



Washington Aqueduct



Presentation to the Northern Virginia Post of SAME

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General Manager**

13 January 2022



Agenda



Opening Remarks by Ed Chamberlayne & COL Estee Pinchasin

Washington Aqueduct History and Current Operations

Ongoing Projects and Initiatives

Capital Improvement Program

Modernization and Resiliency

Closing remarks





Washington Aqueduct USACE Baltimore District



Military Support



Interagency and International Services (IIS)

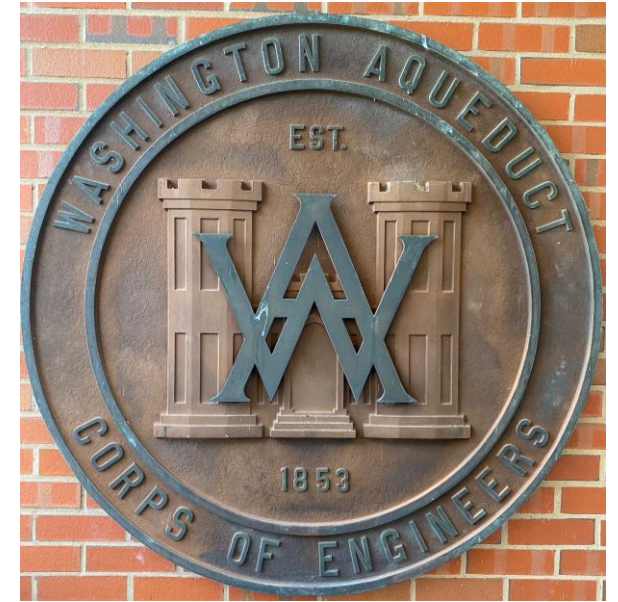


Civil Works



SERVICE

Commissioned by Congress in 1852, construction began in 1853 and placed under the Chief of Engineers in 1859.



Emergency Management



Environmental



Real Property Services Field Office (RSFO)



Washington Aqueduct



MISSION

The Washington Aqueduct produces water for the District of Columbia and Virginia's Arlington and Fairfax counties in a safe, reliable and cost-effective manner.

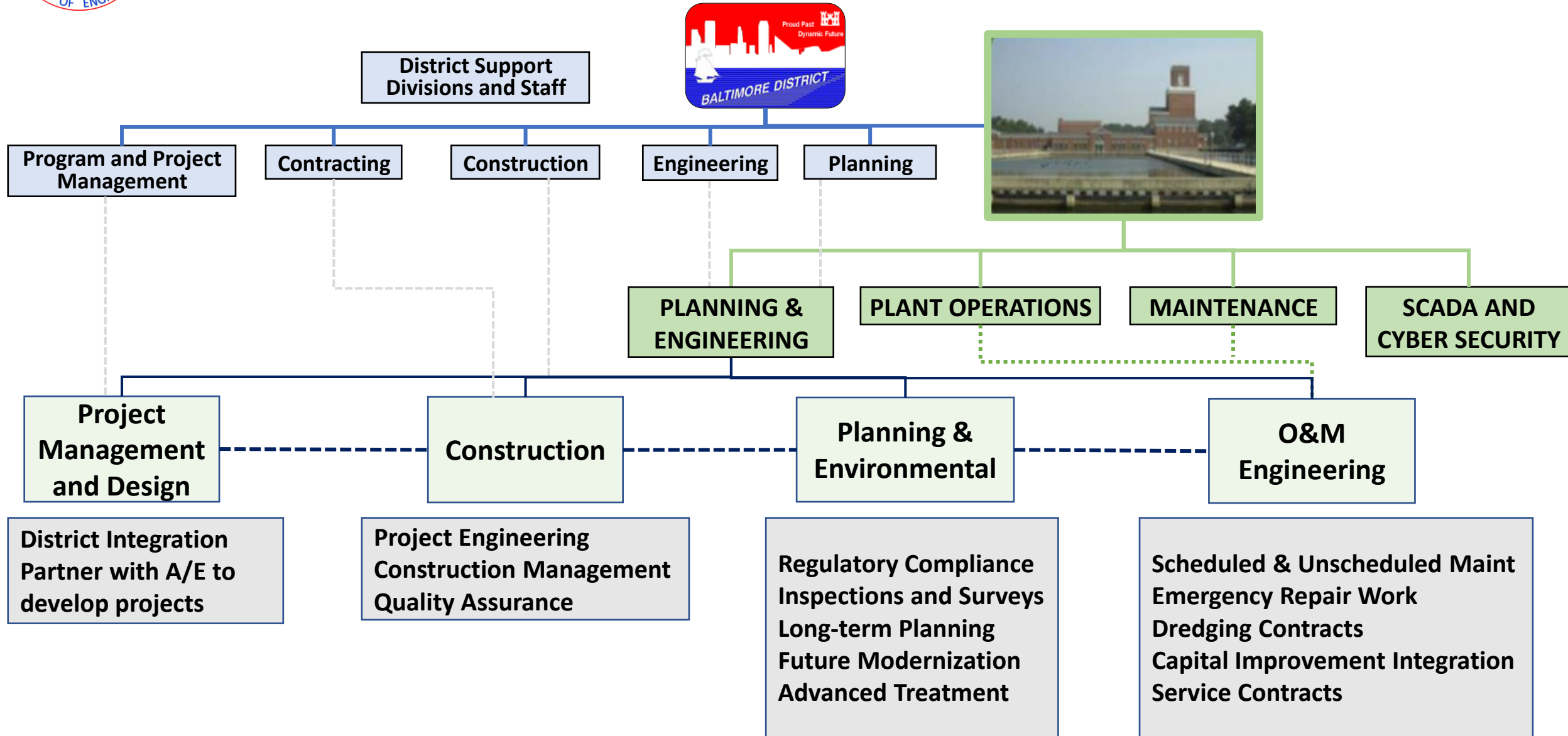
VISION

Be a national leader in the water treatment and supply industry employing technology, highly skilled and trained personnel, creative solutions and reliable processes.

The Washington Aqueduct is a Division of the Baltimore District, consisting of water treatment plant operators, engineers, maintenance specialists, laboratory technicians, safety professionals, and administrative and security staff.



Organizational Structure





Service Area and Major Infrastructure



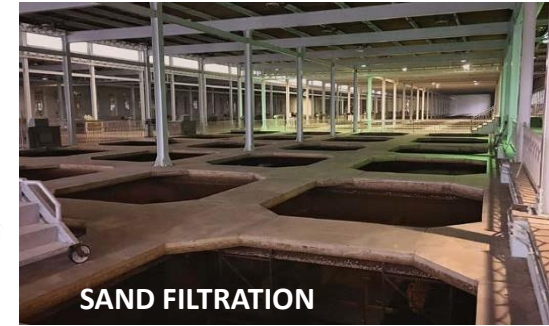
Providing 135 million gallons of water to over 1 Million people and Government and Defense Facilities in the District of Columbia, Arlington and Fairfax Counties.



GEORGETOWN RESERVOIR



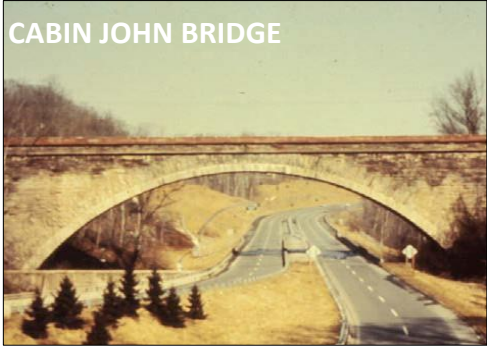
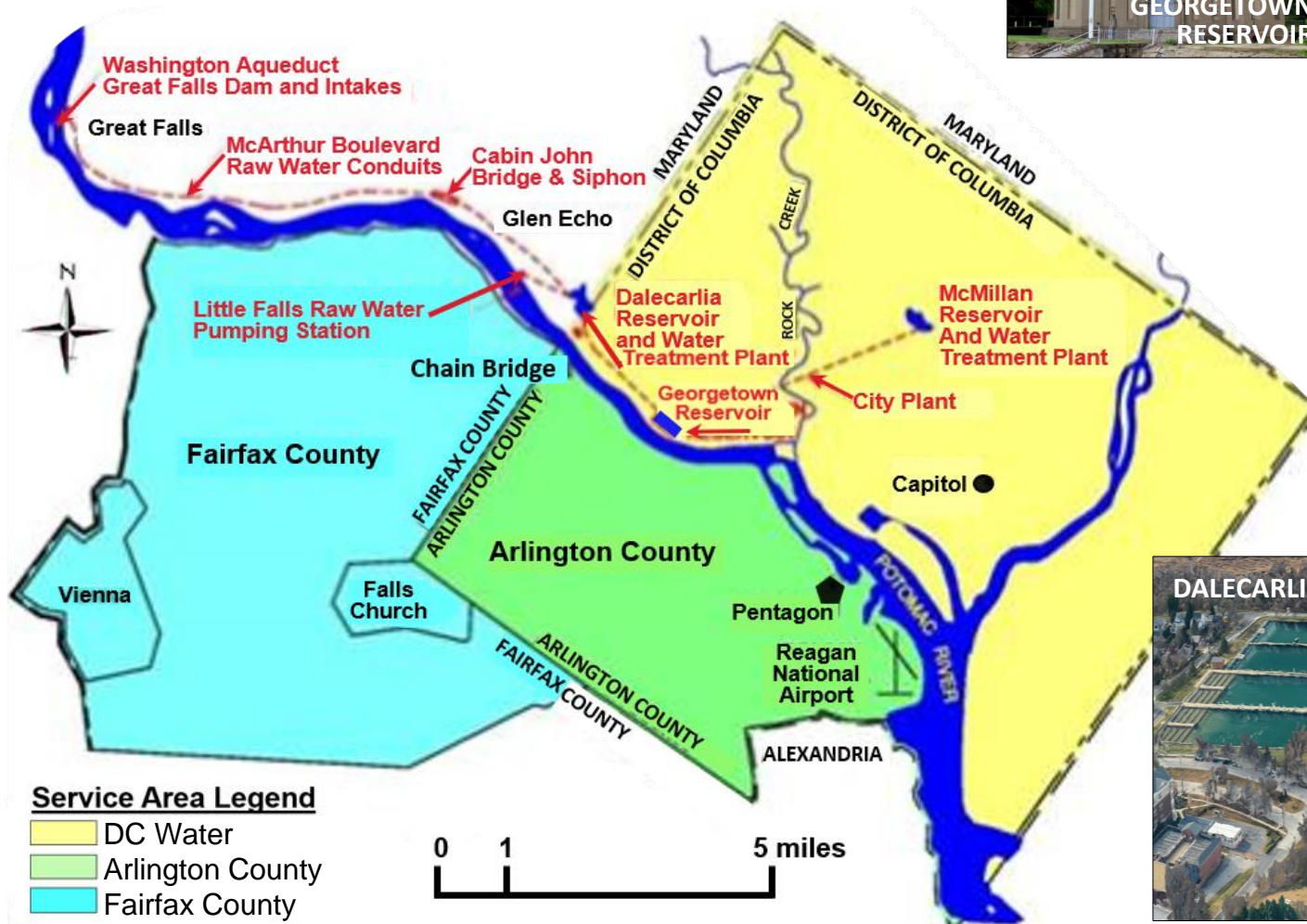
McMILLAN TREATMENT PLANT



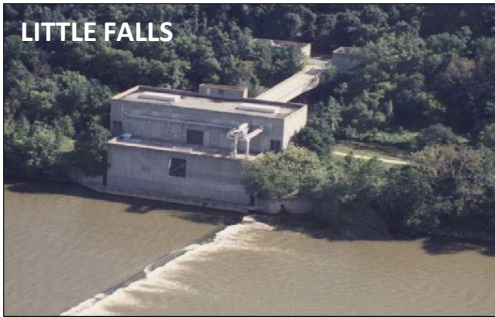
SAND FILTRATION



DALECARLIA TREATMENT PLANT



CABIN JOHN BRIDGE



LITTLE FALLS



RESIDUAL PROCESSING FACILITY



Ongoing Projects and Initiatives



Current Operations

Assess and Upgrade Aging Infrastructure

Active Design and Construction Projects

Water Quality and Sanitary Survey

Project Planning and Programming

Asset Management Implementation

Maximize Maintenance Management Systems

Supervisory Control & Data Acquisition Upgrade





Great Falls and Little Falls Intakes & Pumping Station

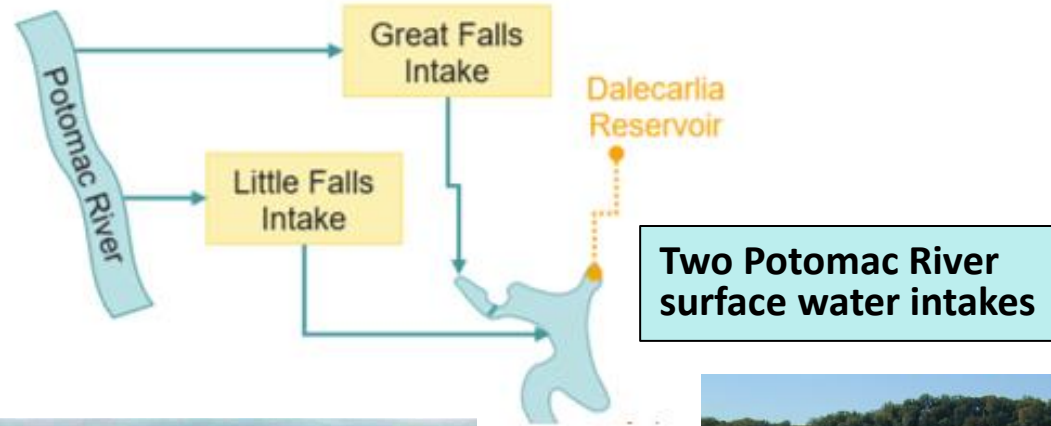


The Great Falls dam is a stone structure and part of our original infrastructure

Two conduits from the intakes at Great Falls to Dalecarlia Reservoir

Little Falls Intake originally constructed to support population expansion

Serves as a back-up to Great Falls



Two 12-mile raw water gravity mains (200 MGD capacity) from Great Falls to Dalecarlia Reservoir



Little Falls 525-MGD low-lift raw water pumping station
Transmission main from Little Falls to Dalecarlia Reservoir



Dalecarlia Reservoir



**In from Little Falls
(pumped)**

**In from Great Falls
(gravity)**

**Out to Dalecarlia
Plant (~ 60%)**

**Out to McMillan Plant
(~ 40%)**





Dalecarlia Plant

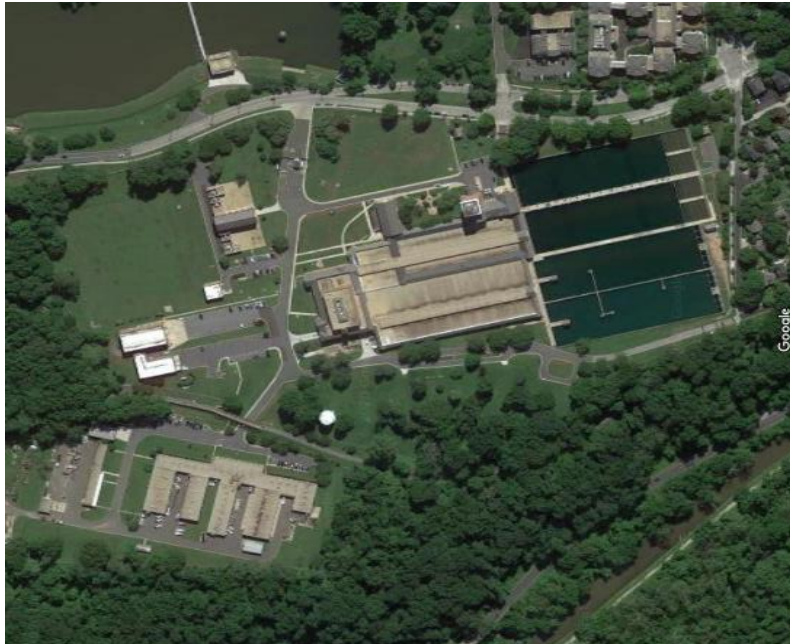


Original construction 1927

Major Expansions in the 1950s and 1960s

Average daily water production – 135 MGD

Total land - 46 acres





Residuals Disposal



In September 2012, ceased discharge of residuals to the Potomac River as required by NPDES Permit.





Georgetown Sedimentation Basins



Provides sedimentation for the
McMillan Plant

Historic part of the Washington
Aqueduct's original infrastructure





McMillan Plant



Operational in 1908 using slow sand filter technology.

Reconstructed in 1985 as a rapid sand filtration plant.



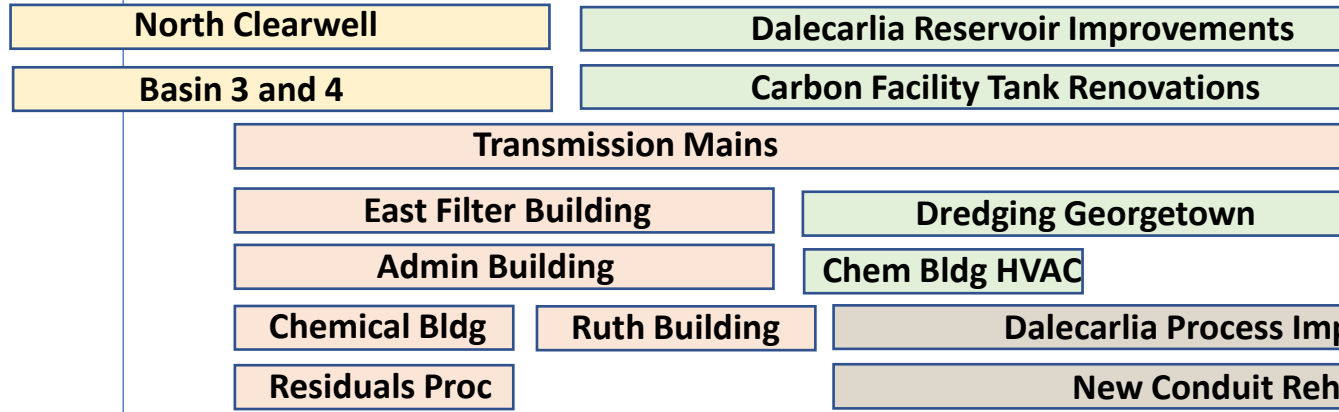
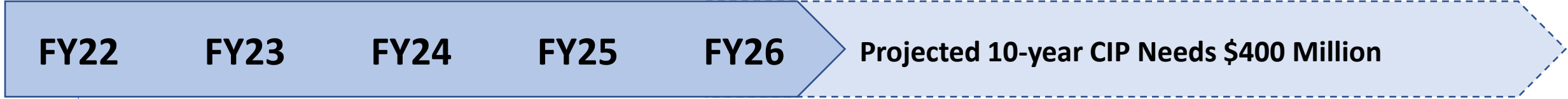
Average daily water production – 60 MGD
with maximum production at 120 MGD

Total land - 38 acres





Capital Improvement Program (CIP)



McMillan Backwash Pump
SCADA Improvements
Georgetown Reservoir
Underground Storage Tank

FY22 O&M Priorities
McMillan Backwash Pump
Underground Storage Tank
Replacement (with aboveground)
Overhaul Human Machine
Interface (HMI) SCADA

Asset management driven capital planning
Predictable and synchronized execution
Infrastructure Life Cycle Management
Consequence and Risk Management



Design Opportunities



Full-Service A/E Contracts
Infrastructure Assessment and Redesign
Planning Document Production
Emergency Assessment and Repair
Facilities Upgrade and Rehabilitation



Current \$13M A-E IDIQ expires Fall 2022

- Unrestricted Businesses – Existing Contracts
 - ARCADIS - 5 year / \$4.0M contract
 - Jacobs - 5 year /\$4.0M contract
- Small Businesses
 - Nova Consulting Inc. - 5 yr./\$2.5M contract
 - River to Tap (R2T) - 5 yr./\$2.5M contract



Upcoming A-E IDIQ for combined Multiple Awards up to \$35M



Construction Opportunities



Instruments Addressing Urgent Needs

- **Mechanical SATOC – Unrestricted (\$5-10M)**
 - Chiller replacement
 - McMillan Backwash Pump
 - Pump station drain line replacement
- **Civil SATOC – Small Business (\$5-10M)**
 - Forebay crane pad
 - Forebay driveway
 - Shed for Operations
- **Emergency Water Main Break Repair**
(expires Spring 2022) – 8A (\$2M)





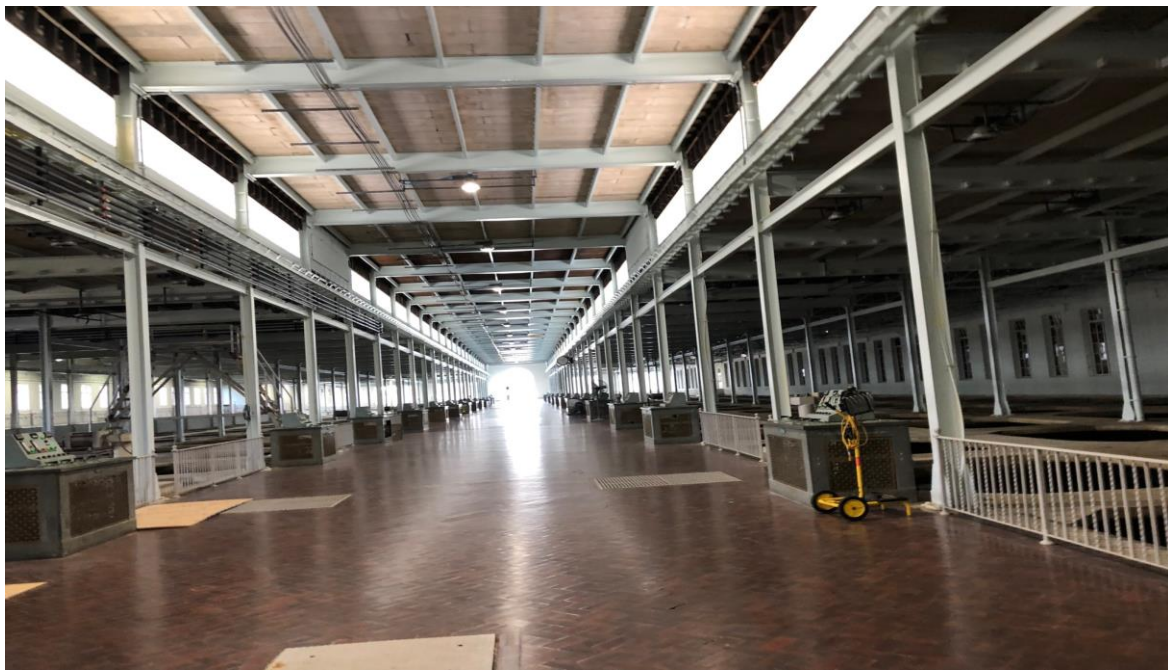
Service Opportunities



Proactively instituting standing task order capability to enable efficient and expedient execution of work across all aqueduct infrastructure plant and facilities.

- Reservoir Cleaning Contract
- Pump Service Contract
- HVAC Service Contract
- Centrifuge Service Contract
- Dredge Service Contracts



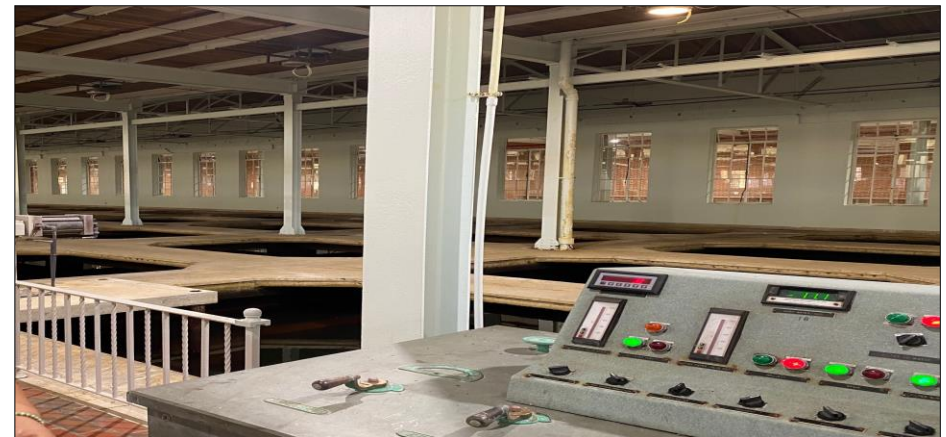


Projects in Planning



East Filter Building Upgrades

- Structural Repairs
- Control System Upgrades
- Filter Underdrain Improvements
- Replenishing Lost Filter Media
- HVAC System and Ventilation Improvement
- Comprehensive Electrical Upgrades Including feeders, circuit breakers, lighting and UPS system installation



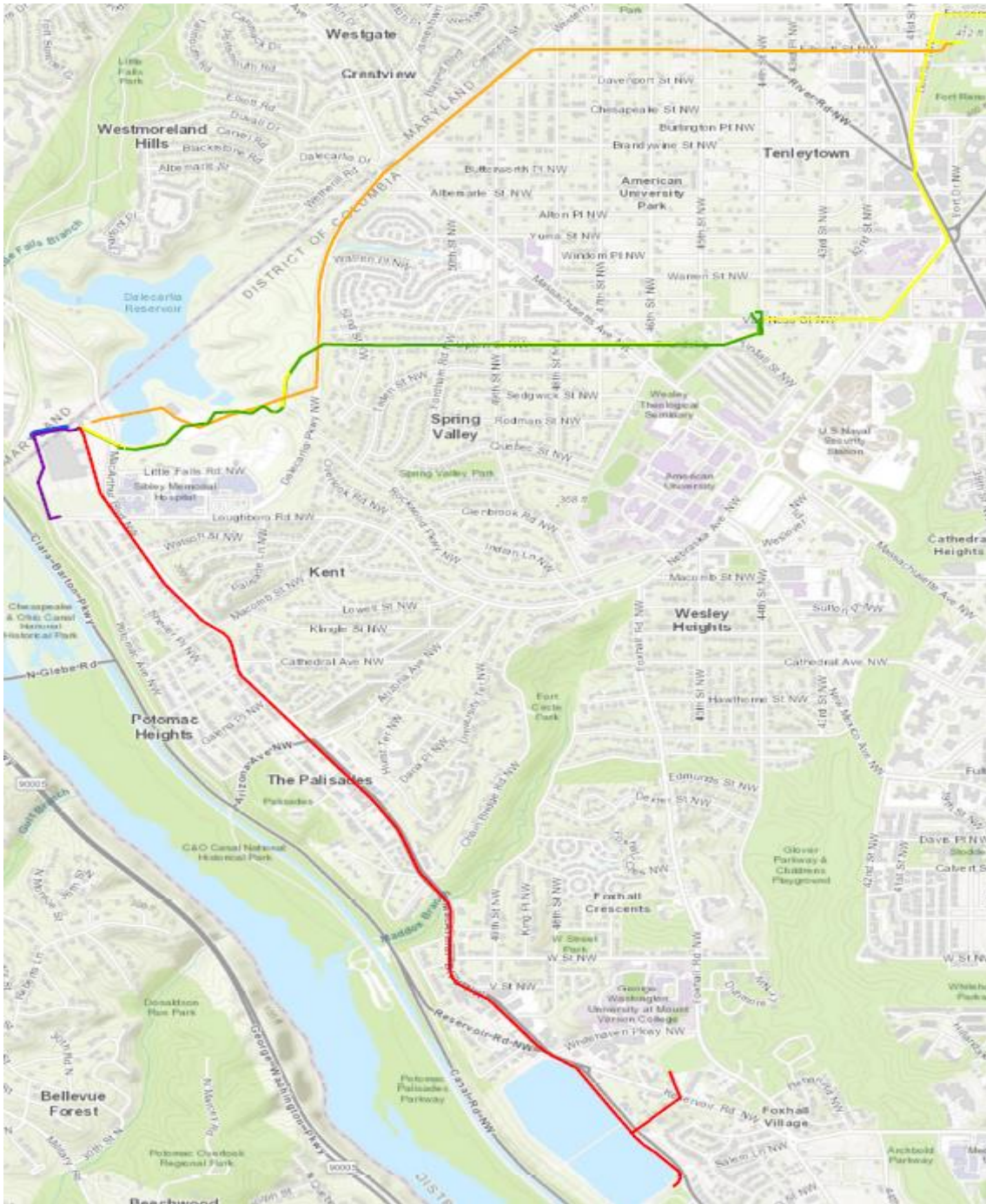
* The filter media was last replaced in 1997.

Projects in Planning

Transmission Mains



- 10.4 miles of 36"-72" transmission mains
- Aging infrastructure lines 60-88 years old
- Serving 4 pressure zones
- 50% of valves require repair/replacement
- Next step - non-destructive testing to identify leaks and pipe wall condition





Projects in Planning

Administration Building

New Building and Possible Extension

Facilities Rehabilitation

Upgrade HVAC system

Structural Improvement and Repair

Design planned for FY23 and
beginning construction in FY24





Projects in Design

Dalecarlia Basins 3 & 4

Flocculation/Sedimentation Improvements



Overhaul of Original Flocculation and Sedimentation Systems

Upgrade Electric and Cathodic Protection Systems to improve reliability and operation

Upgrade existing residuals vacuum collector systems

Replace the wash water flushing system in each basin

Construction expected to start in FY23





Projects in Design

Old Conduit Repairs



Old Conduit conveys raw water from Potomac River in Great Falls to Dalecarlia Reservoir

Constructed in 1850s of various materials – rock, brick and mortar, concrete

- Scope includes
 - Shotcrete sections in poor condition
 - Carbon Fiber Wrap
 - Traffic protection barrier
 - Potential gate replacement

Expected construction start – Q1 FY23





Projects in Design

North Clearwell Replacement



Demolition and construction of 15 MG Gatehouse and Clearwell

Existing 612' x 162' underground structure is 25' deep and built in 1904

Constructed using un-reinforced concrete

Areas of structural instability due to numerous cracks in the roof structure

Construction to start in FY24





Projects in Construction

Georgetown Reservoir Building Improvement



Renovation of Five Structures:

Influent Gatehouse
Circular Platform
Meigs Vault

Constructed in the 1850s

West Shaft Gatehouse
Castle Gatehouse

Constructed around 1900



Renovations include architectural, structural, electrical, mechanical and civil upgrades

The Castle Gatehouse is listed on the US National Register of Historic Places



Projects in Construction



Dalecarlia Clearwell Maintenance & Improvement

Project addresses EPA Sanitary Survey deficiencies in 15MG and 30MG clearwells

- Mechanical improvements to and rehabilitation of sluice gates
- Waterproof membrane installation
- Drainage chamber, valve and structural modifications
- New multi-path acoustic flow meter for ammonia feed

Extensive outage coordination with other planned and ongoing construction projects





Projects in Construction



McMillan Backwash Discharge and Sewer

Construction of concrete equalization basins and a pumping station

Collects and control filter backwash water and discharge it to the DC combined sewer system or into the equalization basins.

Specific work items include:

- Supply and installation of large pipes and appurtenances
- Chemical addition unit
- Two equalization basins, submersible pumps, VFDs, and associated equipment
- Pipes, flow meters, and flow control valves





Projects in Construction

Third High Reservoir Maintenance and Improvement



Upgrades and improvements to water service reservoir per EPA Sanitary Survey requirements

- Demolition and replacement of the Influent and Effluent Control Buildings
- Replacement of the water sampling system
- Replacement of control valves and associated components,
- Upgrade of the reservoir drain line with a pressurized manhole and airgap
- Repair of reservoir expansion joints

Requires outage coordination with other construction projects



Strategic Initiatives



Systems & Processes

Asset Management Strategy
New Integrated CIP Prioritization
Proactive Acquisition Strategy

People

New recruitment and retention strategy
Succession Planning Building the Bench
Credentialing and Certification

Future Planning

Participate in Regional Master Planning
Upgrade Plants to Advanced Treatment





Modernization and Resilience



Raw Water Source Resiliency

- The Potomac River is the sole source of raw water of the Washington metropolitan area.
- Upstream reservoirs can augment capacity in drought; local reservoirs are used daily.
- The Interstate Commission on the Potomac River Basin (ICPRB) explored numerous options to augment future supply, including structural and operational alternatives.
- Structural alternatives require significant investment, comprehensive study, design and construction of a secondary source.

Travilah Quarry ICPRB retained Black and Veatch to study the Travilah Quarry, finding it suitable to serve as a reservoir with expansion options based on mining plans and ultimate capacity available after 2060.

Climate Change U.S. Geological Survey (USGS) models project rising temperatures, and rise and fall in precipitation. Uncertainty in water supply planning requires continual study to improve system performance and long-term resiliency.



Questions and Discussion

