nature. Despite localities likely having wastewater needs in the next 20 years, 22% of localities had no wastewater infrastructure needs reported. Additionally, the response rate from localities used to working with DEQ and CWFAP for funding was relatively high compared with localities that do not typically participate in CWFAP programs.

With the exception of data collected through the Southwest Regional Wastewater Study, localities in large part provided needs for existing wastewater collection and treatment systems. Needs associated with planned future sewer systems in areas without adequate wastewater treatment were largely underreported.

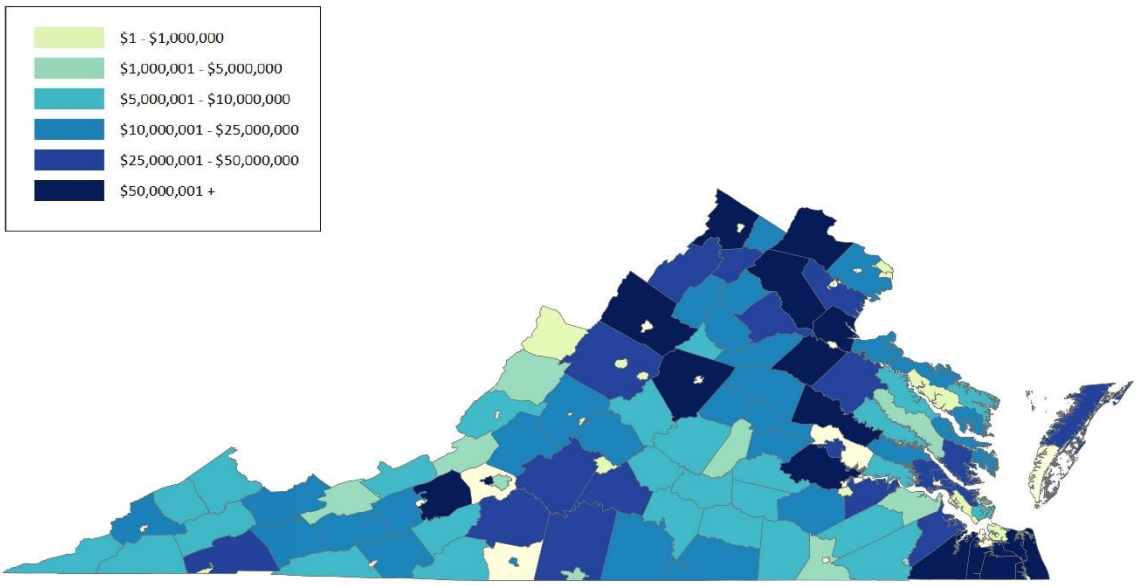
Based on the limitations outlined in this section, it is likely that the estimate of the amount of community wastewater infrastructure funding that is necessary to implement the policy of the Commonwealth is significantly underestimated.

Onsite Wastewater Infrastructure Needs

The total onsite wastewater infrastructure needs per category is the total estimated needs, multiplied by the estimated cost per need, multiplied by 20 (for the 20-year assessment value). The total amount of onsite wastewater infrastructure needs for the Commonwealth is the sum of all five categories of need, approximately $5.1 million. Table 7 summarizes the estimated needs by category and in total. Figure 6 depicts the onsite wastewater needs in the Commonwealth's counties and cities. See Attachment 4 for the full list of onsite wastewater needs compiled by locality.

Table 7: Total Estimated Needs and Costs by Onsite Need Category Over 20-Year Period			
Category Number	**Category**	**Total Number of Needs**	**Total Cost**
1	Connection to public sewer in lieu of repair	9,615	$240,370,034
2	COSS repair	39,646	$779,040,321
3	AOSS & alternative discharge system repair	5,114	$177,966,183
4	COSS operation & maintenance	1,088,253	$1,871,794,341
5	AOSS operation & maintenance	145,984	$1,981,592,796
Total		**1,288,612**	**$5,050,763,675**

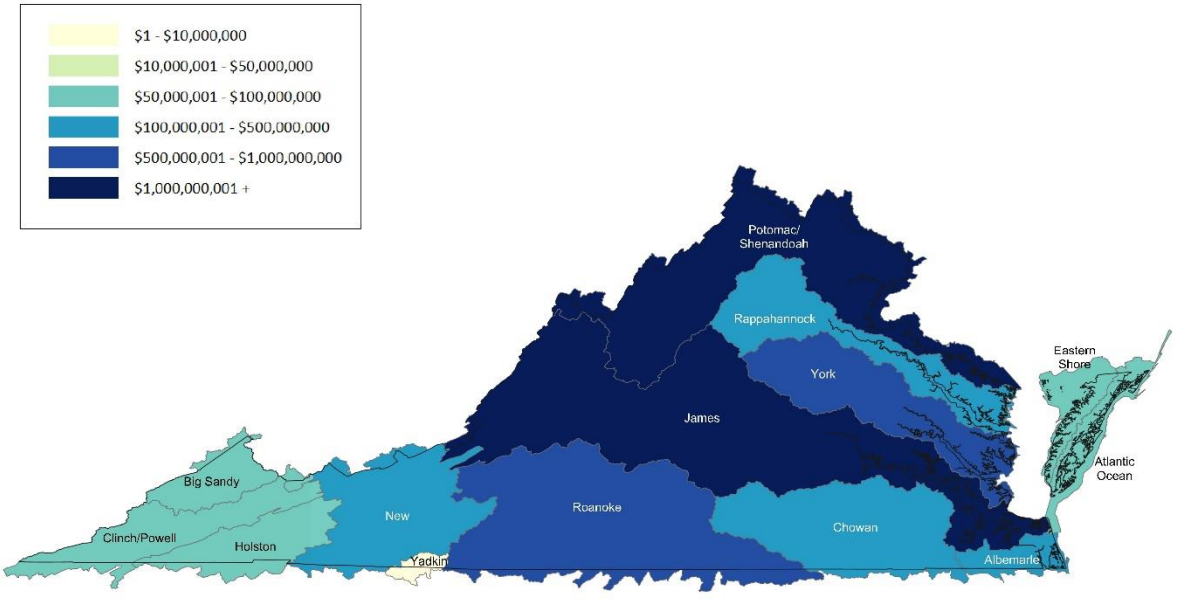
Figure 6 - Onsite Wastewater Needs in Virginia Counties and Cities



Of the total reported onsite wastewater need amount, $3.46 billion in needs are identified for localities located in the Chesapeake Bay watershed and $1.59 billion in needs are identified for localities that are located outside of the Bay. The breakdown by River Basin is found in Table 8 and depicted in Figure 7.

Table 8: Onsite Wastewater Needs by River Basin		
Chesapeake Bay Watershed	Potomac/Shenandoah	$1,248,000,000
	Rappahannock	$402,000,000
	York	$642,000,000
	James	$1,104,000,000
	Eastern Shore	$62,000,000
Total	**$3,461,000,000**	
Non-Chesapeake Bay Watershed	Albemarle	$211,000,000
	Chowan	$252,000,000
	Roanoke	$611,000,000
	New	$206,000,000
	Yadkin	$6,000,000
	Holston	$99,000,000
	Clinch/Powell	$92,000,000
	Big Sandy	$52,000,000
	Atlantic Ocean	$64,000,000
Total	**$1,593,000,000**	

Figure 7 - Onsite Wastewater Needs in Virginia River Basins



There are significant limitations to the data in this assessment. The assessment is based on actual onsite sewage system repair applications. VDH typically only receives an application when a property owner is ready and able to afford installation of an onsite system repair. Many property

owners live with failing onsite sewage systems for years without reporting the issue or seeking repairs, meaning the number of repairs needed over the next 20 years may be vastly under counted. Including a random sample survey of onsite sewage system owners in future assessments could be used to assess the results of data analysis.

The average lifespan of a COSS is 30 to 40 years. VDH estimates that nearly 50 percent of onsite sewage systems are at or beyond their useful life based on U.S. Census data. The data used to develop this needs assessment assumed that only 47,968 systems would be repaired over the next 20 years. However, U.S. Census data shows that 113,497 onsite sewage system were installed between 1980 and 1990, which would account for likely repair needs for just the next 10 years.

The assessment also overestimates the total number of AOSS currently installed across the Commonwealth. The onsite sewage system density analysis conducted by DEQ provided an estimated number of total onsite sewage systems, but the assessment of percent of AOSS permit applications only covers the last 20 years of permit data available in EHD. The use of AOSS has greatly increased since VDH began tracking permit data via the EHD resulting in an overestimation; however, the number of AOSS is likely to be close to the estimated totals towards the end of the 20-year assessment period. As more onsite sewage systems are repaired, more homes will be converted from COSS to AOSS due to site limitations that preclude the installation of COSS.

The installation of onsite sewage systems for newly constructed homes is not included as one of the categories because the construction of new onsite sewage systems for new homes is typically included in the overall construction cost for housing and not an independent need for adequate wastewater treatment. However, if included in the Assessment, VDH estimated that property owners will pay an estimated $5.2 billion over the next 20 years for the installation of new onsite sewage systems.

Lastly, the needs assessment provides data for onsite sewage system repair, operation, and maintenance needs and costs over the next 20 years regardless of homeowner income. VDH's SWAP grant programs limited assistance to households at or below 200 percent of the federal poverty guidelines as directed by appropriation. Despite this limitation, the program's direct project application period for assistance was only open for eight months before the program had committed all the funding allocated for direct assistance. If VDH accepted applications for 12 months, it would have received an estimated $10.8 million in applications. By not incorporating income data of households that are reliant onsite sewage systems, this assessment limits the recommendations it can make for those households currently prioritized for funding via SWAP.

Conclusions and Recommendations

The 2023 Commonwealth Wastewater Needs Assessment includes community wastewater infrastructure needs data collected from owners of wastewater collection and treatment systems including counties, cities, towns, service authorities, sanitation districts, and school systems, and onsite wastewater infrastructure needs data using permitting information and actual costs of system repairs, replacements, and connections to estimate needs across the Commonwealth. Wastewater needs were compiled and reported by locality and total $15.8 billion.

As noted in the report, there were limitations associated with the data collection effort related to agency and locality resources and time constraints, lack of participation from owners of private wastewater facilities and localities that do not typically work with DEQ or CWFAP, documentation requirements, underreporting of needs associated with planned future sewer systems in areas without adequate wastewater treatment, and estimations based on homeowner repair applications. Based on these limitations, it is likely that the estimate of the amount of wastewater infrastructure funding that is necessary to implement the policy of the Commonwealth is significantly underestimated.

To improve the accuracy of future assessments the Commonwealth may want to consider the following future actions:

- Continue or expand financial and technical assistance for wastewater infrastructure to capitalize on the recent federal and state increased investments. The significant number of applications received for DEQ's VCWRLF and ARPA programs and in VDH's SWAP grant program in the last two years is a strong indicator of the tremendous need for assistance.
- Encourage every locality in Virginia to develop a Capital Improvement Program (CIP) that includes all community and onsite wastewater infrastructure. Not only is a CIP a vital source of community wastewater needs data collection, but it can also serve as an important planning exercise for the inventory and prioritization of future projects.
- Promote the development and use of a comprehensive planning document that includes planned future wastewater infrastructure in areas without access to adequate wastewater treatment. Such planning documents would be useful to localities when planning for wastewater infrastructure to further the Commonwealth Wastewater Infrastructure Policy.
- Provide resources to conduct additional regional wastewater studies, like the Southwest Wastewater Study. The studies could highlight duplicative projects and underserved areas to promote collaborative, community-based projects or regionalization, in addition to aggregating needs data effectively and efficiently.

Attachment 1:
Total Wastewater Infrastructure Needs by Locality

Locality	Community Needs	Onsite Needs	Total Needs
Accomack	$41,126,290	$91,881,438	$133,007,728
Albemarle	$36,844,971	$113,293,010	$150,137,981
Alexandria	$449,314,053	$1,717,906	$451,031,959
Alleghany	$9,344,076	$18,631,769	$27,975,845
Amelia	$0	$15,865,221	$15,865,221
Amherst	$0	$35,385,636	$35,385,636
Appomattox	$2,589,656	$15,123,769	$17,713,425
Arlington	$8,407,604	$2,570,853	$10,978,457
Augusta	$17,302,858	$91,720,790	$109,023,648
Bath	$6,582,793	$5,675,041	$12,257,834
Bedford	$14,520,291	$80,247,284	$94,767,575
Bland	$23,761,865	$6,841,582	$30,603,447
Botetourt	$6,857,960	$44,805,866	$51,663,826
Bristol	$18,706,757	$1,157,177	$19,863,934
Brunswick	$0	$16,949,555	$16,949,555
Buchanan	$55,341,444	$21,159,874	$76,501,318
Buckingham	$0	$17,556,184	$17,556,184
Buena Vista	$19,146,110	$1,376,085	$20,522,195
Campbell	$5,219,167	$58,562,514	$63,781,681
Caroline	$21,956,796	$66,979,405	$88,936,201
Carroll	$42,838,213	$30,179,729	$73,017,942
Charles City	$0	$14,199,118	$14,199,118
Charlotte	$338,667	$11,409,473	$11,748,140
Charlottesville	$0	$536,287	$536,287
Chesapeake	$133,577,687	$115,940,074	$249,517,761
Chesterfield	$0	$162,638,929	$162,638,929
Clarke	$2,704,618	$34,052,293	$36,756,911
Colonial Heights	$0	$229,378	$229,378
Covington	$5,605,860	$207,632	$5,813,492
Craig	$0	$6,752,172	$6,752,172
Culpeper	$4,923,098	$63,592,772	$68,515,870
Cumberland	$80,660	$9,051,721	$9,132,381
Danville	$28,752,867	$6,004,484	$34,757,351
Dickenson	$5,138,654	$16,845,989	$21,984,643
Dinwiddie	$0	$32,643,917	$32,643,917
Emporia	$7,286,186	$938,500	$8,224,686
Essex	$2,353,370	$16,459,777	$18,813,147
Fairfax	$1,313,456,304	$45,556,688	$1,359,012,992
Fairfax City	$0	$316,764	$316,764
Falls Church	$5,693,637	$192,294	$5,885,931
Fauquier	$32,744,419	$136,589,938	$169,334,357

Locality	Community Needs	Onsite Needs	Total Needs
Floyd	$6,008,574	$14,748,936	$20,757,510
Fluvanna	$9,586,187	$29,354,414	$38,940,601
Franklin	$517,312,833	$52,078,149	$569,390,982
Franklin City	$1,638,633	$9,183,418	$10,822,051
Frederick	$134,334,554	$275,704,462	$410,039,016
Fredericksburg	$3,899,996	$189,484	$4,089,480
Galax	$0	$910,110	$910,110
Giles	$15,962,936	$12,812,779	$28,775,715
Gloucester	$2,503,575	$75,423,436	$77,927,011
Goochland	$24,881,601	$36,605,593	$61,487,194
Grayson	$121,573,234	$20,266,533	$141,839,767
Greene	$8,149,018	$19,235,588	$27,384,606
Greensville	$25,346,174	$9,523,529	$34,869,703
Halifax	$2,053,443	$33,808,644	$35,862,087
Hampton	$39,752,983	$11,377,987	$51,130,970
Hanover	$948,940	$164,302,942	$165,251,882
Harrisonburg	$5,056,941	$350,866	$5,407,807
Henrico	$354,706,125	$59,106,323	$413,812,448
Henry	$116,722,907	$45,104,986	$161,827,893
Highland	$0	$2,366,338	$2,366,338
Hopewell	$0	$256,221	$256,221
Isle of Wight	$17,365,593	$55,578,752	$72,944,345
James City	$233,457,686	$72,294,312	$305,751,998
King and Queen	$0	$7,978,127	$7,978,127
King George	$19,306,173	$44,359,646	$63,665,819
King William	$44,642,947	$23,845,181	$68,488,128
Lancaster	$8,425,634	$29,158,635	$37,584,269
Lee	$138,347,526	$14,903,036	$153,250,562
Lexington	$0	$149,819	$149,819
Loudoun	$526,861,138	$224,507,102	$751,368,240
Louisa	$1,332,000	$41,583,256	$42,915,256
Lunenburg	$1,351,402	$11,292,028	$12,643,430
Lynchburg	$123,234,030	$4,810,987	$128,045,017
Madison	$8,682,797	$25,240,492	$33,923,289
Manassas	$0	$289,637	$289,637
Manassas Park	$0	$116,601	$116,601
Martinsville	$0	$456,579	$456,579
Mathews	$0	$30,675,464	$30,675,464
Mecklenburg	$9,104,579	$36,741,319	$45,845,898
Middlesex	$85,631,228	$27,423,055	$113,054,283
Montgomery	$21,469,511	$114,019,204	$135,488,715
Nelson	$3,988,298	$16,646,770	$20,635,068
New Kent	$6,424,320	$39,032,793	$45,457,113
Newport News	$583,657,013	$1,403,749	$585,060,762

Locality	Community Needs	Onsite Needs	Total Needs
Norfolk	$987,260,826	$3,192,570	$990,453,396
Northampton	$6,311,005	$30,538,548	$36,849,553
Northumberland	$0	$23,824,187	$23,824,187
Norton	$4,687,069	$881,681	$5,568,750
Nottoway	$8,319,770	$16,407,429	$24,727,199
Orange	$6,438,557	$39,605,801	$46,044,358
Page	$2,870,542	$27,450,896	$30,321,438
Patrick	$3,478,622	$17,280,997	$20,759,619
Petersburg	$19,360,738	$2,341,570	$21,702,308
Pittsylvania	$0	$66,007,186	$66,007,186
Poquoson	$825,577	$7,272,014	$8,097,591
Portsmouth	$153,066,951	$663,046	$153,729,997
Powhatan	$664,258	$36,983,084	$37,647,342
Prince Edward	$0	$22,191,310	$22,191,310
Prince George	$0	$73,139,961	$73,139,961
Prince William	$638,674,127	$61,799,103	$700,473,230
Pulaski	$168,003,097	$32,878,836	$200,881,933
Radford	$238,408	$173,119	$411,527
Rappahannock	$0	$26,250,631	$26,250,631
Richmond	$0	$12,406,254	$12,406,254
Richmond City	$480,971,172	$3,656,587	$484,627,759
Roanoke	$0	$168,614,006	$168,614,006
Roanoke City	$0	$9,335,610	$9,335,610
Rockbridge	$22,841,125	$25,653,550	$48,494,675
Rockingham	$92,868,964	$137,457,696	$230,326,660
Russell	$82,915,494	$21,818,293	$104,733,787
Salem	$17,593,337	$569,056	$18,162,393
Scott	$81,014,340	$17,684,736	$98,699,076
Shenandoah	$4,045,329	$79,673,278	$83,718,607
Smyth	$37,997,163	$28,450,289	$66,447,452
Southampton	$2,169,906	$23,746,786	$25,916,692
Spotsylvania	$14,246,593	$183,943,126	$198,189,719
Stafford	$58,019,744	$103,164,754	$161,184,498
Staunton	$14,068,046	$1,163,011	$15,231,057
Suffolk	$550,022,122	$156,707,985	$706,730,107
Surry	$7,591,516	$9,493,306	$17,084,822
Sussex	$5,916,638	$14,180,469	$20,097,107
Tazewell	$357,017,975	$35,543,130	$392,561,105
Virginia Beach	$486,961,361	$134,707,938	$621,669,299
Warren	$28,126,058	$74,956,287	$103,082,345
Washington	$173,307,912	$59,188,437	$232,496,349
Waynesboro	$33,253,526	$1,063,086	$34,316,612
Westmoreland	$1,286,952	$28,957,358	$30,244,310
Williamsburg	$536,151	$189,110	$725,261

Locality	Community Needs	Onsite Needs	Total Needs
Winchester	$0	$573,190	$573,190
Wise	$266,580,670	$36,914,638	$303,495,308
Wythe	$24,668,362	$30,177,800	$54,846,162
York	$365,964,410	$54,835,770	$420,800,180
Total	**$10,756,421,873**	**$5,050,763,675**	**$15,807,185,548**

Attachment 2:
Blank Version of the CWNS Data Survey Form

CWNS ID

CWNS ID or Facility Name*

51000154002

Infrastructure Type*

Wastewater

Owner*

Public

Owned by and serves a small community (10,000 people or fewer)*

No

***denotes value required**

Facility and Change Type

Facility 1

Infrastructure Type: Wastewater

Facility Type*

Select Change Type*

Tip: hover your cursor over each cell to read definitions

○	No Change
○	New
○	Abandonment
○	Existing

The following will only populate if "existing" is selected as the change type. One or more of these must be chosen as an additional change type if "Existing" is selected under "Select Change Type".

☐	Rehabilitation
☐	Replacement
☐	Increase Capacity
☐	Process Improvement
☐	Instrumentation/Electrical/Laboratory
☐	Increase Level Of Treatment
☐	Improve Energy Efficiency
☐	Climate Change Adaptation
☐	Improve Water Efficiency
☐	Renewable Energy

Facility 2

Infrastructure Type: Wastewater

Facility Type*

Select Change Type*

Tip: hover your cursor over each cell to read definitions

◉	No Change
○	New
○	Abandonment
○	Existing

The following will only populate if "existing" is selected as the change type. One or more of these must be chosen as an additional change type if "Existing" is selected under "Select Change Type".

☐	Rehabilitation
☐	Replacement
☐	Increase Capacity
☐	Process Improvement
☐	Instrumentation/Electrical/Laboratory
☐	Increase Level Of Treatment
☐	Improve Energy Efficiency
☐	Climate Change Adaptation
☐	Improve Water Efficiency
☐	Renewable Energy

Facility Type	Definition
Treatment plant	A combination of unit processes designed to receive and treat wastewater and then discharge the treated wastewater (effluent) into the environment. This type includes both mechanical plants and lagoons or ponds (other than honey bucket lagoons). It also includes unit processes intended to remove pollutants from CSOs prior to the discharge of the overflow to the environment. It can also include package plants, although it is up to the state if these are reported as treatment plants (wastewater) or clustered systems (decentralized). This type does not include unit processes intended to thicken, stabilize, dewater, or store biosolids; they should be designated as biosolids handling facilities.
Collection: combined sewers	Infrastructure designed to collect and transport a combination of wastewater and stormwater. This type does not include sewers that were designed to carry only wastewater and infiltration/inflow, which should be designated as collection: separate sewers.
Collection: separate sewers	Infrastructure designed to collect and transport wastewater. Although this type includes sewer systems that collect and transport infiltration and inflow, it does not include sewers designed to carry both stormwater and wastewater; they should be designated as collection: combined sewers.
Collection: interceptor sewers	Large sewer lines that collect the flows from smaller main and trunk sewers and carry them to the treatment plant.
Collection: pump stations	Mechanical devices designed to move waste and other fluid from underground pipelines and storage areas to higher elevations to reach the treatment plant.
Honey bucket lagoon	A shallow artificial lagoon where human waste from homes is transported to for disposal.
Storage facility	A facility that temporarily holds wastewater until it is transported and treated elsewhere.
Biosolids handling facility	A combination of unit processes designed to thicken, stabilize, dewater, or store biosolids prior to disposal.
Water reuse	The combination of unit processes used to convey treated wastewater that will be reused.
OWTS	A combination of natural and mechanical processes designed to collect, treat, and disperse or reclaim wastewater from a single dwelling or building. Septic tanks and drainfields or holding tanks are examples.
Clustered system	A combination of unit processes under some form of common ownership designed to collect wastewater from two or more dwellings or buildings and convey it to a treatment and dispersal system on a suitable site near the dwellings or buildings. Clustered systems include multifamily septic systems as well as package treatment plants.

Permits Associated with Facility

Permit 1

NPDES Permit Number

Permit Type

Permit 2

NPDES Permit Number

Permit Type

Permit 3

NPDES Permit Number

Permit Type

Note: if the facility has a CWNS ID number from the 2012 survey, EPA has pre-populated the database with the permit number for the facility from the ICIS-NPDES database. Please enter the NPDES permit number so that we may confirm with EPA.

Point of Contact	**Responsible entity:** the point of contact who is the primary authority responsible for the CWNS ID. One responsible entity must be selected per CWNS ID.

Point of Contact 1	Point of Contact 2	Point of Contact 3
Authority Name*	Authority Name*	Authority Name*
Responsible Entity*	Responsible Entity*	Responsible Entity*
Contact Name:	Contact Name:	Contact Name:
Role/Title:	Role/Title:	Role/Title:
Phone Number:	Phone Number:	Phone Number:
Ext:	Ext:	Ext:
Fax Number:	Fax Number:	Fax Number:
Email:	Email:	Email:
Address:	Address:	Address:
Address 2:	Address 2:	Address 2:
City/County:	City/County:	City/County:
State:	State:	State:
Zip:	Zip:	Zip:

Location and Area Related to Needs

Each wastewater CWNS ID must have an identified physical location entered using a single latitute/longitude point. There are two options for identifying the physical location: Using location from NPDES permit OR inputing map coordinates.

Option 1:

Use location from associated NPDES Permit: ☐

NPDES Permit Number

Option 2:

Map Coordinates:

Latitude:* (must be expressed in decimal degrees)

Longitude:* (must be expressed in decimal degrees)

Datum:*

Address:

City:*

Zip Code:*

Needs

Please select reason(s) for needed changes (select all that apply):*	
☐	The project(s) is required to maintain compliance with a NPDES permit.
☐	The project(s) is necessary to obtain compliance with a new permit requirement.
☐	The project(s) is to increase capacity or improve treatment in advance of anticipated new permit requirements.
☐	The project(s) is to achieve or maintain compliance with a TMDL.
☐	The project(s) will prevent unregulated water quality or human health impacts.
☐	The project(s) improves water efficiency, improves energy efficiency, improves water conservation, addresses climate change, or improves resiliency.

Documents & Costs

All needs must have documentation or be input using the Small Community Form for those that meet the definition of "small community"

Only required if the CWNS ID's needs total over $40 million.

Document 1

Document Type*	
Document Title*	
Title Page #	
Author*	
Author Page #	
Published Date (MM/DD/YYYY)*	
Published Date Page #	
Base Month/Year of Cost Information	
Base Month/Year of Cost Information	
Notes	

Project 1 from Document 1

Select Needs Category* (Only one per project)

Tip: hover your cursor over each cell to read

- Secondary Wastewater Treatment
- Advanced Wastewater Treatment
- Infiltration/Inflow (I/I) Correction
- Sewer Replacement/Rehabilitation
- New Collector Sewers and Appurtenances
- New Interceptor Sewers and Appurtenances
- Combined Sewer Overflow (CSO) Correction
- Water Reuse
- Desalination

Select Type of Treatment Plant

Project Description (no more than 1 sentence)*

Project Description Page Numbers

Project Cost*

Cost Page Numbers

Comments

Project Start Date (MM/DD/YYYY)

Project End Date

Does this cost address a SSO?*

Project 2 from Document 1

Select Needs Category* (Only one per project)

Tip: hover your cursor over each cell to read definitions

- Secondary Wastewater Treatment
- Advanced Wastewater Treatment
- Infiltration/Inflow (I/I) Correction
- Sewer Replacement/Rehabilitation
- New Collector Sewers and Appurtenances
- New Interceptor Sewers and Appurtenances
- Combined Sewer Overflow (CSO) Correction
- Water Reuse
- Desalination

Select Type of Treatment Plant

Project Description (no more than 1 sentence)*

Project Description Page Numbers

Project Cost*

Cost Page Numbers

Comments

Project Start Date (MM/DD/YYYY)

Project End Date

Does this cost address a SSO?*

Document 2

Document Type*	
Document Title*	
Title Page #	
Author*	
Author Page #	
Published Date (MM/DD/YYYY)*	
Published Date Page #	
Base Month/Year of Cost Information	
Base Month/Year of Cost Information	
Notes	

Project 1 from Document 2

Select Needs Category* (Only one per project)

Tip: hover your cursor over each cell to read

- Secondary Wastewater Treatment
- Advanced Wastewater Treatment
- Infiltration/Inflow (I/I) Correction
- Sewer Replacement/Rehabilitation
- New Collector Sewers and Appurtenances
- New Interceptor Sewers and Appurtenances
- Combined Sewer Overflow (CSO) Correction
- Water Reuse
- Desalination

Select Type of Treatment Plant

Project Description (no more than 1 sentence)*

Project Description Page Numbers

Project Cost*

Cost Page Numbers

Comments

Project Start Date (MM/DD/YYYY)

Project End Date

Does this cost address a SSO?*

Project 2 from Document 2

Select Needs Category* (Only one per project)

Tip: hover your cursor over each cell to read definitions

- Secondary Wastewater Treatment
- Advanced Wastewater Treatment
- Infiltration/Inflow (I/I) Correction
- Sewer Replacement/Rehabilitation
- New Collector Sewers and Appurtenances
- New Interceptor Sewers and Appurtenances
- Combined Sewer Overflow (CSO) Correction
- Water Reuse
- Desalination

Select Type of Treatment Plant

Project Description (no more than 1 sentence)*

Project Description Page Numbers

Project Cost*

Cost Page Numbers

Comments

Project Start Date (MM/DD/YYYY)

Project End Date

Does this cost address a SSO?*

Population & Flow Information

Population

Population data is only required for collection systems. Population for treatment plants aggregate its population from the collection systems linked to the plant.

Add or edit the population information, entering residential and non-residential numbers separately. If the project is for a new facility, meaning that it is truly a new collection and treatment system, the 2022 population should be "0" and the population it will be serving should be reported under Projected Design Population"

	Residential Population		Non-Residential Population	
	* 2022	* Projected Design Population 2042	2022	Projected Design Population 2042
Receiving Collection				

Flow

There are two option for reporting flow detail: Disaggregated Flow or Total Flow. Disaggregated allows for entering values for municipal, industrial, and/or infiltration flow. Disaggregated flow values will be automatically summed to calculate total flow.

If the project is for a new facility, meaning that it is truly a new collection and treatment system, the current flow should be "0" and the design flow of the new treatment plant be reported as future flow.

Report flows as:*

Total Flow			Disaggregated Flow		
	Current Design Flow (MGD)	Future Design Flow (MGD)		Current Design Flow (MGD)	Future Design Flow (MGD)
Total Flow			Industrial Flow		
			Infiltration Flow		
			Municipal Flow		
Current Flow to Population Ratio (GPCD)	#DIV/0!	#DIV/0!	Current Flow to Population Ratio (GPCD)	#DIV/0!	#DIV/0!

If cells outlined in orange are outside of 25-300 GPDC Range, select a reason:*

Discharges

Discharge entries are required for treatment plants, collection systems (combined and separate). It is optional for other facility types under wastewater.

Multiple discharges may be added for each CWNS ID. All discharges entered must sum to 100%. A total percent discharge of "0" indicates that the type of discharge does not exist in either 2022 (this facility is closing) or is not estimated to exist in 2042 (the facility will close).

If the CWNS has multiple facility types, enter the discharge data of the downstream facility (e.g., for a collection system and a treatment plant, enter the treatment plant's discharge).

Discharge 1

Type of Discharge:*

2022 % of Discharge:*

2042 Estimated % of Discharge:*

CWNS ID:*

Comment:

Discharge 2

Type of Discharge:*

2022 % of Discharge:*

2042 Estimated % of Discharge:*

CWNS ID:*

Comment:

Discharge 3

Type of Discharge:*

2022 % of Discharge:*

2042 Estimated % of Discharge:*

CWNS ID:*

Comment:

Discharge 4

Type of Discharge:*

2022 % of Discharge:*

2042 Estimated % of Discharge:*

CWNS ID:*

Comment:

Discharge Type	Discharge Type Description
Outfall To Surface Waters	Discharge of treated municipal wastewater to waters of the United States.
Ocean Discharge	Discharge of treated municipal wastewater to an ocean, sea, or contiguous zone.
Deep well disposal (UIC Class I)	Discharge of hazardous and nonhazardous municipal waste into deep, confined rock formations below all underground sources of drinking water using a Underground Injection Control (UIC) Class I permit. Does not include discharge of treated municipal wastewater into groundwater aquifers that may potentially be used as drinking water sources.
Reuse: Industrial	Discharge of treated municipal wastewater to an industrial facility for any application.
Evaporation	Facility allows for evaporation of water to the atmosphere.
Reuse: Landscape-related irrigation	Discharge of treated municipal wastewater for irrigation of parks, golf courses, road medians, and other landscapes. This reuse application excludes all agriculture-related water reuse.
Overland Flow, No Discharge	Discharge of treated municipal wastewater to the ground surface with no ultimate discharge
Overland Flow With Discharge	Discharge of treated municipal wastewater to the ground surface that ultimately discharges to a surface water
Discharge To Another Facility	Discharge of untreated, partially treated, or fully treated effluent to another facility, including to the collection system of another facility.
CSO Discharge	Discharge of stormwater and untreated municipal wastewater from a combined sewer system at a point prior to the POTW treatment plant.
Other	Discharge of treated municipal wastewater to a location unknown or not defined by the options provided.
Reuse: Environmental restoration and groundwater discharge	Discharge of treated municipal wastewater to create, enhance, sustain, or augment water bodies such as wetlands, aquatic habitats, or stream flow. Includes groundwater recharge, deep injection for salinity control, protection from saltwater intrusion, stream flow augmentation and wildlife habitat, and source water protection. Also includes groundwater recharge through Underground Inject Control (UIC) Class V wells.
No Discharge, unknown	Facility has no discharge, and location or type of discharge is unknown.
Reuse: Agricultural-related and livestock watering	Discharge of treated municipal wastewater for the production of crops for human consumption, non-food crops of commercial value, and for drinking water for livestock. This discharge category excludes landscape irrigation.
Reuse: Other Centralized Non-Potable	Discharge of treated municipal wastewater for miscellaneous non-potable applications such as dust control, soil compaction, fire protection, commercial laundries, vehicle washing, street cleaning, snowmaking, and others. This discharge category excludes agriculture-related reuse and landscape irrigation.
Reuse: Potable	Discharge of treated municipal wastewater to an environmental buffer or full advanced treatment facility with the intention of eventually reusing it for drinking water purposes. This includes both indirect potable reuse through introduction of recycled water into an environmental buffer such as a surface reservoir or groundwater aquifer, and direct potable reuse through introduction of recycled water into a drinking water system.
Reuse: Impoundments	Discharge of treated municipal wastewater in an impoundment (body of water within an enclosure). This includes both unrestricted (use of reclaimed water in an impoundment in which no limitations are imposed on body-contact water recreation activities) and restricted (use of reclaimed water in an impoundment where body contact is restricted). Includes recreational impoundments and aesthetic impoundments.

Effluent

Effluent entries are only required for CWNS IDs with a treatment plant as a facility type. This tab is optional for IDs with honey bucket lagoon or storage facilities as a facility type.

Indicate the ultimate level of wastewater treatment. Please input both current efflient treatment and future treatment levels. For projects that will abandon a treatment plant, only the current treatement level data may be entered. For projects that will build a brand new facility, only future treatment level data can be entered. If the treatment plant provides two different effluent treatment levels (secondary and advanced) and discharges to surface waters, enter the treatment level discharged to the surface waters. If there is no surface water discharge, enter the treatment level that the majority of the flow receives.

Effluent	
Current Effluent Treatment Level:*	
Is there Disinfection (e.g.,chlorine, UV) currently in place?*	
Future Effluent Treatment Level:*	
Is there Disinfection (e.g.,chlorine, UV) currently in place?*	

Effluent Treatment Level	Definition
Raw	No treatment.
Primary	Typically, less than 45 milligrams per liter (mg/L) 30-day average concentration of biochemical oxygen demand (BOD_5), achieved by removing floating debris and solids by screening, sedimentation, and skimming. The primary treatment must remove at least 30 percent of BOD_5 and total suspended solids from the influent wastewater.
Secondary	Typically, 30 mg/L 30-day average concentration of both BOD_5 and total suspended solids and pH 6–9 (secondary treatment levels required for some waste stabilization ponds and trickling filter systems may be less stringent). In addition, the secondary treatment must remove at least 85 percent of BOD_5 and total suspended solids from the influent wastewater. Secondary treatment is the minimum treatment required for discharges from all municipal wastewater treatment facilities by the CWA; facilities granted ocean discharge waivers under Section 301(h) are exempt from this requirement (listed in Appendix K).
Advanced	A level of treatment that is more stringent than secondary treatment or produces a significant reduction in nonconventional or toxic pollutants present in the facility's effluent. Examples of advanced treatment indicators are nitrogen removal, phosphorus removal, ammonia removal, metal removal, and synthetic organic removal.

Unit Processes

Unit process is optional for treatment plants. If choosing to report unit processes, the asterisk fields are required.

Add unit processes and specify whether they exist currently or are planned for the facility. Planned unit processes should reflect updates to the facility based on the change types and needs reported. Multiple unit processes can be added, scroll down for unit processes 2 & 3

Unit Process 1

Treatment Stage:*

Notes

Unit Process:* **Select all that apply**

Disinfection	Full Advanced Treatment for Potable Reuse	Nutrient Removal and Additional Treatment	Preliminary Treatment	Primary Treatment	Secondary Treatment	Solids Handling
Is this unit process:*	**Is this unit process:***	**Is this unit process:***	**Is this unit process:***	**Is this unit process:***	**Is this unit process:***	**Is this unit process:***
○ Existing	○ Existing	○ Existing	○ Existing	○ Existing	○ Existing	○ Existing
○ Planned	○ Planned	○ Planned	○ Planned	○ Planned	○ Planned	○ Planned
☐ Advanced oxidation process (AOP)	☐ Biologically Active Filtration (BAF)	☐ Biological N Removal	☐ Flow Equalization	☐ Floatation	☐ Attached Growth, Aerobic	☐ Biosolids Aerobic Digestion
☐ Dechlorination	☐ Coagulation	☐ Biological P Removal	☐ Screening	☐ Primary Clarification or Sedimentation	☐ Attached Growth, Anaerobic	☐ Biosolids Anaerobic Digestion with Energy Recovery
☐ Disinfection, thermal	☐ Electrodialysis (ED)	☐ Chemical Addition, Alum			☐ Biological Treatment, Other	☐ Biosolids Anaerobic Digestion withour Energy Recovery
☐ Disinfection, UV	☐ Electrodialysis (EDR)	☐ Chemical Addition, Ferric Chloride			☐ Lagoon, Aerobic	☐ Biosolids Chemical Addiiton
☐ Disinfection, chlorine/ chloramine	☐ Flocculation	☐ Chemical Addition, Polymer			☐ Lagoon, Anaerobic	☐ Biosolids Drying
☐ Disinfection, other chemical	☐ Granular activated carbon (GAC)	☐ Chemical N Removal			☐ Lagoon, Facultative	☐ Biosolids Incineration
☐ Disinfection, ozone	☐ Ion exchange	☐ Chemical P Removal			☐ Sludge Blanket, Anaerobic	☐ Biosolids Mechanical Dewatering
	☐ Lime stabilization	☐ Constructed Wetland			☐ Suspended Growth, Aerobic	☐ Biosolids Thickening
	☐ Media filtration	☐ Filtration			☐ Suspended Growth, Anaerobic	
	☐ Microfiltration (MF)					
	☐ Nanofiltration (NF)					
	☐ Reverse osmosis (RO)					
	☐ Sedimentation					
	☐ Stabilization, calcium chloride for stablization					
	☐ Stabilization, sodium hydroxide					
	☐ Ultrafilration (UF)					

Asset Management

Asset Management is optional for all wastewater facilities.

Add information about utility plan(s) for managing infrastructure capital assets to minimize the total cost of owning and operating them while maintaining service levels. The costs entered should not be added as a part of the facility's needs; rather, this is to inform EPA about the state of asset management plans for the country's utilities.

Asset Management Plans and Programs

Implementation:*	
Annual Cost to Implement Program ($):*	
Remaining Cost to Implement Program ($):*	

Attachment 3:
Community Wastewater Infrastructure Needs by Locality

Locality	Total Need
Accomack	$41,126,290
Albemarle	$36,844,971
Alexandria	$449,314,053
Alleghany	$9,344,076
Amelia	$0
Amherst	$0
Appomattox	$2,589,656
Arlington	$8,407,604
Augusta	$17,302,858
Bath	$6,582,793
Bedford	$14,520,291
Bland	$23,761,865
Botetourt	$6,857,960
Bristol	$18,706,757
Brunswick	$0
Buchanan	$55,341,444
Buckingham	$0
Buena Vista	$19,146,110
Campbell	$5,219,167
Caroline	$21,956,796
Carroll	$42,838,213
Charles City	$0
Charlotte	$338,667
Charlottesville	$0
Chesapeake	$133,577,687
Chesterfield	$0
Clarke	$2,704,618
Colonial Heights	$0
Covington	$5,605,860
Craig	$0
Culpeper	$4,923,098
Cumberland	$80,660
Danville	$28,752,867
Dickenson	$5,138,654
Dinwiddie	$0
Emporia	$7,286,186
Essex	$2,353,370
Fairfax	$1,313,456,304
Fairfax City	$0
Falls Church	$5,693,637
Fauquier	$32,744,419
Floyd	$6,008,574
Fluvanna	$9,586,187
Franklin	$517,312,833
Franklin City	$1,638,633
Frederick	$134,334,554
Fredericksburg	$3,899,996
Galax	$0
Giles	$15,962,936
Gloucester	$2,503,575
Goochland	$24,881,601
Grayson	$121,573,234
Greene	$8,149,018
Greensville	$25,346,174
Halifax	$2,053,443
Hampton	$39,752,983
Hanover	$948,940
Harrisonburg	$5,056,941
Henrico	$354,706,125
Henry	$116,722,907
Highland	$0
Hopewell	$0
Isle of Wight	$17,365,593
James City	$233,457,686
King and Queen	$0
King George	$19,306,173
King William	$44,642,947
Lancaster	$8,425,634
Lee	$138,347,526
Lexington	$0
Loudoun	$526,861,138
Louisa	$1,332,000
Lunenburg	$1,351,402
Lynchburg	$123,234,030
Madison	$8,682,797
Manassas	$0
Manassas Park	$0
Martinsville	$0
Mathews	$0
Mecklenburg	$9,104,579
Middlesex	$85,631,228
Montgomery	$21,469,511
Nelson	$3,988,298
New Kent	$6,424,320
Newport News	$583,657,013
Norfolk	$987,260,826
Northampton	$6,311,005
Northumberland	$0
Norton	$4,687,069
Nottoway	$8,319,770
Orange	$6,438,557
Page	$2,870,542
Patrick	$3,478,622
Petersburg	$19,360,738
Pittsylvania	$0
Poquoson	$825,577
Portsmouth	$153,066,951
Powhatan	$664,258
Prince Edward	$0
Prince George	$0
Prince William	$638,674,127
Pulaski	$168,003,097
Radford	$238,408
Rappahannock	$0
Richmond	$0
Richmond City	$480,971,172
Roanoke	$0
Roanoke City	$0
Rockbridge	$22,841,125
Rockingham	$92,868,964
Russell	$82,915,494
Salem	$17,593,337
Scott	$81,014,340
Shenandoah	$4,045,329
Smyth	$37,997,163
Southampton	$2,169,906
Spotsylvania	$14,246,593
Stafford	$58,019,744
Staunton	$14,068,046
Suffolk	$550,022,122
Surry	$7,591,516
Sussex	$5,916,638
Tazewell	$357,017,975
Virginia Beach	$486,961,361
Warren	$28,126,058
Washington	$173,307,912
Waynesboro	$33,253,526
Westmoreland	$1,286,952
Williamsburg	$536,151
Winchester	$0
Wise	$266,580,670
Wythe	$24,668,362
York	$365,964,410
Total	**$10,756,421,873**

Attachment 4:
Onsite Wastewater Infrastructure Needs by Locality

Locality	Category 1: Sewer Connection Cost	Category 2: COSS Repair Cost	Category 3: AOSS Repair Cost	Category 4: COSS O&M Cost	Category 5: AOSS O&M Cost	Total Infrastructure Need
ACCOMACK	$4,028,907	$33,259,552	$10,566,172	$18,225,458	$25,801,349	$91,881,438
ALBEMARLE	$4,960,360	$18,951,702	$1,814,903	$61,374,723	$26,191,321	$113,293,010
ALEXANDRIA	$0	$0	$0	$987,275	$730,631	$1,717,906
ALLEGHANY	$66,987	$860,637	$196,696	$8,673,717	$8,833,732	$18,631,769
AMELIA	$0	$6,116,610	$191,823	$8,384,986	$1,171,802	$15,865,221
AMHERST	$4,539,460	$9,184,911	$160,988	$19,942,643	$1,557,633	$35,385,636
APPOMATTOX	$43,007	$4,276,354	$41,884	$10,312,435	$450,089	$15,123,769
ARLINGTON	$0	$0	$0	$1,477,461	$1,093,392	$2,570,853
AUGUSTA	$1,053,507	$8,424,685	$1,475,610	$45,361,622	$35,405,366	$91,720,790
BATH	$40,601	$670,770	$151,035	$2,402,253	$2,410,381	$5,675,041
BEDFORD	$3,588,629	$13,121,232	$793,010	$49,431,558	$13,312,854	$80,247,284
BLAND	$0	$1,350,115	$120,821	$3,839,522	$1,531,124	$6,841,582
BOTETOURT	$730,291	$6,364,447	$1,248,203	$19,457,774	$17,005,150	$44,805,866
BRISTOL	$0	$0	$0	$499,694	$657,483	$1,157,177
BRUNSWICK	$0	$4,516,497	$234,650	$9,905,194	$2,293,213	$16,949,555
BUCHANAN	$0	$3,686,896	$308,387	$12,503,953	$4,660,638	$21,159,874
BUCKINGHAM	$0	$6,016,365	$90,260	$10,732,085	$717,474	$17,556,184
BUENA VISTA	$0	$0	$0	$830,246	$545,838	$1,376,085
CAMPBELL	$3,025,946	$16,452,800	$839,360	$31,160,465	$7,083,944	$58,562,514
CAROLINE	$7,499	$11,513,700	$5,694,364	$15,532,243	$34,231,600	$66,979,405
CARROLL	$0	$4,411,895	$419,900	$17,799,082	$7,548,853	$30,179,729
CHARLES CITY	$0	$2,289,811	$1,108,039	$3,422,081	$7,379,187	$14,199,118
CHARLOTTE	$0	$3,516,412	$52,121	$7,355,129	$485,811	$11,409,473
CHARLOTTESVILLE	$100,250	$0	$0	$297,713	$138,324	$536,287
CHESAPEAKE	$4,189,889	$7,739,223	$5,301,113	$24,358,749	$74,351,100	$115,940,074
CHESTERFIELD	$54,455,098	$12,873,883	$3,268,995	$43,180,624	$48,860,328	$162,638,929
CLARKE	$553,420	$9,295,868	$3,419,832	$7,874,287	$12,908,886	$34,052,293
COLONIAL HEIGHTS	$0	$0	$0	$107,612	$121,766	$229,378
COVINGTON	$0	$0	$0	$192,302	$15,330	$207,632
CRAIG	$369,141	$1,098,722	$191,740	$2,864,767	$2,227,802	$6,752,172
CULPEPER	$1,373,646	$17,180,372	$1,990,385	$28,391,181	$14,657,189	$63,592,772
CUMBERLAND	$201,623	$1,697,641	$61,984	$6,098,271	$992,202	$9,051,721
DANVILLE	$0	$236,390	$0	$5,768,094	$0	$6,004,484
DICKENSON	$0	$4,188,885	$396,205	$8,625,406	$3,635,494	$16,845,989
DINWIDDIE	$4,291	$8,025,002	$713,447	$17,119,131	$6,782,047	$32,643,917
EMPORIA	$0	$157,593	$0	$780,907	$0	$938,500

Locality	Category 1: Sewer Connection Cost	Category 2: COSS Repair Cost	Category 3: AOSS Repair Cost	Category 4: COSS O&M Cost	Category 5: AOSS O&M Cost	Total Infrastructure Need
ESSEX	$351,436	$3,711,569	$752,328	$6,118,161	$5,526,282	$16,459,777
FAIRFAX CITY	$0	$0	$0	$141,271	$175,492	$316,764
FAIRFAX	$26,612,955	$3,013,215	$839,986	$6,730,123	$8,360,410	$45,556,688
FALLS CHURCH	$0	$0	$0	$85,760	$106,534	$192,294
FAUQUIER	$2,851,290	$40,229,407	$11,444,339	$36,188,918	$45,875,984	$136,589,938
FLOYD	$0	$3,975,220	$76,863	$9,848,298	$848,555	$14,748,936
FLUVANNA	$223,758	$5,860,672	$473,163	$16,765,190	$6,031,631	$29,354,414
FRANKLIN	$0	$8,426,655	$426,738	$269,261	$60,763	$9,183,418
FRANKLIN COUNTY	$0	$8,691,758	$515,434	$33,909,968	$8,960,989	$52,078,149
FREDERICK	$1,583,369	$4,821,122	$11,166,816	$22,800,208	$235,332,947	$275,704,462
FREDERICKSBURG	$0	$0	$0	$189,484	$0	$189,484
GALAX	$0	$0	$0	$910,110	$0	$910,110
GILES	$39,619	$1,229,481	$218	$10,691,204	$852,257	$12,812,779
GLOUCESTER	$10,975,450	$11,516,731	$4,236,859	$18,449,236	$30,245,160	$75,423,436
GOOCHLAND	$493,651	$12,557,865	$1,354,306	$14,993,989	$7,205,781	$36,605,593
GRAYSON	$0	$4,509,697	$665,337	$9,105,299	$5,986,200	$20,266,533
GREENE	$441,150	$4,652,310	$217,333	$11,525,518	$2,399,276	$19,235,588
GREENSVILLE	$0	$922,486	$40,860	$7,149,110	$1,411,073	$9,523,529
HALIFAX	$0	$7,434,599	$369,537	$21,289,090	$4,715,418	$33,808,644
HAMPTON	$401,000	$0	$0	$3,724,627	$7,252,361	$11,377,987
HANOVER	$12,917,152	$21,529,193	$6,129,696	$54,535,425	$69,191,476	$164,302,942
HARRISONBURG	$0	$0	$0	$350,866	$0	$350,866
HENRICO	$18,232,969	$6,470,498	$3,768,973	$8,519,679	$22,114,204	$59,106,323
HENRY	$0	$15,504,283	$32,989	$29,289,997	$277,716	$45,104,986
HIGHLAND	$0	$373,259	$36,701	$1,360,335	$596,043	$2,366,338
HOPEWELL	$100,250	$0	$0	$155,971	$0	$256,221
ISLE OF WIGHT	$7,024,056	$5,379,658	$1,069,189	$22,329,610	$19,776,239	$55,578,752
JAMES CITY	$1,977,933	$2,210,337	$309,628	$41,740,665	$26,055,750	$72,294,312
KING AND QUEEN	$0	$2,506,674	$165,783	$4,097,938	$1,207,731	$7,978,127
KING GEORGE	$3,491,367	$5,084,907	$1,903,610	$12,697,433	$21,182,328	$44,359,646
KING WILLIAM	$300,209	$4,769,312	$764,506	$10,506,343	$7,504,811	$23,845,181
LANCASTER	$241,502	$10,815,554	$3,534,985	$5,929,889	$8,636,704	$29,158,635
LEE	$0	$0	$0	$14,171,332	$731,704	$14,903,036
LEXINGTON	$100,250	$0	$0	$49,569	$0	$149,819
LOUDOUN	$12,644,823	$79,305,886	$22,107,889	$49,258,169	$61,190,335	$224,507,102
LOUISA	$16,120	$10,133,710	$730,270	$23,240,109	$7,463,046	$41,583,256

Locality	Category 1: Sewer Connection Cost	Category 2: COSS Repair Cost	Category 3: AOSS Repair Cost	Category 4: COSS O&M Cost	Category 5: AOSS O&M Cost	Total Infrastructure Need
LUNENBURG	$159,879	$2,674,411	$64,816	$7,574,853	$818,070	$11,292,028
LYNCHBURG	$235,377	$3,962,072	$51,599	$531,116	$30,823	$4,810,987
MADISON	$89,142	$12,871,991	$942,423	$8,548,053	$2,788,882	$25,240,492
MANASSAS	$0	$0	$0	$289,637	$0	$289,637
MANASSAS PARK	$0	$0	$0	$116,601	$0	$116,601
MARTINSVILLE	$0	$0	$0	$456,579	$0	$456,579
MATHEWS	$93,383	$7,225,864	$5,912,041	$3,754,708	$13,689,468	$30,675,464
MECKLENBURG	$0	$11,952,909	$740,525	$18,845,178	$5,202,706	$36,741,319
MIDDLESEX	$351,998	$8,341,169	$3,297,757	$5,587,725	$9,844,407	$27,423,055
MONTGOMERY	$918,691	$7,428,310	$1,753,269	$50,648,406	$53,270,528	$114,019,204
NELSON	$4,010	$6,225,591	$132,783	$9,391,754	$892,631	$16,646,770
NEW KENT	$1,305,656	$6,553,238	$1,927,072	$12,658,760	$16,588,067	$39,032,793
NEWPORT NEWS	$0	$0	$0	$1,240,516	$163,233	$1,403,749
NORFOLK	$100,250	$0	$0	$1,396,849	$1,695,471	$3,192,570
NORTHAMPTON	$263,647	$15,893,921	$2,325,098	$7,298,244	$4,757,638	$30,538,548
NORTHUMBERLAND	$144,791	$6,743,253	$1,950,549	$6,546,810	$8,438,784	$23,824,187
NORTON	$0	$0	$0	$443,865	$437,816	$881,681
NOTTOWAY	$114,826	$3,402,199	$234,100	$9,686,268	$2,970,035	$16,407,429
ORANGE	$389,572	$10,805,725	$555,319	$22,664,762	$5,190,423	$39,605,801
PAGE	$241,753	$4,613,657	$563,349	$14,268,403	$7,763,735	$27,450,896
PATRICK	$0	$5,654,059	$34,161	$11,288,838	$303,939	$17,280,997
PETERSBURG	$300,750	$0	$0	$1,001,082	$1,039,738	$2,341,570
PITTSYLVANIA	$0	$18,856,696	$933,744	$37,862,078	$8,354,668	$66,007,186
POQUOSON	$99,809	$347	$0	$7,171,858	$0	$7,272,014
PORTSMOUTH	$0	$0	$0	$663,046	$0	$663,046
POWHATAN	$2,163,676	$10,196,689	$978,489	$16,561,976	$7,082,255	$36,983,084
PRINCE EDWARD	$459,466	$4,864,101	$235,402	$13,681,737	$2,950,604	$22,191,310
PRINCE GEORGE	$2,153,119	$6,137,953	$3,017,898	$19,376,638	$42,454,353	$73,139,961
PRINCE WILLIAM	$10,585,919	$2,186,706	$1,486,673	$11,797,595	$35,742,210	$61,799,103
PULASKI	$0	$5,589,430	$567,263	$18,400,502	$8,321,642	$32,878,836
RADFORD	$0	$0	$0	$99,491	$73,628	$173,119
RAPPAHANNOCK	$0	$20,605,442	$488,139	$4,664,624	$492,426	$26,250,631
RICHMOND	$1,603,198	$599	$55	$1,459,333	$593,402	$3,656,587
RICHMOND COUNTY	$152,089	$2,702,177	$445,129	$5,251,736	$3,855,123	$12,406,254
ROANOKE	$8,587,876	$26,180	$440	$670,874	$50,240	$9,335,610
ROANOKE COUNTY	$1,193,897	$1,472,410	$1,033,293	$39,957,813	$124,956,594	$168,614,006

Locality	Category 1: Sewer Connection Cost	Category 2: COSS Repair Cost	Category 3: AOSS Repair Cost	Category 4: COSS O&M Cost	Category 5: AOSS O&M Cost	Total Infrastructure Need
ROCKBRIDGE	$202,976	$3,597,051	$464,056	$13,581,541	$7,807,926	$25,653,550
ROCKINGHAM	$21,985	$8,182,919	$3,479,203	$43,450,019	$82,323,571	$137,457,696
RUSSELL	$0	$2,936,777	$101,814	$16,266,666	$2,513,036	$21,818,293
SALEM	$384,278	$13,143	$0	$171,634	$0	$569,056
SCOTT	$0	$840,325	$46,818	$13,456,654	$3,340,939	$17,684,736
SHENANDOAH	$446,614	$5,263,771	$2,615,536	$22,197,213	$49,150,145	$79,673,278
SMYTH	$0	$2,470,790	$229,333	$18,215,858	$7,534,307	$28,450,289
SOUTHAMPTON	$0	$5,313,831	$776,250	$10,694,790	$6,961,915	$23,746,786
SPOTSYLVANIA	$2,074,724	$13,267,782	$4,175,855	$68,438,391	$95,986,374	$183,943,126
STAFFORD	$2,641,948	$8,410,378	$10,453,677	$12,488,325	$69,170,426	$103,164,754
STAUNTON	$255,938	$35,222	$0	$871,850	$0	$1,163,011
SUFFOLK	$11,379,518	$5,113,553	$2,594,604	$42,201,174	$95,419,136	$156,707,985
SURRY	$41,854	$1,728,398	$369,458	$3,766,164	$3,587,430	$9,493,306
SUSSEX	$0	$1,036,213	$258,094	$6,107,419	$6,778,743	$14,180,469
TAZEWELL	$0	$1,811,122	$141,669	$24,908,113	$8,682,226	$35,543,130
VIRGINIA BEACH	$1,702,165	$2,591,974	$854,908	$52,457,726	$77,101,164	$134,707,938
WARREN	$862,250	$10,795,739	$5,217,860	$18,416,095	$39,664,342	$74,956,287
WASHINGTON	$0	$4,194,984	$664,500	$31,848,163	$22,480,790	$59,188,437
WAYNESBORO	$100,250	$0	$0	$720,856	$241,980	$1,063,086
WESTMORELAND	$2,485,649	$4,198,425	$966,179	$10,519,451	$10,787,655	$28,957,358
WILLIAMSBURG	$0	$0	$0	$92,169	$96,941	$189,110
WINCHESTER	$300,750	$0	$0	$178,518	$93,922	$573,190
WISE	$0	$2,285,477	$417,974	$18,849,573	$15,361,615	$36,914,638
WYTHE	$0	$4,850,319	$480,743	$17,234,602	$7,612,136	$30,177,800
YORK	$1,403,500	$0	$0	$38,414,266	$15,018,003	$54,835,770
Total	**$240,370,034**	**$779,040,321**	**$177,966,183**	**$1,871,794,341**	**$1,981,592,796**	**$5,050,763,675**