Planning for Water Resources in Carroll County

Purpose of Water Resources Element (WRE)

To evaluate water supply, wastewater, and stormwater to ensure that projected demands are consistent with the availability and capacity to meet those needs, both short– and long-term, while maintaining or improving water quality

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To ensure future county and municipal comprehensive plans reflect the opportunities and limitations presented by local and regional water resources to address the relationship between planned growth and water resources

Water Resources Element (WRE)

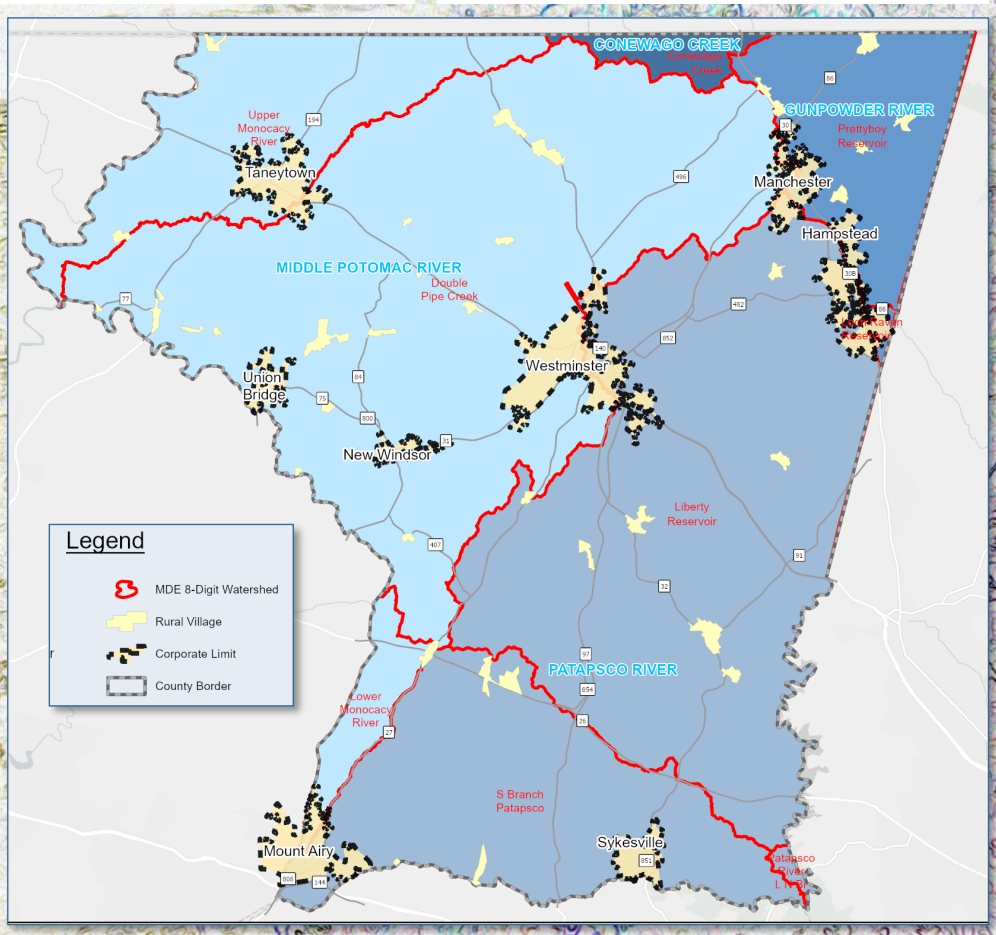
- The WRE is a State-required element of the comprehensive plan.
- Both the original 2010 WRE and the 2024 WRE represent a joint effort by the County and all eight municipalities to cooperatively and collaboratively develop one document that all nine jurisdictions adopt. The majority of the plan document applies to all nine jurisdictions, except for the individual system-specific sections.
- This joint effort provides a holistic look at the demand and capacities countywide, water availability, and joint and regional options for addressing future needs.
- The WRE helps to inform that comprehensive planning process by showing areas where growth may or may not be possible due to availability and limitations of water resources.

Connection to Comp Plan

- Ability to provide public drinking water service to existing and planned growth impacts the recommended land use plan.
- Federal and State requirements related to stormwater and water quality should be considered in land use and policy decisions, as well as in how they relate to economic development, public facilities, transportation, and other comprehensive plan elements.
- Plan recommendations can include land use, financial/capital improvements, and policy/regulatory measures needed to implement.
- ***As a comprehensive plan element, the Planning Commission reviews, holds a public hearing, and approves the WRE and forwards to the local legislative body with a recommendation for adoption.***

Setting

- For decades, a major tenet of the County Master Plan has been to direct growth to the municipalities and Freedom, where public facilities and services are most available and accessible.
- Carroll County has 8 municipalities, each with their own planning & zoning authority. All but one own and operate their own public water supply and/or wastewater systems.
- The political boundary of Carroll County includes lands which drain to nine different 8-digit watersheds. Two of these watersheds – Double Pipe Creek and Liberty Reservoir – cover most of Carroll County. Watershed boundaries cross jurisdictional borders.
- The County and all 8 municipalities are legally required to meet the conditions of their joint stormwater permit, which includes treating stormwater runoff to improve water quality and implementing projects to reduce pollution to local streams and the Chesapeake Bay.



About the WRE

Why a Separate Document from Comprehensive Plan?

- The WRE includes substantial technical information to support and develop the plan document, which also takes a lot of space in a document to be able to address requirements and State guidance.
- Maryland Department of the Environment's (MDE) has a more substantial role in reviewing the WRE than in most plan elements.
- The WRE represents a cooperative, joint effort between the County and all 8 municipalities to address related strategies and action items both countywide and individually, which is different than other elements
- This information needs to be available prior to developing the land use element and other relevant plan elements.
- Timing between the 9 jurisdictions' plan updates differs.

Requirements

- Drinking water supply
- Wastewater
- Stormwater

→ ***Water Quantity & Quality Overall***

2010

- Identify resources adequate to meet needs of existing & planned development
- Protect water quality as land use plan is developed
- Address pollutant loads from both stormwater and septics from existing development and future growth

Added in 2022

- Reflect changes to water resource laws, policies, & regulation since 2010
- Integrate climate change considerations
- Consider planned growth & development impacts on water resources through an equity lens

Water & Wastewater Capacity & Demand Info

Uses **MDE methodology** for WREs

Point in Time → **Based on buildout of 2023 Water/ Sewer Service Areas using 2022 zoning in place**

Service Areas include Existing, Priority, Future, and Long-Range Service Areas

Collaborative County/Municipal Process

- Joint effort between County & municipalities → Cooperatively developed 1 document for all 9 jurisdictions
- Holistic look at demand & capacities countywide, water availability, & joint & regional options for addressing future needs
- Comprehensive planning process informed by showing areas where growth may or may not be possible due to availability & limitations of water resources.

Information Process

- Collect water & wastewater capacity & demand information for each system
- Engage consultant
  - Update 2010 supporting documents
  - Develop supporting documents for climate change & emerging contaminants
- Update 2010 document text
- Collaborate to identify action items to address strategies

Water-Related Regulatory Setting Changes

- Chesapeake Bay Total Maximum Daily Loads (TMDLs) established
  - Maryland's Watershed Implementation Plan (WIP)
  - National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System (NPDES MS4) Permits
- *Joint* NPDES MS4 Permit between County & municipalities
- Climate Change
  - Incorporate to comprehensive plans
  - Reduce & mitigate flooding
  - Update stormwater regulations
- Water & Wastewater
  - Enhanced Nutrient Removal (ENR) treatment @ wastewater treatment plants (WWTPs)
  - Water reuse (ex. PUREWater Westminster)
  - Safe Drinking Water Act Standards (ex. PFAS, Lead & Copper)
- And more...

Document Contents

Water Supply

Public water supply *is* expected to be a limiting factor, but most should be able to overcome via additional water sources %/or increased appropriations.

- The **Freedom** water supply system is **the only system** that will have **capacity available** once buildout of the **2023** Water Service Area is reached.
- Hampstead, Manchester, Mount Airy, Taneytown, and Westminster would not have enough capacity to meet buildout demand in the 2023 Water Service Area. However, excluding Westminster, the limiting factors can be overcome with **additional water sources and increased appropriations**. For Westminster, the PUREWater reuse plant will be permitted to provide an additional .500 mgd of capacity, which is roughly 75% of the additional capacity needed. Design capacity will be 1.0 mgd. Therefore, capacity will be available when needed if permitted capacity is increased.
- Both New Windsor and Union Bridge face limitations **much more difficult to overcome. While funding is an issue for every system, significant funding would be needed for both systems**, as the WWTPs do not have capacity to accommodate the added water usage, even if adequate water capacity is available. **New WWTPs would need to be constructed to handle the additional flow.**

Note: **CAPACITY NEEDED** reflects MDE's +10% for drought demand as well as capacity available w/ the largest well out of service, which increases the capacity needed.

Based on 2023 Water Service Areas and 2022 Zoning

Buildout Demand Status	Municipal System(s)	Potential Action to ↗ Capacity or Meet Buildout Demand
🟢	Freedom	• Capacity available = additional growth > 2023 WSA buildout = ~3,550 DUs
🟡	Hampstead	• Additional water sources • ↗ appropriations
	Manchester	• Additional water source • ↗ pump capacity
	Mount Airy	• Additional water sources • ↗ appropriations • WWTP expansion
	Taneytown	• Water recharge easements • Additional water sources • ↗ appropriations
	Westminster	• .5 mgd water reuse plant online 2027 ➞ capacity needed ↘162,619 gpd • Plant can expand to 1 mgd
🔴	New Windsor	• WWTP expansion • Additional water sources • ↗ appropriations
	Union Bridge	• New WWTP • Additional water sources • ↗ appropriations

Wastewater

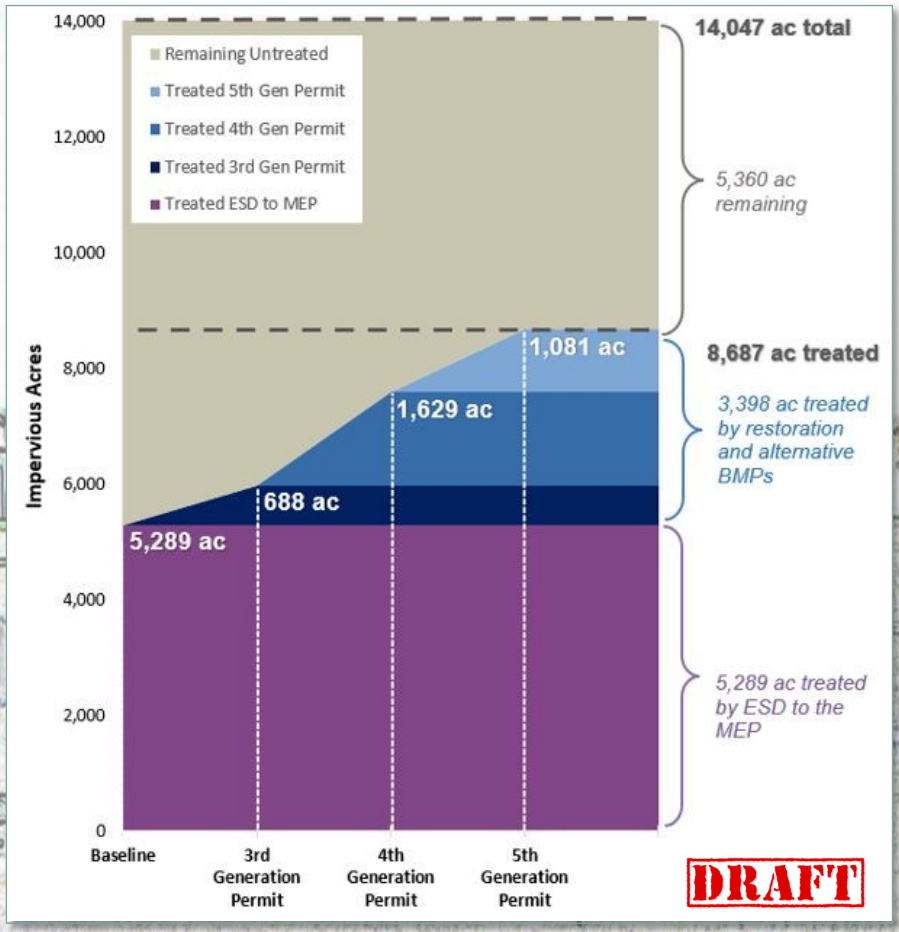
Public wastewater capacity *is* expected to represent a significant limitation. However, most systems should be able gain flow capacity via I&I improvements.

- Manchester and Mount Airy are the only systems that will have **capacity available** at buildout of the **2023** Sewer Service Area.
- Freedom, Hampstead, Taneytown, and Westminster will need additional capacity to serve the projected 2023 buildout demand. However, they may be able to **increase flow capacity** enough to meet demand through identifying and **fixing** inflow & infiltration (**I&I**) issues. The County also may be able to negotiate with the State to increase its allocation of the Freedom WWTP capacity. Beyond I&I improvements, all of these WWTPs will be constrained by caps on total phosphorus based on current design capacity. Nutrient caps would need to be evaluated if an expansion were contemplated.
- in order to serve 2023 buildout demand, New Windsor would need to expand its WWTP, and Union Bridge would need to construct a new WWTP. **Funding represents a significant limitation for both systems** within these small towns.

Based on 2023 Sewer Service Areas and 2022 Zoning

Buildout Demand Status	Municipal System(s)	Potential Actions to ↗ Capacity or Meet Buildout Demand
	Manchester	• Capacity available = additional growth > 2023 WSA buildout = ~260 DUs
	Mount Airy	• Capacity available = additional growth > 2023 WSA buildout = ~43 DUs • WWTP expansion to ↗ capacity
	Freedom (CCG Portion)	• Negotiate ↗ allocation WWTP capacity • I&I improvements
	Hampstead	• I&I improvements
	Taneytown	• I&I improvements
	Westminster	• I&I improvements
	New Windsor	• WWTP expansion
	Union Bridge	• New WWTP

2024 Carroll County Impervious Area Treatment Progress



Stormwater management *is not* anticipated to be a limiting factor in achieving buildout of the 2023 Water & Sewer Service Areas. Stormwater management *is not* expected to limit the amount and location of future development.

- Stormwater management for new **development** is addressed through County Code Ch. 151.
- Stormwater management for **existing, untreated** impervious areas and stormwater management facilities constructed prior to current standards is addressed by the County's and municipalities' National Pollutant Discharge Elimination System (**NPDES**) Municipal Separate Storm Sewer (**MS4**) **permit**, for which the County and municipalities are co-permittees.
- The MS4 permit requires a certain percentage restoration of untreated impervious area, as well as progress toward achieving the Total Maximum Daily Loads (TMDLs). Progress is reported annually to MDE. The *Countywide TMDL Implementation Plan* addresses how TMDLs will be achieved and by when.

2024 Local TMDL Benchmarks for Carroll County HUC-8 Watersheds

HUC-8 Watershed	TMDL Pollutant	Current Progress (FY2024)	CIP-Planned Progress (FY2031)	% Reduction Required	Projected TMDL End Date
Liberty Reservoir*	TP	18%	26%	50%	2068
	TSS	23%	34%	38%	2064
Prettyboy Reservoir*	TP	31%	51%	15%	2055
Loch Raven Reservoir*	TP	95%	100%	15%	2030
Upper Monocacy River*	TP	100%	100%	5%	Complete
	TSS	24%	27%	44%	2067
Lower Monocacy River*	TP	3%	23%	30%	2070
Double Pipe Creek*	TP	9%	12%	72%	2075
	TSS	22%	28%	34%	2067
South Branch Patapsco River*	TP	75%	86%	15%	2038
	TN	59%	68%	15%	2047

**Assumes 2.00% reduction rate/year; TN = Total Nitrogen, TP = Phosphorus, TSS = Sediment*

Source: *Carroll County TMDL Stormwater Implementation Plan*, 2024

Stormwater

Countywide Strategies, Options, & Key Action Items

Strategies: The Strategies below generally apply to all eight municipal water supply and wastewater systems and/or nine jurisdictions in the county. Action Items specific to a particular system are included in those individual sections of the WRE.

Drinking Water Supply

- Protect and sustain existing drinking water supplies serving existing development
- Identify and develop, as needed, new water supplies adequate to support planned future growth without over-allocating available sources
- Promote water conservation measures and manage demand for potable water to ensure adequate supplies are available for planned development
- Develop emergency supply plans and measures

Wastewater

- Sustain existing wastewater treatment capacity
- Develop new public wastewater treatment and disposal capacity Fund & move forward with improvements in *Water & Sewer Master Plan* to accommodate projected needs

Stormwater

- Protect / restore water quality and make progress toward any applicable TMDLs
- Enhance stormwater management programs
- Identify changes to planned land use patterns and land development requirements to help achieve the needed reduction in pollutant loads
- Reduce flood event impacts to water quality and mitigate effects of climate change

Regional Water Supply Alternatives

- Reservoirs
- Surface Water Intake
- Quarries
- Groundwater Wells
- Interconnection
- Indirect Potable Reuse

Overall Wastewater Options

- Inflow & infiltration (I&I) reduction
- Water reuse
- Expanded/new WWTPs ($$$)

Overall Stormwater Approach

- Stormwater Regs
- NPDES MS4 Requirements
- Countywide TMDL Implementation Plan
- Land Use Considerations

Key Action Items

- Diversify water supply for increased redundancy & to mitigate climate change impacts
- Investigate water reuse options
- Drought management plans
- Identify emergency supplies & measures
- Shared services agreements

Key Action Items

- Coordinate I&I reductions & share equipment & contractors
- Upgrade minor WWTPs to Enhanced Nutrient Removal (ENR) treatment level
- Explore zero discharge & water reuse opportunities to avoid/reduce nutrient cap limitations
- Fund & move forward with improvements in *Water & Sewer Master Plan* to accommodate projected needs

Key Action Items

- Amend stormwater code to incorporate new State requirements once adopted
- Watershed-specific flood management plans
- Continued support for agricultural land preservation programs
- Identify additional best practices with co-benefits
- Take advantage of funding opportunities

Climate Change

- State agencies are required to integrate the consideration of the impacts of climate change. This includes explicit consideration of storm surges and flooding, increased temperature and precipitation, and extreme weather.
- Climate change continues to compound water resource challenges and will likely intensify in the coming decades.
- MDE's 2021 Advancing Stormwater Resiliency in Maryland (A-StoRM) initiative was developed to account for urban flood risks in the state and to adjust design criteria for stormwater facilities and drainage systems. A-StoRM was developed to account for climate change in urban flood risk assessment and urban stormwater management.

Trends

- Warmer temperatures
- Increased extreme / intense precipitation events
- Increased flooding
- Increased water quality issues
- Increased pro-longed or severe drought potential

Key Action Items

Action Items have been incorporated to the drinking water supply, wastewater, and stormwater strategies as applicable.

- Create diversity and redundancy in water systems to mitigate impacts of drought
- Revise local stormwater management regulations to incorporate the revised State Stormwater Management Act, which is intended to address stormwater runoff quantity and quality changes due to climate change
- Develop watershed management plans to address flooding

Emerging Contaminants

- An "emerging contaminant" in drinking water refers to a substance that has more recently been detected in water sources or is being detected at levels that are significantly different from previous expectations.
- These contaminants may not be subject to federal regulation and are suspected or known to pose potential risks to human health and the environment.
- In April 2024, EPA issued the first-ever national, legally enforceable drinking water standard to protect communities from exposure to harmful PFAS (per-and polyfluoroalkyl substances). PFAS is known to affect human and animal health, as well as impact water quality. High PFAS levels have already caused some municipal wells in the county to be taken offline and/or for expensive treatment to be pursued.
- Some contaminants are also being addressed through other means, such as requirements in the NPDES MS4 (stormwater) permit.

Examples of Emerging Contaminants

- PFAS
- Microplastics
- Pharmaceuticals & personal care products (PPCP)
- Chloride (road salt)
- Lithium

Key Action Items

With the exception of the Countywide Strategies, Action Items have been incorporated to the drinking water supply, wastewater, and stormwater strategies in some areas as applicable.

- Prevent, minimize, and mitigate sources of PFAS
- Diversification of sources and source types
- Proactive approach to water quality monitoring & testing
- Develop and implement PFAS Mitigation Plans
- Design and construct PFAS treatment facilities

Equity Lens

- Where planned growth and development is occurring in the above or similarly disadvantaged/overburdened areas, care should be taken in the comprehensive plan to avoid, minimize, and mitigate water resource and infrastructure impacts that exacerbate or otherwise fail to address continued inequities in the communities of concern.
- Disadvantaged or low-income (LMI) communities tend to be found in areas with limited access to resources and services like employment, fresh food, healthcare, and transportation.
- In Carroll County, parts of Westminster, Taneytown, and Union Bridge, as well as the Northeast and Northwest sectors of the county, are generally considered to have lower incomes and potentially higher rates of poverty compared to other areas within the county. However, each community needs to be verified as to its applicability compared to the criteria for disadvantaged/overburdened communities.
- MDE provides an online screening tool to help locate these communities.

Key Action Items

Action Items have been incorporated to the drinking water supply, wastewater, and stormwater strategies as applicable.

- Avoid, minimize, and mitigate project impacts that exacerbate or continued inequities in disadvantages communities
- Identify and mitigate, if needed, planned development in or adjacent to a watershed where downstream and disadvantaged communities experience chronic or repeat flooding

WRE Comprehensive Plan Implications

Implications

- More water & wastewater systems have limitations than those with capacity to serve buildout demand.
  - ↳ Balance planned land use demands with each system's ability to accommodate demand within the short– and long-term planning horizon.
  - ↳ Systems with limitations that are hard to overcome may need to be looked at differently than those with limitations easier to overcome.
  - ↳ Water & wastewater need to be looked at together, as one can affect the other.
  - ↳ For systems where capacity cannot meet 2023 buildout demand, but limitations can more easily be overcome with available funding, how can improvements be funded?
- Land may need to be protected to accommodate future water, wastewater, & stormwater facilities to serve demand both within the 10-year planning horizon as well as longer-term.

Action Items to Include in the Comp Plan

- Are there action items that are *not already included* in the WRE that could address limitations and water quality protection in the comprehensive plan as it relates to the following areas?
  - Land Use
  - Regulatory
  - Policy
  - Capital / Financial
- Are there action items that *are included* in the WRE that relate to land use or relevant issues that should be prioritized by also including them in the comprehensive plan and expanded them further?

A Note About Strategies & Action Items

- In the context of the WRE, a Strategy is an overall direction or outcome that can be addressed or implemented by a set of one or more Action Items. Each jurisdiction should be striving to implement the strategies in pursuit of the overall plan goals.
- Similarly, Action Items within the WRE are individual specific activities that, as a whole, are intended to address or implement one or more strategies. Inclusion of individual Action Items ***does not represent a commitment*** to implement that Action Item. They are activities that *could* be pursued to help move the County or municipality toward the desired direction or outcome.

Land Use & Comp Plan Considerations

- What mix of planned land uses over the next 10 years fits with each water & wastewater system's ability to provide that capacity within that timeframe?
- Are there limitations to water and/or wastewater systems in any of the Designated Growth Areas (DGAs) that preclude planning for additional growth or densities during this planning horizon?
- Can capacity improvements be made where land uses would result in a buildout demand that cannot currently be accommodated?
- What land needs to be protected to accommodate future water, wastewater, &/or stormwater facilities to serve demand both within the next 10 years as well as long-term?
- What funding mechanisms could be put in place to pay for needed capacity improvements / expansion?

Review, Approval, & Adoption Process

Process for Each Planning Commission

- *Nov 12, 2025, to Jan15, 2026*: State agencies & neighboring jurisdictions review
- *Nov 12, 2025, to Feb 23, 2026*: Public review period
- *Jan 14, 2026*: Public information session
- *Jan 15 to Feb 23, 2026*: Planning Commission public hearings
- *Feb 23, 2026*: Comment record closed
- *Mar-Apr 2026*: PCs approve, Chairs signs approval resolution, & PCs recommend adoption to elected officials

No public comments were received during the public review period or as a result of any of the nine public hearings.

Process for Each Council & Board of County Commissions (Elected Bodies)

- Introduction to elected body
- Before adopting or modifying, elected body holds public hearing (*required by State law*)
- *Work session(s) may be held before &/or after public hearing if desired*
- Elected body adopts the plan element & signs adoption resolution