

## Appendix 4: Environmental Resources Analysis

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### Vision

White Flint will be a green sustainable community with improved air and water quality. The Plan area's environmental function and appearance will be defined by:

- high performance architecture that saves energy
- more transit choices and connections with better facilities for walking and biking that provide alternatives to automobile travel
- a unifying open space system connecting parks and community destinations that creates a healthy urban landscape
- tree canopy that generously shades streets and spaces
- rainfall captured by state-of-the-art techniques such as green roofs and bio-retention areas.

The Plan's environmental goal is to:

- achieve sustainability by minimizing carbon emissions creating a healthy, livable urban environment by improving water and air quality.

### Background

The White Flint Sector Plan area is located within the Urban Ring described in the 1993 General Plan Refinement. It also falls within a State-designated Priority Funding Area designed to encourage growth. The study area spans five subwatersheds in the Lower Rock Creek basin and the Cabin John watershed (see White Flint Stream Conditions). The area is highly urbanized and all but a small amount of land has been developed. Most of the development occurred at a time before stormwater management regulations were in place, so all area streams are degraded. There are almost no natural resources or environmental functions remaining and there are no remaining sensitive areas to protect.

### Pervious Land Cover

All five subwatersheds influenced by development activity in the White Flint study area have poor or fair stream conditions. The existing land area covered by impervious surface covers approximately 87 percent of the study area leaving about 13 percent pervious and tree canopy shades just 10.5 percent of the study area.

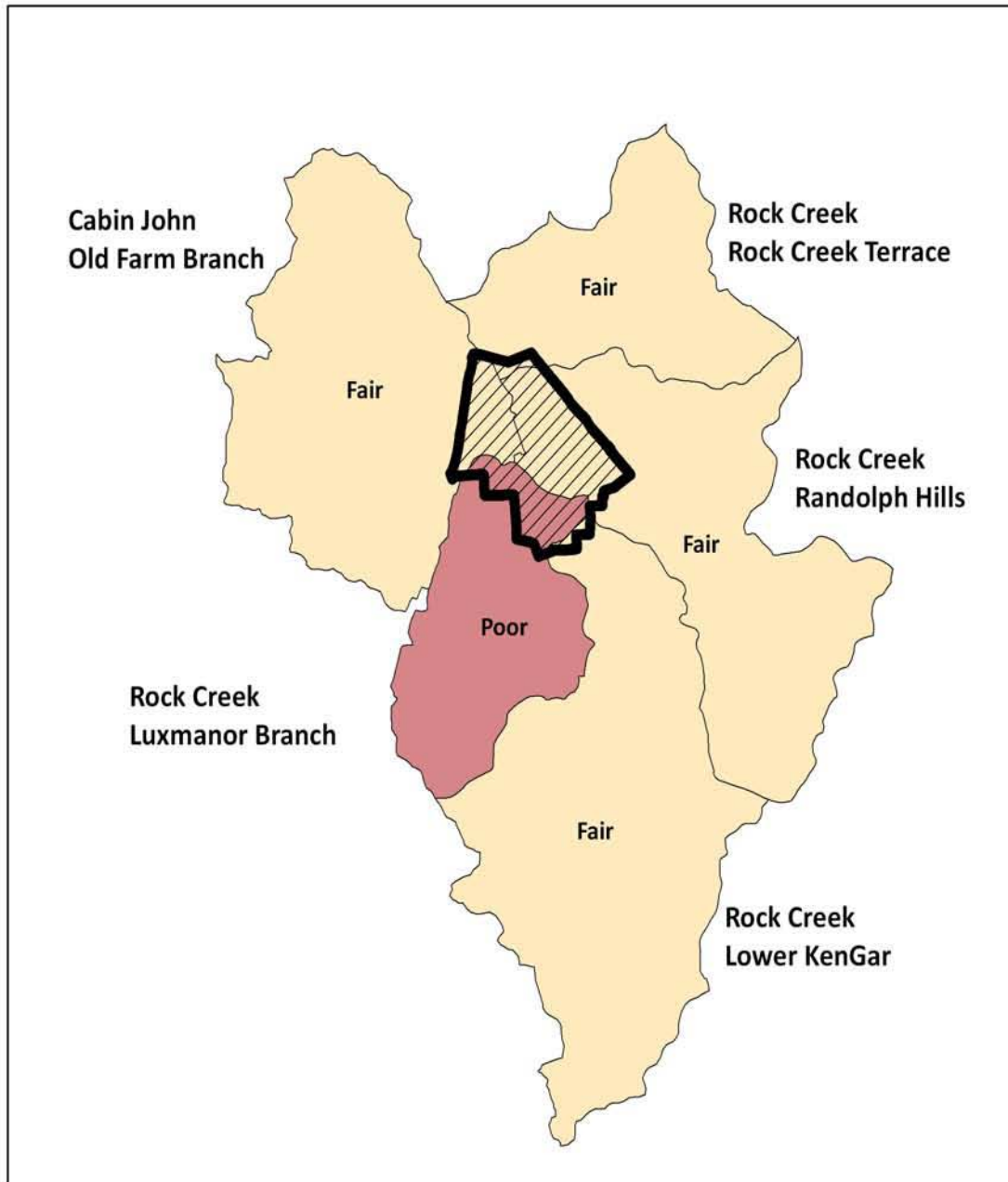
Much of White Flint developed prior to stormwater management regulations. The current water quality in those watersheds is fair or poor and is likely to remain in those categories due to high existing and projected imperviousness. However, stream conditions can be improved and the amount of erosion and nutrients contributed to Rock Creek and Cabin John (and eventually, the Chesapeake Bay) can be significantly reduced through the development process.

A large portion of the area will redevelop over the life of the Plan. This development will have to incorporate stormwater management requirements current at the time of development. Stormwater management requirements have become standard practice since most of White Flint was developed and the State has recently upgraded these standards. The regulations require environmental site design (ESD), which will establish higher standards and innovative treatment methods to the maximum possible extent. Montgomery County will be adopting these requirements as part of the County Stormwater Manual.

### Carbon Emission Analysis

Montgomery County Bill number 32-07 establishes a goal to stop increasing greenhouse gas emissions by the year 2010, and to reduce emissions to 20 percent of 2005 levels by the year 2050. Another Montgomery County law (Bill number 34-07) requires the Planning Board to estimate the carbon footprint of areas being master planned, and to make recommendations for carbon emissions reductions.

## White Flint Stream Conditions



Our current greenhouse gas modeling effort uses a version of the spreadsheet model developed by King County, Washington. While many of the inputs are derived from national averages, wherever possible we have substituted Montgomery County data derived by the Planning Department's Research and Technology Division. While the model considers all greenhouse gas emissions, results are reported in terms of the equivalent effect of a given volume of carbon dioxide ("carbon dioxide equivalents").

To project total emissions for an area, the spreadsheet model considers embodied energy emissions, building energy emissions, and transportation emissions. The model documentation defines embodied emissions as "emissions that are created through the extraction, processing, transportation, construction and disposal of building materials as well as emissions created through landscape disturbance (by both soil disturbance and changes in above ground biomass). Building energy emissions are created in the normal operation of a building including lighting, heating cooling and ventilation, operation of computers and appliances, etc. Transportation emissions are released by the operation of cars, trucks, buses, motorcycles, etc.

Inputs for each planning area include the numbers and types of housing units and the square footage of different categories of retail, commercial, and public buildings. The model is run once using 2005 data to establish baseline results. The model is run again using housing units, and commercial and retail space projected to develop under the master plan to estimate future greenhouse gas emissions. The model estimates emissions over the life of the development, and results are given in metric tons of CO<sub>2</sub> equivalents.

This is different from the County Emissions Inventory prepared by the Montgomery County Department of Environmental Protection, which estimates annual emissions.

The model only deals with emissions; no calculations are included to estimate potential carbon offsets from best management practices. The estimates also assume "business as usual" when projecting emissions. As estimates of building energy consumption, vehicle fuel efficiency, vehicle miles travelled, and other input parameters change, it may be possible to re-run the model to see how design and technology improvements affect projected outcomes. Many of these parameters are changing constantly, so input parameters are a moving target.

The results are also restricted to estimates for a specific master plan. Overall greenhouse gas emissions are projected to increase due to increased population and commercial development within a given master or sector plan area. As model results are evaluated, we must bear in mind that Montgomery County's greenhouse gas reduction targets are considered at a County wide scale.

Modeling results using these assumptions, along with sprawl scenario estimates are shown in the table below. Sprawl scenario estimates assume that growth beyond buildout of the 1992 plan would have occurred in a sprawl pattern outside White Flint, causing the emission of 40 percent more carbon than if it were built in White Flint. The land use pattern in White Flint will prevent the emission of approximately six to seven million metric tons of carbon equivalent over the lifetime of development. This reflects the physical savings of more compact building types and reduced vehicle miles traveled as compared to the sprawl scenarios. The Plan area is proposed to accommodate from 10 to 13 percent of the anticipated growth in population in Montgomery County at buildout on less than 0.2 percent of the County's land area.

## Estimated Baseline and Projected Carbon Emissions

Year	Emissions
	MTCO <sub>2</sub> e*
2005 (baseline)	13,000,000
Buildout (current zoning)	21,000,000
2030 Staging Capacity	29,000,000
2030 Staging Capacity Sprawl	35,400,000
2030 Potential Phase 4	32,000,000
2030 Potential Phase 4 Sprawl	39,600,000

\*Metric Tons Carbon Dioxide Equivalents  
(over the life of the development)

The Plan makes several recommendations intended to reduce carbon emissions, beginning with the recommendation to make White Flint a model of smart growth. Some of the smart growth effects are modeled in the results above but it is difficult to know the full range of behavior changes that the new White Flint will inspire. The vision is to create a compact community of mixed uses, enabling residents to live, work, and shop in a walkable area. The smart growth approach is enhanced by the provision of mass transit service, further enabling people to run errands and to commute without a car.

Many Plan recommendations will promote reductions in carbon emissions (such as open space, bicycle routes, and pedestrian priority streets) and many programs outside the planning process that will result in substantial reductions over time. Montgomery County's Climate Protection Plan has many recommendations for reducing carbon emissions, but we can only model the two with specific targets relating to master planning:

- 50 percent of residences will reduce energy consumption by 25 percent (resulting in a 12.5 percent reduction in existing and proposed residential building emissions)
- commercial properties will reduce their energy consumption by 25 percent.

Once the baseline projections were made, the model was used to test the recommendations for carbon footprint reduction to determine the magnitude of effects on the carbon footprint of White Flint beyond that already discussed. The results below illustrate the potential reduction for either the Staging Capacity or the Potential Phase IV projections.

## Potential Carbon Footprint Reduction from 2030 Projection

Recommendations	Reduction From 2030 Projections
50% of residences reduce energy consumption by 25% (12.5% reduction)	2%
Commercial properties reduce energy consumption by 25%	8%

Further reductions in carbon footprint will come from changes in building and site design, improvements in technology for vehicles and building energy conservation as well as the behavioral changes enabled by a compact, livable urban environment.

## Community Water and Sewer

Community (public) water and sewer service is available throughout the Plan area and is provided by the Washington Suburban Sanitary Commission (WSSC). There is sufficient capacity to support planned development but there may be local system improvements needed for individual projects, which will be determined during development review.

### Water

The Plan area lies within the Montgomery Main Service Area, which is served with water from the Potomac

Water Filtration Plant. A major project in the Plan area is the Potomac Bi-County Water Tunnel (formerly called the Bi-County Water Supply Main). The proposed tunnel is a new 84-inch diameter water main designed to meet growing demand and ensure continued reliable water supply. The new tunnel will connect two existing mains deep underground. The western connection is northeast of Tuckerman Lane's passage under I-270 in Rockville and the eastern connection is near the intersection of Beach and Stoneybrook Drives in Kensington. There is no expected impact to the Plan area.

There are, however, two high pressure water mains that generally follow Nicholson Lane through the Plan area. Projects here may be asked to set back their development some distance from those mains, but that would be determined at time of development review. The location of these mains may affect road improvements or improvements to the mains may need to be included in road projects.

## **Sewer**

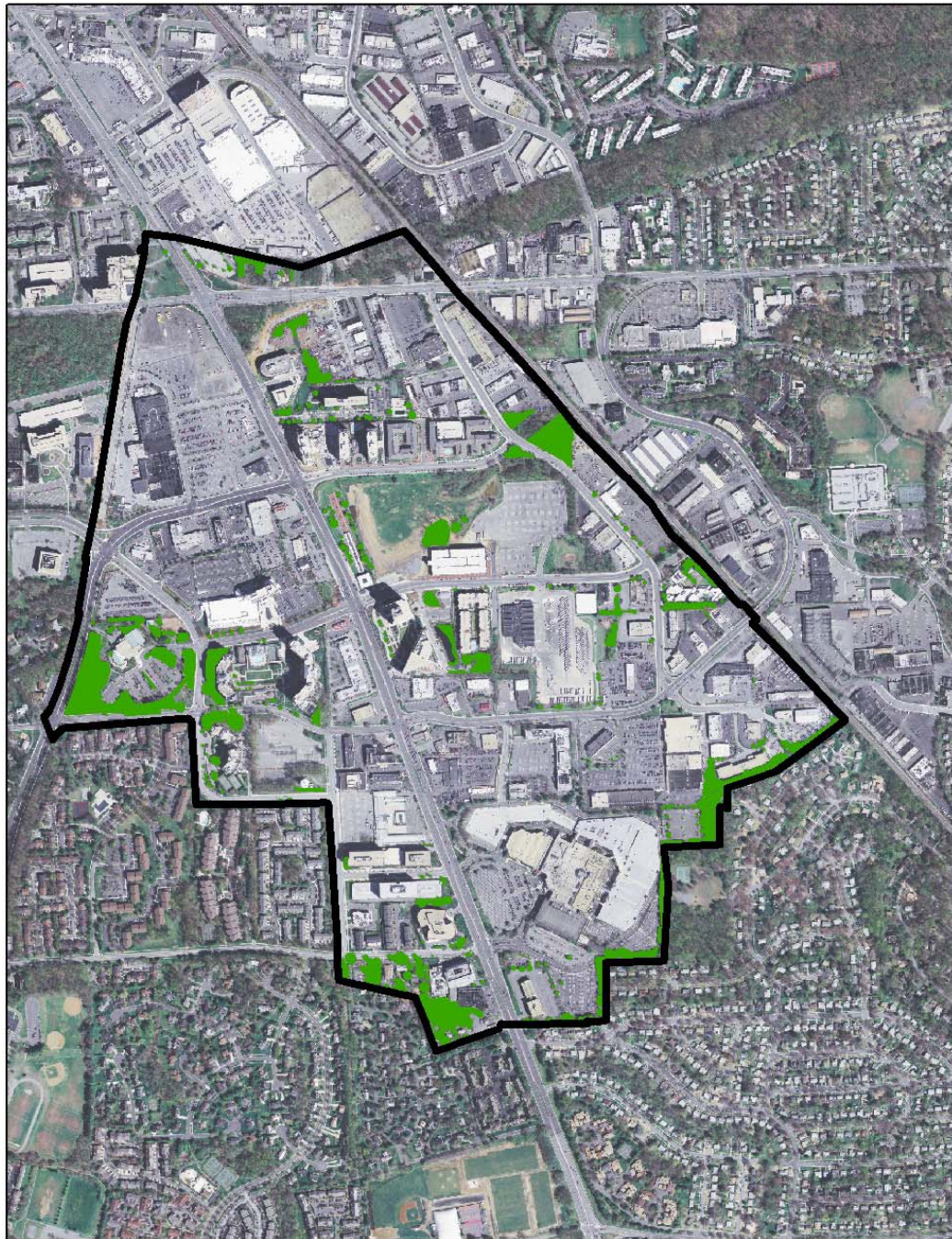
Wastewater in the Plan area flows through the Rock Creek conveyance system from the Rock Creek Basin in the WSSC service area to ultimate treatment at the Blue Plains Wastewater Treatment Plant in Washington, D.C. The sewer transmission line that provides service for the area runs along Rock Creek to the east of the Plan area.



During significant storms, up to six million gallons of the peak wastewater flows are diverted and stored at the WSSC's Rock Creek Storage Facility. The facility, located downstream of the Plan area, is designed to limit peak flow at the D.C. line. Stored wastewater flows are later allowed back into the Rock Creek conveyance system to drain by gravity flow under low demand conditions. This storage and release is arranged under an inter-municipal agreement with the District.

Local sewer capacity will be an issue and will be addressed for each project as development proposals are submitted for review.



# White Flint Tree Canopy



-  Sector Plan Boundary
-  Tree Canopy