PRINCE WILLIAM WATER

Your Water • Your Environment • Our Mission

Water Supply Briefing:

Prince William County Sustainability Commission

- December 16, 2024

Agenda

1. Overview
2. Water System Results
3. Sewer System Results
4. Water Reuse Considerations
5. Water Supply Resiliency

Presenter

Don Pannell, P.E.

Deputy General Manager/COO

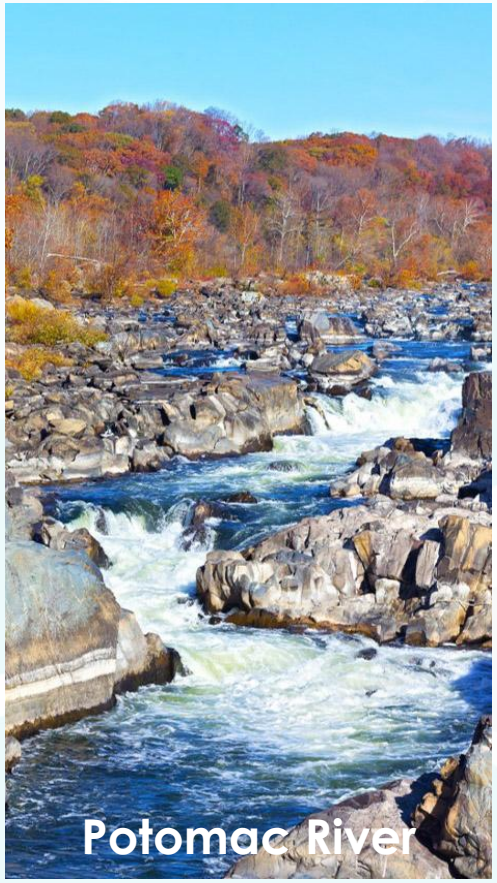
Prince William Water

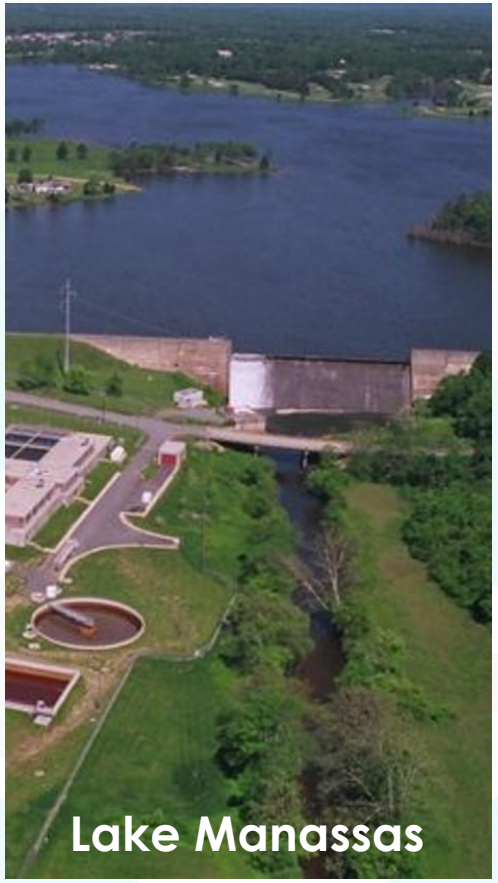
Prince William Water

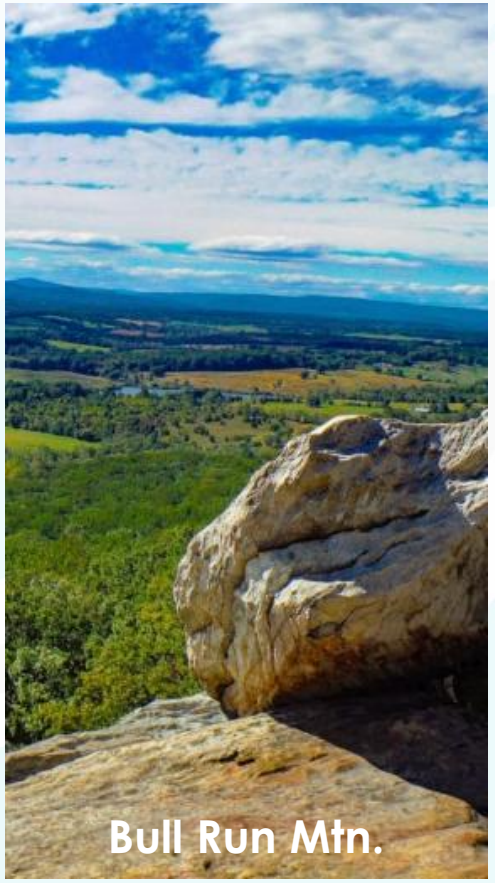
Prince William Water **protects public health** and the **environment** by reliably providing **clean, safe** and **dependable** water and wastewater reclamation services to our community.

We serve approximately 380,000 people across Prince William County.

Our Water Sources





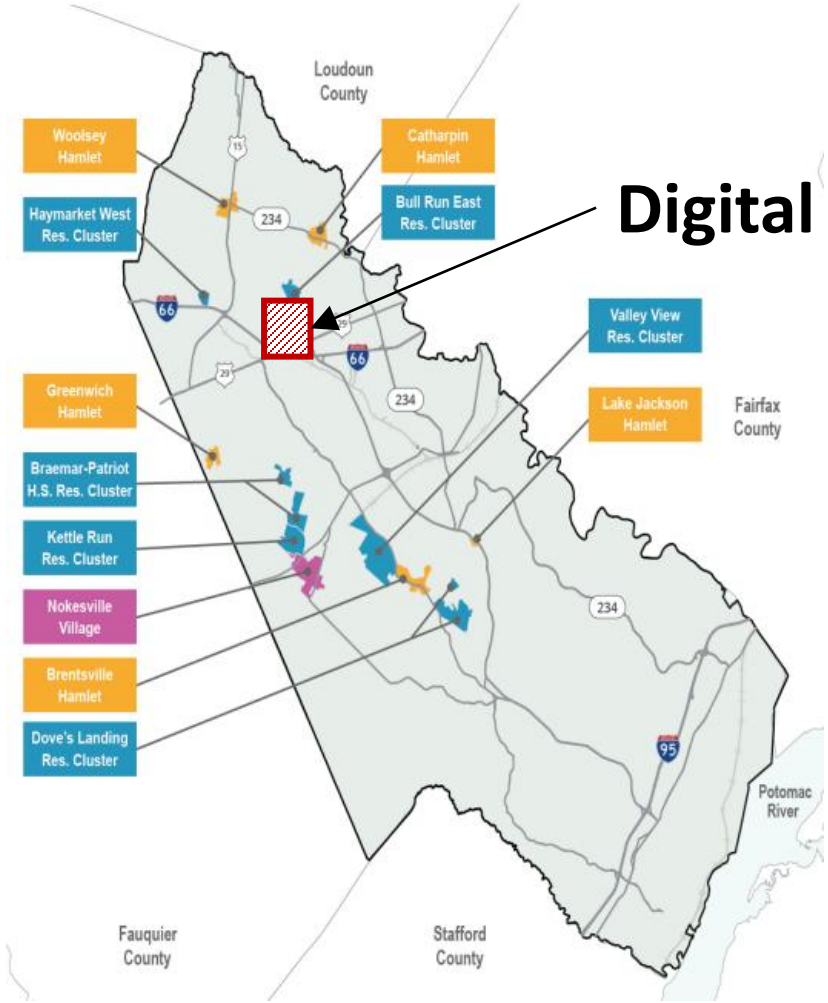


Fairfax Water
62.4 MGD

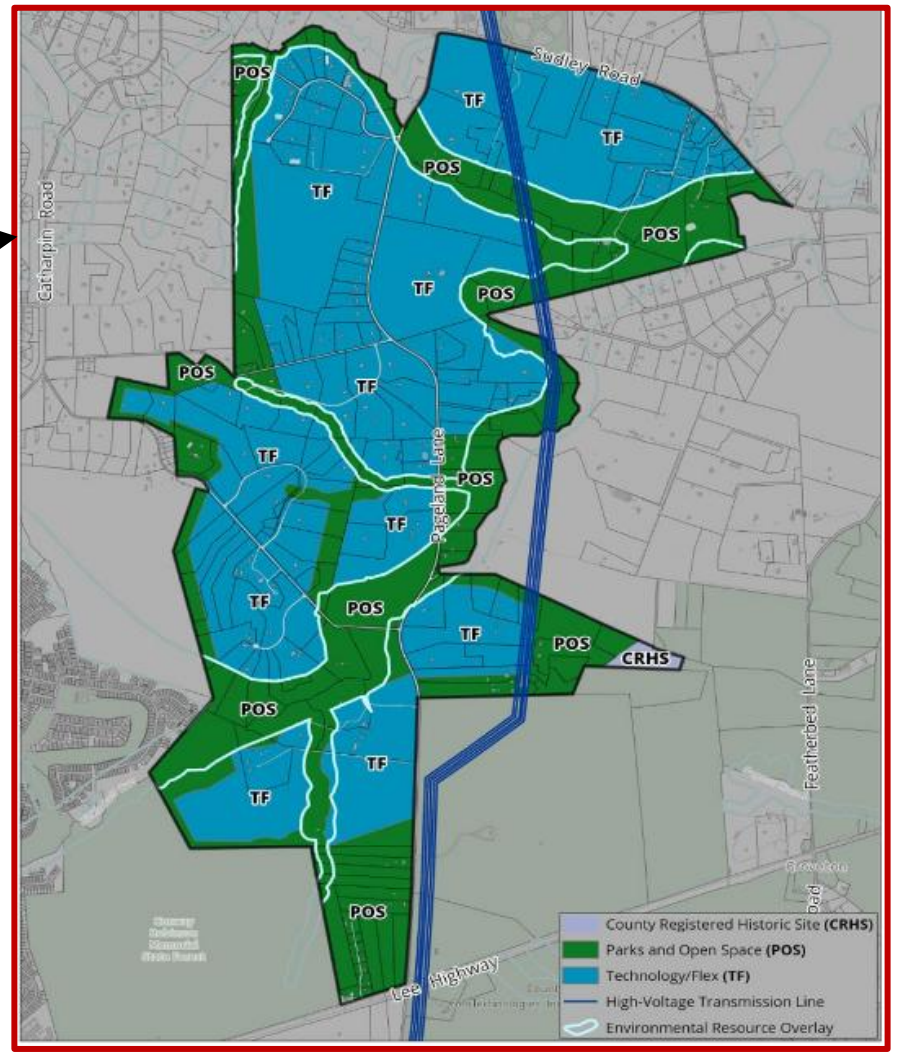
City of Manassas
5.0 MGD

Bull Run Mtn. Wells
0.4 MGD

Area Overview



Digital Gateway



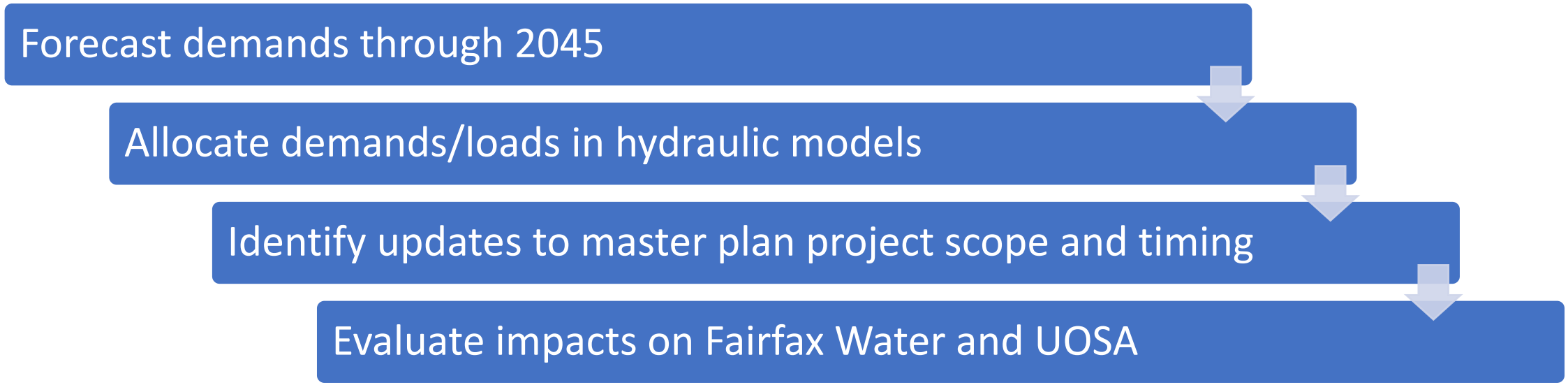
Land Use Chapter Updates

Digital Gateway CPA

Analysis Overview

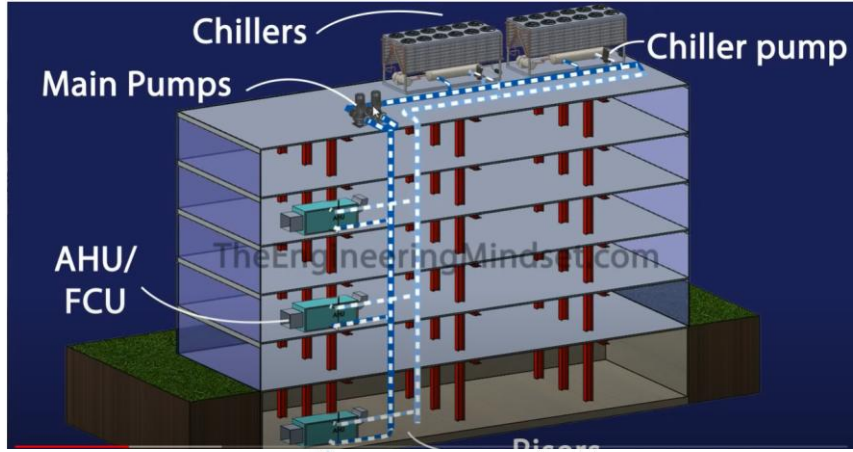
Objective: Evaluate impact to system and required capital improvement plan (CIP) projects due to new data center and rural development demands

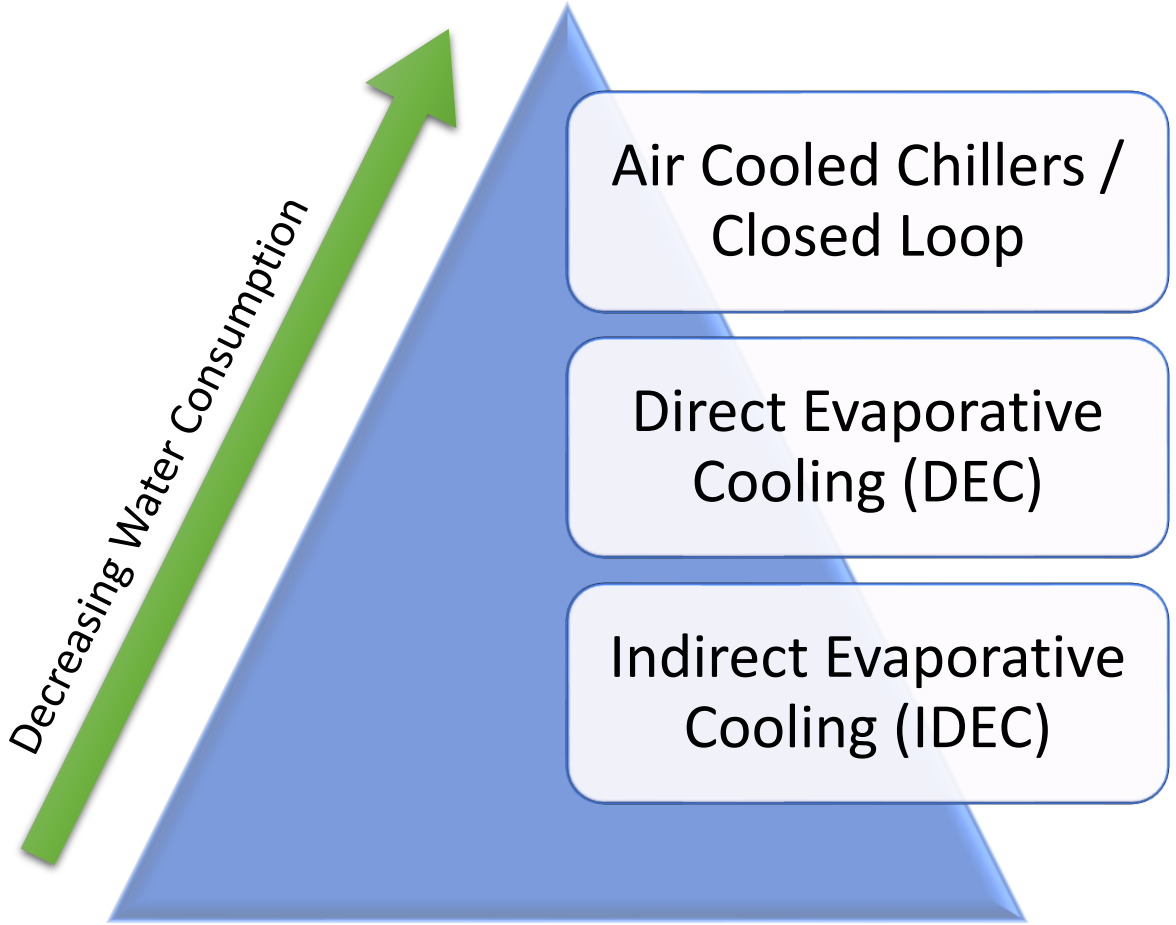
Methodology:

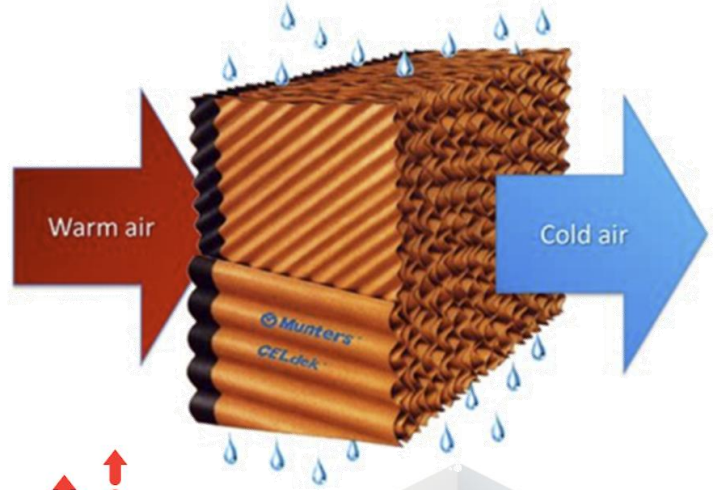


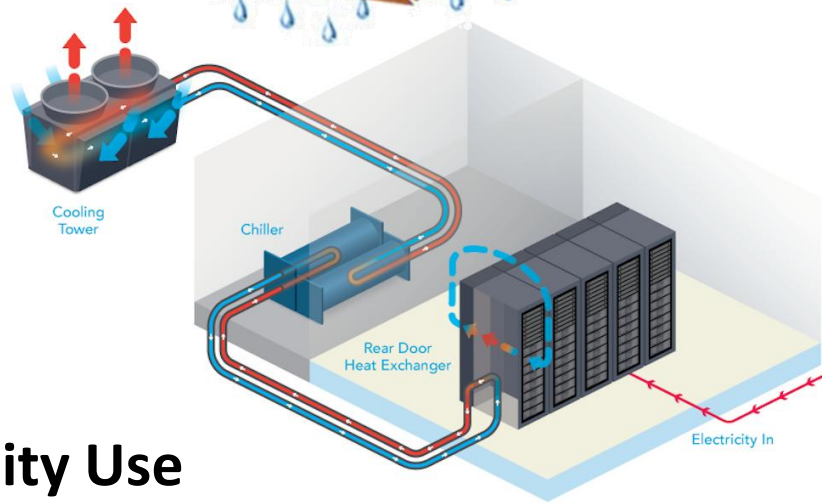
Water System

Data Center Technology



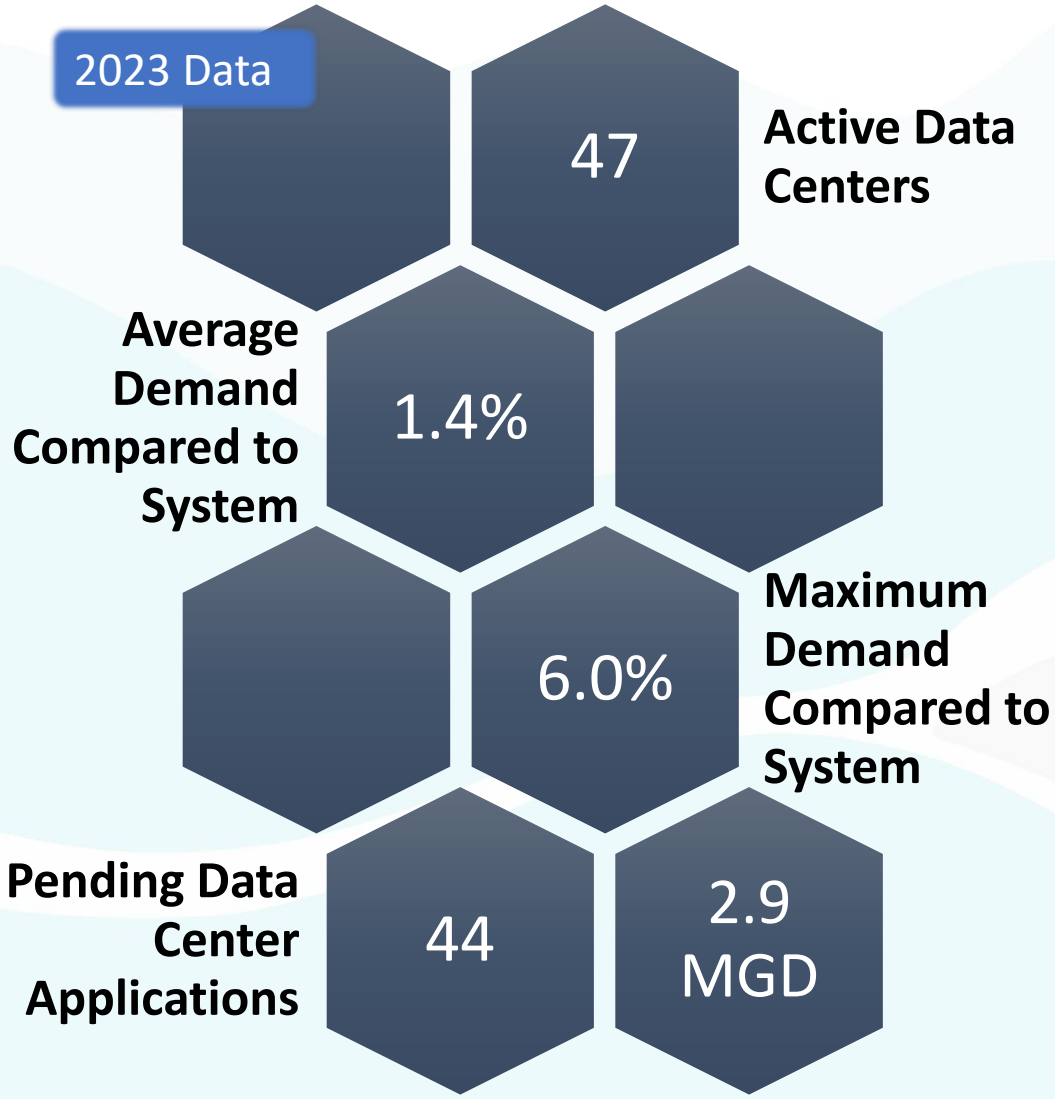






Tradeoff between Water Use and Electricity Use

Data Centers in Prince William County

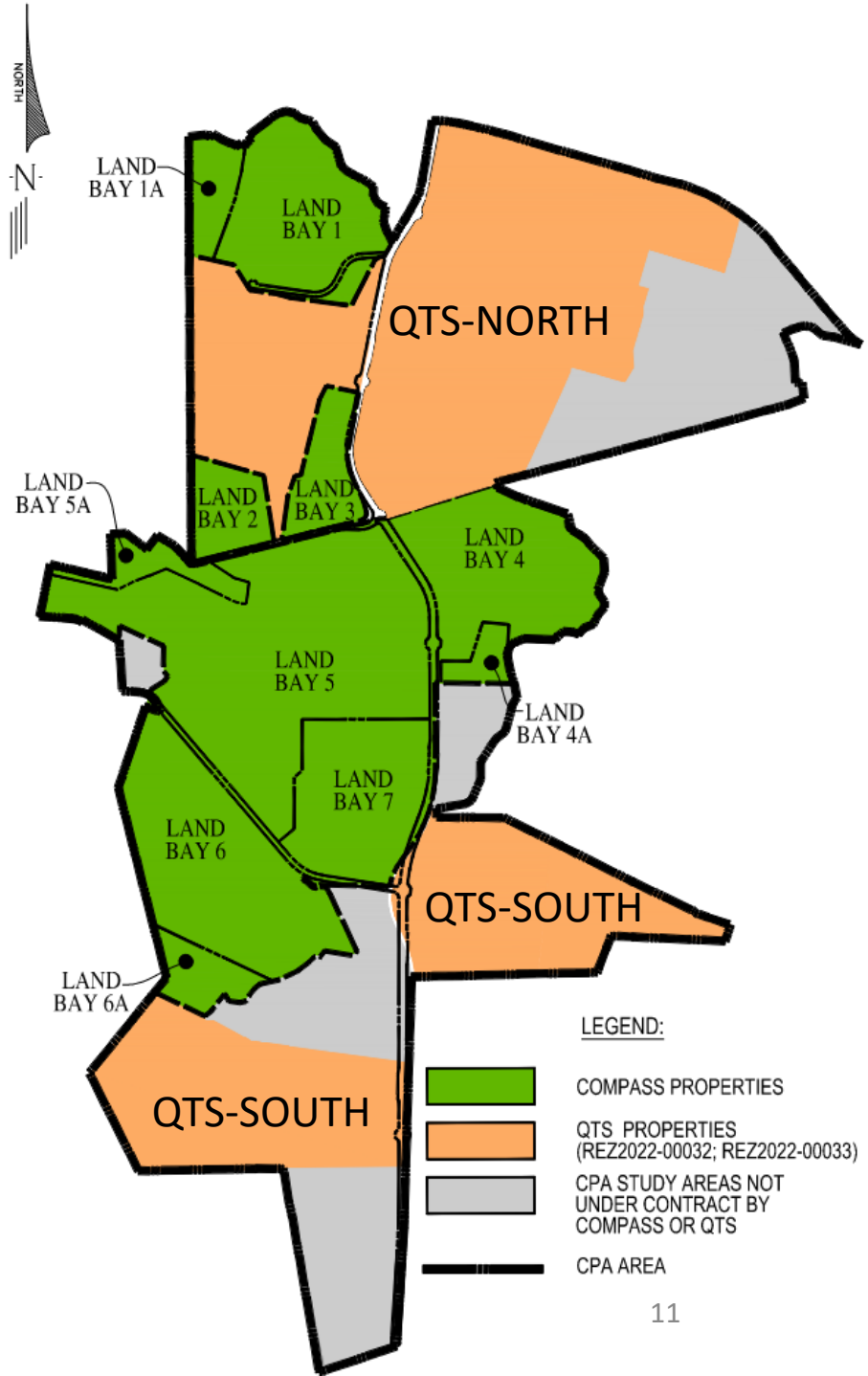


- Selected cooling technology drives water needs
- Data Center diurnal demands differ from residential diurnal demands

Digital Gateway Rezoning

Section	Area (ac)	Open Space (ac)	Buildable Area (ac)	Floor Area Ratio (FAR)
QTS-North	534	189	345	0.30
QTS-South	342	184	158	0.25
Compass	868	382	486	0.30
Other	395	395	0	--
	2,139	**1,150**	**989**	

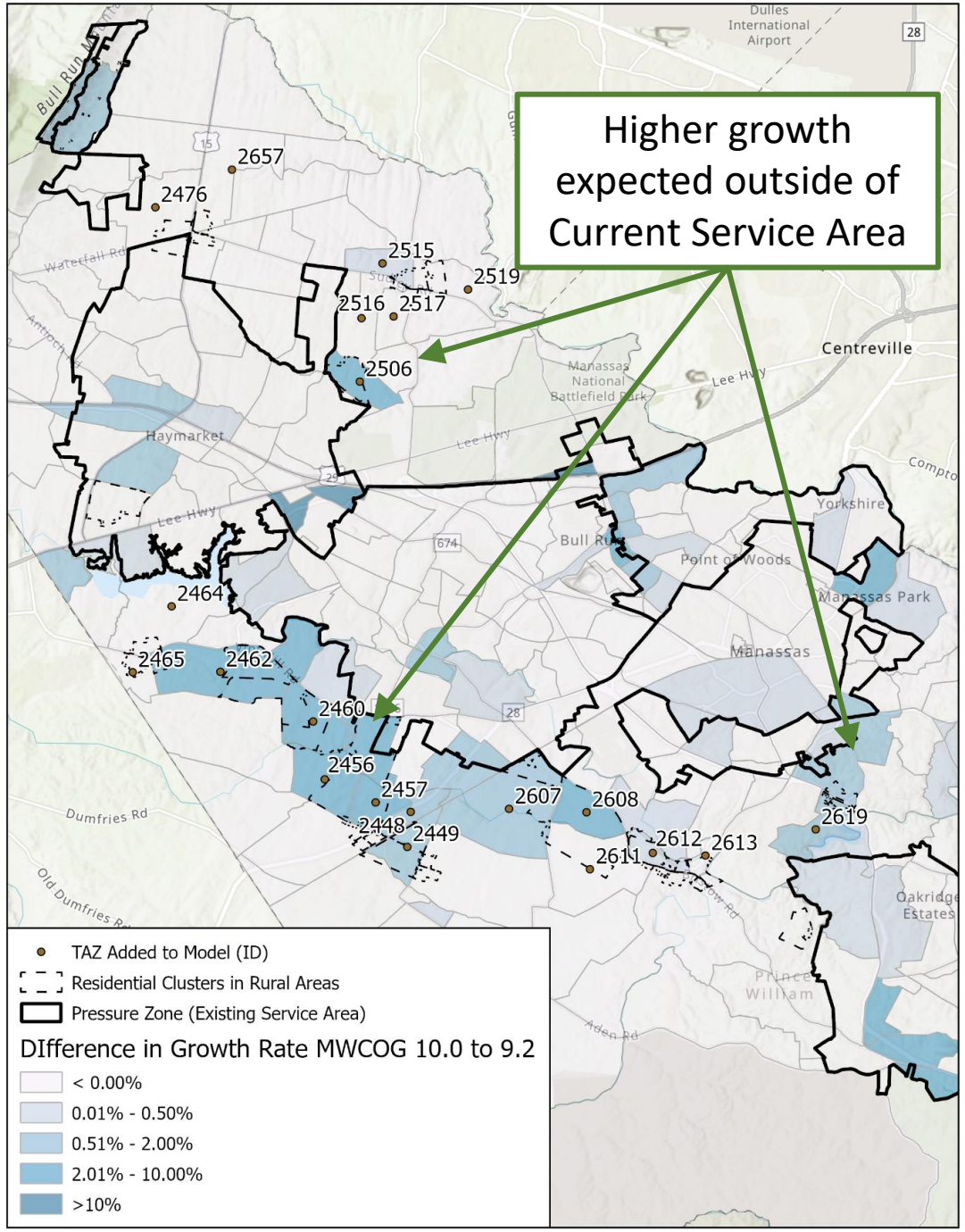
- QTS has proffered closed-loop/air cooling
- Water demand may be lower than previously expected



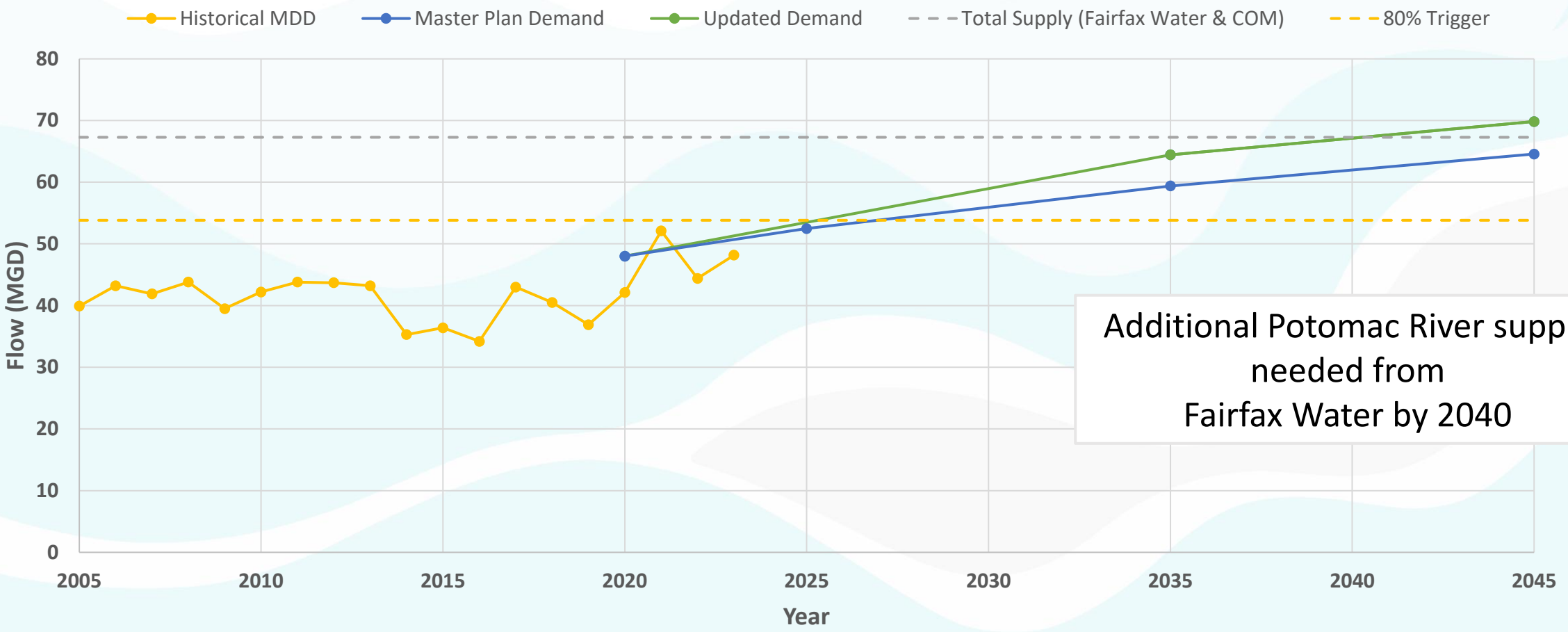
Rural Demands

- Increase in annual growth rate from WMCOG* shows higher projections in residential clusters
- 1.25 MGD added on 2045 MDD (0.75 MGD ADD)
- Most demand falls within Gainesville-Wellington

**Metropolitan Washington Council of Governments*



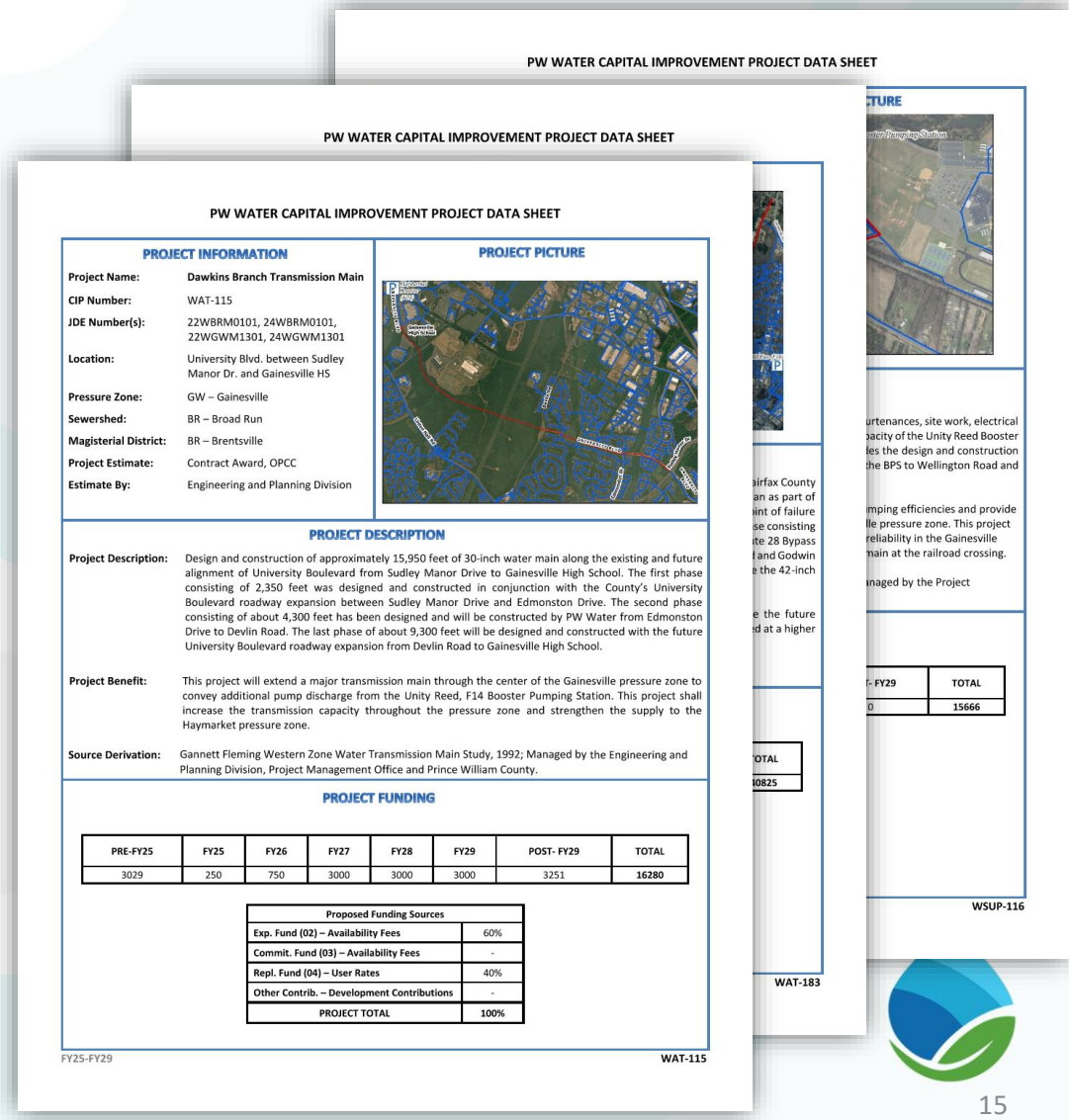
Key Takeaways – Water Supply



Additional Potomac River supply needed from Fairfax Water by 2040

Key Takeaways – Water Transmission

- Adequate pumping capacity into Haymarket
- Necessary improvements are currently part of the FY25-29 CIP
  - Need to complete improvements at Unity Reed (WSUP 116)
  - Transmission mains needed
    - Between MS-23 (Fairfax Water) and Unity Reed (WAT-183)
    - Between Unity Reed and Haymarket Booster (WAT-115)



PW WATER CAPITAL IMPROVEMENT PROJECT DATA SHEET

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PROJECT INFORMATION

Project Name:	**Dawkins Branch Transmission Main**
CIP Number:	WAT-115
JDE Number(s):	22WBRM0101, 24WBRM0101, 22WGWM1301, 24WGWM1301
Location:	University Blvd. between Sudley Manor Dr. and Gainesville HS
Pressure Zone:	GW – Gainesville
Sewershed:	BR – Broad Run
Magisterial District:	BR – Brentsville
Project Estimate:	Contract Award, OPCC
Estimate By:	Engineering and Planning Division

PROJECT PICTURE

PROJECT DESCRIPTION

Project Description: Design and construction of approximately 15,950 feet of 30-inch water main along the existing and future alignment of University Boulevard from Sudley Manor Drive to Gainesville High School. The first phase consisting of 2,350 feet was designed and constructed in conjunction with the County's University Boulevard roadway expansion between Sudley Manor Drive and Edmonston Drive. The second phase consisting of about 4,300 feet has been designed and will be constructed by PW Water from Edmonston Drive to Devlin Road. The last phase of about 9,300 feet will be designed and constructed with the future University Boulevard roadway expansion from Devlin Road to Gainesville High School.

Project Benefit: This project will extend a major transmission main through the center of the Gainesville pressure zone to convey additional pump discharge from the Unity Reed, F14 Booster Pumping Station. This project shall increase the transmission capacity throughout the pressure zone and strengthen the supply to the Haymarket pressure zone.

Source Derivation: Gannett Fleming Western Zone Water Transmission Main Study, 1992; Managed by the Engineering and Planning Division, Project Management Office and Prince William County.

PROJECT FUNDING

PRE-FY25	FY25	FY26	FY27	FY28	FY29	POST- FY29	TOTAL
3029	250	750	3000	3000	3000	3251	**16280**

Proposed Funding Sources	
Exp. Fund (02) – Availability Fees	60%
Commit. Fund (03) – Availability Fees	-
Repl. Fund (04) – User Rates	40%
Other Contrib. – Development Contributions	-
PROJECT TOTAL	100%

FY25-FY29 WAT-115

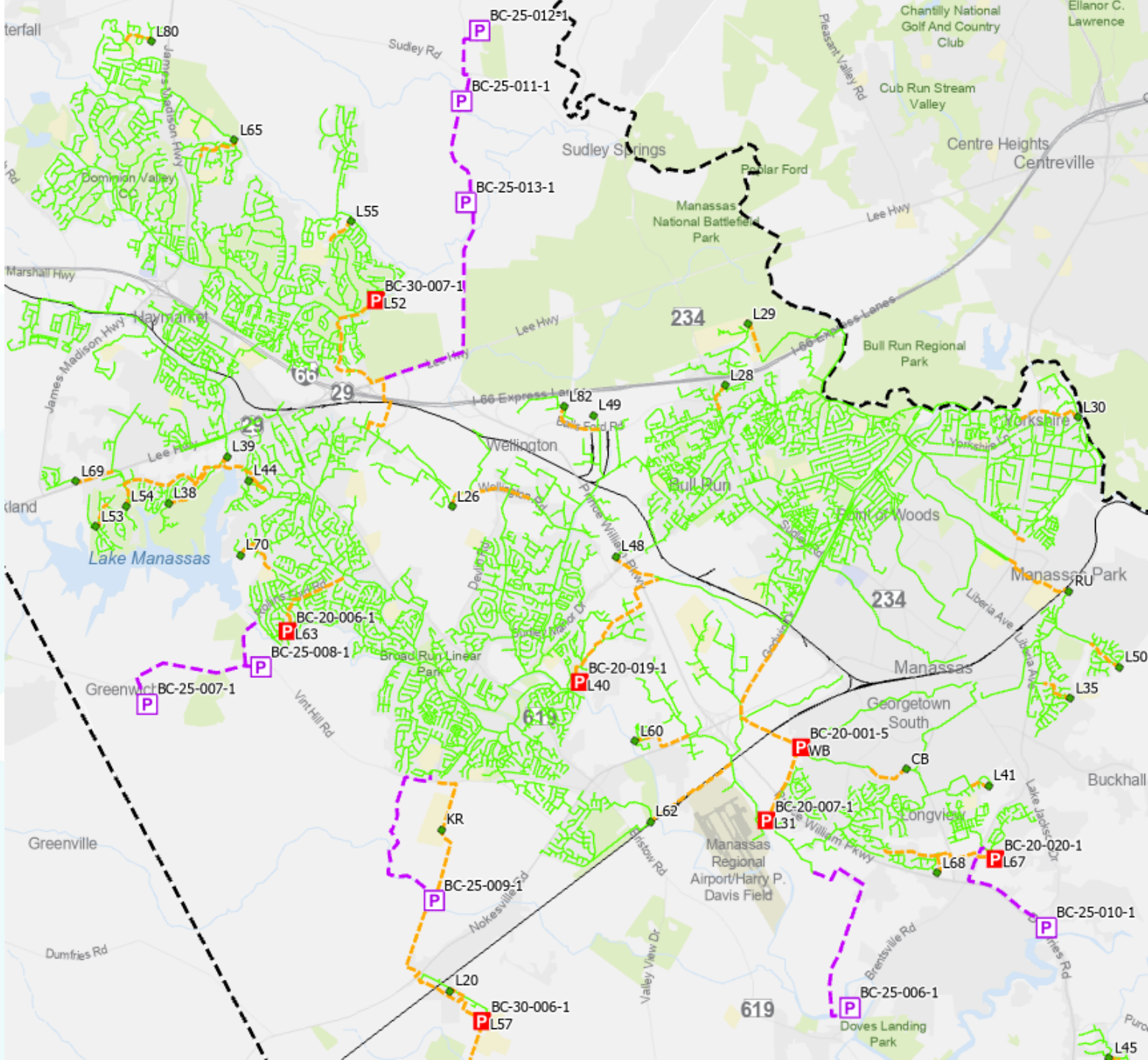
WAT-183

WSUP-116

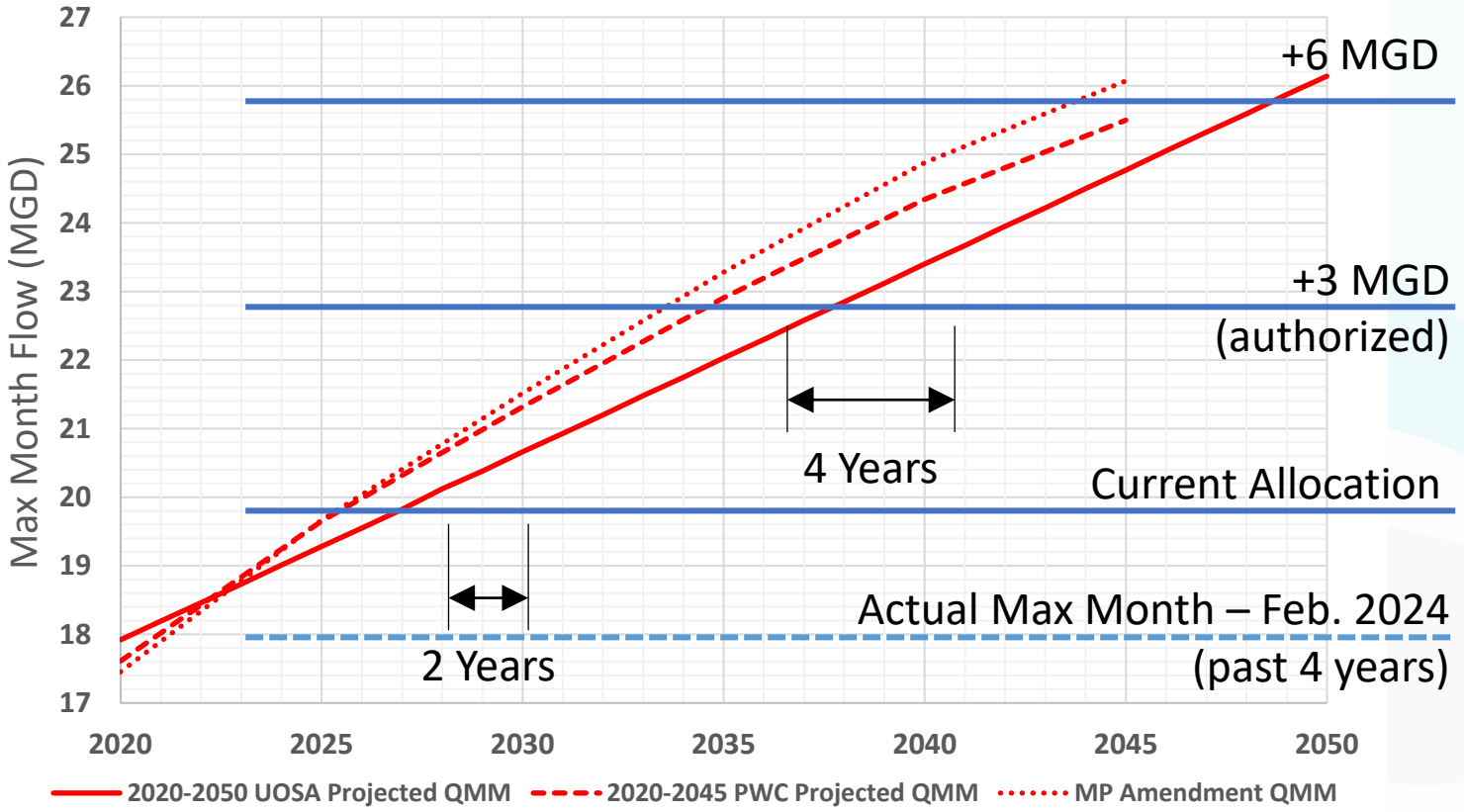
Sewer Analysis

Lift Station & Force Main Improvements

- 7 lift station projects were affected
  - Increased capacity
  - Timing
- 8 new lift stations added to the plan
- Associated force mains and gravity mains affected



Key Takeaways – UOSA Flow Allocation

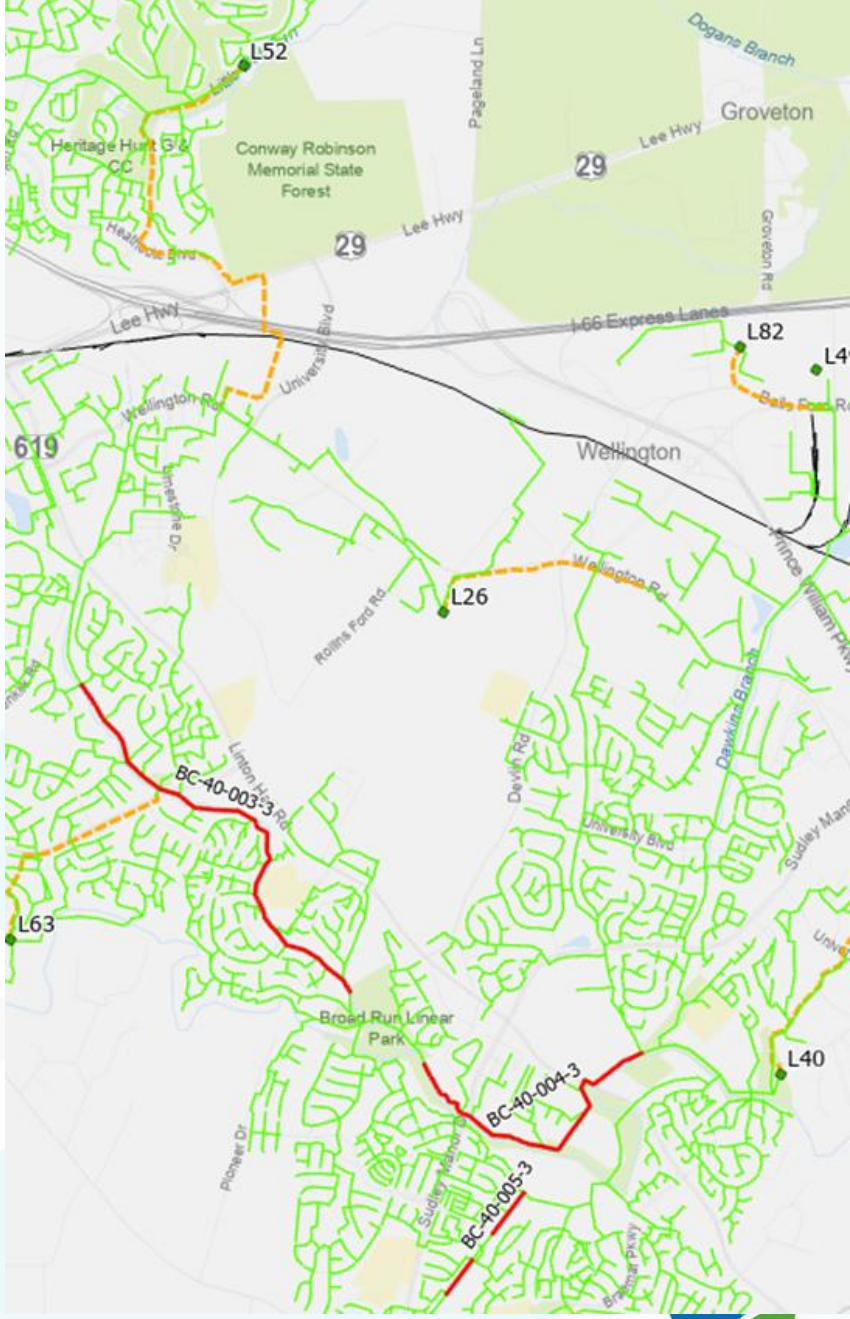


- Timing of UOSA flow allocation affected by increased discharge*
- Initial 3 MGD already authorized
- UOSA Re-rating study is underway and could impact allocations
- Further action not required at this time

**Assumes timing of Digital Gateway and rural areas in the short-term. Actual timing will vary.*

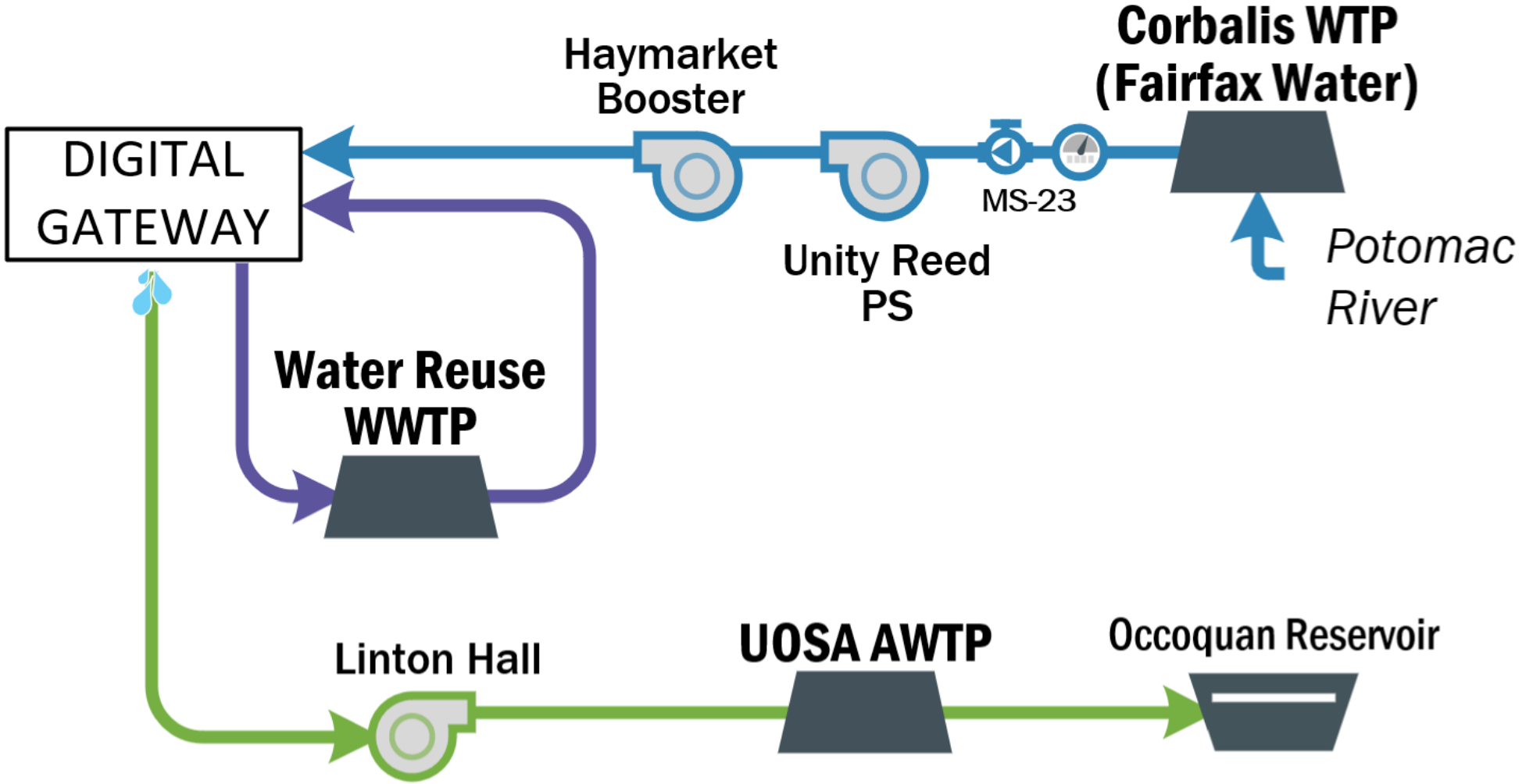
Key Takeaways – Sewer Collection

- New rural developments and the Digital Gateway contribute to additional collection system and pump station improvements under current loading assumptions
- Participation from development community is critical
- Monitor development activity for timing of collection system and pump station improvement triggers



Water Reuse Considerations

Water Reuse Conceptual Overview



Key Takeaways – Digital Gateway Water Reuse

- Currently, BC sees limited value in pursuing a water reuse option for the Digital Gateway

Feasible from a regulatory perspective, but will require significant coordination with UOSA

Limited revenue potential from a highly-variable waste stream from the Digital Gateway

County guidance encouraging lower water use and therefore limiting the available recycle feed

Water reuse is a viable technology that could be employed in different scenarios

In Summary

Water

- Sufficient water capacity available from Fairfax Water
- Continue execution of transmission improvements in the CIP

Sewer

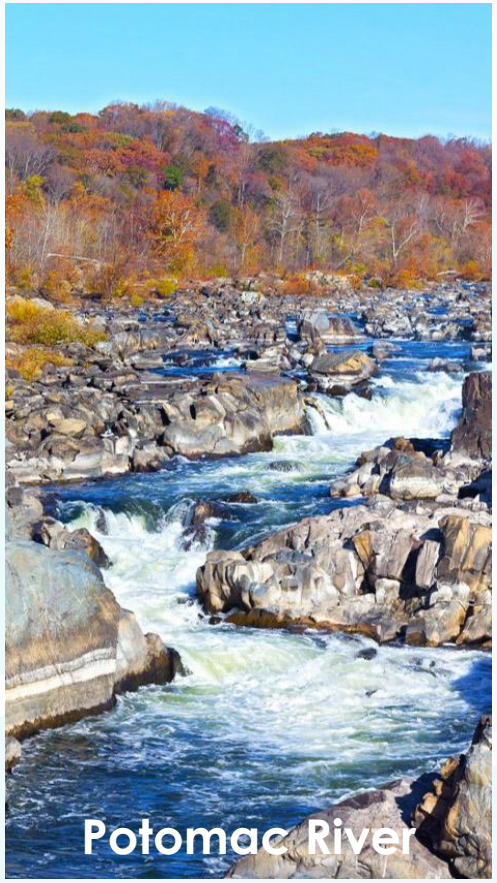
- Monitor development activity to align with timing of sewer improvements

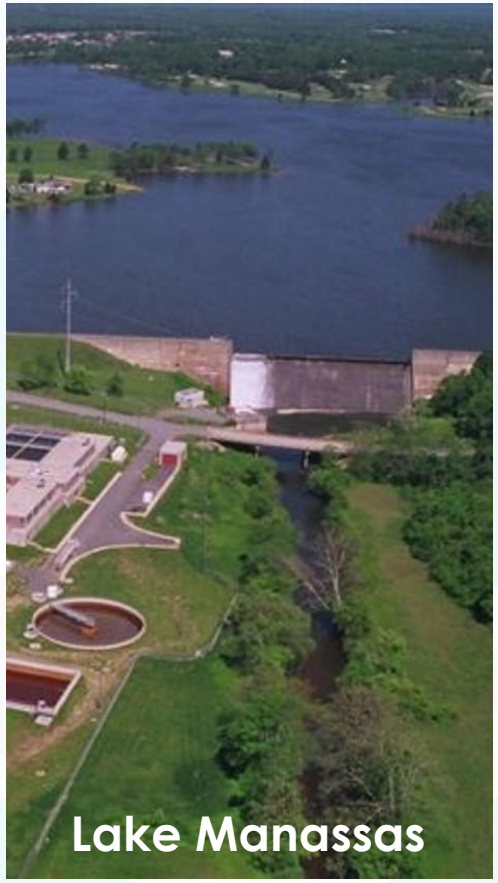
Water Reuse

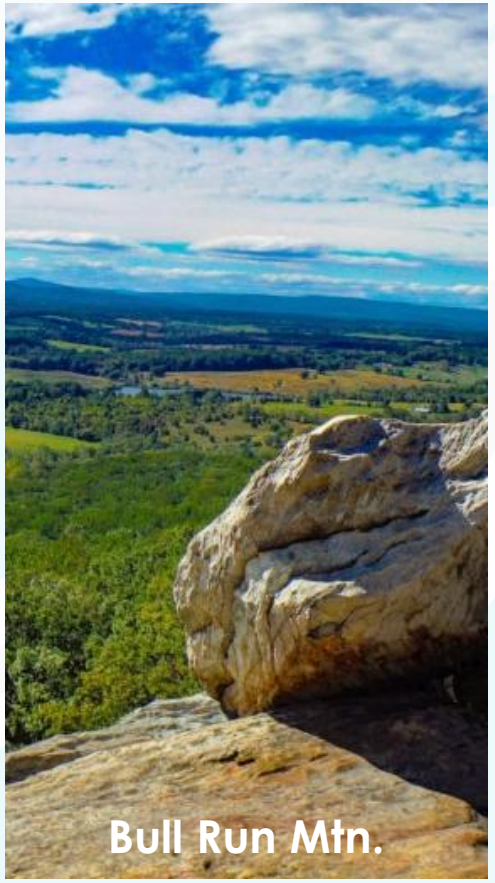
- Continue to consider viable options

Water Supply Resiliency

Our Water Sources







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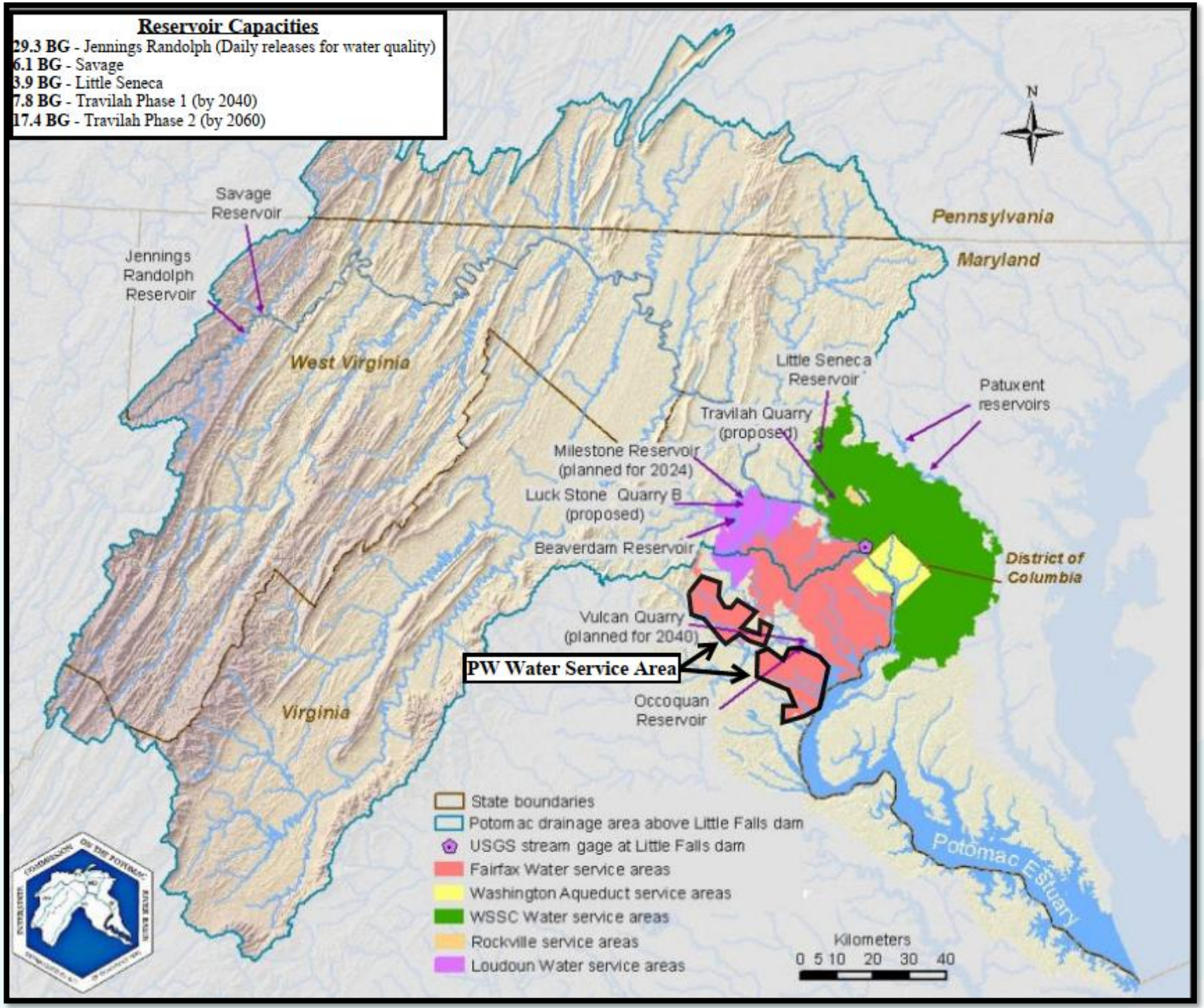
Reservoir Capacities
29.3 BG - Jennings Randolph (Daily releases for water quality)
6.1 BG - Savage
3.9 BG - Little Seneca
7.8 BG - Travilah Phase 1 (by 2040)
17.4 BG - Travilah Phase 2 (by 2060)
N
Savage Reservoir
Jennings Randolph Reservoir
Pennsylvania
Maryland
West Virginia
Little Seneca Reservoir
Patuxent reservoirs
Travilah Quarry (proposed)
Milestone Reservoir (planned for 2024)
Luck Stone Quarry B (proposed)
Beaverdam Reservoir
District of Columbia
Vulcan Quarry (planned for 2040)
PW Water Service Area
Occoquan Reservoir
Virginia
Potomac Estuary
State boundaries
Potomac drainage area above Little Falls dam
USGS stream gage at Little Falls dam
Fairfax Water service areas
Washington Aqueduct service areas
WSSC Water service areas
Rockville service areas
Loudoun Water service areas
Kilometers
0 5 10 20 30 40

- Occoquan Source benefits from indirect potable reuse
- Vulcan quarry will bolster Occoquan drought resilience
- Potomac River system managed by ICPRB (Interstate Commission on the Potomac River Basin)
  - https://www.potomacriver.org/focus-areas/water-resources-and-drinking-water/cooperative-water-supply-operations-on-the-potomac/long-term-planning/
- Strong resilience due to upstream reservoirs
- Travilah needed to meet needs under most severe climate change assumptions

Discussion