



MEMORANDUM

TO: Richmond City Council
FROM: Dr. Scott Morris, Director of Public Utilities
DATE: June 3, 2025
RE: Water Infrastructure Modernization: Progress Update and Path Forward

Dear Members of City Council,

I write to provide you with a comprehensive update on the Department of Public Utilities' progress since I assumed leadership four months ago, and more importantly, to offer crucial context about the magnitude of the infrastructure challenge we face together.

The January event served as a stark reminder of the consequences of decades of deferred maintenance and underinvestment in our water infrastructure. While needed investments were made to water infrastructure, these investments were done in a manner to keep the system functioning at the minimum standard and not in a forward-looking manner. While the public's demand for immediate solutions is understandable and justified, it is essential that we collectively understand and communicate the reality of modernizing a water treatment system that has served our community for over a century.

Our water treatment plant, originally constructed more than 100 years ago, represents a complex amalgamation of technologies from different eras. This system serves over 500,000 residents across Richmond, Henrico, Hanover, Goochland, and portions of Chesterfield County through nearly 1,000 miles of distribution pipes, 12 water storage facilities, and numerous pumping stations. Many of these critical components have been maintained; however they have also exceeded their design life by decades. While these systems are maintainable, it also creates a web of interdependent vulnerabilities that cannot be addressed in isolation.

The January event revealed the true extent of these vulnerabilities. Our electrical infrastructure, including antiquated switchgear and transformers, requires complete redesign. The legacy SCADA control systems need modernization while somehow maintaining round-the-clock operations. Aging pumps, valves, filters, and treatment equipment require systematic replacement. Perhaps most critically, we discovered inadequate redundancy at multiple failure points throughout the system. Preliminary assessments indicate that addressing these needs comprehensively will require capital improvements exceeding \$500 million over the next decade.

Despite these daunting challenges, I am proud to report that my new leadership team has achieved significant progress in just four months. We have hired fifteen critical positions, including specialized electricians and SCADA technicians who were notably absent during the January crisis. We have implemented 24/7 skilled technician coverage, addressing the

dangerous gap that left our plant vulnerable during overnight hours. New Standard Operating Procedures (SOPs) for power failures have been developed and tested through three successful emergency drills, each showing measurable improvements in response time and coordination.

On the physical infrastructure front, we have already replaced the faulty switchgear coil that contributed to the January failure, upgraded our battery backup systems from a mere 45-minute capacity to a more robust 4-hour capacity. Simultaneously, we have completed Phase 1 of a comprehensive infrastructure assessment covering 40 percent of our total system, identified and prioritized 127 critical vulnerabilities, and developed a risk-based replacement schedule that will guide our efforts moving forward.

Our team has also made substantial progress in regulatory compliance, most of the items in the Virginia Department of Health's Corrective Action Plan. We have established reporting protocols with state regulators and significantly improved our water quality testing procedures. Additionally, my team has engaged national water infrastructure experts for peer review, developed a detailed 5-year capital improvement plan, and submitted federal infrastructure grant applications to assist with funding and reducing the burden to our ratepayers.

However, I must emphasize why comprehensive solutions cannot be achieved in a matter of months. The engineering and procurement realities we face are sobering. Major equipment now has 6-to-12-month lead times due to ongoing post-COVID supply chain impacts. Each project requires environmental review, engineering design, competitive bidding, and contractor mobilization—processes that cannot be circumvented without risking project failure or legal challenges. Most critically, we cannot take systems offline for upgrades without backup systems in place, as we must maintain uninterrupted water service to half a million people.

The interdependencies within our system create a complex sequencing challenge. Electrical upgrades must precede SCADA modernization. SCADA improvements are necessary before we can automate valves. We cannot replace major pumps until backup power is reliable. Each phase builds upon the previous one and attempting shortcuts risks catastrophic failure worse than what we experienced in January. Furthermore, developing the specialized workforce needed for modern water treatment operations takes time. We face a national shortage of water infrastructure professionals, and new staff require 6-to-12 months to fully understand the unique characteristics of our system. The knowledge transfer from retiring employees is critical and cannot be rushed without losing decades of institutional memory. This knowledge transfer has been assisted through the development of robust SOPs and training for our staff – a total of 58 procedures have been identified, with 17 in final review by VDH.

Looking forward, I want to provide you with a realistic timeline for achieving our shared goal of a fully modernized water system. This year we will focus on foundation building—completing critical electrical infrastructure upgrades, finishing our comprehensive system assessment, addressing the highest-priority compliance items, and establishing a robust preventative maintenance program. Years two and three will see core system

modernization, including SCADA replacement, primary treatment equipment upgrades, redundant power system construction, and critical distribution main replacements. By years four and five, we will achieve true system resilience through complete automation of backup systems, full redundancy for all critical components, advanced water quality monitoring implementation, and major distribution system improvements. The final phase, years six through ten, will address remaining infrastructure needs, implement smart water technology, achieve industry-leading reliability metrics, and complete our transition to a fully modern system.

This timeline may seem lengthy, but it reflects the reality faced by every major city that has undertaken similar modernization efforts. Our peer cities have consistently required 8-to-12 years to achieve comprehensive water system modernization, and attempting to compress this timeline has invariably led to costly failures and public safety risks.

To succeed in this monumental undertaking, we need your partnership and support. We need your help in setting realistic expectations with the public, explaining that four months cannot undo decades of deferred maintenance and oversight. We need sustained financial commitment through necessary rate adjustments and your advocacy for state and federal infrastructure funding. Most importantly, we need your assistance in public communication—helping residents understand the complexity of these challenges, celebrating incremental progress while maintaining focus on long-term goals, and countering unrealistic expectations with factual information.

The January event was indeed a wake-up call, but it was also an opportunity. With new leadership, renewed focus, and your continued support, we are not just repairing a broken system—we are building a water infrastructure that will serve Richmond reliably for the next century. The progress my team and I have made in four months demonstrates our commitment and capability. The journey ahead is long, but with patience, sustained investment, and unified support, Richmond will emerge with a water system that matches the aspirations of our great city.

We are, quite literally, rebuilding this plane while flying it. This requires a delicate balance of urgency and patience, bold action and careful planning, immediate fixes and long-term solutions. I am confident that together, we can achieve this transformation, but it will require all of us to remain committed to the journey, not just the destination. Thank you for your continued support and leadership during this critical period in our city's history. I look forward to providing regular updates on our progress and working collaboratively with each of you to ensure Richmond's water future is secure, reliable, and resilient.

Respectfully submitted,

Dr. Scott Morris
Director of Public Utilities