DRINKING WATER

2009 SUMMARY

In its most recent assessment of infrastructure needs, the American Society of Civil Engineers graded drinking water systems nationwide a "**D-**" based on lack of sustainable funding, age and capacity limitations of existing systems. This 2009 national report cites lack of progress on EPA's 2002, Clean Water and Drinking Water Infrastructure Gap Analysis, which identified 20 year capital funding needs of $161 billion to rebuild our national drinking water infrastructure. Despite this defined need, Congress has only allocated $9.5 billion for the nationwide revolving loan funds between 1997 and 2008 (a principal component of water system project funding); an 11 year total barely meeting the annual requirement during those years.

In November, 2009 there were 2,944 regulated public water supply systems providing drinking water to more than seven million Virginians. **Virginia's 2007 EPA Drinking Water Needs Survey report identifies a requirement of $6.1 billion to maintain these systems over the next 20 years.** Ninety-six percent of this need is related to replacement of transmission, storage and distribution components by 2030 as these assets are nearing the end of their service lives.

This $6.1-billion requirement will be funded primarily by water users, through increased billing rates and user fees. **The average billing rate in Virginia has already risen by 40 percent since 1999, including a 4.2 percent increase in 2008.** Over the next 20 years, water rates will need to increase by 80 percent to just maintain current levels of service.

880 Safe Drinking Water Act violations were issued in Virginia in 2007, (latest year of record). Of those violations, 430 were related to exceedances of maximum contaminant levels; affecting the drinking water of more than 900,000 Virginians. Considering the growing strains of population growth and emerging contaminants, sustained investments to improve the resiliency and efficiency of Virginia's waterworks is essential to protect public health and well-being.

INTRODUCTION AND BACKGROUND

In Virginia, the Virginia Department of Health, Office of Drinking Water (VDH-ODW) is responsible for regulatory oversight of public water supplies in accordance with federal and state statutes. The VDH-ODW provides technical assistance, regulatory oversight, engineering support and training to system operators, and manages the Virginia revolving loan fund providing grants and low-interest loans for drinking water capital improvement projects. The 2,944 active public water systems in Virginia provide drinking water to more than 80% of Virginia's population, supported by a staff of 116 at the VDH-ODW.

Over 58% of these water supply systems (1726 systems) are small non-community waterworks serving a widely distributed population of 500,000 people in the Commonwealth. These small systems pose many challenges due to their limited size, technological capabilities, broad distribution around the state, and age.

CONDITION AND ADEQUACY

Waterworks in Virginia date back to the early 1800's, with the City of Lynchburg operating one of the oldest in the nation, having constructed a gravity fed water supply system in 1825, second only to Philadelphia, making it the second oldest water system in the United States.[2] There were 90 organized waterworks serving Virginia localities in 1910, the City of Martinsville received the first waterworks

operating permit issued by the state health department in 1916.[3] Today, Virginia defines a public waterworks as a system which serves piped water for drinking or domestic use to at least 15 connections, to an average of 25 individuals for at least 60 days out of a year, or to the public, (i.e. a community well or spring). This demonstrates the broad scope of this regulatory program from small systems to highly complex urban networks in our major Cities.

Water systems in Virginia routinely rely on pipes and storage tanks that have been in service over 100 years. In many cases these pipes have exceeded their design lives but there are no current plans to replace these pipes. The EPA 2002 Clean Water and Drinking Water Infrastructure Gap Analysis Report, projects that by 2020, 45% of water and sewer pipes in the US will require replacement.[4]

Virginia saw large growth in all aspects of its infrastructure including public water systems after 1940, and as such a large number of these systems will require significant asset renewal within the next 20 years as they are approaching 70 years of age today. This is particularly true of reinforced concrete and brick structures at treatment facilities, pump stations and storage tanks which typically designed for a 25-50 year service period.

With 80% of Virginians dependent on these systems to deliver clean, safe water for personal, business and institutional use it is vital that we invest now to ensure adequate supplies are available to meet growing populations, systems are maintained appropriately to withstand adverse events, and operations are managed to protect public health and safety.

INVESTMENT NEEDS AND FUNDING DEDICATED

Between 2007 and 2009, (including $20M in 2009 ARRA funds) Virginia received slightly over $189M in federal revolving loan funds (DWSRLF), the second highest distribution of funds within our region, which includes WV, MD, DC, D, and PA. These federal funds required a 20% state match, so Virginia contributed an additional $34M to match these drinking water investments over the past 11 years, for a total investment of $223M or $20.27M/year. **Virginia's federal DWSRLF allocation is projected to be nearly $25M in 2010, but is subject to the state providing the required $5M, 20% local match.**

Virginia's population in 2020 and 2030 is estimated to grow to 8.92 million and 9.83 million residents respectively, a 21% increase over the 2009 population of 7.77 million. Even with improved conservation efforts, this increase in population will create a higher demand for potable water and associated infrastructure, i.e. fire fighting capabilities. In 2008 an average of 786 million gallons per day (MGD) was withdrawn from Virginia's groundwater and surface water sources for public water supplies, for an average of nearly 102 gallons per capita per day. This would indicate by 2020, 112 MGD of additional supplies will be required and by 2030 another 92 MGD will be required to sustain Virginia's growth. Competition for water resources and drought availability is already an issue at the state level and recently enacted water supply planning regulations targeted balancing these needs are a proactive step to ensure drought availability and sustainable use of these finite resources. Enhanced conservation and alternative water reuse opportunities will need to thoroughly evaluated to reduce the strain these increased demands will place on our water resources.

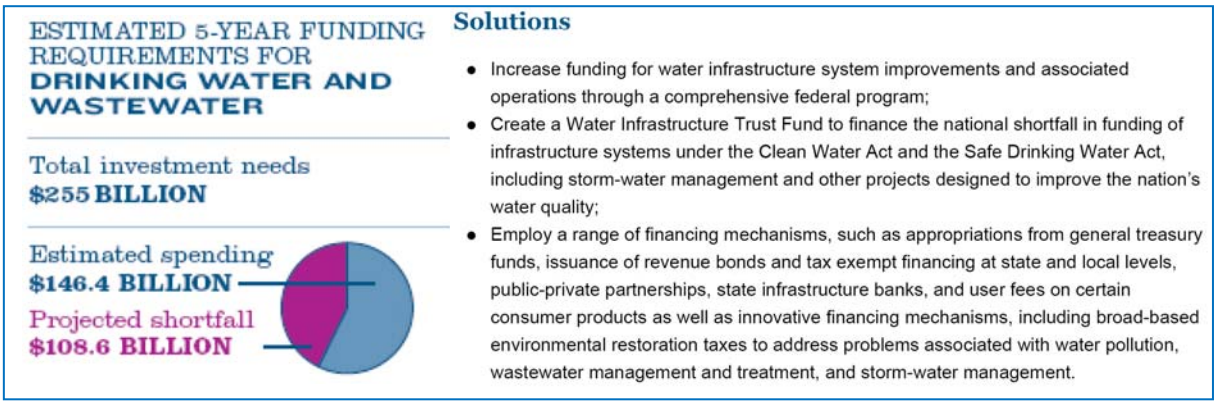
The Virginia DWSRF provided funds for 10 plant expansion or upgrade projects and 21 distribution system projects, 13 of them focused on bringing clean drinking water out to communities that do not have adequate water supplies in 2008.[5] The remaining 8 distribution system projects relate to replacement of

distribution components that are no longer reliable. Virginia's DWSRF program achieved national recognition in 2005 for delivering 95% of DWSRF funding and 88% of DWSRF loans to small, disadvantaged water systems around the Commonwealth. **Unfortunately, it is simply a matter of not enough funds to go around with the 2009 DWSRF ARRA project summary listing over 255 projects requesting over $416M in support. Only 20 projects received funds during this initial windfall funding opportunity, leaving $394M currently unfunded.**

Based on the 2020 population estimates and the 2007 EPA needs report, the per person requirement in Virginia equates to an estimated $685/capita. Comparing national figures from the same report, in 2020 the national requirement is estimated to be $1,008/capita. Given this wide variance in defined needs it is vital that Virginia clearly define needs in the next reporting period to appropriately justify federal allocations otherwise program funding may be cut.

As previously mentioned, future water program needs are expected to grow significantly as Virginia's 50-70 year old infrastructure has to be replaced over the next 20 years. This coupled with emerging regulatory requirements to improve water quality within the distribution system and address concerns about persistent manmade contaminants in our water supply and requirements to address system reliability and vulnerability points are likely to exacerbate these funding needs.

The ASCE National Report Card has identified similar concerns at a nationwide level with Drinking Water Infrastructure, identifying the requirement for sustained funding as a major deficiency nationwide as shown below. **The national report highlights that EPA estimates $161 billion in capital improvements will be needed to maintain the current level of service of our nation's drinking water systems over the next 20 years**.



ASCE 2009 National Infrastructure Report Card Needs – Water and Wastewater Category
(Source: 2009 ASCE IRC)

DRINKING WATER

BASIS OF GRADE

Assigning an overall grade to Virginia's drinking water infrastructure is based on the proven ability to meet Safe Drinking Water Act (SDWA) standards; comparative evaluation of existing and future funding needs, and assessment of the resiliency of public water supply networks around the state, including water quality, quantity and availability to consumers in need:

Rating of Virginia's Drinking Water Infrastructure			
Category	**Percent of Systems Meeting Goals**	**Percent Compliance Desired**	**Rating**
Compliance with Water Quality Standards (2007 Reporting Year) - % of Systems reporting no violations.	68.9%	99%	Poor (D+)
Existing and Future Funding Needs Routinely Identified and Reported	-	-	Excellent (A)
Existing and Future Funding Provided Adequate to Capitalize Needs	-	-	Poor (D+)
Capacity Analysis Planning Completed, Source Protection Standards Provided	Pending	Pending	Average (C)

Overall Virginians enjoy safe, high quality drinking water and are fortunate that waterborne disease and contamination are not common occurrences within the Commonwealth. However, significant components of the infrastructure that enables delivery of this high quality water to our homes, businesses and institutions will require replacement within the next 10-20 years.

The fiscal requirements associated with replacement of this infrastructure have been defined however, alternative funding mechanisms and improved stewardship of our water resources will be required to sustain these systems over the next 20 years. **Given these limitations on the performance of Virginia's Drinking Water infrastructure, we have assigned a "C" average for this 2009 Virginia Infrastructure Report Card. This compares favorably with the national ranking of Drinking Water infrastructure which is ranked as a "D-" as described below and reflects the lower fiscal burden per capita currently projected for Virginia.**

ASCE 2009 National Infrastructure Report Card Summary – Drinking Water Category (Source: 2009 ASCE IRC)

CONCLUSIONS, RECOMMENDATIONS AND POLICY OPTIONS

The past 50 years of growth and technologic innovation have enabled us to significantly improve the safety and quality of our public water supplies in Virginia. We have grown accustomed to high quality, safe, aesthetically pleasing water and rarely experience limits on the volumes and quality available.

As we operate some of the oldest systems in the nation we have an impending burden to rehabilitate and replace this infrastructure to ensure the same high quality of service over the next 50 years. Some key recommendations to assist Virginia in achieving that goal include:

- **Enabling VDH-ODW to achieving objectives outlined in the VAPERFORMS Service Area Strategic Plan mission statement, www.vaperforms.virgina.gov including;**
    - Increase Virginia's citizens access to safe and affordable drinking water.
    - Collaborate with co-funding partners (USDA/HUD/Commerce) to assemble the most appropriate financial package for the funding recipients.
    - Inventory and document funding needs to maximize utilization of funding opportunities.
- **Utilize annual Virginia utility rate studies and available record information from water utilities to define asset replacement value in Virginia and develop a toolkit for owners to fully capture asset depreciation and replacement cost for business planning.**
- **Complete ongoing efforts to address statewide water resource planning and define strategic water supply alternatives to protect threatened groundwater areas, promote conservation and enhance water reuse opportunities.**
- **Strengthen requirements for watershed protection in water supply areas to limit development and potential contamination of high-quality sources, including areas where groundwater is the under the direct influence of surface water.**
- **Fund research into emerging contaminants in partnership with federal authorities to ensure appropriate treatment mechanisms are in place for persistent man-made chemicals.**
- **Identify hazards associated with subsurface carbon sequestration initiatives, including mapping of potential impact areas and potential migration routes.**
- **Target assistance to under-performing systems to improve compliance, including development of financial stability guidance criteria for permitting of new sources.**
- **Reward compliant systems with less reporting requirements and streamlined access to state and federal resources.**
- **Bundle regulatory and technical services to be more effective in supporting system owners/operators. Partner with industry organizations to foster excellence and sustainable business practices, establish mentorship relationships between well financed urban systems and smaller systems that are technically and fiscally challenged.**

FOOTNOTES

1) Lynchburg: A City Set on Seven Hills, By Clifton Potter and Dorothy Potter, pg 37, available online at: Lynchburg: A City Set on Seven Hills - Page 37

2) VDH-ODW History and Mission of the ODW, October, 2004, available online at: http://www.vdh.state.va.us/drinkingwater/documents/ODW%20Overview%20Presentation.pdf

3) 2002 Clean Water and Drinking Water Infrastructure Gap Analysis, available online at:: http://www.epa.gov/ogwdw000/gapreport.pdf

4) VA DEQ DWSRF Intended Use Plan, 2009 Report, available online at: http://www.vdh.virginia.gov/drinkingwater/documents/fy09drft_iup.pdf

5) STATUS OF VIRGINIA'S WATER RESOURCES, A REPORT ON VIRGINIA'S WATER RESOURCES MANAGEMENT PROGRAM ACTIVITIES, OCTOBER, 2009, available online at: http://www.deq.virginia.gov/export/sites/default/watersupplyplanning/2009_Annual_Water_Report_Finalx1x.pdf

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ASCE National 2009 Infrastructure Report Card: www.infrastructurereportcard.org

US Census Bureau, State Interim Projections: www.census.gov/ipc/www/usinterimproj/

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Virginia Department of Health (VDH) – Annual Report, 2007

VDH, Office of Drinking Water – The Efficacy of Virginia's Capacity Development Strategy, 2008

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Virginia Resources Authority (VRA) – 2008 Annual Report; Drinking Water State Revolving Fund, 2008

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U.S. EPA – 2007 Drinking Water Infrastructure Needs and Assessment Survey, 2007

Draper Aden Associates – 20th Annual Virginia Water and Wastewater Rate Report 2008