

Onsite Sewage Systems: Background, Framework, and Solutions



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Photo Credit: Installation of a residential treatment system, Maine Septic System LLC.

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Scott Herbert is a Marine Corps veteran from Newport News, Virginia. He graduated from the University of Maryland. Scott is interested in environmental policy because, growing up in coastal Virginia, he has seen the deterioration of local wetlands and more recurrent flooding. He wants to learn more about how our actions are impacting the environment and our natural resources and how we can better protect human interests as our environment evolves.



About the Virginia Coastal Policy Center

The Virginia Coastal Policy Center (VCPC) at the College of William & Mary Law School provides science-based legal and policy analysis of ecological issues affecting the state's coastal resources, by offering education and advice to a host of Virginia's decision-makers, from government officials and legal scholars to non-profit and business leaders.

With two nationally prominent science partners – the Virginia Institute of Marine Science and Virginia Sea Grant – VCPC works with scientists, local and state political figures, community leaders, the military, and others to integrate the latest science with legal and policy analysis to solve coastal resource management issues. VCPC activities are inherently interdisciplinary, drawing on scientific, economic, public policy, sociological, and other expertise from within the University and across the country. With access to internationally recognized scientists at VIMS, to Sea Grant's national network of legal and science scholars, and to elected and appointed officials across the nation, VCPC engages in a host of information exchanges and collaborative partnerships. VCPC grounds its pedagogical goals in the law school's philosophy of the citizen lawyer. VCPC students' highly diverse interactions beyond the borders of the legal community provide the framework for their efforts in solving the complex coastal resource management issues that currently face Virginia and the nation.

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I. INTRODUCTION

Septic system failures, as well as the lack of either septic or sewer systems for some properties, pose both significant public health and water quality risks for our communities. The risk of septic system failure is increasing as sea level rises, particularly in Virginia, where the situation is exacerbated by land subsidence. Yet despite this being a community-wide threat, the cost of design and installation of septic systems usually is borne by individual property owners, all at once and up front when a residence is built. This funding challenge should be addressed holistically by the state. In addition, connection to available municipal sewer systems can be very expensive and is not required by the Commonwealth, and only certain localities are authorized to require it. The Virginia Department of Health (VDH) has limited tools to address situations where low-income property owners without access to municipal sewer systems cannot afford to have septic systems designed and installed or repaired, and imposing monetary penalties on the owners would not address the financial challenge or resolve the situation. Addressing all of these challenges will require new policy approaches in the Commonwealth.

II. ONSITE SEPTIC SYSTEMS

Onsite septic systems, a type of decentralized wastewater treatment, are used to treat low volumes of wastewater usually from homes or businesses.¹ These systems can be divided into conventional and alternative septic systems. The Environmental Protection Agency (EPA) defines a conventional septic system as “[a] wastewater treatment system consisting of a septic tank and a typical trench or bed subsurface wastewater infiltration system.”² Alternative septic systems include differing components from a conventional wastewater system and are utilized when conventional systems are either impracticable or impossible.³ For example, alternative septic systems have been integral in aiding development in coastal areas where liquid does not sufficiently percolate⁴ and rural areas where it is too expensive to install or extend municipal sewer systems.⁵ Components used in alternative septic systems include sand filters, aerobic treatment units, disinfection devices, and alternative subsurface infiltration designs.⁶ These alternative subsurface designs include mounds, gravelless trenches, low pressure distribution, and drip distribution.⁷ Advantages of alternative septic systems include providing a higher quality effluent, allowing use of sites where conditions preclude the use of a conventional system, increased life of the dispersal field, and providing a more reliable dispersal.⁸ Disadvantages include a potentially

¹ *Septic System Overview*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/septic/septic-systems-overview>.

² *Vocabulary Catalogue*, U.S. ENVTL. PROT. AGENCY, https://ofmpub.epa.gov/sor_internet/registry/termreg/searchandretrieve/glossariesandkeywordlists/search.do?details=&glossaryName=Septic%20Systems%20Glossary.

³ *Id.*

⁴ Charles Wardell, *Septic Systems for Coastal Homes* (2005), https://www.jlconline.com/how-to/foundations/septic-systems-for-coastal-homes_o.

⁵ See Kevin Nelson, *Essential Smart Growth Fixes for Rural Planning, Zoning, and Development Codes*, U.S. ENVTL. PROT. AGENCY, 17 (2012), https://www.epa.gov/sites/production/files/documents/essential_smart_growth_fixes_rural_0.pdf.

⁶ *Vocabulary Catalogue*, *supra* note 2.

⁷ *Id.*

⁸ *Section 7 Onsite Wastewater/Septic*, VA. DEP’T OF ENVTL. QUALITY, 97, <https://www.deq.virginia.gov/Portals/0/DEQ/Water/TMDL/Baywip/wipsection7.pdf>.

higher initial cost for purchase and installation, training requirements for operators, and more maintenance and monitoring than required for conventional systems.⁹ Straight pipes, although illegal, are also utilized as a method of sewage management. Straight pipes do not treat sewage, but rather direct sewage into locations such as water bodies and ditches.¹⁰

III. WATER QUALITY AND PUBLIC HEALTH

The use of straight pipes is particularly problematic for both the environment and public health, given the fact that they effectively discharge wastewater from the home directly into the surrounding environment.¹¹ Further, failed and failing septic systems are not as protective of water quality and public health as municipal sewer connection and properly designed and functioning septic systems.¹² And, of course, straight pipes are very poor substitutes for septic systems or sewer connections, as they are just what they sound like – pipes that direct wastewater straight into the environment.¹³ Failed and failing septic systems, along with straight pipes, raise a number of water quality concerns. Failing septic systems can cause untreated wastewater to reach source water. This contamination process leads to a proliferation of bacteria and viruses that can cause dysentery, hepatitis, and typhoid fever.¹⁴ Additionally, contamination of soil with sewage can encourage human contraction of parasites, including hookworm,¹⁵ and water contamination caused by sewage can result in the closure of areas of offshore bottomland to shellfish harvesting.¹⁶

⁹ *Advanced Treatment Systems—Alternatives to Conventional Septic Systems*, 2,

<https://www.nvca.on.ca/Shared%20Documents/Septic%20Smart%20Advanced%20Systems.pdf>.

¹⁰ John Helland, *Straight Pipe Septic Systems*, (2004), <http://www.house.leg.state.mn.us/hrd/pubs/ss/sspiped.pdf>.

¹¹ See, e.g., Megan L. McKenna et al., *Human Intestinal Parasite Burden and Poor Sanitation in Rural Alabama*, 97 AM. J. TROP. MED. HYG. 1623, 1623-24 (2017), <https://perma.cc/CE37-45ML>; *Kentucky Straight Pipes Report*, U.S. ENVTL. PROT. AGENCY, 3 (2002), <https://www.epa.gov/sites/production/files/2015-06/documents/2002-1107.pdf>.

¹² R. Mohamed, *Why Households in the United States do not Maintain their Septic Systems and why State-Led Regulations are Necessary: Explanations from Public Goods Theory*, 4 INT. J. SUS. DEV. PLANN. 1, 1 (2009).

¹³ *Kentucky Straight Pipes Report*, *supra* note 11, at 3.

¹⁴ *Septic Systems and Source Water Protection*, 19 PIPELINE 1, 2 (2008), http://www.nesc.wvu.edu/pdf/WW/publications/pipline/PL_SU08.pdf.

¹⁵ McKenna, *supra* note 11.

¹⁶ The Virginia Department of Health, Division of Shellfish Sanitation (DSS), is responsible for enforcing regulations and safety requirements related to the production and sale of shellfish. Those who process shellfish must apply for and receive a Certificate of Inspection by DSS each year. *Certification of Shellfish and Crab Meat Processing Facilities*, VA. DEP'T OF HEALTH, <http://www.vdh.virginia.gov/environmental-health/environmental-health-services/shellfish-sanitation/certification-of-shellfish-and-crab-meat-processing-facilities/>. Every year, DSS either approves or condemns shellfish growing areas using the criteria of the National Shellfish Sanitation Program (NSSP), which considers the proximity of the area to known sources of pollution (e.g., sewage treatment outflows) as well as results of water samples collected. *Shellfish Harvester Education Program*, VA. DEP'T OF HEALTH, Slide 11, <https://webapps.mrc.virginia.gov/public/training/open/story.html>.

IV. SEA LEVEL RISE IMPACTS

In addition to water quality and public health issues inherent in malfunctioning onsite septic systems, the impacts of recurrent flooding and sea level rise will likely lead to the development of new water quality and public health problems as well as exacerbating problems already present. According to data compiled by the Virginia Institute of Marine Science (VIMS) and provided on their website, *Adapt Virginia*, the vast majority of coastal Virginia is rated as having moderate to very high vulnerability to sea level rise,¹⁷ depending on both the rate of sea level rise and the relative land subsidence.¹⁸ Newport News, Hampton, Norfolk, and Virginia Beach are all primarily designated as very high vulnerability areas.¹⁹ Generally speaking, the coastal communities that are directly facing the Chesapeake Bay are classified as being of very high vulnerability.²⁰ Rural areas, where septic systems are more frequently found, will suffer equally from sea level rise alongside more urban areas like Hampton. Large swaths of the Middle Peninsula, including Mathews and Gloucester counties, and the Northern Neck, including Lancaster and Northumberland counties, will suffer from a moderate risk to sea level rise while Accomack County will suffer from a moderate to high risk.²¹

The vulnerability of these coastal communities to sea level rise is crucial to keep in mind when crafting policy related to septic and sewerage systems. This is because flooding (especially if it is recurrent, as it is in the high vulnerability areas) can cause septic system failure, or can compound the issues that already exist with failing systems.²² Flooding can cause onsite systems to overload, which can impede or completely stop treatment.²³ This, in turn, can cause onsite systems to back up, “particularly if [the] drainfield becomes clogged.”²⁴ Onsite system failure will have deleterious impacts on water quality and public health. Therefore, the problems associated

¹⁷ *Adapt VA Interactive Map*, ADAPT VA, http://cmap2.vims.edu/AdaptVA/adaptVA_viewer.html (last visited Oct. 17, 2018). *Adapt Virginia* is an online database for climate adaptation research created by the Virginia Institute of Marine Science. It is meant to act “as a gateway to information for individuals, local programs, and agencies engaged in climate adaptation.” *Id.* *Adapt Virginia* fulfills this role by focusing on both physical and social vulnerabilities to sea level rise by “integrating the best available science, legal guidance, and planning strategies” into different interactive tools, including maps and a searchable web catalogue. *Id.*

¹⁸ There are many factors contributing to sea level rise, including the presence of land subsidence. Land subsidence in the region has occurred because of two reasons: (1) groundwater withdrawals from the aquifer system and the resulting soil compaction, and (2) glacial isostatic adjustment, or the flexing of Earth’s crust due to the changing balance resulting from glacial melting. Jack Eggleston & Jason Pope, *Land Subsidence and Relative Sea-Level Rise in the Southern Chesapeake Bay Region*, U.S. GEOLOGICAL SURVEY 10-11, 14 (2013), <https://pubs.usgs.gov/circ/1392/pdf/circ1392.pdf>. “Data indicate that land subsidence has been responsible for more than half the relative sea-level rise measured in the region.” *Id.* at 1.

¹⁹ *Adapt VA Interactive Map*, *supra* note 17.

²⁰ *Id.*

²¹ *Id.*

²² *See Septic Systems—What to Do after the Flood*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/ground-water-and-drinking-water/septic-systems-what-do-after-flood> (last visited Oct. 17, 2018) (detailing many of the issues for homeowners associated with flooded septic systems); Michael A. Mallin et al., *Impacts and Recovery from Multiple Hurricanes in a Piedmont–Coastal Plain River System: Human development of floodplains greatly compounds the impacts of hurricanes on water quality and aquatic life*, AM. INST. OF BIOLOGICAL SCIS., <https://academic.oup.com/bioscience/article/52/11/999/285953> (last visited Oct. 17, 2018) (describing increased pollution and negative environmental consequences of floods in areas with septic systems).

²³ *Protecting Your Septic System From Flooding*, PENNSTATE EXTENSION, <https://extension.psu.edu/protecting-your-septic-system-from-flooding> (last visited Oct. 17, 2018).

²⁴ *Id.*

with septic failure are even further exacerbated in communities that are subject to recurrent flooding associated with sea level rise. The data on coastal Virginia’s vulnerability to recurrent flooding that is already publicly available on the *Adapt Virginia* portal, when combined with soil type data, can demonstrate the areas in which septic system failure and straight pipe use are most likely to occur and be of concern. The Center for Coastal Resources Management at VIMS currently is developing an as-yet unpublished analysis indicating these “hot spots” for potential water quality and public health impacts in a sample Virginia coastal locality, with plans to develop such mapping statewide in the future.²⁵ The VIMS Systems Ecology and Modeling Program (SEMP) also has developed models that help to place septic system failures and the resulting nitrogen discharges into context with other sources of nitrogen being delivered through groundwater from coastal watersheds to receiving waterbodies.²⁶ One model specifically examines watersheds leading to coastal bays in Virginia, Maryland, and Delaware,²⁷ which could be used by local planning district commissions to help understand the impact of septic system repairs.

V. ENVIRONMENTAL JUSTICE

Some parts of rural, coastal Virginia are within areas that VDH defines as “wastewater islands,” which are “areas where individuals and communities do not have access to affordable wastewater solutions that are protective of public health and the environment.”²⁸ Often, homeowners within these wastewater islands are forced to utilize means other than connection to municipal sewer systems to remove waste from their homes, such as septic systems or straight pipes.²⁹

The problems associated with the use of straight pipes and failing septic systems are particularly salient in the context of rural, impoverished communities. This is in large part because homeowners in these communities often cannot afford to repair their systems, let alone pay the fines authorized by the Virginia Code for failure to comply with wastewater regulations. This presents an environmental justice issue,³⁰ as impoverished homeowners in rural Virginia are, under the Code, to be fined for their inability to pay to repair or replace their failing onsite systems.³¹ The Commonwealth’s existing legal framework provides the Board of Health with authority to impose a penalty on any household that fails to comply with wastewater regulations.³² The use of this standard enforcement mechanism, *i.e.*, penalty authority, is counterproductive in situations

²⁵ Discussions with Dr. Carl Hershner, Director, Center for Coastal Resources Management, VIMS, Oct. 2018.

²⁶ *SEMP Online Models*, VA. INST. OF MARINE SCI., <http://www.vims.edu/research/departments/bio/programs/sempp/models/index.php> (follow the links under “Delmarva Coastal Bays” to access the model and instructions for use).

²⁷ *Id.*

²⁸ *Advisory Council on Health Disparity and Health Equity (ACHDHE): January 12, 2016 Meeting Minutes*, VA. DEP’T OF HEALTH 1, 3, <http://www.vdh.virginia.gov/content/uploads/sites/76/2017/02/ACHDHEJanuary122016MeetingMins.pdf>.

²⁹ *See, e.g., id.* at 3-4; McKenna, *supra* note 11, at 1623-24. As noted earlier, straight pipes are simply pipes that direct waste away from a home.

³⁰ The United Nations General Assembly declared in 2010 that adequate sanitation systems are “a human right essential to the full enjoyment of life and all other human rights.” *The Human Right to Water and Sanitation*, UN—WATER DECADE PROGRAMME ON ADVOCACY AND COMM’N AND WATER SUPPLY AND SANITATION COLLABORATIVE COUNCIL, 1, http://www.un.org/waterforlifedecade/pdf/human_right_to_water_and_sanitation_media_brief.pdf.

³¹ VA. CODE ANN. § 32.1-27 (2003).

³² VA. CODE ANN. § 32.1-164(F) (2009).

where a household is forced to operate a failing onsite system or straight pipe as a result of limited financial means. Common issues resulting from the use of straight pipes and failing septic systems are further exacerbated by recurrent flooding and the looming threat of sea level rise in many communities.³³ This raises not only water quality concerns, but public health concerns as well, as flooded onsite systems can cause pollutants to enter the environment.³⁴ In reality, fines are rarely levied against these homeowners.

The environmental justice concerns raised by these failing wastewater systems are myriad. Not only do these systems damage water quality via runoff, but they also endanger public health in that parasites, such as hookworm, can be transmitted to humans through “dermal penetration” from soil that is contaminated with fecal matter.³⁵ These concerns raise the question of whether access to adequate and affordable wastewater and sewage treatment is such a basic human right that the government should help to fund it, as the federal government did in the 1930s with the provision of electricity in rural areas.³⁶ In some parts of Virginia, such as the Eastern Shore, homeowners are living without access to any indoor plumbing. As of a 2007 study, there were 117 occupied or occupiable homes in the Eastern Shore that had *no* indoor plumbing.³⁷ As a result, homeowners must resort to using night pails, unpermitted privies or backyard port-a-johns.³⁸

³³ See e.g., *Septic Systems—What to Do after the Flood*, *supra* note 23 (detailing many of the issues associated with flooded septic systems); Mallin et al., *supra* note 22 (describing increased pollution and negative environmental consequences of floods in areas with septic systems).

³⁴ Mallin et al., *supra* note 22.

³⁵ McKenna, *supra* note 11, at 1623.

³⁶ See Rural Electrification Act of 1936, 7 U.S.C. § 904(a) (1996). Pursuant to this Act, the federal government provided low-cost loans to states and electric power companies for the purpose of extending electricity to rural areas. The Act was meant to provide rural farmers with a “fair chance” to live a full life even if not born in a city or town. *Rural Electrification Act*, NAT’L PARK SERV., <https://www.nps.gov/home/learn/historyculture/ruralelect.htm>.

³⁷ Skeo Solutions, *Indoor Plumbing Needs on the Eastern Shore of Virginia*, 4 (2015), http://www.a-npdc.org/wp-content/uploads/2016/03/Eastern-Shore-IPR-Report_DRAFT-FINAL_2015.11.03b_2-up.pdf.

³⁸ *Id.* at i.

Alabama Case Study

The negative realities of failing wastewater systems are starkly demonstrated by a recent study conducted by researchers at Baylor College’s National School of Tropical Medicine in Alabama that focused on the presence of intestinal parasites in residents in rural areas due to improper waste management. These parasites “have a significant impact on health outcomes and morbidity in adults and children worldwide, ranging from diarrhea and stunting in children to impaired cognitive development from iron deficiency anemia.”³⁹ Hookworm, one such parasite, is transmitted via fecal matter in the soil to humans through penetration of the skin.⁴⁰ Hookworm is generally found in impoverished countries with poor sanitation and was previously common in the American South in the 1930s.⁴¹

This particular study focused on Lowndes County, Alabama, a deeply impoverished community⁴² where proper waste treatment is unaffordable and many households utilize straight pipes.⁴³ These straight pipes are simply a network of pipes or ditches that remove waste from the home, and are usually no more than 10 meters in length, meaning that waste is drained close to the home.⁴⁴ This is particularly problematic in that, during flooding or rainfall, waste can back up into the homes.⁴⁵

Ultimately, the study found that a high proportion of the individuals surveyed in Lowndes County had hookworm and other parasites.⁴⁶ Thirty-four and a half percent (34.5%) of those surveyed tested positive for hookworm, specifically.⁴⁷ The researchers concluded that, while the parasite burden was low, the results still suggested that hookworm had possibly reached endemic levels within the community.⁴⁸ This study highlights the importance of appropriate waste management in rural areas, as improper systems have not only an environmental impact but a public health impact as well.

Therefore, the Alabama Center for Rural Enterprise (ACRE) Community Development Corporation is currently coordinating with federal agencies and the business community in hopes of developing an affordable, pre-packaged septic system that homeowners could purchase at a hardware store.⁴⁹ The Alabama researchers are still working on this solution, however, and it has yet to be brought to market.⁵⁰

³⁹ McKenna, *supra* note 11, at 1623.

⁴⁰ *Id.* at 1623.

⁴¹ *Id.*

⁴² *Id.* at 1623 (“the per capita income is \$18,046, and 31.4% of the population lives below the poverty line . . .”).

⁴³ *Id.* at 1623-24.

⁴⁴ *Id.*

⁴⁵ PENNSTATE EXTENSION, *supra* note 23.

⁴⁶ McKenna, *supra* note 11 at 1625 (“Stool samples were collected for 55 individuals. Of these, 19 (34.5%) were positive for *N. americanus*, four (7.3%) for *Strongyloides stercoralis*, and one (1.8%) for *Entamoeba histolytica* . . .”).

⁴⁷ *Id.*

⁴⁸ *Id.*

⁴⁹ Telephone Interview with Catherine Flowers, Alabama Center for Rural Enterprise (ACRE) Community Development Corporation (Feb. 22, 2018).

⁵⁰ *Id.*

VI. CURRENT VDH FRAMEWORK

With respect to onsite sewage systems, VDH provides policy, procedures, guidance, training, technical assistance, grants, and administrative support.⁵¹ Virginia law requires a permit for the construction of sewage disposal systems.⁵² For conventional systems serving an individual residence, submitting an application and the associated fee is all that is typically required for the permitting process to begin.⁵³ Once a site inspection is conducted, a construction permit will be issued by the local health department if design standards are met.⁵⁴ Once the conventional system is constructed, the local health department must inspect the system and corrections must be made if necessary before it can be operated.⁵⁵ For alternative onsite systems, an owner must engage a licensed private sector professional to prepare the construction permit and oversee its construction. Each system must be recorded in the land records of the health district having jurisdiction over the site.⁵⁶ The local health department has to receive legal documentation that the system has been recorded before a permit can be issued for an alternative system.⁵⁷ For large alternative systems and alternative systems with direct discharge of effluent to groundwater, an owner is required to renew their permit every five years.⁵⁸ Additionally, all alternative onsite systems are subject to ongoing operation and maintenance requirements.⁵⁹

Virginia's Administrative Process Act⁶⁰ governs enforcement of wastewater regulations. Following the issuance of a Notice of Alleged Violation, an informal hearing is held which results in a case decision.⁶¹ If the case decision is not followed, then additional enforcement actions can be triggered. As the law currently stands, noncompliance with the applicable wastewater regulations can be a Class 1 misdemeanor,⁶² punishable by both fines and imprisonment.⁶³ Individuals who are noncompliant with the regulations may be compelled to obey them "by injunction, mandamus, or other appropriate remedy," violations of which are subject to "a civil

⁵¹ *Division of Onsite Sewage and Water Services, Environmental Engineering, and Marina Programs*, VA. DEP'T OF HEALTH, <http://www.vdh.virginia.gov/environmental-health/onsite-sewage-water-services-updated/division-of-onsite-sewage-water-services-environmental-engineering-and-marina-programs/>.

⁵² 12 VA. ADMIN. CODE § 5-610-240 (1988).

⁵³ 12 VA. ADMIN. CODE § 5-610-250(A) (2000).

⁵⁴ 12 VA. ADMIN. CODE § 5-610-280(A) (2000).

⁵⁵ 12 VA. ADMIN. CODE § 5-610-320 (2012).

⁵⁶ 12 VA. ADMIN. CODE § 5-613-60(A) (2011).

⁵⁷ 12 VA. ADMIN. CODE § 5-613-60(B).

⁵⁸ 12 VA. ADMIN. CODE § 5-613-60(C).

⁵⁹ 12 VA. ADMIN. CODE § 5-613-140 et seq.

⁶⁰ VA. CODE ANN. § 2.2-4000 et seq.

⁶¹ See, e.g., *Guidance Memorandum and Policy #2018-01: Enforcement manual for the Regulations for Alternative Onsite Sewage System, 12VAC5-613 (the AOSS Regulations), including use of the Civil Penalty Regulations 12VAC5-650*, VA. DEP'T OF HEALTH, <http://www.vdh.virginia.gov/content/uploads/sites/20/2018/07/gmp-2018-01.pdf> (detailing enforcement procedures with respect to AOSS).

⁶² VA. CODE ANN. § 32.1-27(A).

⁶³ VA. CODE ANN. § 18.2-11 (2000). While the law provides for criminal punishments, some Commonwealth's Attorneys are hesitant to use their authority to enforce these regulations. See *Land and Water Quality Protection in Middle Peninsula*, 41 (2012), [http://www.mppdc.com/articles/reports/FINAL%20REPORT LAND AND WATER QUALITY 94.02 RED.PDF](http://www.mppdc.com/articles/reports/FINAL%20REPORT%20LAND%20AND%20WATER%20QUALITY%2094.02%20RED.PDF).

penalty not to exceed \$25,000 for each violation.”⁶⁴ Further, each day of noncompliance can constitute a separate violation,⁶⁵ meaning that these fines have the potential to accumulate quickly. Homeowners in localities subject to the Chesapeake Bay Preservation Act⁶⁶ also are required to either install and maintain a plastic filter on their septic systems or pump out their septic systems every five years (or, alternatively have a professional certify that pump-out is not necessary),⁶⁷ and can be subject to a civil penalty not to exceed \$5,000 for each day of violation if they fail to do so.⁶⁸

Additionally, under the existing legal framework, VDH can revoke a noncompliant onsite system’s operation permit and deny construction applications,⁶⁹ which in effect serves as a *de facto* condemnation because no certificate of occupancy will be issued if an approved sewage disposal method is not in place. This remedy unfairly punishes homeowners who simply cannot afford to repair or replace their existing onsite system. Generally speaking, these types of enforcement actions are not the preferred method of enforcing compliance with wastewater regulations, in large part because they do not result in a positive resolution of the issue due to the homeowner’s inability to pay the penalty or for repair of their septic system. In practice, VDH “strives to work with property owners to repair failing sewage systems within 60 days of discovery.”⁷⁰ Additional approaches to solve these issues should be evaluated that ensure impoverished homeowners are not punished for their inability to pay for expensive repairs or replacement of their septic systems, but rather are provided with financial assistance to address this public health and environmental threat.

VII. CURRENT FUNDING OPTIONS

There are some funding options that already exist with respect to onsite systems, some of which could be utilized to help homeowners pay for onsite system repair or replacement. Several organizations offer both loan programs and grant funds to address onsite system repair or replacement. Loan programs typically involve money lent at a low interest rate with an extended pay period to address failing onsite systems. Grant programs typically provide money to homeowners specifically to fix inadequate septic systems without charging interest or the expectation of repayment. At the federal level, the United States Department of Agriculture (USDA) offers funding options, and at the state level, the Virginia Department of Health (VDH), Virginia Department of Environmental Quality (DEQ), Virginia Department of Conservation and Recreation (DCR), and Virginia Department of Housing and Community Development (DHCD) offer a variety of loan and grant programs. Beyond the realm of federal and state assistance, localities and third-party organizations, such as the Southeast Rural Community Assistance Project (SERCAP), also offer funding options.

⁶⁴ VA. CODE ANN. § 32.1-27(B)-(C). This can include penalties from VDH and DEQ for the use of straight pipes, since VDH generally informs DEQ when a straight pipe is found.

⁶⁵ VA. CODE ANN. § 32.1-27(C).

⁶⁶ See VA. CODE ANN. § 62.1-44.15:67 et seq.

⁶⁷ 9 VA. ADMIN. CODE § 25-830-130(7) (2014).

⁶⁸ VA. CODE ANN. § 62.1-44.15:74 (2016).

⁶⁹ See, e.g., 12 VA. ADMIN. CODE § 5-610-290(A) (2000); 12 VA. ADMIN. CODE § 5-613-50(H) (2011).

⁷⁰ *Report to the General Assembly, Long Range Plan for Onsite Sewage*, VA. DEP’T OF HEALTH, 4 (Dec. 2016) <https://rga.lis.virginia.gov/Published/2017/RD39/PDF>. “Currently, about 45% of failing sewage system are repaired within 60 days of discovery statewide.” *Id.*

A. United States Department of Agriculture Rural Development Program

1. Utilities Loan Assistance: Water & Waste Disposal

The USDA provides a Water & Waste Disposal Loan and Grant Program that provides funding for sanitary sewage and solid waste disposal to households and businesses in eligible rural areas.⁷¹ The program is available for state and local governments, private nonprofits, and federally-recognized tribes who are not otherwise able to obtain reasonable credit.⁷² The program is designed for rural areas with less than 10,000 people.⁷³ Long term, low interest loans are available for funding and a grant may be combined with a loan.⁷⁴ The funds may be used for the construction or improvement of sewer connection, transmission, treatment, and disposal.⁷⁵ The Department also provides a loan guarantee program that helps private lenders provide financing to approved borrowers to improve access to waste disposal systems⁷⁶ and a Predevelopment Planning Grants program to help low income communities initiate the loan/grant and loan guarantee programs.⁷⁷

B. Virginia Department of Health Programs

The Virginia Department of Health (VDH) offers multiple funding programs related to onsite systems, some of which may be able to assist homeowners with the installation, maintenance, and repair of such systems.⁷⁸

1. Betterment Loan Program

Virginia Code § 32.1-164.1:2 establishes a betterment loan eligibility program explicitly for the purpose of addressing failed and failing onsite systems. The statute states:

The Board [of Health] shall establish a betterment loan eligibility program to assist owners with the repair, replacement, or upgrade of failing or noncompliant onsite sewage systems, and the Board may identify sources for betterment loans to be

⁷¹ *Water & Waste Disposal Loan & Grant Program*, U.S. DEP'T OF AGRIC., <https://www.rd.usda.gov/programs-services/water-waste-disposal-loan-grant-program>.

⁷² *Id.*

⁷³ *Id.*

⁷⁴ *Id.*

⁷⁵ *Id.*

⁷⁶ *Water & Waste Disposal Loan Guarantees*, U.S. DEP'T OF AGRIC., <https://www.rd.usda.gov/programs-services/water-waste-disposal-loan-guarantees>.

⁷⁷ *Water & Waste Disposal Predevelopment Planning Grants*, U.S. DEP'T OF AGRIC., <https://www.rd.usda.gov/programs-services/water-waste-disposal-predevelopment-planning-grants>.

⁷⁸ On December 11, 2018, the Virginia Environmental Endowment (VEE) announced a \$300,000 funding award to VDH for a septic system repair cost share program as part of VEE's James River Water Quality Improvement Program. The Smithfield Foundation provided an additional \$200,000 to support VDH's efforts to repair and/or replace failing septic systems in parts of the counties of James City, Isle of Wight, and Surry. *James River Water Quality Improvement Program*, VA. ENVTL. ENDOWMENT, <http://www.vee.org/grant-programs-application/james-river-water-quality-improvement-program/> (see "Press Release" hyperlink toward the bottom of the page). This report was posted to VCPC's website in December 2018 and did not evaluate this new program as a potential funding source.

provided by private lenders, directly or through conduit lenders. In addition, owners may also apply to [VDH] for betterment loan eligibility to upgrade an onsite or alternative discharging sewage system that is not failing, provided such upgrade is for the purposes of reducing threats to public health, and ground and surface waters, including the reduction of nitrogen discharges.⁷⁹

Eligibility for these betterment loans is predicated upon submission of an estimate of the project cost, which must be accepted by VDH.⁸⁰ This can be done at any point prior to the completion of the project.⁸¹ A project will only be deemed eligible once the Department has issued a permit and once it has received the homeowner's estimate.⁸² The statute also provides for appellate review by the Sewage Handling and Disposal Appeal Review Board, should VDH refuse to deem a project eligible.⁸³ Further, the homeowner is completely responsible for obtaining a betterment loan from or through a private lender.⁸⁴ The statute also allows for localities to "act as the collection agent for the payments made by the owner on a betterment loan."⁸⁵ According to a VDH report from 2016, funding sources have yet to be identified and no loans have been issued under this program.⁸⁶

2. Onsite Operation and Maintenance Fund

The General Assembly also has established an Onsite Operation and Maintenance fund under Virginia Code § 32.1-164.8. As the name would imply, the money within the Fund is explicitly delineated only for "supporting the maintenance and operation of these systems including but not limited to (i) training operators and (ii) supporting the reporting system required by subsection H of § 32.1-164."⁸⁷ This particular subsection requires that the system is operated by a licensed operator who reports on all site visits.⁸⁸ Further, this subsection mandates the creation of a statewide web-based reporting system to "track the operation, monitoring, and maintenance requirements of each system"⁸⁹ This subsection also provides the Board of Health with discretion as to any further prerequisites that may be imposed.⁹⁰

⁷⁹ VA. CODE ANN. § 32.1-164.1:2(A) (2009).

⁸⁰ VA. CODE ANN. § 32.1-164.1:2(B).

⁸¹ *Id.*

⁸² *Id.*

⁸³ *Id.*

⁸⁴ *Id.*

⁸⁵ VA. CODE ANN. § 32.1-164.1:2(D).

⁸⁶ *Report to the General Assembly in Response to House Bill 558: A Plan for the Orderly Reduction and Elimination of Evaluation and Design Services by the Virginia Department of Health for Onsite Sewage Systems and Private Wells*, VA. DEP'T OF HEALTH, 44 (Nov. 2016), http://www.vdh.virginia.gov/content/uploads/sites/20/2016/05/HB558-Report-FINAL_11.29.16.pdf.

⁸⁷ VA. CODE ANN. § 32.1-164.8 (2007).

⁸⁸ VA. CODE ANN. § 32.1-164 (2009).

⁸⁹ VA. CODE ANN. § 32.1-164(H)(3).

⁹⁰ VA. CODE ANN. § 32.1-164.

3. Onsite Sewage Indemnification Fund

Virginia Code § 32.1-164.1:01 also provides for the creation of an Onsite Sewage Indemnification Fund, which is funded by part of the fees generated by permit applications and inspections.⁹¹ Under the statute:

The owner of an onsite sewage system that has been permitted by the Department of Health may cause, by filing a request for payment from the [onsite sewage indemnification] fund within one year from the date the system or components thereof failed, the Commissioner to review the circumstances of the onsite sewage system failure, if the onsite sewage system has failed within three years of construction. Upon the Commissioner's finding that the onsite sewage system was permitted by the Department and (i) the system or components thereof failed within three years of construction; (ii) that specific actions of the Department were negligent and that those actions caused the failure; and (iii) that the owner filed a request for payment from the fund within one year from the date the system or components thereof failed, the Commissioner shall, subject to the limitations stated herein, reimburse the owner for the reasonable cost of following the Board's regulations to repair or replace the failed onsite sewage system or components thereof.⁹²

The maximum amount allowed to each homeowner under the fund is \$30,000, with reimbursement available only for “the costs of labor and equipment required to repair or replace the failed onsite sewage system or components thereof.”⁹³ Homeowners must submit an application within one year of system failure.⁹⁴ While the statute also allows the Commissioner of Health to aid homeowners in “seeking redress” for any systems that fail within a set period of three years,⁹⁵ such aid is triggered only in certain circumstances so implementation of this provision is difficult.

⁹¹ VA. CODE ANN. § 32.1-164(C) & (E). Subsection C states in relevant part, “[a] fee of \$75 shall be charged for filing an application for an onsite sewage system or an alternative discharging sewage system permit with the department . . . \$10 of each fee shall be credited to the Onsite Sewage Indemnification Fund established pursuant to § 31.1-164.1:01. The Board, in its regulations, shall establish a procedure for the waiver of fees for persons whose incomes are below the federal poverty guidelines established by the United States Department of Health and Human Services or when the application is for a pit privy or the repair of a failing onsite sewage system.” VA. CODE ANN. § 32.1-164(C) (2017). Subsection E states, in relevant part, “[f]urther a fee of \$ 75 shall be charged for such installation and monitoring inspections of alternative discharging sewage systems as may be required by the Board . . . \$10 of each fee shall be credited to the Onsite Sewage Indemnification Fund established pursuant to § 32.1-164.1:01. The Board, in its regulations, shall establish a procedure for the waiver of fees for persons whose incomes are below the federal poverty guidelines established by the United States Department of Health and Human Services.” VA. CODE ANN. § 32.1-164(E).

⁹² VA. CODE ANN. § 32.1-164.1:01(C) (2016).

⁹³ VA. CODE ANN. § 32.1-164.1:01(D)-(E).

⁹⁴ VA. CODE ANN. § 32.1-164.1:01(C)

⁹⁵ VA. CODE ANN. § 32.1-164.1:01(F).

C. Virginia Department of Environmental Quality Funding

1. Virginia Clean Water Revolving Loan Fund

Another potential option is for localities to pursue loans from the Virginia Department of Environmental Quality (DEQ), which they could then use to fund their own local programs. When it was first created, the Virginia Clean Water Revolving Loan Fund (VCWRLF)⁹⁶ focused on improvements for publicly-owned wastewater treatment facilities and/or collection systems.⁹⁷ The scope of how VCWRLF moneys could be used was subsequently expanded to include, among other things, onsite system improvements. For example, loans can be provided “to a local government [with] a low-interest loan program to provide loans or other incentives to facilitate the correction of onsite sewage disposal problems . . .”⁹⁸ The Virginia Resources Authority (VRA) serves as the financial manager of the VCWRLF, and the State Water Control Board directed DEQ to administer “the policy aspects of the Fund[.]”⁹⁹

Years ago, DEQ began a pilot program in five localities and planning district commissions utilizing these revolving loan funds for onsite septic system repair. The program largely failed, with the exception of the one administered by the Middle Peninsula Planning District Commission (MPPDC).¹⁰⁰ Some of the participating localities and PDCs found the bookkeeping and administrative requirements to be too onerous, and some resistance was expressed to the idea that the localities had to function as the “middle man” for the funds.¹⁰¹ Under the pilot program, localities acted as an intermediary between the state agency - here, DEQ - and individual homeowners in terms of the administration of the loan funds.¹⁰² The risk of default is lower for a locality than for individual homeowners, so the state reduces its risk by loaning the funds to localities.¹⁰³

A further complication with this program is that homeowners must eventually repay any and all loans made to them, and many homeowners cannot take on this added cost.¹⁰⁴ In theory, however, a loan option would be much more palatable to homeowners as it defers much of the up-front cost, instead spreading it out over the long term such that it is financially more manageable. Presumably, many homeowners would prefer to defer the costs of repair over a period of several years, rather than paying up front (along with the statutorily mandated penalty).

⁹⁶ VA. CODE ANN. §§ 62.1-224 *et seq.*

⁹⁷ *Clean Water Financing & Assistance*, VA. DEP’T OF ENVTL. QUALITY, <https://www.deq.virginia.gov/Programs/Water/CleanWaterFinancingAssistance.aspx> (last visited Oct. 17, 2018).

⁹⁸ VA. CODE ANN. § 62.1-229 (1999).

⁹⁹ *Id.*; see also Clean Water Revolving Loan Fund, VA. RES. AUTH., <https://www.virginiresources.gov/page/clean-water-revolving-loan-fund/> (last visited Oct. 17, 2018).

¹⁰⁰ *Onsite Repair Program*, MIDDLE PENINSULA PLANNING DIST. COMM’N, <http://www.mppdc.com/index.php/service-centers/wastewater/septic-repair> (last visited Oct. 17, 2018).

¹⁰¹ Telephone Interview with Walter Gills, Clean Water Financing and Assistance Program Manager, Office of Clean Water Financing and Assistance, Virginia Department of Environmental Quality (Feb. 6, 2018).

¹⁰² *Id.*

¹⁰³ *Id.*

¹⁰⁴ *Id.*

The program instituted by the MPPDC has repaired or replaced over 100 onsite systems and provides a combination of grants and loans directly to homeowners.¹⁰⁵ The funding for the initial implementation of the program was provided by the Virginia Clean Water Revolving Loan Fund Program, in the form of a loan.¹⁰⁶ The funding provided to each homeowner is dependent upon need and funding availability.

2. Clean Water Act Funding

Section 319(h) of the federal Clean Water Act provides states with grant money to address nonpoint source pollution.¹⁰⁷ In 2017, Virginia used this funding to pump out septic systems and to repair and replace failing septic systems.¹⁰⁸ The funding was also used to remove straight pipe systems.¹⁰⁹ In total, 651 homes were serviced with \$833,144 in federal money spent.¹¹⁰

3. Water Quality Improvement Fund

The Water Quality Improvement Fund is a source that multiple departments have access to for point and nonpoint source pollution prevention.¹¹¹ The financing for this fund comes from collections to the general fund that are in excess of official estimates.¹¹² Although the fund is utilized for multiple purposes by multiple agencies, DEQ is the lead agency for any grants related to point source pollution.¹¹³ DEQ receives thirty percent of the money available in the fund to provide grants for projects related solely to “designing and installing nutrient removal technologies for publicly owned treatment works designated as significant dischargers or eligible nonsignificant dischargers.”¹¹⁴ While DEQ may provide grants pursuant to this Fund for projects other than nutrient removal technology, it may only do so when the Director of the DEQ determines there is sufficient funding available to fund other projects until the time when certain nutrient reductions are satisfied.¹¹⁵

D. Virginia Department of Conservation and Recreation Funding

Like DEQ, the Virginia Department of Conservation and Recreation (DCR) also receives funding from the Water Quality Improvement Fund, but DCR is the lead agency for any grants related to nonpoint source pollution, rather than point source pollution.¹¹⁶ The purpose of the fund in the realm of nonpoint source pollution is to give grants to those projects that help to reduce

¹⁰⁵ *Onsite Repair Program*, *supra* note 100.

¹⁰⁶ *Id.*

¹⁰⁷ 33 U.S.C. § 1329(h) (2018).

¹⁰⁸ *DEQ Highlights Septic Maintenance Programs During SepticSmart Week*, VA. DEP'T OF ENVTL. QUALITY, <http://www.deq.virginia.gov/Portals/0/DEQ/Water/NonpointSource/DEQ%20SepticSmart%20Week.pdf>.

¹⁰⁹ *Id.*

¹¹⁰ *Id.*

¹¹¹ VA. CODE ANN. § 10.1-2128 (2015).

¹¹² VA. CODE ANN. § 10.1-2128(A).

¹¹³ VA. CODE ANN. § 10.1-2131(A) (2018).

¹¹⁴ VA. CODE ANN. § 10.1-2129(A)(2) (2015).

¹¹⁵ VA. CODE ANN. § 10.1-2131(C). *See also* L. Preston Bryant, Jr., Virginia Secretary of Natural Resources, *Virginia Water Quality Improvement Fund Guidelines*, 11 (2006), http://townhall.virginia.gov/L/GetFile.cfm?File=GuidanceDocs%5C440%5CGDoc_DEQ_2285_v3.pdf.

¹¹⁶ VA. CODE ANN. § 10.1-2132(A) (2015).

nitrogen and phosphorous from nonpoint source polluters.¹¹⁷ The Director of DCR may provide grants to a variety of entities, including local governments, soil and water conservation districts, “institutions of higher education and individuals who propose specific initiatives that are clearly demonstrated as likely to achieve reductions in nonpoint source pollution.”¹¹⁸ In 2016, the fund helped provide assistance to over 1,000 households with onsite sewage treatment.¹¹⁹ While money from this source can be used for septic systems, priority must be given to agricultural best management practices.¹²⁰

E. Virginia Department of Housing and Community Development Programs

1. Community Development Block Grant: Water & Sewer Assistance

The Virginia Department of Housing and Community Development (DHCD) administers a Community Development Block Grant (CDBG) program that provides funding to local governments to address wastewater services.¹²¹ The program is targeted to low and moderate income persons.¹²² The DHCD offers a competitive grant program that can be used for stand-alone projects or for comprehensive plans,¹²³ as well as a construction-ready block grant program.¹²⁴ This Construction-Ready Water and Sewer Fund provides support for localities for the construction of public water and sewer services for communities comprised of 60%+ low and moderate income individuals.¹²⁵ This program focuses on localities that are ready to provide the services but need further funds for construction.¹²⁶ The Department further offers a block grant from a Community Economic Development Fund.¹²⁷ The fund provides support for eligible localities for economic development activities to create employment opportunities for low and moderate income persons.¹²⁸ The level of financial assistance depends on the Department’s classification of the community as Distressed, Transitional, or Competitive.¹²⁹ Finally, the

¹¹⁷ VA. CODE ANN. § 10.1-2129(A)(1).

¹¹⁸ VA. CODE ANN. § 10.1-2131(C).

¹¹⁹ *Funding Opportunities*, VA. DEP’T OF HEALTH, <http://www.vdh.virginia.gov/environmental-health/onsite-sewage-water-services-updated/organizations/>.

¹²⁰ VA. CODE ANN. § 10.1-2129(1).

¹²¹ *Community Development Block Grant (CDBG)—Water and Sewer Assistance*, VA. DEP’T OF HOUS. AND CMTY. DEV., <http://www.dhcd.virginia.gov/index.php/community-partnerships-dhcd/water-and-sewer-assistance/community-development-block-grant-cdbg.html>.

¹²² *Id.*

¹²³ *Id.*

¹²⁴ *Community Development Block Grant (CDBG) Construction-Ready*, VA. DEP’T OF HOUS. AND CMTY. DEV., <http://www.dhcd.virginia.gov/index.php/community-partnerships-dhcd/81-community-development-block-grant-cdbg.html>.

¹²⁵ *Id.*

¹²⁶ *Id.*

¹²⁷ *Community Development Block Grant (CDBG) Community Economic Development Fund (CED)*, VA. DEP’T OF HOUS. AND CMTY. DEV., <http://www.dhcd.virginia.gov/index.php/community-partnerships-dhcd/downtown-revitalization/cdbg/77-community-development-block-grant-cdbg.html>.

¹²⁸ *Id.*

¹²⁹ *Id.*

Department offers an Urgent Need block grant program,¹³⁰ which allows funding for immediate and serious threats to local safety.¹³¹ A state of emergency declaration by the Commissioner of Health or the Governor is required for localities to receive funding through this program.¹³²

2. Virginia Indoor Plumbing Rehabilitation Loan Program

DHCD offers an Indoor Plumbing Rehabilitation Loan Program. The program is designed to provide homeowners with funds for installation of indoor plumbing or to correct failed wastewater systems.¹³³ The program provides a zero percent interest rate and a subsidized loan for indoor plumbing in eligible localities.¹³⁴ Seventeen cities, 90 counties, and 183 towns are eligible for this program.¹³⁵ Loan repayment is contingent upon the homeowner's ability to pay.¹³⁶

F. Local Government Loans

Virginia Code § 15.2-958.6 allows for localities to “authorize contracts with property owners to provide loans for the repair of septic systems.”¹³⁷ The Code allows localities to choose the types of repairs that may be included,¹³⁸ the interest rate,¹³⁹ the minimum and maximum aggregate dollar amount that may be financed,¹⁴⁰ and other terms. The statute allows considerable flexibility in terms of how localities may structure their individual programs,¹⁴¹ and provides that planning district commissions or localities act as the “middle man” between homeowners and banks.¹⁴² However, a lien can be placed on a property such that the locality will be able to have some form of collateral for the loan.¹⁴³ The lien can be “equal in value to the loan against any property where such septic system repair is being undertaken.”¹⁴⁴

G. Southeast Rural Community Assistance Project Loans and Grants

The Southeast Rural Community Assistance Project (SERCAP) is an organization focused on providing low-income individuals with affordable water and wastewater facilities as well as

¹³⁰ *Community Development Block Grant (CDBG) Urgent Need*, VA. DEP'T OF HOUS. AND CMTY. DEV., <http://www.dhcd.virginia.gov/index.php/community-partnerships-dhcd/80-community-development-block-grant-cdbg-urgent-need.html>.

¹³¹ *Id.*

¹³² *Id.*

¹³³ *Indoor Plumbing Rehabilitation (IPR)*, VA. DEP'T OF HOUS. AND CMTY. DEV., <http://www.dhcd.virginia.gov/index.php/community-partnerships-dhcd/water-and-sewer-assistance/indoor-plumbing-rehabilitation-ipr.html>.

¹³⁴ *Id.*

¹³⁵ *Indoor Plumbing Eligible Localities*, VA. DEP'T OF HOUS. AND CMTY. DEV., <http://www.dhcd.virginia.gov/index.php/community-partnerships-dhcd/water-and-sewer-assistance/indoor-plumbing-rehabilitation-ipr/164-indoor-plumbing-eligible-localities.html>.

¹³⁶ *Indoor Plumbing Rehabilitation*, *supra* note 133.

¹³⁷ VA. CODE ANN. § 15.2-958.6(A) (2013).

¹³⁸ VA. CODE ANN. § 15.2-958.6(A)(1).

¹³⁹ VA. CODE ANN. § 15.2-958.6(A)(2).

¹⁴⁰ VA. CODE ANN. § 15.2-958.6(A)(3).

¹⁴¹ *See* VA. CODE ANN. § 15.2-958.6.

¹⁴² VA. CODE ANN. § 15.2-958.6(D).

¹⁴³ VA. CODE ANN. § 15.2-958.6(E).

¹⁴⁴ *Id.*

achieving other community development and environmental goals in seven states in the southeastern United States.¹⁴⁵ SERCAP provides a variety of services related to water quality and wastewater disposal, including training for water and wastewater operators, technical assistance meant to identify vulnerabilities, and various grant and loan programs.¹⁴⁶ At the individual level, SERCAP offers low-income homeowners with affordable loans to help them repair or replace failing septic systems,¹⁴⁷ and at the community level, SERCAP offers loans to localities for wastewater infrastructure and community development needs.¹⁴⁸ In Virginia, SERCAP also offers a grant program entitled “Facilities Development Grants.”¹⁴⁹ This grant program is meant to offer financial aid to local governments and private non-profit community organizations serving low to moderate income communities for system upgrades and compliance, data gathering, and lateral fees, among other uses.¹⁵⁰ The program is funded through an annual appropriation from the General Assembly and will reimburse participants for the cost of accepted projects.¹⁵¹

VIII. APPROACHES IN OTHER STATES

A. Minnesota

Through a combination of different loans and grants, Minnesota offers several options to municipalities and homeowners dealing with failing septic systems. For example, one source of grant funding comes from a 3/8 of 1% sales tax, imposed for 25 years pursuant to Minnesota’s Clean Water Land and Legacy Amendment to the state constitution.¹⁵² Minnesota voters approved this tax in 2008.¹⁵³ Under this program, the Minnesota legislature advises the Minnesota Board of Water and Soil Resources how the money will be allocated each year.¹⁵⁴ Then, depending on how much money is available, local governments can make requests to the Board, which will issue a decision depending on the potential environmental benefits stemming from the proposed project, the support of local citizens, and a municipality’s track record.¹⁵⁵ If a proposed project is accepted, the county will receive the money and pay it out once the project is completed.¹⁵⁶ As a result of this grant program, it is estimated that 86% of Stearns County’s 16,663 septic systems are

¹⁴⁵ Andy Crocker, *An Introduction to SERCAP*, SOUTHEAST RURAL CMTY. ASSISTANCE PROJECT, INC., https://www.epa.gov/sites/production/files/2016-06/documents/d1s2_andy_crocker_sercap.pdf.

¹⁴⁶ *Id.* See also *Water & Wastewater*, SOUTHEAST RURAL CMTY. ASSISTANCE PROJECT, INC., <http://sercap.org/services/water-wastewater>.

¹⁴⁷ *Water & Wastewater*, *supra* note 146. SERCAP can provide up to \$15,000 for a septic system repair or replacement. *Id.*

¹⁴⁸ *Id.*

¹⁴⁹ Crocker, *supra* note 145.

¹⁵⁰ *Id.*

¹⁵¹ *Id.*

¹⁵² Ken Wysocky, *Lending a Fiscal Hand*, PUMPER (2013), https://www.pumper.com/editorial/2013/04/lending_a_fiscal_hand.

¹⁵³ *Id.*

¹⁵⁴ *Id.*

¹⁵⁵ *Id.*

¹⁵⁶ *Id.*

compliant.¹⁵⁷ In addition to its successful grant program, Minnesota also offers a variety of loans.¹⁵⁸

B. Maryland

Maryland has an onsite repair and replacement program that is primarily funded by the Bay Restoration Fund (BRF) as part of its efforts to comply with its Chesapeake Bay Total Maximum Daily Load requirements.¹⁵⁹ The program is financed through a \$60 per year fee “from each user served by an onsite system.”¹⁶⁰ Additionally, the program takes the form of grants, rather than loans.¹⁶¹ Maryland’s program requires three bids per project for low income owners in particular.¹⁶² Further, the state pays for the dispersal systems as well as the aerobic treatment systems that have met their criteria.¹⁶³

C. Florida

In Bithlo, Florida, which does not offer residents municipal sewer access, a local nonprofit organization, United Global Outreach, has proposed installation of a vacuum sewer system to a community package plant¹⁶⁴ as a potential solution.¹⁶⁵ The project is envisioned to be implemented through the use of private sector and philanthropic funding, using engineering expertise from a local university.¹⁶⁶ This approach is still being researched, but one challenge to the program is the existence of government restrictions related to purchasing public project materials using non-public funds.¹⁶⁷ Such an approach, which incorporates non-governmental resources, could be considered in Virginia for areas without an available municipal sewer system. Nonetheless, this approach would require that some third party organization initiate the program through discussions with corporations, local governments, and universities.

¹⁵⁷ *Id.*

¹⁵⁸ *SSTS financial assistance*, MINN. POLLUTION CONTROL AGENCY, <https://www.pca.state.mn.us/water/ssts-financial-assistance>.

¹⁵⁹ *Maryland’s Nitrogen-Reducing Septic Upgrade Program*, MD. DEP’T OF THE ENV’T, <http://mde.maryland.gov/programs/Water/BayRestorationFund/OnsiteDisposalSystems/Pages/index.aspx> (last visited April 10, 2018); *Bay Restoration (Septic) Fund (BRF) Program Implementation Guidance for FY 2018*, MD. DEP’T OF THE ENV’T, <http://mde.maryland.gov/programs/Water/BayRestorationFund/OnsiteDisposalSystems/Documents/FINAL%20FY%202018%20Program%20Guidance-Appendix%20C.pdf> (last visited April 10, 2018); Posting of Steven Krieg, steven.krieg@maryland.gov, to sora@mail-list.com (March 13, 2018) (on file with authors).

¹⁶⁰ *Bay Restoration Fund*, MD. DEP’T OF THE ENV’T, <http://www.mde.state.md.us/programs/Water/BayRestorationFund/Pages/index.aspx> (last visited April 10, 2018); Krieg, *supra* note 159.

¹⁶¹ Krieg, *supra* note 159.

¹⁶² *Id.*

¹⁶³ *Id.*

¹⁶⁴ The name by which these plants are called varies by states, however, the EPA refers to them as package plants, so this paper utilizes that term. Another example is “residential wastewater treatment systems.” *See, e.g., Residential Wastewater Treatment Systems*, NSF, <http://www.nsf.org/consumer-resources/water-quality/wastewater-sewage-treatment/residential-wastewater-treatment-systems>.

¹⁶⁵ Telephone interview with Tim McKinney, Chief Executive Officer, United Global Outreach (Feb. 14, 2018).

¹⁶⁶ *Id.*

¹⁶⁷ *Id.*

D. Oregon and Washington

Oregon partners with a regional nonprofit organization called Craft3,¹⁶⁸ which provides loan funding for environmental (among other) projects.¹⁶⁹ The program has been structured such that homeowners are given multiple options as to how they can make payments on their loans, including deferring payments until the home is sold.¹⁷⁰ During this past legislative cycle, the state legislature allocated \$1.25 million in funds for the program, although Craft3 also sources funds from other organizations, including foundations and other private sector actors.¹⁷¹ Fifteen counties in Washington have also partnered with Craft3 to take advantage of its clean water loans.¹⁷²

IX. POLICY RECOMMENDATIONS

There are a variety of steps the Commonwealth could undertake to more effectively and efficiently deal with the issues associated with onsite sewage. This section will provide various policy recommendations to address concerns associated with public health, environmental health, and environmental justice.

A. Collect Data, Develop Informed Solutions, and Educate the Public

Having reliable and up-to-date information is extremely important for developing solutions to the issues associated with onsite sewage. A clear understanding of what types of onsite systems exist, where these systems are located, and when these systems were installed is needed to determine appropriate solutions for moving forward. Answering these questions will require funding to modernize previous collection and reporting efforts, as well as to support new efforts to gather and map this information.

Once this information is collected, the most feasible and effective solutions to address the issue – whether that is nutrient reduction, public health protection, or both – should be identified. This may not be a one-size fits all answer – some issues may be remedied by connection to a municipal sewer system while the solution for others may be to repair an existing onsite system or install a new system that is fully compliant with current VDH regulations. Therefore, in addition to creating an inventory of existing systems, it would be useful to conduct an assessment of potential solutions in order to frame the magnitude of the funding that is needed. Having this assessment will allow funding mechanisms to be tailored to match the identified solutions. Once funding gaps have been identified, changes to existing repair and replacement programs can be explored, as well as the establishment of new programs to permit connection to public sewer, support monthly sewer fees for low-income customers, or to cover the design and installation of onsite systems for property owners.

¹⁶⁸ *Clean Water Loans*, CRAFT3, <https://www.craft3.org/Borrow/clean-water-loans> (last visited April 10, 2018).

¹⁶⁹ *About Craft3*, CRAFT3, <https://www.craft3.org/About/Mission> (last visited April 10, 2018).

¹⁷⁰ *Id.*

¹⁷¹ Posting of Randall Trox, Randall.TROX@state.or.us, to sora@mail-list.com (Feb. 16, 2018) (on file with authors).

¹⁷² *Clean Water Loans*, *supra* note 168.

In addition to VDH needing more data, there is also a need for the general public to be better informed about onsite sewage – both the function of the systems, as well as availability of financial assistance. Improving education is likely to improve overall operation and maintenance practices, which in turn may extend the life of the system and reduce repair costs for property owners. Additionally, increased awareness is likely to lead to improved public and environmental health outcomes as people better understand the connection between water quality and the proper functioning of their systems. And, if property owners have a better awareness and understanding of existing financial assistance, they may be more likely to seek help.

B. Identify, Modify, and Expand Funding Options

Many funding sources exist to help property owners with onsite sewage systems – including regional nonprofits, such as the SERCAP; federal entities, such as USDA; and state agencies, like VDH and DCR. This funding can take the form of a low-interest loan or a grant, and can be used for a variety of septic-related tasks. Although many funding sources exist, these options are not without their limitations – limitations in the amount of funding that is available, who may be eligible to apply, and what tasks the funding can support. Because so many funding options do exist, it would be useful to inventory the various resources so that planning district commissions, localities, state agencies, and property owners can better position themselves to utilize and leverage available funds. One way to achieve a more coordinated approach could be to create a grant administrator position in state government to handle this task.

As the Commonwealth evaluates current funding options and considers ways to modify or expand them, other state approaches can provide new ideas. For example, Minnesota increased the state sales tax, and directed a portion of this revenue into a Clean Water Fund that is then distributed to counties for purposes of providing grants to low-income homeowners with non-compliant systems. In Oregon and many counties within Washington State, a regional nonprofit organization, called Craft3, utilizes monies from the state, private foundations, and private investors to provide non-traditional financing to property owners which covers the full cost of designing, permitting, and installing a residential system and, in some cases, to the cost of connecting a home to a nearby municipal system. And, in Alabama, a non-profit trade group, the Alabama Onsite Wastewater Association, sponsors a program in which manufacturers and installers donate their services and products by providing systems to low-income applicants and, in return, receive continuing education credits. These are potential innovative approaches to help address funding gaps.

Additionally, consideration should be given to how other financially significant infrastructure projects are funded. Projects regarding privately owned water systems and privately owned dams¹⁷³ are subsidized by grants and low-interest loans. However, in the realm of septic, the cost is borne solely by property owners, and payment is up front. Therefore, steps should be taken to ensure that governmental assistance is structured to provide support early in the process.

¹⁷³ The Virginia Dam Safety, Flood Prevention and Protection Assistance Fund provides loans and grants to local governments and private entities. VA. CODE ANN. § 10.1-603.19(C) (2017).

C. Encourage Proactive Maintenance and Monitoring of Onsite Systems

The Commonwealth should also look at ways to encourage property owners to be more proactive in the maintenance and monitoring of their systems. Onsite system repairs are expensive and if the property owner is unable to afford the repair, VDH currently must either require the property owner to vacate the property, allow temporary corrections, or take criminal enforcement action. While a waiver from pre-treatment and pressure-dosing requirements is available if certain conditions are met, and the availability of this waiver does help property owners avoid the high cost of these additional regulatory requirements, it is not protective of public health and water quality.

One way to be more proactive with respect to the proper functioning of onsite systems could be to establish maintenance reporting requirements for conventional systems – similar in concept to the operation and maintenance requirements that are now in place for alternative onsite systems. Having this type of reporting will provide VDH with better program oversight and access to information regarding the functionality of systems.

Another option could be to expand the Chesapeake Bay Preservation Area pump-out or inspection requirement to the entire Bay watershed or, if the goal is water quality protection overall, expand this requirement statewide. Similar to establishing maintenance reporting requirements for conventional systems, expanding the pump-out or inspection requirement would motivate property owners to take a more active role in the maintenance of their system.

It is important to recognize that either of these options would result in increased costs to the property owner as well as the agency managing the program, so it would be important to consider changes that may be necessary to existing funding sources or even the creation of new funding sources to balance the increased cost.

D. Additional Options

Other options, beyond those identified above, also could be considered. For example, VDH could offer a limited amnesty period that enables property owners to self-report failed or failing systems without the risk of enforcement action. Although, in practice, VDH currently works with property owners to remedy violations, having a written amnesty policy may be a potential way to encourage property owners to notify the agency about septic system issues.

And, in light of potential issues associated with sea level rise and recurrent flooding, the technical design criteria could be reviewed to determine if the current framework is the most protective of public and environmental health. VDH is currently undergoing a periodic review of both its Regulations for Alternative Onsite Sewage Systems and the Sewage Handling and Disposal Regulations, wherein different performance and setback standards are being discussed to improve treatment and reliability of the systems. Members of the public can submit comments for agency consideration.¹⁷⁴

¹⁷⁴ *News of Interest*, VA. DEP'T OF HEALTH, <http://www.vdh.virginia.gov/environmental-health/onsite-sewage-water-services-updated/news-of-interest/>.

Additionally, if one of the goals is to increase connection to municipal sewer systems, then local government authority to require such connection could be expanded. Currently, cities¹⁷⁵ and certain counties¹⁷⁶ have the authority to require such connection. Although this expanded authority might achieve the goal of increasing connection to municipal sewer systems, there are potential drawbacks – such as increased demand on the system, which may result in a need for more funding to expand treatment plant capacity for the system.

X. CONCLUSION

Failure to deal with sewage has both public health and water quality effects. Developed areas have the benefit of their sewage treatment being undertaken by centralized, municipal systems that are able to take advantage of their large-scale efficiencies and engage in successful long-term planning of capital projects. However, many individual homeowners are not connected to municipal systems and are not prepared for the prohibitive cost of repairing or replacing a failing septic system. The threat of failing systems will only increase as Virginia confronts imminent sea level rise because septic systems experience inefficiencies in saturated soils. Despite the widespread, societal effects of septic system failures, individual property owners are responsible for the cost of installing and maintaining septic systems. To ensure that septic systems are properly designed, installed, maintained, and repaired, it is critical that the Commonwealth have reliable and up-to-date data on the location and type of systems; that property owners are educated on the topic; that both the Commonwealth and property owners are aware of funding sources; and that funding sources are structured to provide adequate support to deal with these issues.

¹⁷⁵ VA. CODE. ANN. § 15.2-2122(7) (2017).

¹⁷⁶ VA. CODE. ANN. § 15.2--2110 (2018).

DIFFERENT APPROACHES TAKEN BY OTHER STATES¹⁷⁷						
State	Funding Type (amount)	Funding Program	Partners / Organizations	Eligibility Requirements	Timeframe / Processes	Completed Projects
Alabama	equipment & service provided by non-profits	Alabama Onsite Wastewater Association (AOWA)	AOWA Technical Review and Advisory Committee (TRAC)	low income (applicants approved through TRAC)		
Delaware	loan: low interest & due-on-transfer	Delaware Water Pollution Control Revolving Fund	State Environmental Finance Section Water Infrastructure Advisory Council	projects approved by Water Infrastructure Advisory Council	approval process begins in January	
Florida- City of Jacksonville	Loan	Utility Tap-In Program (Housing and Community Development)	Community Development Block Grant Program State Housing Initiatives Partnership Program	home must be owned and occupied income must not exceed 80% of area median income		
Idaho	grant if household income < \$24,587 loan if household income < \$49,174	Revolving Loan Fund Household Septic System Program		rural area w/ population < 50k own & occupy house no new construction no encumbrances	first-come, first-serve	
Kansas	loans: low-interest loans; min \$2k	Local Conservation Lending Program	Kansas Dept. of Health and Environment local banks			

¹⁷⁷ This information has been compiled from responses to a question posed in a listserv entitled sora@mail-list.com. Individuals working in different states responded to a question posted on Feb. 16, 2018 regarding the funding programs in place in other states. The individual emails are on file with the Virginia Coastal Policy Center (VCPC). The VCPC wishes to thank VDH staff for their assistance in collecting this information.

Maryland	grant: income dependent (\$8 mil)	Bay Restoration Fund	Department of the Environment	septic system within the “Critical Area” (land within 1,000 ft. of tidal waters)		> 12,000
Massachusetts	state loan to communities (\$200k)	Community Septic Management Program		community must prepare a “Community Inspection Plan” or “Local Septic Management Plan”		
Minnesota	grant: administered by localities, funding distributed by state (\$1 mil)	Clean Water Land and Legacy Amendment		noncompliant septic system		
Ohio	state-made loans to localities grant	Water Pollution Control Loan Fund Community Housing Improvement Program	Ohio Environmental Protection Agency Ohio Development Services Agency			
Oregon	loan: multiple options determined by income (\$1.25 mil)	Craft3		one of the following: 1) system > 25 years old 2) system failing w/ supporting evidence 3) contacted by Health Officials 4) under orders to fix septic system		over 1,000

Pennsylvania	loan: up to \$25k	PENNVEST Homeowner Septic Program	Housing Finance Agency Clean Water State Revolving Fund	primary residence allowable projects: rehabilitation, improvement, repair, or replacement		
South Dakota	federal loan	Rural Development Program	U.S. Dept. of Agriculture			
Utah	loan: max \$15k (≈\$24 mil)	Clean Water State Revolving Fund	Utah Division of Water Quality			
Vermont	loan		Clean Water State Revolving Fund			
Washington	loan: multiple options	Centennial Clean Water	Craft3	one of the following: 1) system > 25 years old 2) system failing w/ supporting evidence 3) contacted by Health Officials 4) under orders to fix septic system		
West Virginia	loan: maximum 10k	WV Housing Development Fund	WV Dept. of Environmental Protection	owner-occupied or long-term lessee		