

Anne Arundel County Clean Water Program

# Presentation for Metropolitan Washington Council of Government

March 10, 2023

**Our wAAter.**



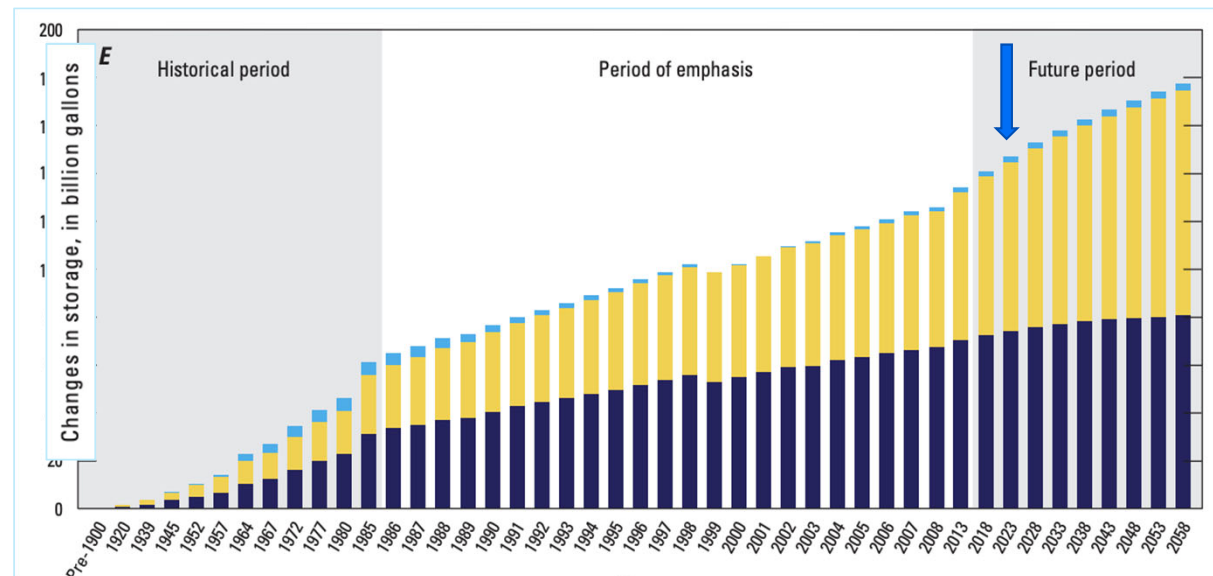
# Our wAAter Program

5 initiatives | one strategy



# Why is AA County Concerned About Long-Term Water Sustainability?

- All water use in AA County is groundwater – water withdrawals greater than recharge (all treated wastewater is returned to surface waters)
- AA County is largest user of groundwater in the State
- Other jurisdictions are experiencing groundwater shortages
- Confining unit is being depleted
- Protection from land subsidence



Source: *Assessment of Groundwater Availability in the Northern Atlantic Coastal Plain Aquifer System From Long Island, New York, to North Carolina, Professional Paper 1829, USGS, 2016*

#### EXPLANATION

- Surficial aquifer depletion
- Surficial aquifer replenishment
- Confining unit depletion
- Confining unit replenishment
- Confined aquifer depletion
- Confined aquifer replenishment

# County Aquifers

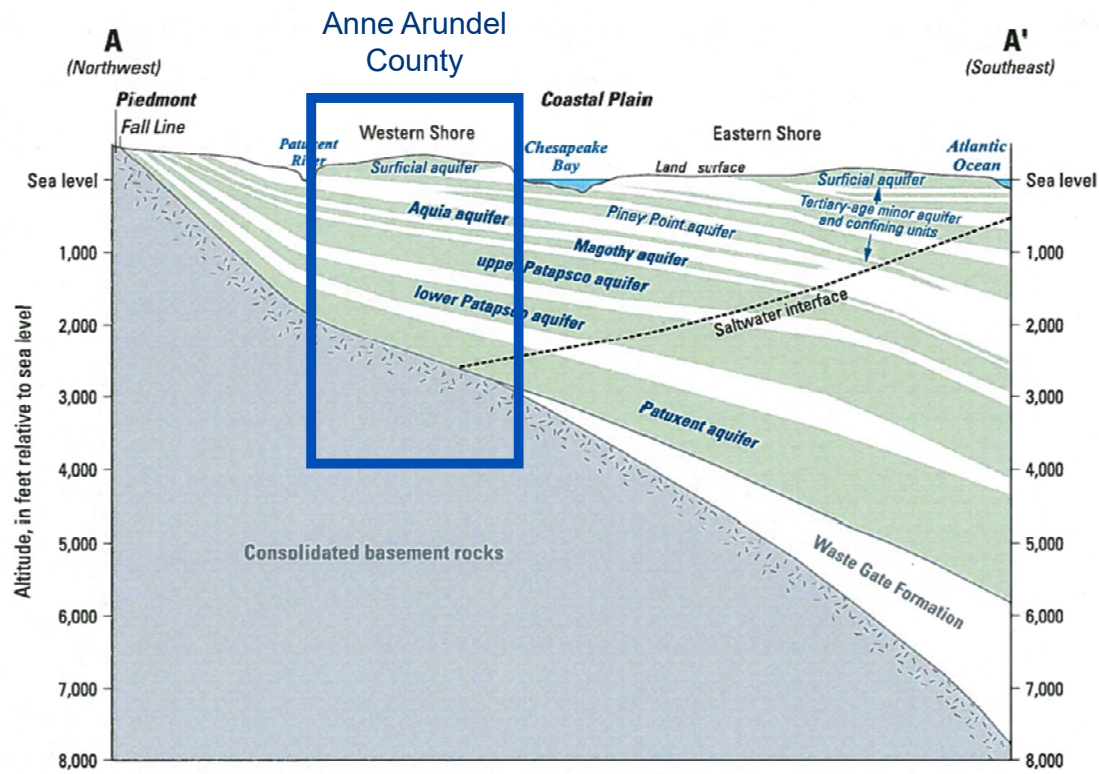


Figure 2-3  
Cross Section A - A'  
Anne Arundel County, Maryland

ch2m

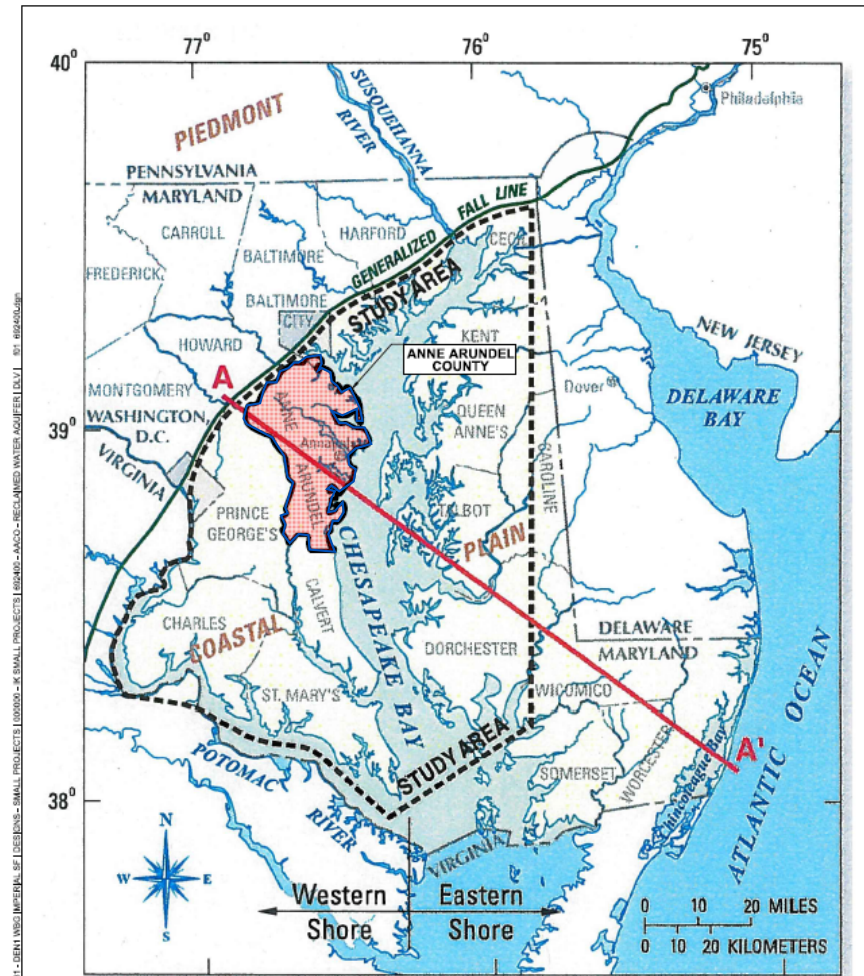


Figure 2-1  
Location Map Showing  
Anne Arundel County  
and Section Line A - A'  
Anne Arundel County, Maryland

ch2m

# What does long-term sustainability look like?

- No imminent shortfall for Anne Arundel County
  - Others in Coastal Plain Aquifer have experienced shortfalls
- Support sustainable aquifer now and for generations to come
- Impacts go beyond declining aquifer levels:
  - Declining freshwater inflows to Chesapeake Bay
  - Increased potential for brackish water recharge near estuaries
  - Significant risk of land subsidence
- Climate change may also impact groundwater resources

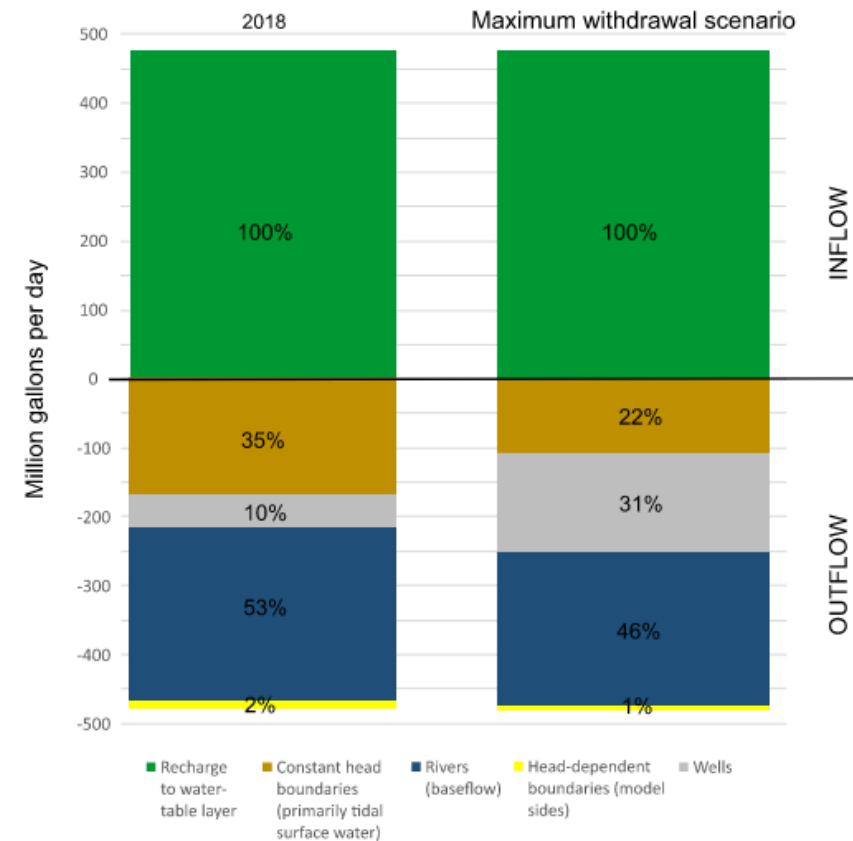


Figure 14. Net water budget for the entire model domain for 2018 and maximum withdrawal scenario.

# Program Drivers for Managed Aquifer Recharge

## Water Quality

- Nutrient reduction in Chesapeake Bay
- Water quality improvement locally
- Develop a long-term plan for maintaining or reducing nutrient levels

## Water Supply

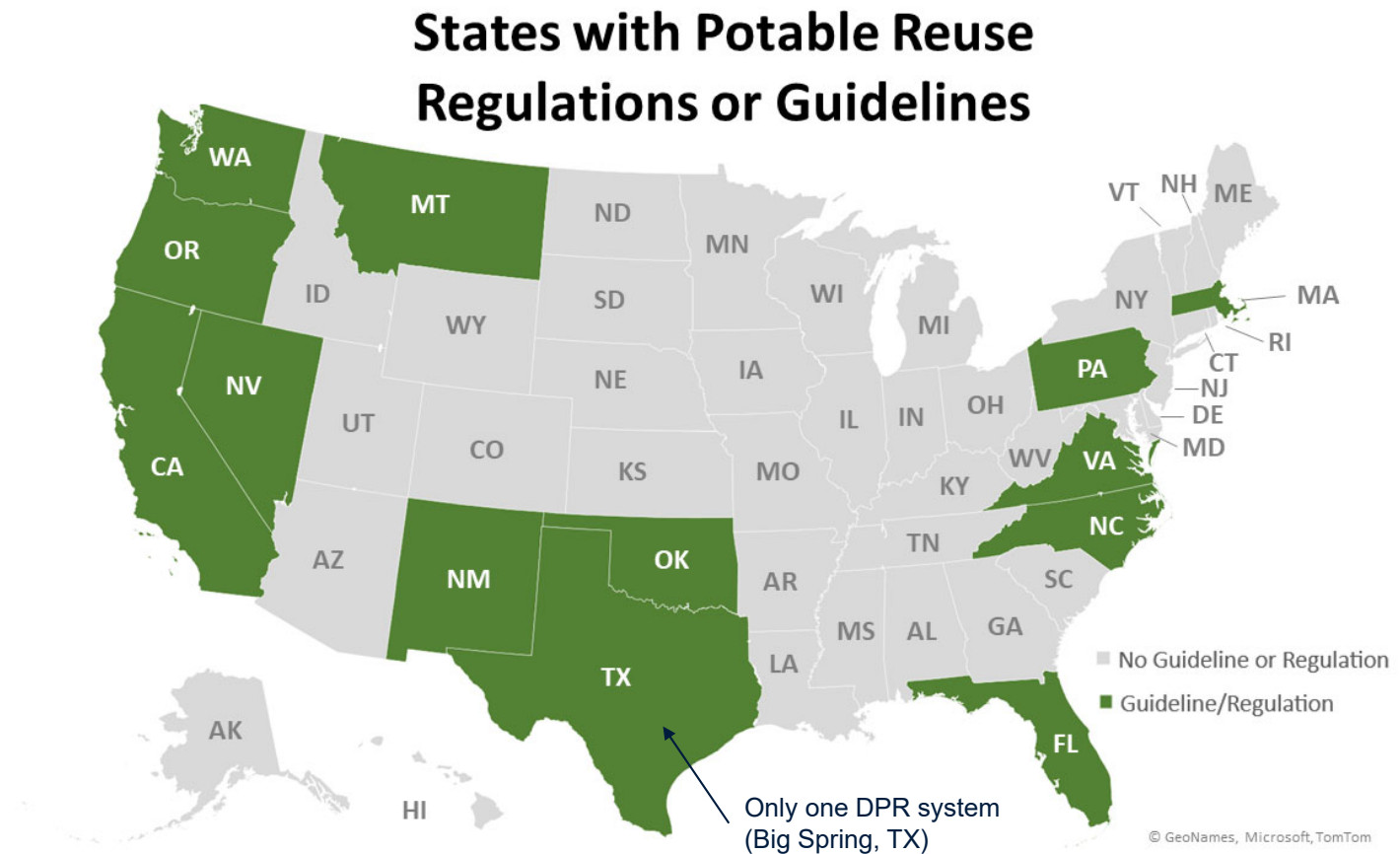
- Groundwater replenishment
- Long-term water supply resiliency and sustainability



# Key States with Indirect Potable Reuse Regulation

Source: EPA

- California
- Washington
- Arizona
- New Mexico
- Florida
- Massachusetts
- Texas (Case-by-case Review)



# SWIFT Program (Hampton Roads, VA)

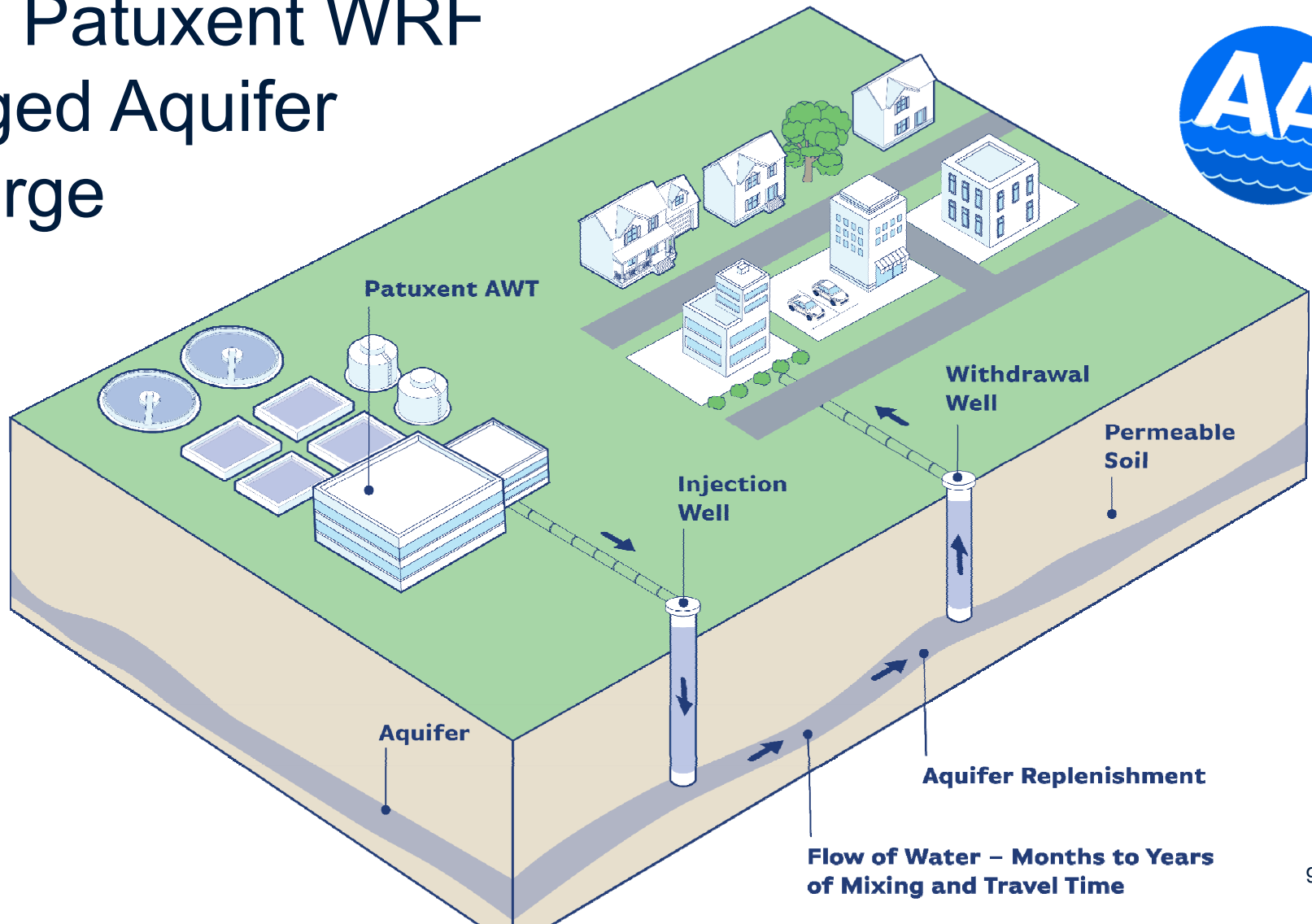


- Pilot testing began in 2016
- Current demonstration scale (1 MGD)
- Add advanced treatment processes to several HRSD facilities to produce water that meets drinking water standards
- SWIFT will be added to the Potomac Aquifer, the primary source of groundwater throughout eastern Virginia





# Future Patuxent WRF Managed Aquifer Recharge



# Managed Aquifer Recharge Pilot



## Advanced Treatment

- Identify constituents of concern
- Current effluent characteristics
- Additional treatment steps
- Critical control points

## Aquifer Recharge

- Hydrogeological compatibility
- Injection rates & travel times
- Monitoring program

# Treatment Goals for Piloting



Safe Drinking Water Act  
Compliance

End Use Requirements  
(Total Organic Carbon, Turbidity, Aquifer  
Compatibility, Corrosion Control,  
Microbial Risk)

**Potable Reuse  
Monitoring**

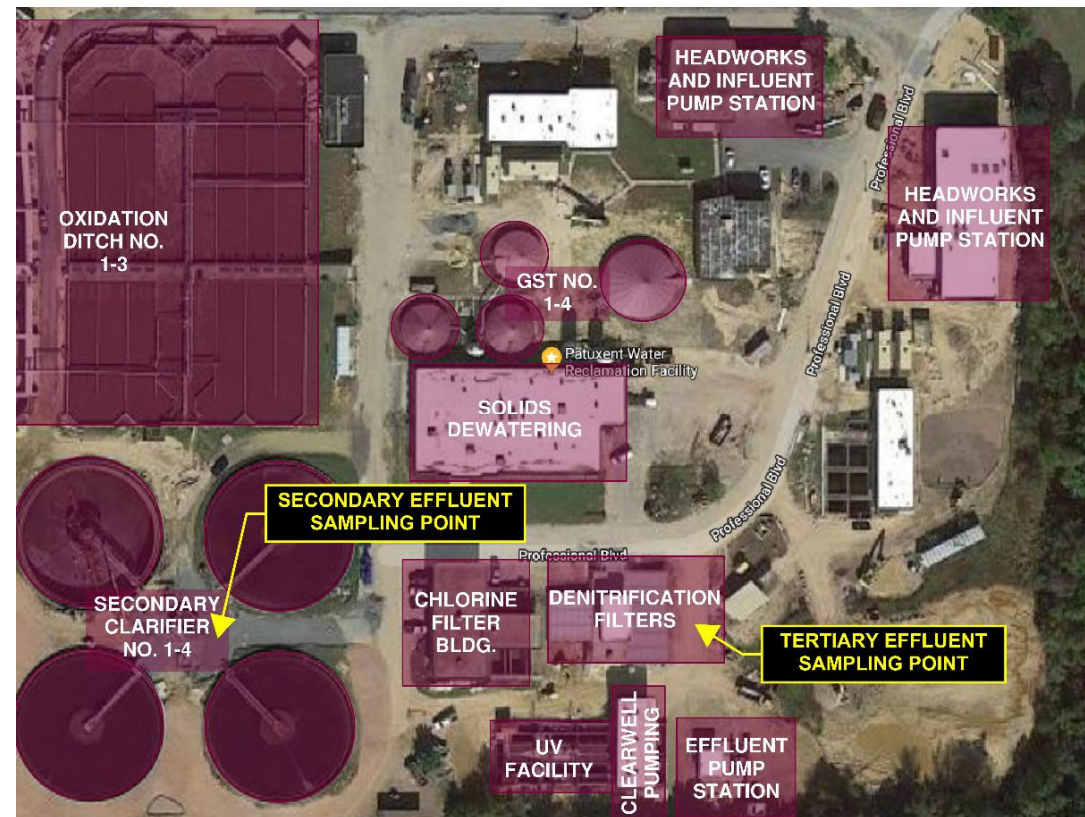
Pathogens  
(Giardia, Crypto, Viruses)

Constituents of  
Emerging Concern

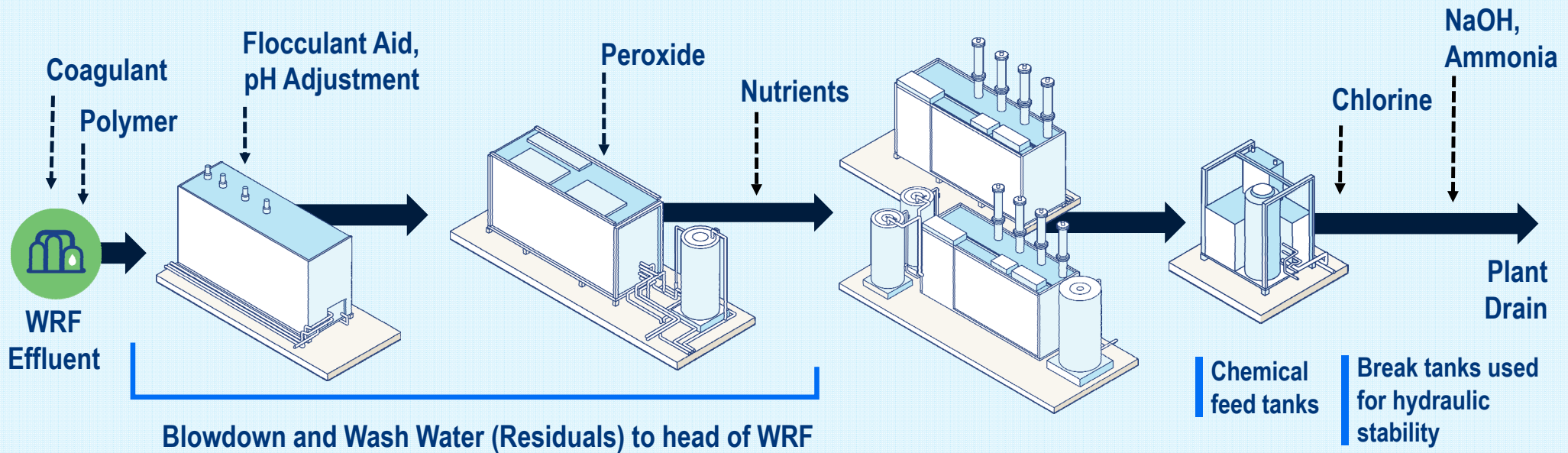
# Patuxent WRF Overview and Effluent Sampling Effort



- Focus on characterizing tertiary effluent (post-denitrification filter, pre-UV)
  - Patuxent Water Reclamation Facility
- Additional periodic sample of secondary effluent (post-secondary clarification)
- Sampled over 100 constituents
- Summary focuses on tertiary effluent sampling



# Treatment Train Selection



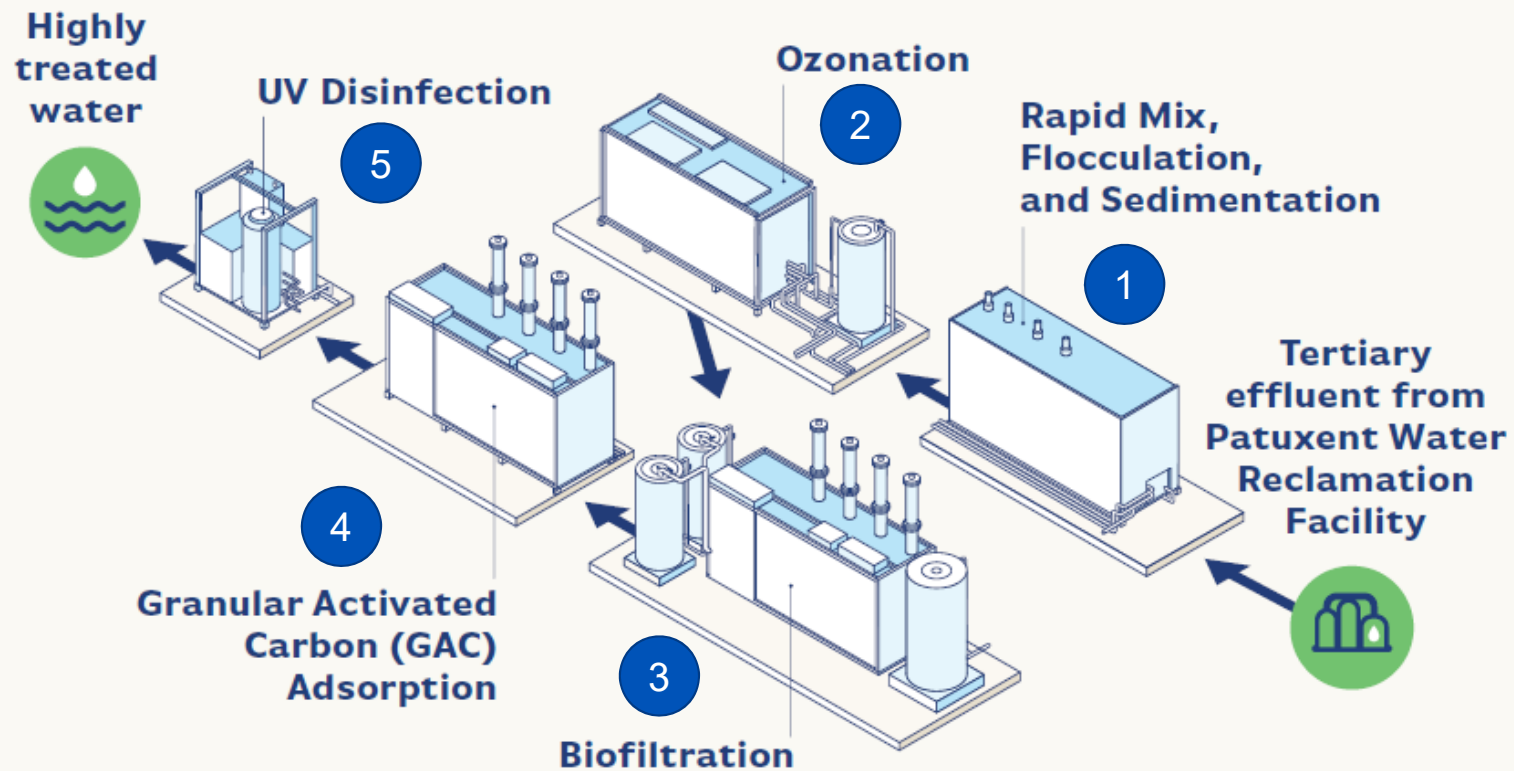
Coagulation/Flocculation/  
Sedimentation

Ozone/Ozone  
Advanced  
Oxidation  
Processes

Biological Aerated  
Filter/Granular  
Activated Carbon

UV

# Pilot Treatment Train



# Pilot Tours and Community Outreach



# Updates & Next Steps

- AWT Pilot Testing
- Independent Scientific Advisory Panel (ISAP) Report
- Groundwater Injection Well Permit
- Water Reuse Funding







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**Thank you!**