# CHAPTER 8
# ENVIRONMENT AND SUSTAINABILITY


TREE CI
Arbor Day F


## Goals

- Increase the use of sustainable practices by residents, the business community and the Town
- Protect and enhance the existing tree canopy in residential neighborhoods and commercial zones
- Protect, restore, and enhance the Town's watersheds
- Reduce the amount of solid waste produced by residents and increase the amount of recycling in the Town
- Encourage LEED building practices for construction of new facilities

# Introduction

The Town of Vienna strives to attain a sustainable way of living that preserves the natural environment, conserves finite resources and supports a resilient community for future generations. It also recognizes its role to help mitigate greenhouse gas pollution and promote energy efficiency and sustainable practices.

For the purposes of this plan, environmental sustainability is to be defined as responsible interaction with the environment to avoid depletion or degradation of natural resources and allow for long-term environmental quality. The practice of environmental sustainability helps to ensure that the needs of today's population are met without jeopardizing the ability of future generations to meet their needs. The quality of a town's life is highly dependent on a healthy balance of all of the elements that are covered in the Comprehensive Plan.

## Overview

The health of Vienna's natural surroundings, and the community's efforts to spur wise choices that can preserve the environment, reduce unnecessary consumption of resources, and build a more sustainable community will provide an atmosphere that allows residents and businesses to thrive.

The Town's policies and programs should promote sustainable development, encourage renewable energy deployment, protect and preserve open spaces, and reduce waste and hazardous materials. The Community Enhancement Commission (CEC) has acted as one of the focal points for such efforts and works to educate citizens about environmental initiatives and programs to benefit and enhance the Town.

| | |
|---|---|
| **Town Area** | 4.409 square miles (2,821.9 acres) |
| **Average Elevation** | 389 feet |
| **Highest Point** | 492 feet |
| **Lowest Point** | 170 feet |
| **Watersheds** | Wolftrap Creek to the east and northeast |
| | Bear Branch to the southwest |
| | Hunters Branch to the southwest |
| | Piney Branch to the northwest |
| **Primary Soils** | Wheaton type, with variations |
| **Average High Temperature** | 64.18 degrees Fahrenheit |
| **Average Low Temperature** | 45.48 degrees Fahrenheit |
| **Average Precipitation** | 43.15 inches |

# General Characteristics

The Town of Vienna is located within the Virginia Piedmont, just west of the fall line which separates the coastal plains. The Town is situated approximately five miles southwest of the Potomac River and is comprised primarily of low-density residential neighborhoods with maintained landscaping and substantial tree cover. The Maple Avenue Commercial Corridor has relatively little landscaping or tree cover and includes the most significant areas of impervious surfaces. Some naturalized areas remain, primarily in parks, though these often include invasive and introduced species. Wildwood, Southside, and Northside parks are all heavily wooded and follow stream valley corridors.

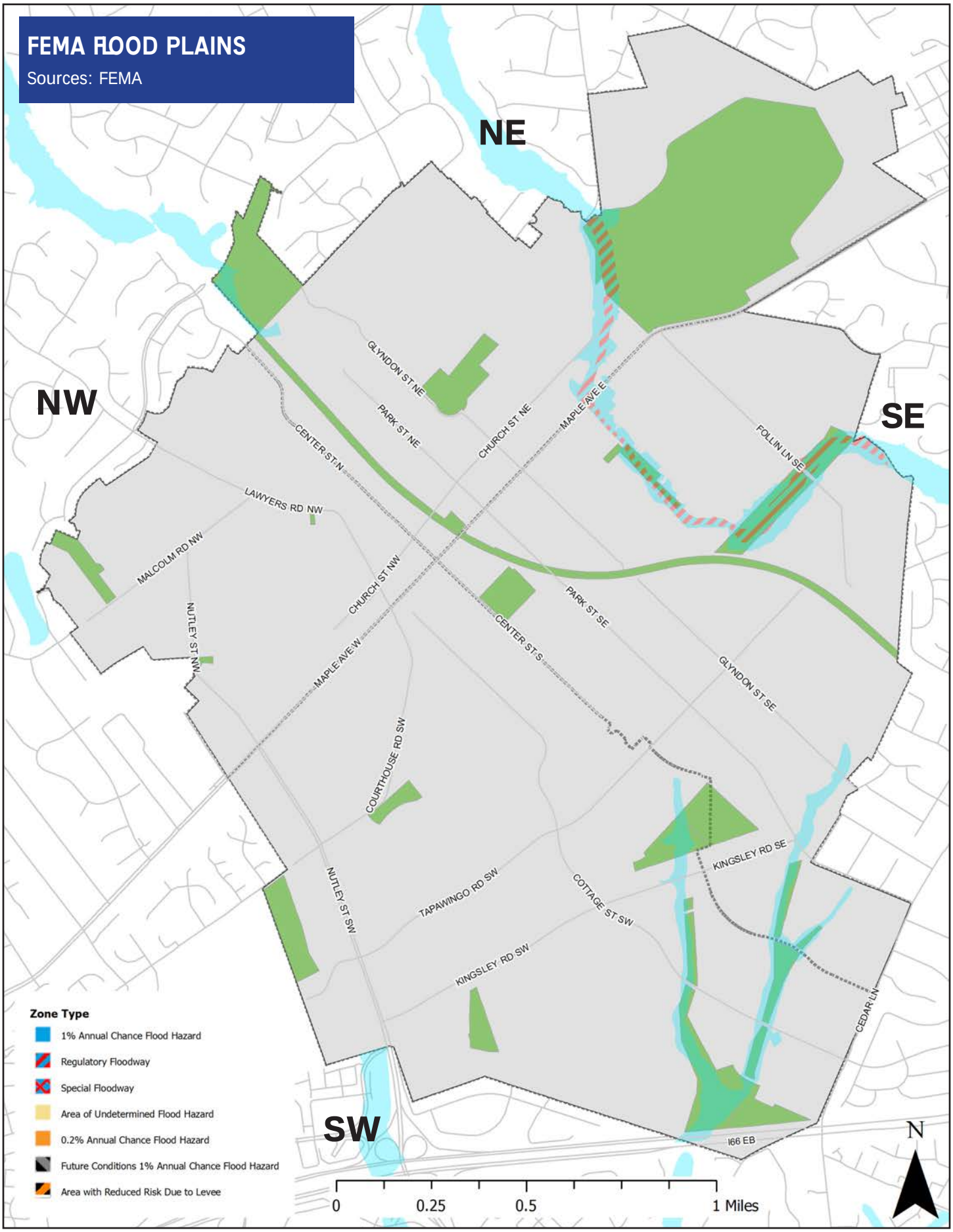
## Watersheds

Several separate watersheds can be found in the Town. Wolftrap Creek, a tributary of Difficult Run, runs north through the eastern portion of the Town. Piney Branch begins near Mill Street NE and also flows north into Difficult Run. Bear Branch, a tributary of Accotink Creek, flows south from the southwest part of the Town. Hunters Branch has its origins near Moorefield Park and flows south into Accotink Creek.

## Flood Plains

Flood plains are found in three of the four quadrants of the Town (see map on Page 138). They flank the streams of Bear Branch in the southwest quadrant and Piney Branch in the northeast quadrant. They also exist along Wolftrap Creek and a section of Piney Branch in Northside Park in the eastern half of Town. Many lots abutting flood plains are prone to flooding.

The Flood Plain Ordinance restricts new construction and redevelopment of old structures in delineated flood plains. Because the ordinance imposes land use controls on development, current residents are eligible for participation in the Federal Flood Insurance program administered by the Federal Emergency Management Agency (FEMA). Affected property owners within a Special Flood Hazard Area also are eligible for lower insurance rates as a result of the Town's participation in FEMA's Community Rating System. The Town's efforts under the Community Rating System include distribution of flood plain information to the public through the Department of Public Works at Town Hall and the Patrick Henry Library.


FEMA FLOOD PLAINS
Sources: FEMA
NE
NW
SE
SW
GLYNDON ST NE
PARK ST NE
CHURCH ST NE
MAPLE AVE E
FOLLIN LN SE
CENTER ST N
LAWYERS RD NW
MALCOLM RD NW
CHURCH ST NW
NUTLEY ST NW
MAPLE AVE W
CENTER ST S
PARK ST SE
GLYNDON ST SE
COURTHOUSE RD SW
NUTLEY ST SW
TAPAWINGO RD SW
COTTAGE ST SW
KINGSLEY RD SE
KINGSLEY RD SW
CEDAR LN
I66 EB
Zone Type
1% Annual Chance Flood Hazard
Regulatory Floodway
Special Floodway
Area of Undetermined Flood Hazard
0.2% Annual Chance Flood Hazard
Future Conditions 1% Annual Chance Flood Hazard
Area with Reduced Risk Due to Levee
0
0.25
0.5
1 Miles
N

Part of Hunters Branch, located in the southwest quadrant, is currently being restoried.

## Chesapeake Bay Preservation Areas

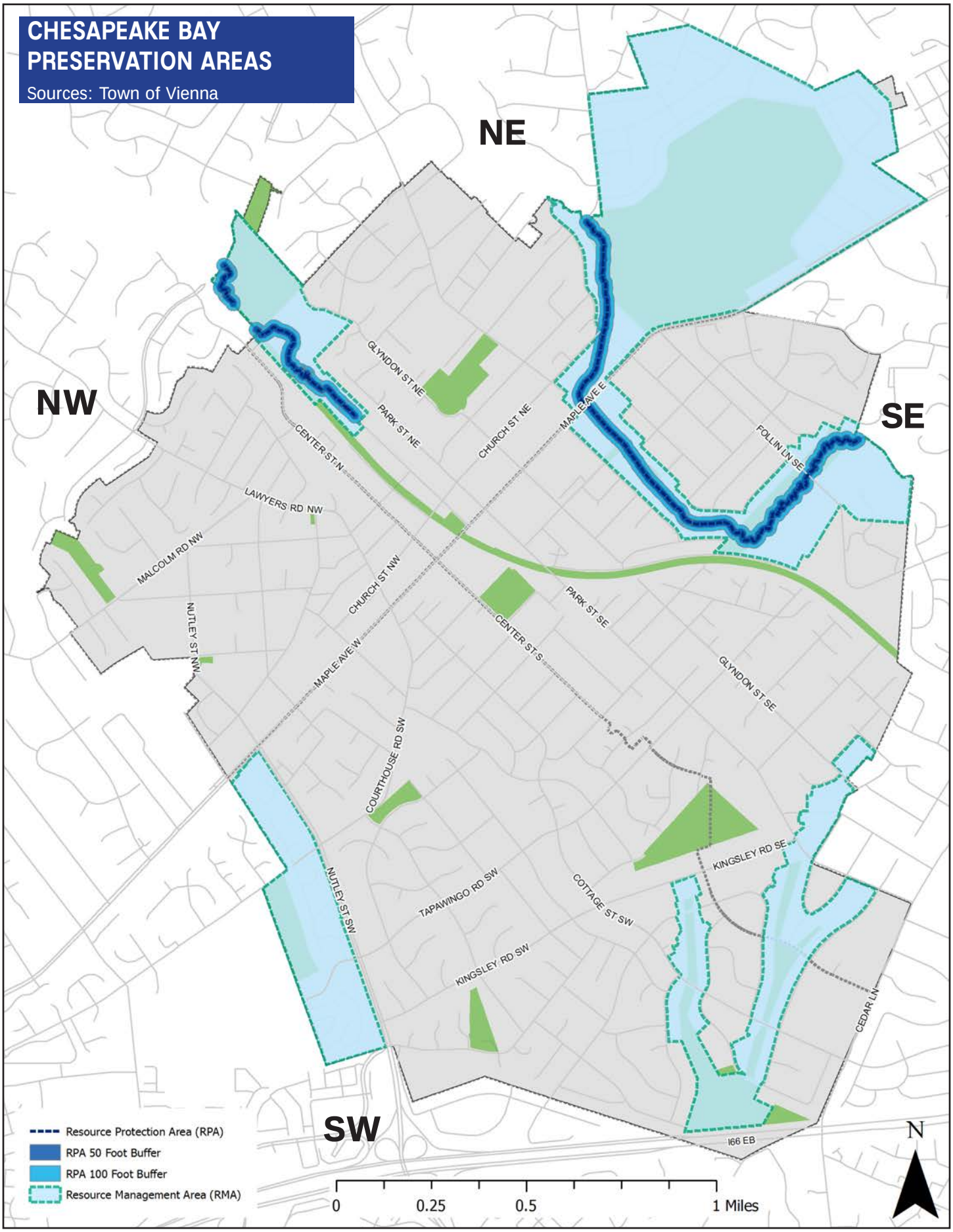
The Chesapeake Bay Preservation Act, (the "Bay Act") requires the Town to institute land use regulations to mitigate nonpoint source pollution and to protect the quality of streams and tributaries flowing into the Chesapeake Bay. Under the Act, two levels of land use control to protect water quality for such land are established, Resource Protection Areas (RPAs) and Resource Management Areas (RMAs).

### Resource Protection Areas

RPAs are subject to strict land use control. These areas are required to remain free of construction activities except under very restricted conditions. The Bay Act requires that designated wetlands and a 100 foot buffer area adjacent to and along both sides of a perennial stream be classified as an RPA.

### Resource Management Areas

RMAs have been designated in areas that have potential for contributing to significant water quality degradation through pollution runoff in the natural drainage system. These areas include flood plains and intermittent streams, and lands with sensitive soil conditions, such as hydric or highly erodible soils and soils with high water tables.


CHESAPEAKE BAY PRESERVATION AREAS
Sources: Town of Vienna
NE
NW
SE
SW
GLYNDON ST NE
PARK ST NE
CHURCH ST NE
MAPLE AVE E
FOLLIN LN SE
CENTER ST N
LAWYERS RD NW
MALCOLM RD NW
CHURCH ST NW
NUTLEY ST NW
MAPLE AVE W
CENTER ST S
PARK ST SE
GLYNDON ST SE
COURTHOUSE RD SW
NUTLEY ST SW
TAPAWINGO RD SW
KINGSLEY RD SW
COTTAGE ST SW
KINGSLEY RD SE
CEDAR LN
I66 EB
Resource Protection Area (RPA)
RPA 50 Foot Buffer
RPA 100 Foot Buffer
Resource Management Area (RMA)
0
0.25
0.5
1 Miles
N

# Water Pollution Control Efforts

There are two types of potential water pollution, point sources and nonpoint sources. A point source is a single identifiable source of pollution, such as a leaking gasoline tank or discharge from a wastewater treatment plant. A nonpoint source is often the result of a range of dispersed urban and rural land use activities.

## Potential Point Sources

Two commercial car washes are located within the Town, both of which are required to manage and recycle their wash wastewater on-site. Vienna also has several commercial gasoline stations with underground storage tanks and two municipal fueling stations with above ground tanks. All gasoline stations are required to inspect their underground storage tanks and ensure compliance with applicable state and federal standards. There have been no reported leaks from underground storage tanks in the Town within the last five years. If leaks are reported or suspected, the Town works with the Virginia Department of Health to investigate the situation and, when necessary, requires full on-site remediation systems including, but not limited to, ground water/free product recovery wells, granular activated carbon systems, and monitoring wells.

Other potential water pollution sources include leaching trash dumpsters and improperly stored refuse. Such situations are prohibited by the Town's Refuse Storage, Collection and Disposal Ordinance and are enforced by Town staff. The Town of Vienna has no landfills or dumps. However, the Town's Department of Public Works maintains its road salt supply under cover at the Northside Property Yard. Stormwater management at that site prevents downstream pollution from the stored road salt. The Town has also instituted stormwater management measures to filter run-off at the Beulah Road mulch site.

The Department of Public Works staff cleans out catch basins to help prevent nonpoint pollution.

Business sites that may produce wastewater with regulated substances are tightly regulated. Wastewater discharge forms, which are required for every new business application, are designed to identify regulated substances discharged from commercial and industrial sites into the Town's sanitary sewer system and, ultimately, into the regional treatment plants. A business or industry that generates wastewater with a regulated substance is required to design and implement a plan to treat the wastewater consistent with the National Categorical Pretreatment Standards, adopted by reference in the Town Code. In the absence of a Town-approved treatment system the business would be precluded from discharging into the Town's sanitary sewer system.

The Town should also verify that electrical power transformers located within the Town are not prone to hazardous leaks.

## Potential Nonpoint Sources

The Town also strives to prevent nonpoint source water pollution. Vienna has instituted a number of requirements and programs to prevent pollution of surface water and ground water. The Town Code prohibits the deposit of any substance or material, including leaves, in any storm drainage facility, including gutters, ditches, and water courses, that would lead to water pollution. The Town provides positive support to residents through the collection of yard debris, leaves, and automobile wastes, including used motor oil, antifreeze, and batteries. Fairfax County maintains a collection center for other hazardous waste, including pesticides, fertilizers, and paints.

The Town has 50 underground stormwater management/detention systems used to control the quantity and quality of stormwater flow. During a storm event the water is detained underground and held for slow release. This detention process results in the settlement of particles and pollutants that can be regularly cleaned out by the Department of Public Works.

There are also privately owned and maintained stormwater systems. A large and unique system is the retention/wet pond on the business campus of the Navy Federal Credit Union in the southeastern quadrant of Town. The system was designed in 1995 in full compliance with the "Bay Act." The system includes a Bentonite layer and vegetation for filtration of the retained stormwater. The system is regularly inspected by the Department of Public Works to ensure it is not leaking into the Town's streams.

# Stormwater

The Town operates a municipal separate storm sewer (MS4) system under authorization of the General Virginia Stormwater Management Program (VSMP) Permit for Discharges of Stormwater from Small MS4s. Since its issuance in 2003, the Town has established policies and procedures to implement the six minimum control measures (MCMs) outlined in the permit. Among these are measures to implement and enforce provisions for construction site stormwater runoff control and post-construction stormwater management.

The Town has established funding and staffing mechanisms adequate to maintain compliance with the MS4 permit requirements.

## New Regulations

Changes to the VSMP adopted by the Virginia Soil and Water Conservation Board in 2011 imposed additional responsibilities on the Town that were implemented July 1, 2014.

These new responsibilities include ensuring that an applicant for a regulated land disturbing activity has:

- Complied with enhanced requirements for stormwater quality and quantity control.
- Paid all applicable fees.
- Applied for and received coverage under the VSMP General Permit for Discharges of Stormwater from Construction Activities.

In addition, the Town must enforce implementation of a stormwater pollution prevention plan (SWPPP) during the construction inspection process. The SWPPP consists of a stormwater management plan, erosion, and sediment control plan, and pollution prevention plan (PPP). These changes necessitate amendments to the Town Code, a review of roles and responsibilities, and the development of a Funding and Staffing Plan.

# Trees and Landscaping

The Town has long recognized the contribution of trees and landscaping to community aesthetics and property values, and as natural resources that need to be protected. The subdivision and zoning ordinances include tree protection criteria that preserve arboreal resources within the Town limits. These provisions protect trees during construction and development activity, can help discourage the unnecessary clear-cutting of lots, encourage the planting of new vegetated areas, and ensure minimum tree canopy coverage for all new development.

## Infill Lots and Subdivisions

In 2012, CEC expressed concerns that with the trend of redevelopment of single lots many mature trees were being lost. To remedy the situation, the Town formulated new Code provisions to adopt minimum tree canopy coverage requirements for single-lot developments. An amendment to the Zoning Ordinance was adopted in the Spring 2014 and requires 20% tree canopy within 20 years after the development and tree protection. The Town should consider codifying incentives for developers to preserve existing trees since, under the current ordinance, developers and land owners are allowed to clear mature trees that offer much more value than younger, newer trees. A Code amendment to require 20% tree canopy within 10 years, similar other local jurisdictions, should also be studied.

In regards to subdivisions, the Town should consider requiring 10% tree canopy for individual lots in subdivisions and 20% for the entire subdivision. The Town should also continue to work with developers on selecting appropriate street trees for subdivisions. The Department of Parks and Recreation, for example, currently maintains a list of approved street trees for when there are and are not overhead wires present.

## Tree Vienna Donation Program

The Tree Vienna program, adopted by Council in 2014, provides a mechanism for individuals and organizations to contribute money to purchase trees to be planted within Town. The program is another way to increase Vienna's tree canopy coverage.

# Air Quality

Air quality improvements are coordinated on a regional level through the Metropolitan Washington Council of Governments. The Clean Air Act requires the U.S. EPA to set national air quality standards to reduce pollutants that can harm our health and environment. These national standards limit the concentrations of six pollutants, including carbon monoxide, lead, nitrogen dioxide, ground-level ozone, particulate matter, and sulfur dioxide.

## Efforts to Improve Air Quality

Although air quality has improved over the last decade, the area remains classified as a non-attainment area for some pollutants, including ozone and particulate matter. Air quality monitors located throughout the Washington, D.C. region measure pollutant concentrations throughout the day. The closest sampling station (testing facility) to the Town is located in Annandale.

Continued efforts are necessary to improve air quality. The Town's commitment to additional tree cover and landscape planting can help reduce greenhouse gases. Further, the Town has obtained grants under the Congestion Mitigation for Air Quality (CMAQ) program. This federal program, jointly administered by the Federal Highway Administration and the Federal Transit Administration, provides funds through the Commonwealth of Virginia, for projects that reduce criteria air pollutants regulated from transportation-related sources. The Town of Vienna has received CMAQ grants for a variety of projects, including sidewalks, trails, and traffic signalization, all of which encourage modes of transportation other than by automobile.

# Energy

Energy use is an essential component of residential life and commercial enterprise. The Town recognizes that affordable energy must be readily available for basic functions of homes, businesses, and their multiple (and ever-increasing) devices. While the Town does not have its own utility for its residents and businesses, it seeks to ensure that resilient sources of energy can be tapped, including traditional and renewable sources (including solar and geothermal). Energy efficiency should also be considered as a means to reduce energy use and save residents and business owners money.

## State Goals

The Commonwealth of Virginia has a target of reducing energy use by 10% by 2022. The Virginia Energy Plan includes a comprehensive approach that addresses all aspects of energy use, which may result in new policies and initiatives adopted across the Commonwealth. The Town of Vienna should seek to become one of the model communities in Virginia that embraces new technologies that build a more sustainable and resilient community. The first step in that process should be a thorough benchmarking of Vienna's public facilities' energy use.

## Solarize Vienna

In 2015 the Town Council approved "Solarize Vienna," a program which promotes solar installations throughout Town, in both residences and businesses. The program provides a bulk purchase discount to homeowners and commercial building owners who want to install solar photovoltaic systems on their buildings. The solarize program also has an energy efficiency component where an "energy coach" does a visual inspection of the residence and makes suggestions on how the home can be made more energy efficient. The Town should consider annually reauthorizing the program.

As part of the Solarize NoVA campaign, Falls Church Mayor David Tarter and Vienna Mayor Laurie DiRocco entered in a friendly competition to see whose community could enroll the greatest number of participants for free home energy checkups and solar PV reviews. (The Town of Vienna won this competition in 2015.)

## Energy Efficiency

Energy efficiency is a focus of Solarize Vienna. Efficiency is the most cost efficient means of saving money and energy. Energy efficiency opportunities should focus on:

- Coordinating with utility programs that provide incentives for energy efficient upgrades.
- Promoting tax incentives (both state and federal) for local building upgrades.
- Educating residents about state tax holidays for energy efficient purchases.
- Encouraging development around LEED, ENERGY STAR, and other certifications for building improvements.
- Evaluating and promoting behavior change programs.

## Residential and Commercial Changes

The nature of Vienna's residential character is evolving from modest, mid-20th century homes to larger, multi-story homes. Homeowners, homebuilders, and contractors should be encouraged through education and incentives to upgrade existing and new residences to be energy efficient.

Programs should be identified, developed and/or promoted to cover all income levels, so that everyone can benefit from energy efficient improvements that save money on utility bills.

As Vienna experiences redevelopment along the Maple Avenue Commercial Corridor, the Town should also encourage its businesses to reduce their energy consumption through LEED, ENERGY STAR, and the Commercial PACE (Property Assessed Clean Energy) program in Virginia.

# Resiliency

In the upcoming decades the effects of a changing environment will be increasingly prevalent at a local level. The Town, along with other local jurisdictions, will need to be able to adapt to the effects of environmental changes using policy, planning, programmatic and infrastructure solutions to create a long-term sustainable community resilient to these expected changes.

## Planning

The Town will need to remain vigilant in planning for more frequent extreme weather events, such as droughts, floods, hurricanes, windstorms, snow storms, and heat waves. There will also most likely be an increase in vector-borne diseases, such as West Nile and Zika viruses. The Town will need to be cognizant of and plan to meet or exceed the evolving standards for air pollutants.

There are several ways in which the Town can help plan for these effects and do its part in reducing greenhouse gas emissions. They include the following:

- Assess and update emergency plans for extreme weather events.
- Ensure that stormwater management practices are up-to-date and take into account increases in flooding events.
- Plant and encourage planting of more drought resistant native trees, shrubs, and grasses.
- Move towards a more efficient Town vehicle fleet.
- Inventory the Town's consumption of fossil fuels, in buildings and vehicles, and water to better understand where consumption can be reduced and money saved.
- Calculate the Town's greenhouse gas and other air pollutant emissions with the aim of making reductions.
- Work with regional and state agencies in combating the spread of vector-borne diseases.

The Town will also need to be aware of and follow up on any state recommendations and plans. Governor McAuliffe's Climate Change and Resiliency Update Commission recently released a report with recommendations to the governor on how the Commonwealth should deal with climate change. This report follows the 2008 Climate Change Action Plan.


# Community Involvement and Outreach

The Town strives to broaden awareness of the environmental issues that impact the Town and region. Numerous programs and events, some of which are listed below, support these efforts.

## Green Expo

The annual Green Expo is a free, juried showcase of local and regional environmentally focused exhibitors. Its intention is to educate the public on how to live more sustainably. Exhibits focus on solar energy, efficient vehicles, sustainable gardens, recycling, as well as other green and sustainable technologies.

## Eco-Efficient Homes Initiative and Native Plants Sale

The Eco-Efficient Homes Initiative recognizes builders and homeowners who build homes to third-party standards such as ENERGY STAR, Passive House, etc.

In an effort to also make it easier to acquire native plants, which enhance the population of beneficial insects and birds in the region, the CEC hosts a native plant sale in the fall, during the ideal time to plant perennials.

## Recycling

The CEC and Town/Business Liaison Committee are currently working to encourage businesses to increase their recycling. Restaurants in Town that achieve sustainability goals set out by the Virginia DEQ achieve the Virginia Green Restaurant designation.

## Ivy Free Vienna

Ivy Free Vienna, a program run by the CEC, helps educate the public on the harm caused by English ivy to the Town's trees, which provide environmental benefits by soaking up carbon dioxide and generating oxygen.

English ivy, when it grows up a tree, eventually hobbles the tree's ability to photosynthesize, ultimately killing the tree and making it more susceptible to falling in a storm. The tree then needs to be removed, an expensive endeavor for the owner of the property. English ivy has also been known to attract mosquitoes.

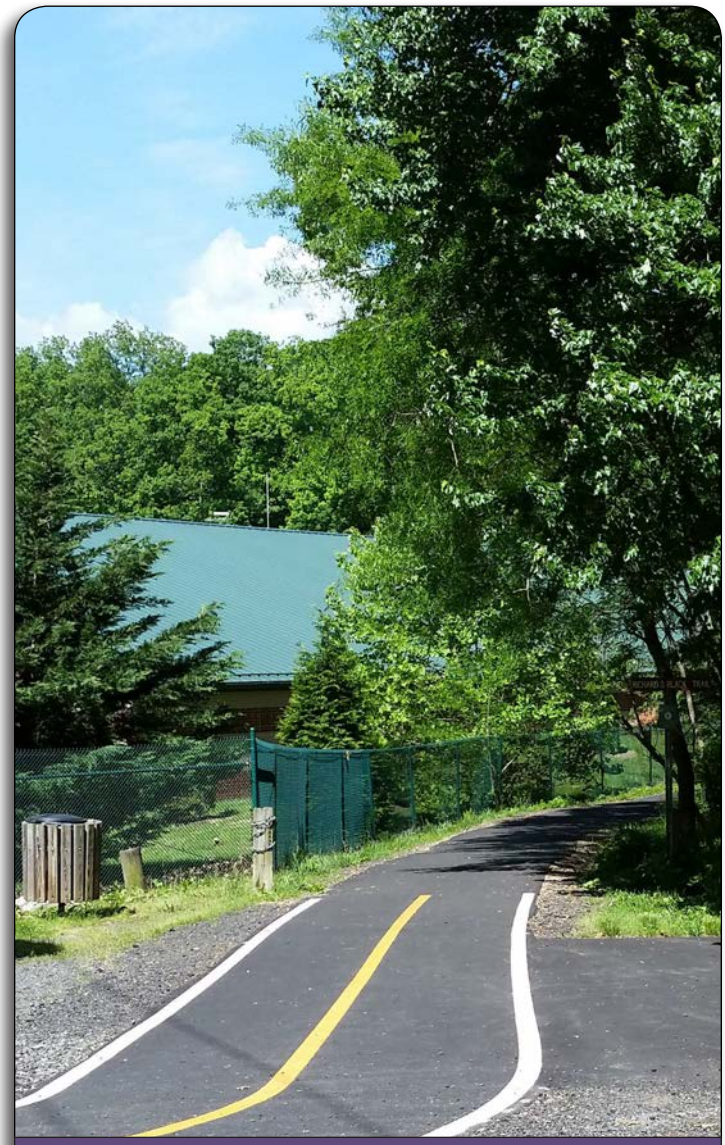
The Virginia Native Plant Society has listed native alternatives to English ivy, which do not cause harm to trees.

## Objective 1 - Promote a positive visual experience.

### Implementation Strategies

- Enhance and protect the aesthetic character of the Town through the continued oversight by the Board of Architectural Review for applications other than single-family residences.
- Promote public art through private support of public murals and sculptures.
- Preserve the natural environment.

Church Street is enhanced by its streetscape and the architecture of the buildings



Northside Park contains a series of trails throughout 26 acres of wooded, naturalized land

## Objective 2 - Protect the natural environment and the natural beauty of the Town's environmental setting.

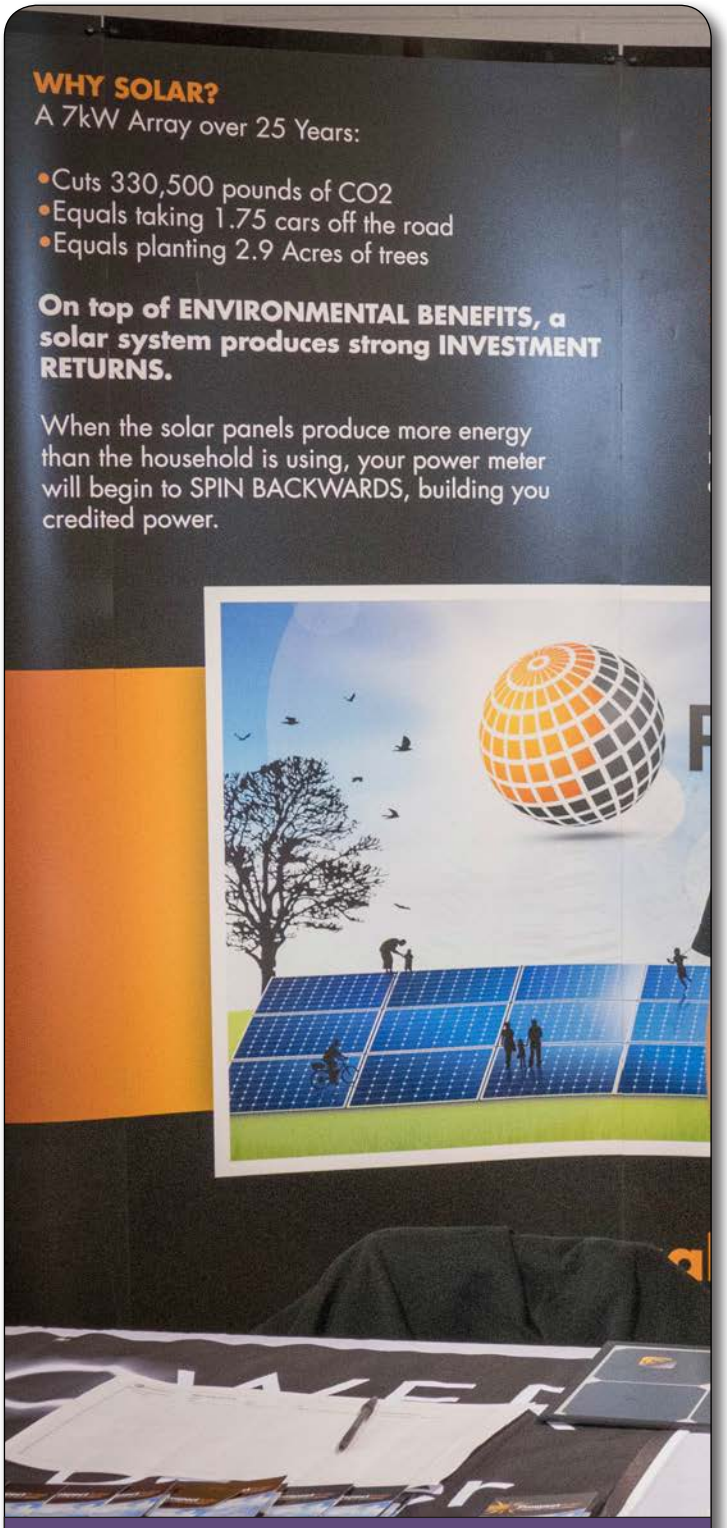
### Implementation Strategies

- During the development review process, support efforts to preserve and protect native habitat and vegetation.
- Continue to support collaborations between the Town and Fairfax County regarding stream valley enhancement that increase wildlife and aquatic habitat, increase groundwater recharge, stabilize stream flows, and decrease sedimentation.
- Promote and educate the public regarding efforts and opportunities to protect the natural environment, increase efficiency, and reduce the demand for resources.
- Ensure public access to natural open spaces, trails, and bicycle paths, including those in stream valleys. Where possible, identify opportunities to enhance trail access or connectivity. Promote pedestrian access and marked bicycle lanes on major town thoroughfares.
- Protect and enhance the Town's tree canopy.
- Identify opportunities to improve air quality to support a healthy environment.
- For redevelopment projects, consider implementing a type of legacy tree ordinance to protect trees deemed to be of historic or significant value.

**Objective 3 - Promote sustainable living and governance through initiatives and investments that reduce energy costs and reduce or eliminate greenhouse gas (GHG) emissions.**

**Implementation Strategies**

- Establish a baseline and track greenhouse gas emissions of Town operations through periodic inventories or assessments and adopt steps to reduce energy waste and its associated GHG emissions.
- Set a community example by the decisions and investment choices that use energy with greater efficiency including new ways of living in Town through an overarching emphasis on energy efficiency in buildings that is exemplary.
- Consider process (procedural) strategies for reducing demand and increasing energy efficiency for existing Town facilities and operations.
- Consider strategies for reducing demand and increasing water efficiency for Town facilities and operations.
- Promote the adoption of third-party certified energy efficiency programs for new residential and commercial construction and major renovations in Town.
- Promote adoption of renewable energy sources such as solar photovoltaic, solar thermal and geothermal systems through the use of zoning authority (proffers), public education initiatives and recognition of the owners, builders and architects whose contributions are meritorious.
- Promote the installation of green roofs (planted) for building insulation and water quality improvement.
- Maintain the Town's robust recycling program, striving to increase the participation rate and challenge businesses to implement steps to become equally robust recyclers.
- Encourage businesses and residents to compost, possibly with a paid subscription service.



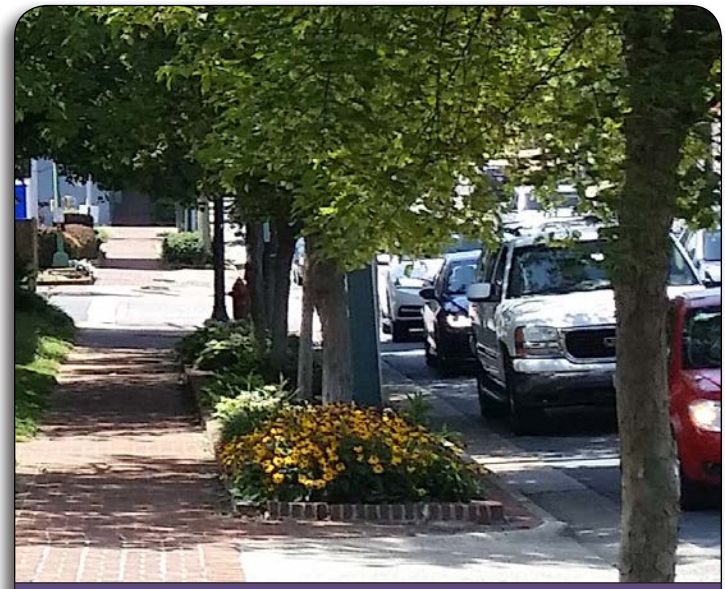

At the Green Expo, vendors presented information about the advantages of solar panels for home owners

## Objective 4 - Decrease GHG emissions produced by vehicles in the Town.

### Implementation Strategies

- Reduce the impacts of vehicular traffic on air quality by continuing to invest in a Town fleet which incorporates low-emission and alternate-fuel vehicles, and supporting other strategies which increase fuel efficiency in Town operations.
- Support the reduction in single-occupancy vehicle travel by supporting flexible work schedules and telecommuting policies, and increasing opportunities for transit and bicycle use, in addition to sidewalks and pathways.


The Fairfax Connector 463 bus travels from the Vienna Metro Station to the Tysons Corner Metro Station along Maple Avenue



Black-eyed Susans are used throughout Town because they are drought tolerant and native to the area

## Objective 5 - Adopt effective stormwater management practices.

- Promote the use of permeable pavers and surfaces for parking lots and sidewalks and advanced rainwater collection on Maple Avenue sidewalks.
- Implement necessary stormwater programs/policies to satisfy regulatory requirements and meet state and federally-mandated water quality protections required as part of the Chesapeake Bay Preservation Act.
- Ensure erosion and sedimentation control requirements are met at all Town construction sites.
- Promote the use of regionally adaptive native and drought-tolerant plants.
- Improve public and private storm water infrastructure.

## Indicators

- Increase in the Town's tree canopy
- Decrease in emissions produced by Town-owned vehicles
- Increase in number of LEED certified buildings
- Decrease in trash produced per capita by Town residents
- Increase in the number of solar panels installed by residents and businesses
- Increase in the amount of recycled materials collected by the Town
- Increase in the percentage of streams restored