

## Carroll County

*(in support of individual municipal systems & focusing growth in GABs)*

The countywide strategies included in this plan apply to all nine jurisdictions. System-specific strategies for the Freedom water and sewer systems and the Hampstead sewer system are included in those sections. However, there also are strategies that are specific to the County that do not fall into either of these categories. The County undertakes many separate, County-specific actions in its support of individual systems, as well as continued focus of development into DGAs. This section describes those County-specific water supply and water quality projects and individual action items to help achieve the goals and land use plans of the County's and the municipalities' adopted comprehensive plans.

## Water Supply Options/Alternatives

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The County continues to be committed to working proactively with the municipalities to provide public water supply capacity to accommodate planned development in the DGAs. Therefore, the County continues to evaluate and support regional water supply projects to meet those needs.

The following projects are County projects that are considered for regional water supply options. However, inclusion here does not imply that there is a definite plan to move forward with an option. Exploration of additional sources, even for those systems that currently project enough capacity to meet demand, is included in order to be prepared for policy changes or other changes that would result in the need for additional available water capacity or other future scenario.

*Note: Estimated cost is the total of cost plus 40 percent contingency.*

### ■ Piney Run Reservoir (as built):

- Existing reservoir
- Safe yield 3.65 mgd with normal pool elevation of 524 ft.
- Construct new 2.0 mgd water treatment plant (WTP) on Hollenberry Road and 1.0 mg storage facility
- Approximately 1,000 feet of 16-inch diameter raw water transmission main
- Approximately 10.5 miles of 16-inch diameter treated water transmission main to connect to Mount Airy service area
- 2 pump stations – one at WTP, one booster pump station near Woodbine
- 2.0 mg storage tank (located near Woodbine)

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- To serve as regional source of water supply for Mount Airy and Sykesville/Freedom Service Areas
- Estimated Capital Cost: WTP at Piney Run + Infrastructure to Serve Freedom Only = \$18.15 Million
- Estimated Capital Cost: Treated Water Pipe (\$13.51 M) + Pump Station (\$1.96 M) = \$15.47 Million (infrastructure to serve Mount Airy region)

**Recommended Priority:** Medium

**Timeframe:** 6-20 years

**Justification:** While the Alternatives Evaluation indicates that the Freedom system has adequate water available to serve planned development within the GAB, additional water supply sources are needed for the Mount Airy water system. Additional supply is needed to serve existing and planned growth, particularly if Mount Airy's planned commercial and industrial areas are to develop to their potential. Additionally, the Town has been part of a consent agreement with MDE. The Piney Run Reservoir was intended to serve as a regional water supply that includes the Mount Airy community.



### ■ Piney Run Reservoir (expanded):

- Increase capacity of existing reservoir by raising the spillway riser and emergency spillway; raise normal pool elevation by 4 feet
- Safe yield 4.11 mgd
- All components of Piney Run Reservoir (as built) option would already be in place prior to expansion of Piney Run Reservoir
- To serve as regional source of supply for Mount Airy and Sykesville/Freedom Service Areas
- Estimated Capital Cost: \$8.8 Million

**Recommended Priority:** Medium

**Timeframe:** 6-20 years

**Justification:** While the Alternatives Evaluation indicates that the Freedom system has adequate water available to serve planned development within the GAB, additional water supply sources are needed for the Mount Airy water system. Additional supply is needed to serve existing and planned growth, particularly if Mount Airy's planned commercial and industrial areas are to develop to their potential. Additionally, the Town has been part of a consent agreement with MDE. The Piney Run Reservoir was intended to serve as a regional water supply, including the Mount Airy community. Expanding the capacity of the existing reservoir will provide the County with additional supply in the event another source is no longer available or needs to be supplemented. In addition, the State will view moving

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forward with developing Piney Run Reservoir as a water supply as a prerequisite for successfully permitting another reservoir project in Carroll County.

### ■ Union Mills Reservoir:

- Planned reservoir (adopted *Carroll County Water and Sewerage Master Plan*)
- New intake, storage impoundment, three pump stations, raw and treated transmission mains, water treatment plant, dam
- To serve as regional source of supply for Westminster, Hampstead, Manchester, and Taneytown (to be served through flow augmentation of Big Pipe Creek and downstream withdrawal) Service Areas
- Potential for phased implementation, starting with a groundwater option, then a surface water intake on Big Pipe Creek; to be implemented prior to construction of a reservoir
- Environmental surveys may include wetland/stream delineation, cultural resources survey, and possibly a freshwater mussel survey
- Key permits required:
  - USACE Section 404 permit
  - Water appropriation and use permit
  - Water and sewerage construction permit
  - Non-tidal wetland and waterways permit
  - Dam safety permit

**Justification:** For the municipalities to be served by the planned Union Mills reservoir, projected demand was compared to the potential future water supply capacity that could reasonably be achieved based on water availability. The evaluation indicates that enough water supply is available through groundwater and other existing regional water supply options to serve the projected demand at buildout of the entire DGA for all four municipalities. However, several other factors could influence the need to continue to evaluate the feasibility of and make progress toward installing infrastructure for the planned Union Mills reservoir. Among these influences are the potential for administrative changes at MDE, changes in regulatory procedures or policy at the state and/or federal level, and climate change. The ability to justify need and administrative issues regarding land acquisition may present major challenges to full reservoir development. This phased project facilitates the diversification, regionalization, and redundancy of water supply sources for Carroll County's jurisdictions.

### Phase 1: (Groundwater Wells + Pump House + Electrical) + Raw Water Transmission Main + Pump Station

**Recommended Priority:** High

**Timeframe:** 0-6 years

**Estimated Capital Costs:** \$2.21 M + \$7 M + \$.97 M = \$10.18 Million

- Develop 5-10 groundwater wells on the County's property at Union Mills; anticipated total yield 0.500 mgd; includes wells, pump houses, and electrical (\$1.6M)

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- Install about 5 miles of 20-inch diameter raw water transmission mains to connect Union Mills Reservoir to Cranberry Reservoir (\$5M)
- Construct 1 pump station (\$.69M)

### Phase 2: (Surface Water Intake + Storage) + WTP + Envir Surveys

*Recommended Priority:* Medium

*Timeframe:* 6-20 years

*Estimated Capital Costs:* \$23.5 M (including storage) + \$4 M + \$.2 M = \$27.7 Million

- Develop a new surface water intake on Big Pipe Creek in the vicinity of the proposed Union Mills Reservoir dam area to supply water to Westminster (\$23.5M)
- Safe Yield: 0.70 mgd yield achieved with a 4.0 mgd intake and a 280 mg storage impoundment
- Expand existing water treatment plant (\$4M)
- Conduct environmental surveys (\$.14M)

### Phase 3: Reservoir + Treated Water Transmission Mains + 2 Pump Stations + WTP

*Recommended Priority:* Low

*Timeframe:* 20+ years

*Estimated Capital Costs:* \$57 + \$5.9 M + \$1.94 M + \$28M = \$92.84 Million

- Safe yield 3.76 mgd with normal pool elevation of 610 ft. (\$57M, contingency already built in)
- Install of approximately 7.8 miles of treated water transmission main to connect to Hampstead and Manchester Water Service Areas (\$4.21M)
- 2 pump stations (\$1.39M)
- Construct new WTP at reservoir (\$20M)

### ■ Gillis Falls Reservoir:

- Planned reservoir (adopted *Carroll County Water and Sewerage Master Plan*)
- Safe yield 3.85 mgd with normal pool elevation of 610 ft.
- 1 pump station
- To serve as regional source of supply for Mount Airy and Sykesville/Freedom Service Areas
- Potential alternative use as mitigation site for wetlands and stream impacts resulting from the Union Mills reservoir
- Key permits required:
  - USACE Section 404 permit
  - Water appropriation and use permit
  - Water and sewerage construction permit
  - Non-tidal wetland and waterways permit
  - Dam safety permit
- Estimated Capital Cost: \$104.4 Million (excluding additional land acquisition costs)

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**Recommended Priority:** Low

**Timeframe:** 20+ years

**Justification:** While the Alternatives Evaluation indicates that the Freedom system has adequate water available to serve planned development within the GAB, additional water supply sources are needed for the Mount Airy water system. Additional supply is needed to serve existing and planned growth, particularly if Mount Airy's planned commercial and industrial areas are to develop to their potential. Additionally, the Town has been part of a consent agreement with MDE. The Gillis Falls reservoir has long been included in the *Carroll County Water and Sewerage Master Plan* as a planned public water supply source. However, despite the challenges that would be faced by moving forward with this project, it remains an option on the table. It will be considered and evaluated, along with the other options, in the event that additional water supply is needed as a result of changes in regulatory procedures or policy at the state and/or federal level, future expansion of GABs not currently contemplated in adopted community comprehensive plans, or climate change. It is, however, considered a low-priority project. If the project is deemed at some point in the future to be infeasible, the area will also be evaluated as a potential wetland and stream impacts mitigation site if the Union Mills reservoir project moves forward.

## ■ Prettyboy Reservoir:

- Based on Baltimore City's plans to develop a 120-mgd treatment plant for its Susquehanna River intake and the resulting increased system reliability, purchase excess capacity from Prettyboy Reservoir
- Conceptual plans for a 3.0 mgd intake and 7.5-mile long, 16-inch diameter raw water pipeline from Prettyboy Reservoir to a new 3.0 mgd water treatment plant in Hampstead
- Requires one high-service pump station located at the intake on Prettyboy Reservoir, and two pump stations for the Manchester and Westminster interconnections
- Regional approach includes an interconnection with the Manchester (3.0-mile transmission main) and Westminster (6.7-mile transmission main) Service Areas to help supply future demands
- Key permits required:
  - USACE Section 404 permit
  - Water appropriation and use permit
  - Water and sewerage construction permit
  - Non-tidal wetland and waterways permit
  - Dam safety permit
- Estimated Capital Cost: \$39.8 Million



**Recommended Priority:** Low

**Timeframe:** 20+ years

**Justification:** The Alternatives Evaluation indicates that the Westminster, Manchester, and Hampstead systems have adequate water supply available as potential sources to serve

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currently planned development within the GABs. However, this option will remain on the list of alternatives in the event that changes in regulatory procedures or policy at the state and/or federal level, future expansion of GABs not currently contemplated in adopted community comprehensive plans, or climate change necessitate implementation of additional public water supply sources. This option will be considered and evaluated, along with the other options, in the event that additional water supply is needed. It is considered a low-priority project, as the development of the phased Union Mills projects remain a higher priority.

### Water Quality

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Carroll County does not have specific capital projects to address regional wastewater supply or to provide wastewater capacity for multiple jurisdictions. (System-specific strategies for the Hampstead and Freedom WWTPs and systems are included in those sections.) However, specific actions and projects may be undertaken by the County to address septic and other water quality issues.

#### ■ Septic System Improvements

Failing septic systems are a high-priority target for both nutrient reduction and protection of public health. Repair of a failing septic system, as well as connection to sanitary sewer or alternate treatment, would help reduce nutrient loading as well as address the problem of a failing septic for that affected homeowner. Leveraging of funds (e.g., the Bay Restoration Fund) to pay for such improvements may make it more cost effective.

#### ■ Targeting of Sustainable Watershed Management Practices

(BMPs intended to protect water quality have other environmental effects that can be positive or negative with regard to ecosystem services and overall sustainability. Some BMPs provide net benefits to greenhouse gas (GHG) emissions, energy usage, wildlife habitat, flood risks, baseflow protection, etc., whereas other practices cause net detriments in these regards. Similarly, BMPs vary greatly in their cost-effectiveness; i.e., environmental benefit gain per dollar invested. For example, urban stormwater retrofits tend to be very expensive relative to the pollutant reduction achieved, and provide relatively low ecological benefits compared to other practices such as forestation, riparian buffers, and agricultural BMPs. WWTP upgrades increase GHG emissions, whereas nutrient management planning decreases GHG emissions and is extremely cost effective per pound of nitrogen load reduced. The County will need to carefully weigh costs and benefits when determining which BMPs to continue or encourage as well as which new BMPs should be pursued.

#### ■ Funding Sources for Water Quality Implementation

Implementation of the Chesapeake Bay TMDL is expected to significantly increase financial burdens on all pollutant source sectors. ENR upgrades at major WWTPs will partially be funded by Maryland's Chesapeake Bay Restoration Fund. However, implementation for

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stormwater, agriculture, and other nonpoint sectors will probably need to be met by a combination of sources, including local tax revenue and utility fees, state grants and cost-share programs (e.g., Maryland's Bay Restoration Fund), and federal grant and cost-share programs (e.g., Section 319 NPS implementation grants, the Conservation Reserve Enhancement Program, and the Environmental Quality Incentives Program), and out-of-pocket landowner costs.

The financial burden of TMDL-related mandates is thus a major element of the planning process, especially for the stormwater sector. In conjunction with other planning activities, the County will need to initiate focused efforts to evaluate the total costs of TMDL implementation, identify both internal and external funding sources to meet those costs, and pursue specific grant opportunities to ensure that County jurisdictions receive an equitable share of available public funding. Studies could include an evaluation of the impact of TMDL implementation costs on utility user fees, and the need/practicality of new revenue structures (e.g., stormwater/watershed fees).

## Specific Strategies: Carroll County

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### ■ Water Supply

#### 1. *Protect and sustain existing water supplies serving existing development*

##### Specific Action Items Already in Place:

- ✓ Continue programmatic and management practices such as buffering and setbacks needed to protect water resources from the impacts of development (done through County Code) [from Guidance doc]

##### Specific "To Do" Action Items:

###### *Short-term*

- Include water resource protection as a criterion in the Land Preservation, Parks and Recreation Plan (LPPRP) [from Guidance doc]

###### *Long-term*

- Explore additional sources for future water supply to prepare for policy changes or other changes that would result in the need for additional available water capacity

#### 2. *Identify and develop, as needed, new water supplies adequate to support planned future growth without over-allocating available sources*

##### Specific Action Items Already in Place: ("Continue to...")

- ✓ Rigorously enforce existing laws that require zoning, plat approval, and development approval be contingent upon a demonstration that water supplies are adequate to meet requested demands [from Guidance doc]
- ✓ Include provisions in the subdivision/development regulations that require that site plan/subdivision plat submittals have documentation from an engineer or official notification from the appropriate municipal or county agency(ies) stating that

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- adequate water either presently exists or will exist for all development depicted [from Guidance doc]
- ✓ Implement future water resource options and the appropriate restrictions and/or protections to ensure water supply development can proceed at the designated time period [from Guidance doc]
  - ✓ Require watershed and wellhead protection around existing water supply sources [from Guidance doc]
  - ✓ Created open space and land preservation program measures that support water protection requirements [from Guidance doc]
  - ✓ Created and implemented drought management procedures and requirements [from Guidance doc]
  - ✓ Protect and develop wellsite locations outside municipal boundaries

### Specific “To Do” Action Items:

#### Short-term Strategy/ies

- Conduct detailed design and engineering studies for Union Mills reservoir
- Incorporate the acquisition of water recharge areas through land preservation easements to develop a bank of water allocations municipalities with recharge credit
- Rezone areas outside the GABs to be consistent with other areas of the county that are not within a DGA to reflect desired rural densities that would help protect or improve water quality
- Assist the municipalities with updating the WSCMP worksheets developed as background data for this plan document to reflect the most current information, then complete and for this plan document to reflect the most current information then complete and submit a full WSCMP to MDE for review

#### Long-term Strategy/ies

- Track development of credits available in commercial mitigation banks serving this region of Maryland in anticipation of stream and wetland mitigation requirements that would be associated with development of a planned reservoir

#### Long-term Water Supply Options

*Note: These are options that will be considered for long-term supply. However, inclusion here does not imply that there is a definite plan to move forward with an option.*

*Exploring additional sources, even for those systems that currently project enough capacity to meet demand, is included in order to be prepared for policy changes or other changes that would result in the need for additional available water capacity.*

- Piney Run Reservoir (as built):
  - Obtain key permit required – Water and Sewerage Construction Permit
  - Complete land easement/acquisition for WTP and pipeline
  - Complete engineering for pipeline, storage, and pump station
- Piney Run Reservoir (expanded):
  - Receive approval from MDE Dam Safety to raise normal pool elevation and change dam classification from current “high hazard” designation
  - Obtain key permits required
  - Complete land easement/acquisition for reservoir expansion

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- Complete surveys for aquatic habitat and cultural resources within the affected project footprint
- Develop mitigation plan: 12.6 acres wetland impacts and 1.05 miles of stream impacts
- Confirm that any impacts to Waters Edge Farm and County park/marina can be addressed
- Complete engineering for pipeline, storage, and pump station
- Union Mills Reservoir (planned):
  - Continue County purchase of approximately 781 acres total of land
  - Conduct more detailed design and engineering studies
  - Consider whether other County-owned lands may be appropriate for use as habitat preservation and enhancement areas to mitigate for aquatic habitat losses that would be incurred with the Union Mills Reservoir alternative
- Gillis Falls Reservoir (planned):
  - Continue County purchase of approximately 587 total acres of land
  - Investigate less restrictive minimum reservoir releases with MDE to increase project safe yield
  - Address any State requirements associated with Tier II stream designations extending upstream of the north arm from Gillis Road crossing and extending downstream from just upstream of the dam site
- Prettyboy Reservoir:
  - Pursue discussions with the City of Baltimore to purchase raw water from Prettyboy Reservoir
  - Evaluate treatment capacity of Manchester and/or Hampstead WTPs to treat additional water

## 4. Promote water conservation measures and manage demand for potable water to ensure adequate supplies are available for planned development

### Specific Action Items Already in Place: (“Continue to...”)

- ✓ Public Education Measures: Produce and distribute water-saving brochures through Bureau of Utilities
- ✓ Drought Management Measures: Restrict or limit water use in Freedom

## ■ Water Quality

### 5. Sustain existing wastewater treatment capacity

#### Specific Action Items Already in Place: (“Continue to...”)

- ✓ Limit allocations and connections to a system that would cause the system capacity to exceed a set level under maximum capacity [from Guidance doc]



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## 6. Develop new public wastewater treatment and disposal capacity

### Specific “To Do” Action Items:

#### Short-term

- Coordinate with Carroll County Health Department to track and share relevant data for NPS modeling

## 7. Reduce nutrient loading via the implementation of the Statewide Tributary Strategies

### Specific Action Items Already in Place: (“Continue to...”)

#### Urban Sources: Stormwater Strategy

- ✓ Strongly support and implement erosion and sediment control and stormwater management measures and requirements
- ✓ Administer local development processes to support the implementation of the Tributary Strategy and minimize water quality impacts on local waterways

#### Urban Sources: Growth Management Strategy

- ✓ Promote and direct growth to Priority Funding Areas, which will resolve conflicting and competing requirements

#### Agriculture Strategy

- ✓ Provide staff and funding to the Soil Conservation District for technical assistance to farmers and landowners for the implementation of BMPs
- ✓ Provide technical assistance and guidance on programs available to farmers and landowners for the implementation of BMPs and coordinate activities and funding among district, State, and federal programs

### Specific “To Do” Action Items:

#### Urban Sources: Septic Strategy

#### Short-term

- Implement local policy and code requirements to encourage or require the upgrade of onsite sewage disposal systems (septics) [from MD Trib Strat Impl Plan doc]

#### Long-term

- Apply for funding on behalf of landowners in a block-grant approach, as appropriate, to reduce failing or inadequate septic systems and to replace septic systems with public sewer service [from MD Trib Strat Impl Plan doc]

#### Agriculture Strategy

#### Short-term

- Continue to lead the state in and be a model for agricultural BMP implementation [from MD Trib Strat Impl Plan doc]
- Continue to lead the state in and be a model for the agricultural land preservation program [from MD Trib Strat Impl Plan doc]

## 9. Reduce the amount of impervious surface that could result from new development

### Specific Action Items Already in Place: (“Continue to...”)

- ✓ Evaluate and adopt amendments to parking requirements, imposing limits on the surface area of a site devoted to parking

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### Specific “To Do” Action Items:

#### *Short-term*

- Work with the municipalities, where applicable, to incorporate in their road standards measures that reduce the allowable street width while still allowing for the minimum required pavement width needed to support travel lanes, on-street parking, and emergency vehicle access
- Create a Geographic Information System (GIS) impervious cover data layer to help model loading impacts and track impervious surfaces
- Where cul-de-sacs are allowed, offer credit through the County Landscape Manual review process for landscaped cul-de-sac islands
- Encourage the use of sidewalks on one side of the street where safety and pedestrian circulation are not a concern and where pedestrian alternatives are provided

### **10. Protect or restore water quality, keep waters off Maryland’s list of impaired waters, and make progress toward any applicable TMDLs**

#### Specific Action Items Already in Place: (“Continue to...”)

- ✓ Retrofit existing stormwater management facilities that do not meet existing stormwater management requirements, where doing so will have a significant impact
- ✓ Systematically re-establish forested stream buffers in the county
- ✓ Increased the frequency of storm drain cleanouts to prevent storm drain clogging and reduce the amount of stormwater runoff that bypasses existing stormwater management practices
- ✓ Continue to preserve or restore, where possible, riparian stream buffers with native vegetation that can be maintained throughout the plan review, delineation, construction, and occupancy stages of development
- ✓ Conserve trees and other vegetation at a site by planting additional vegetation, clustering tree areas, and promoting the use of native plants
- ✓ Retrofit existing stormwater management facilities that do not meet existing stormwater management requirements, where doing so would have a significant water quality impact
- ✓ Develop a program to systematically re-establish forested stream buffers in the county
- ✓ Increase the frequency of storm drain cleanouts to prevent storm drain clogging and reduce the amount of stormwater runoff that bypasses existing stormwater management practices
- ✓ Preserve or restore riparian stream buffers with native vegetation that can be maintained throughout the plan review, construction, and occupancy stages of development
- ✓ Conserve trees and other vegetation at a site by planting additional vegetation, clustering tree areas, and promoting the use of native plants

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### Specific “To Do” Action Items:

#### Short-term

- Work with the municipalities that do not have a water resource protection ordinance to adopt the County’s ordinance or something with similar or greater levels of protection
- Decrease allowable residential densities in rural areas outside DGAs to reduce the number of future residential septic systems that could be added, thereby reducing some of the potential increase in nitrogen loads
- Provide strong leadership on joint planning of point and nonpoint pollutant reduction activities to help ensure that Watershed Improvements Plans (WIPs) and two-year milestones, developed as a result of the completion of the Bay TMDL, are reasonably attainable, cost-effective, and properly targeted; and achieve ancillary public benefits
- Assemble a Watershed Implementation Plan Work Group to take the leadership in developing local Two-Year Milestones, to plan specific pollutant reduction activities, and to communicate with MDE (For more information on the Two-Year Milestones, see the BayStat website at <http://www.baystat.maryland.gov/>).
- Use GIS modeling tools to target specific management practices, explore grant funding opportunities, and play a role in public outreach/education programs to identify and address the WIP two-year milestones
- Develop a system for tracking all implementation activities to “take credit” for these nutrient reduction activities, including those already accomplished; use also as an accounting tool for point-point nutrient credit trades, point-nonpoint nutrient credit trades, and septic system hookup credits
- Initiate focused efforts to evaluate the total costs of TMDL implementation; identify both internal and external funding sources to meet those costs; and pursue specific grant opportunities to ensure that the County and municipalities receive an equitable share of available public funding

#### Long-term

- Participate in State programs of trading or offsets to maintain or reduce nutrient loading in impaired watersheds
- Develop a program to systematically re-establish forested stream buffers in the county
- Upgrade wastewater treatment plants to state-of-the-art technology, such as (but not limited to) ENR, to help meet Tributary Strategy load caps for total nitrogen and phosphorus
- Evaluate the need/practicality of new revenue structures

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## 11. Establish additional measures to protect Carroll County's and Baltimore City's reservoir watersheds

### Specific Action Items Already in Place: (“Continue to...”)

- ✓ Conduct watershed assessments for all watersheds in the county for which they have not yet been completed to identify improvements and retrofits for individual streams and watersheds
- ✓ Incorporate the commitments and strategies within the Reservoir Watershed Agreement into the County's planning, zoning, and decision-making process

### Specific “To Do” Action Items:

#### Short-term

- Establish a priority preservation area that incorporates protection for reservoir watersheds
- Identify and develop additional funding and implementation mechanisms for preserving land and protecting reservoir watersheds
- Expand the focus and scope of the County Agricultural Land Preservation Program beyond agricultural land to encompass other types of easements and land preservation mechanisms that address forest land, natural system and sensitive environmental areas, open space, and features contributing to the county's heritage

#### Long-term

- Identify and develop additional funding and implementation mechanisms for preserving land and protecting reservoir watersheds

## 12. Enhance stormwater management programs

### Specific Action Items Already in Place:

#### (“Continue to...”)

- ✓ Incorporate the use of nonstructural BMPs such as natural conservation areas, roof and non-roof top disconnection, vegetated swales, sheet flow to buffer, reduced impervious cover to the maximum extent practical and promote ESD or LID techniques, as required in Carroll County local laws since 2004 [from Guidance doc]
- ✓ Require permanent protection of existing forest on development sites and promote the enhancement and creation of

There are six existing or planned water supply **reservoirs** whose watersheds extend partially or entirely within Carroll County: Loch Raven, Prettyboy, Liberty, Piney Run, Gillis Falls, and Union Mills. Combined, these existing and planned reservoirs could potentially provide high-quality water for nearly 2 million people in Baltimore City and the five surrounding counties.

Most of the watersheds for these reservoirs are on the State's list of “impaired” waters (the 303(d) list), and a TMDL will ultimately be set for the impairing substance. A TMDL for phosphorus has already been set for Prettyboy Reservoir. A TMDL for phosphorus and sediments has been set for Loch Raven Reservoir. Liberty Reservoir is listed as impaired, which indicates that a TMDL will eventually be set for it as well. While no TMDL has been set for Piney Run Reservoir, a watershed management plan is being developed to ensure continued maintenance of its water quality. To ensure the future quality of water provided by these reservoirs, the County needs to take measures both to address the TMDLs as well as make certain that future development does not further negatively impact the watersheds that drain to these reservoirs.

The Board of County Commissioners signed a new Reservoir Watershed Management Agreement in 2005. This was an updated agreement whose beginnings date to 1984.

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contiguous forest areas [from Guidance doc]

- ✓ Retrofit existing stormwater management facilities that do not meet existing stormwater management requirements where doing so will have a significant impact

### Specific “To Do” Action Items:

#### Short-term

- Require open section roadways in all new developments outside DGAs [from Guidance doc]
- Perform a countywide review of individual programs and ordinances, relative to the new requirements to ensure compliance with the new 2007 stormwater management law

### 13. Address NPS loading impacts

#### Specific Action Items Already in Place: (“Continue to...”)

- ✓ Aggressively promote Carroll County’s land preservation programs, such as the MALPF, Rural Legacy, Critical Farms, and the Leveraged IPA program [from Guidance doc]
- ✓ Expand the IPA program outside of DGAs to offer leveraged IPA options that provide tax incentives to interested property owners as a means of accelerating the preservation of farmland (Leveraged IPAs could significantly accelerate easement acquisition while simultaneously decreasing acquisition costs.)

### 14. Identify changes to planned land use patterns and land development requirements to help achieve the needed reduction in pollutant loads

#### Specific Action Items Already in Place: (“Continue to...”)

- ✓ Implement agricultural best management practices (BMPs) to reduce nutrient impacts from agricultural areas [from Guidance doc]

### Specific “To Do” Action Items:

#### Short-term

- Reduce residential densities outside the GABs to decrease future nitrogen loads estimated to result from the current land use plan as well as to slow the growth rate of impervious surfaces

### 15. Refine the NPSS to more accurately reflect Carroll County conditions and to coincide with the revised Chesapeake Bay Program model and results

#### Specific “To Do” Action Items:

#### Short-term

- Create the remaining attributes of the impervious cover data layer so that a complete impervious cover layer is reflected by the combined attributes
- Evaluate the specific impervious cover rates for each land use category in Carroll County based on existing and projected development

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- Remove all SHA-owned properties from the NPSS acreage, as these areas fall under a different NPDES permit
- Coordinate with the Carroll County Health Department to track new septic approvals to input and keep up-to-date
- Complete a true land cover layer for the county based on latest available orthophotography and using the same land cover categories as the Chesapeake Bay Program Model 5.0.
- Use BLI data to derive future land use scenario acreages
- Use updated loading rates from the CBP Model phase 5.0 or by using Carroll County specific data if available

### *Short-term*

- Create a model in ArcMap to calculate loads within the GIS environment (instead of using ArcMap derived acreages in Excel to calculate loads)