

# **Town Of Vienna Virginia**

## **Solid Waste Management Plan**



**December 2004  
Updated 2010**

# **Town Of Vienna Virginia**

## **Solid Waste Management Plan**

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## **Section 1 EXECUTIVE SUMMARY**

This solid waste management plan provides an integrated, comprehensive strategy for the management of solid waste generated within the Town of Vienna. The integrated approach is based on the Northern Virginia Waste Management Board's regulations hierarchy which looks to reduce, reuse, and recycle solid waste as the preferred method of waste management. The Town of Vienna has a fairly stable population and employment base. It is expected that over the 20-year planning period the population will increase by about 5.4 percent. Because of these anticipated changes, the Town will continue to take an active role in the management of solid waste.

### **1.1 OBJECTIVES OF THE PLAN**

The Town's Solid Waste Management Plan focuses on providing a cost-effective, environmentally sound program that has the support of the community and elected officials. The objectives of the plan are to:

- Develop a plan that is consistent with the Department of Waste Management's (DWM) hierarchy.
- Continue to provide a collection and recycling program that anticipates the future waste generated within the Town.
- Maintain an agreement with Fairfax County to provide disposal services for Town waste.
- Provide an opportunity for private firms to provide collection, disposal and recycling services for a portion of the waste generated within the Town.

### **1.2 SUMMARY OF SELECTED ALTERNATIVES**

The Town has met the Virginia Waste Management Board's recycling requirement of 25 percent through its residential recycling programs. In calendar year 2009 the Town recycled 53 percent of its waste. The Town intends to continue its efforts in reducing the waste stream in excess of the regulatory required 25 percent through existing and enhanced recycling programs. In 2009 Town residents generated about 10,142.17 tons of solid waste. The Town was directly responsible for the collection of 4,764.35 tons of solid waste from all single-family units and about 40 percent of the multifamily units in Vienna, and 5,377.82 tons of recyclables. The remainder of the waste was collected by private haulers. The privately collected waste included commercial and the remaining multi-family units.

The Town of Vienna has developed an agreement with Fairfax County regarding the management of commercial and multi-family waste collection and recycling. The agreement has the County responsible for reporting the amount of privately collected recyclables within the Town. Centralized reporting of business recycling data minimizes duplication and eliminates the need for separate record keeping by the Town. This will permit the Town to use its staff more efficiently for residential recycling program implementation. The County will report recycling rates and waste generation for both the residential and commercial waste streams in the County and the privately collected waste and recyclables from the Cities of Fairfax and Falls Church and the Towns of Herndon and Vienna.

Management of Town collected waste will consist of the following program, as summarized in Table 1-1:

### **1.2.1 RECYCLING**

The Town offers curbside recycling. Materials collected include mixed recyclable materials, newspapers, flattened cardboard, magazines, catalogs, junk mail, telephone books, and bundled brush. Recyclables are picked up on the second day of the scheduled route. The Town will continue to collect leaves and brush curbside. The collected leaves and brush will be mulched and returned to the citizens free of charge.

### **1.2.2 RESOURCE RECOVERY**

The majority of the Town's non-recyclable waste will be combusted at the existing Fairfax County Energy/Resource Recovery Facility under an agreement between the Town and County. This approach will serve as the primary means of disposal of Town collected waste for the next 20 years. The Town will monitor the ability to use the proposed Prince William Waste to Energy facility for disposal.

**Table 1-1  
SUMMARY OF SOLID WASTE MANAGEMENT PLAN  
FOR THE TOWN OF VIENNA**

Source Reduction

Public Education Program/Town Newsletter

Reuse

Leaf Mulching

Recycling

Continue providing curbside pickup of recyclables to single-family residences  
Continue to provide drop off facility for used motor oil at the Northside Property Yard  
Continue to provide curbside collection of leaves and brush  
Commercial recycling managed through a County-administered program

Resource Recovery

Operate under an agreement with Fairfax County

Incineration

No action

Landfilling of Waste Collected by Municipality

The Town currently takes all residential household waste to the Fairfax County Division of Solid Waste Disposal and Resource Recovery Center located on West Ox Road. The Town will continue to use the I-95 Resource Recovery Center for disposal of nonprocessible materials that bypass the West Ox Fairfax County Energy/Resource Recovery Facility and require landfilling.



### **1.2.3 INCINERATION**

The Town plans no independent action regarding incineration as a waste management technique at this time.

### **1.2.4 LANDFILLING**

The Town currently takes all residential household waste to the Fairfax County Division of Solid Waste Disposal and Resource Recovery Center located on West Ox Road. The Town will continue to use the I-95 Resource Recovery Center for disposal of nonprocessible materials that bypass the Fairfax County Energy/Resource Recovery Facility and require landfilling. Once the I-95 Resource Recovery Center reaches capacity and is closed or is expanded under a new permit, the Town will continue to rely on Fairfax County for disposal of nonprocessible or bypass material through the disposal agreement with the County. Disposal of debris will continue through the use of the Furnace Road Landfill, a private landfill.

### **1.2.5 TREATMENT AND STORAGE PRACTICES**

The Town does not store any household waste collected. Collected household waste is hauled directly from curbside to the Fairfax County Transfer Station on I-66. Leaves are collected curbside during October, November and December and processed into mulch on Town property. The mulch is delivered to Town residents and local nurseries in January, February and March.

## **1.3 SCHEDULE OF PLAN IMPLEMENTATION**

The attached schedule, Figure 1-1, presents the anticipated implementation schedule for the Town's solid waste management plan.

Figure 1.1  
**TOWN OF VIENNA**  
**IMPLEMENTATION SCHEDULE**

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Existing Programs																						
Curbside Recycling	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**
Office Paper Recycling in Town Offices	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**
Leaf and Brush Collection	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**
New Programs																						
Public Education to Help Increase Recycling	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**

## **Section 2 SUMMARY OF INCORPORATED DATA, EXISTING SYSTEMS AND WASTE PROJECTIONS**

This section of the report discusses the demographics and existing solid waste management program in the Town of Vienna. The Town of Vienna is located within Fairfax County, Virginia, and has an area of 4.40925 square miles.

### **2.1 DEMOGRAPHIC INFORMATION**

Table 2-1 presents estimated and projected population figures for the Town of Vienna.

<b>Table 2-1 TOWN OF VIENNA, ESTIMATED AND FORCASTED POPULATION JANUARY 2002</b>	
<b>Year</b>	<b>Population</b>
2000	14,453
2002	15,669
2005	15,681
2010	15,912
2015	16,146
2020	16,385
2025	16,568
Source: US Bureau of the Census of Population and Housing, 2000 Fairfax County Department of Systems Management for Human Services, 2002 through 2025 <a href="http://www.co.fairfax.va.us/comm/demogrph/demrpts/report/section4.pdf">http://www.co.fairfax.va.us/comm/demogrph/demrpts/report/section4.pdf</a>	

Table 2-2 presents information on housing units for the year 2003. The housing units are classified based on the number of dwelling units per structure.

<b>Table 2-2</b> <b>HOUSING UNITS For 2009<sup>1</sup></b>		
	Percentage of Housing Units	Number of Housing Units
Single Family	82.31	4,732
Townhouses	7.36	423
Apartment	5.44	313
Condominium	4.89	281
<b>Total</b>	<b>100</b>	<b>5,749</b>
<sup>1</sup> Town of Vienna, Virginia Department of Planning & Zoning Statistical Data February 17, 2010		

## 2.2 URBAN CONCENTRATIONS AND TRANSPORTATION ROUTES

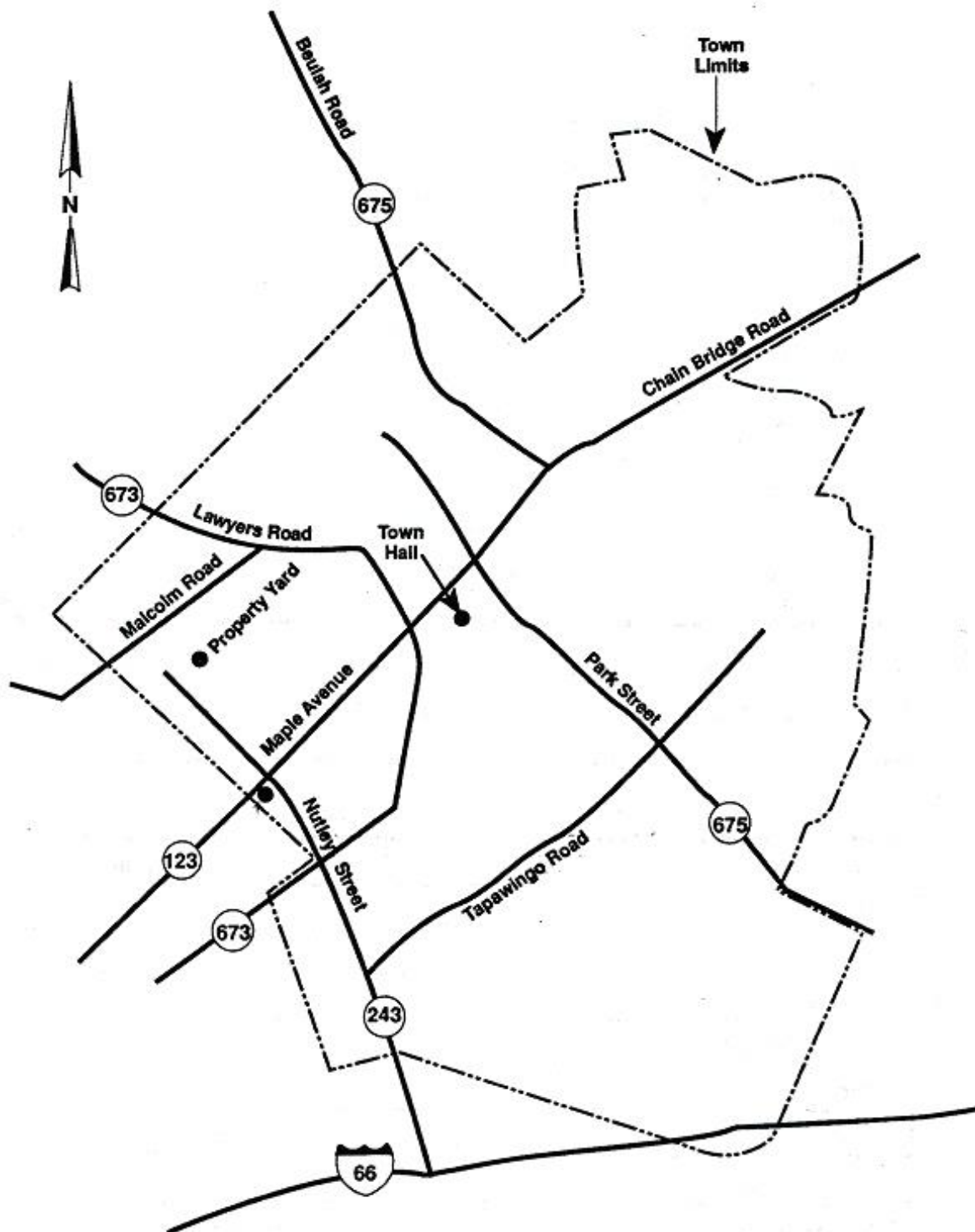
The primary areas of commercial and industrial use are located along Maple Avenue (Route 123), Follin Lane, Electric Avenue, and Church Street. The majority of the remaining area is residential, mostly single-family housing.

The Town of Vienna is zoned mostly residential as shown in Table 2-3.

<b>Table 2-3</b> <b>ACRES BY ZONING CATEGORY<sup>1</sup></b>		
	Acres	Percentage
Residential	2,144.15	75.98
Commercial	131.75	4.67
Industrial	128.31	4.55
Other (Transportation, etc.)	417.69	14.80
<b>Total</b>	<b>2,821.9</b>	<b>100.0</b>
<sup>1</sup> Town of Vienna, Virginia Department of Planning and Zoning Statistical Data February 17, 2010		

The major transportation routes serving the Town of Vienna include Maple Avenue, also known as Chain Bridge Road (Route 123), Nutley Street (Route 243), and Route 66, as shown on Figure 2-1. Major regional transportation routes include Interstate 495 (I-495), located about 5 miles to the east, and Interstate 66 (I-66), located about 2 miles south of the Town.

Figure 2.1  
TOWN OF VIENNA MAP



## 2.3 EMPLOYMENT

Projections for employment within the Town of Vienna are given in Table 2-4. This table also presents information on the ratio of population to employment. As the table shows, there are more people employed in the Town of Vienna than residents. This fact is expected to yield higher waste generation projections when compared to jurisdictions where the number of residents is greater than employees.

<b>Table 2-4 EMPLOYMENT PROJECTIONS, TOWN OF VIENNA<sup>1</sup></b>		
	Employment	Ratio (Pop. /Employ.)
1990	18,431	0.81
1995	18,800	0.73
2000	19,176	0.71
2005	19,559	0.71
2010	19,950	0.70
<sup>1</sup> 1991 Solid Waste Management Plan for the Town of Vienna		

Table 2-5 provides information on employment classified by business activity for Fairfax County.

<b>Table 2-5</b>	
<b><i>1998 Employment Characteristics for all of Fairfax County</i></b>	
Self Employed	10.9 percent
Private for profit	50.0
Private Non-profit	9.8
Federal Government	15.2
State or Local Government	7.8
Armed Forces	2.6
Other	3.7
Source: Town of Vienna Website: Fairfax County, VA, Population and Economic Characteristics, 2002	

Table 2-6 presents information, by area, on the type of businesses operating in Vienna and the other planning districts in Fairfax County.

Table 2-6

Planning District	Structure Type			Total Gross Floor Area
	Industrial	Office	Retail	
Annandale	3,728,704	3,406,456	2,135,646	9,270,806
Baileys	474,182	4,299,305	3,758,291	8,531,778
Bull Run	10,340,653	13,765,451	5,785,342	28,891,466
Fairfax	465,829	9,386,063	3,916,630	13,768,522
Jefferson	2,894,887	9,666,888	2,825,905	15,387,680
Lincolnia	1,882,607	847,862	1,730,673	4,461,142
Lower Potomac	3,060,236	180,433	519,524	3,760,193
McLean	1,418,748	24,989,803	6,926,563	33,335,114
Mount Vernon	344,352	1,314,519	4,069,859	5,728,730
Pohick 1/	657,007	644,874	2,170,346	3,472,227
Rose Hill	393,036	645,859	1,512,063	2,550,958
Springfield	12,195,612	2,443,089	5,388,731	20,027,432
Upper Potomac 2/	4,753,464	36,515,400	8,015,531	49,284,395
Vienna 3/	710,472	9,690,703	3,373,874	14,275,049
Fairfax County	43,319,789	117,796,705	52,628,978	213,745,472

**Source: Fairfax County Department of Systems Management for Human Services, 2008**

**Note:** All data in square feet. Countywide totals may vary by table depending on how well the geographic layer aligns with actual county boundaries.

- 1/ Includes the Town of Clifton
- 2/ Includes the Town of Herndon
- 3/ Includes the Town of Vienna

## 2.4 ESTIMATE OF WASTE GENERATION AND COMPOSITION

### 2.4.1 WASTE GENERATION

The Town of Vienna collects solid waste from about 90 percent of the residences within its boundaries. Records documenting the amount of residential waste collected by the jurisdiction were obtained from the Vienna Public Works Department. An estimate of waste generated by the households not served by municipal collection was developed from this information. There is limited information available regarding the amount of demolition waste, land clearing debris, commercial, industrial, and construction waste generated in Vienna because this waste is collected by private haulers. An estimate of this waste stream has been developed based on literature information and data available from Fairfax County. The commercial and industrial waste generation estimate is based on the number of employees working within the Town of Vienna, and the type of work they perform. This information was presented in Tables 2-4 and 2-5. The various employee generation rates are summarized in Table 2-7 below.

<b>Table 2-7 BUSINESS WASTE GENERATION RATES<sup>1</sup></b>	
<b>Business Activity</b>	<b>Estimated Generation Rate (lbs/employee/day)</b>
Retail	7.1
Service	3.3
Wholesale	5.2
Industrial/Manufacturing	6.2
Finance	3.3
Government	4.9
<sup>1</sup> 1991 Solid Waste Management Plan for the Town of Vienna	

Table 2-8 illustrates the amount of waste generated in the Town of Vienna for calendar years 2007, 2008, and 2009. Current information indicates that the Town does not generate within its boundaries sludge, mining waste, ash, septage or agricultural waste.

Table 2-9 is an estimate of per capita waste generation rates based on population and waste generation rates estimated from available information. Table 2-9A shows the projected increase in solid waste for Fairfax County due to an increase in the population, assuming that the generation rate remains constant.



**Table 2-8**  
**HISTORICAL WASTE GENERATION**

Component	2007* (tons)	2008** (tons)	2009*** (tons)
Paper	1,484.89	718.53	Single Stream
Metal	66.87	29.39	34.04
Plastic	n/a	n/a	Single Stream
Glass	n/a	n/a	Single Stream
Commingled	583.03	237.64	n/a
Yard Waste (Composted or Mulch)	3,070.15	804.22	1,009.54
Waste Wood	621.30	1006.10	612.18
Textiles	n/a	n/a	n/a
Waste Tires	4.06	3.69	3.16
Used Oil	5.10	6.89	5.29
Used Oil Filters	.63	.38	.38
Used Antifreeze	n/a	.93	.23
Batteries	n/a	1.35	1.6
Electronics	1.87	n/a	n/a
Other (Single Stream)	n/a	1,078.85	1,839.84
Other (Leaves)	n/a	2,198.88	1,871.56
Household Municipal Solid Waste	5,269.92	5,196.76	4,764.35
Commercial Solid Waste	n/a	n/a	
<b>Total</b>	<b>11,107.82</b>	<b>11,283.61</b>	<b>10,142.22</b>

\*Commonwealth of Virginia Locality Recycling Rate Report for Calendar Year 2007

\*\*Commonwealth of Virginia Locality Recycling Rate Report for Calendar Year 2008

\*\*\*Commonwealth of Virginia Locality Recycling Rate Report for Calendar Year 2009

<b>Table 2-9</b> <b>PER CAPITA WASTE GENERATION RATES</b> <b>(lbs/resident/day)<sup>1</sup></b>					
	Residential	Commercial	C/D <sup>2</sup>	Recycled	Total
Vienna	3.24	4.40	0.5	1.38	9.52
Herndon	2.49	3.43	1.0	0.59	7.51
Falls Church	3.85	4.1	0.5	1.52	10.01
Fairfax County	2.64	3.64	1.0	0.42	7.70
City of Fairfax	2.97	5.25	0.7	0.99	9.91
<sup>1</sup> Based on 365 days per year. <sup>2</sup> Construction and demolition waste. Source: 1991 Solid Waste Management Plan for the Town of Vienna					

<b>Table 2-9A</b> <b>Fairfax County MSW Generation Projections 2004-2025:</b> <b>Alternative 1—No Increase in Generation Rate</b>						
Year	Population	MSW generation rate (pcd)	MSW generation projection (tons)	Recycling rate (%)	MSW recycled (tons)	MSW disposal (tons)
2004	1,063,735	6.30	1,223,029	32.0	391,369	831,660
2005	1,079,600	6.30	1,241,270	32.0	397,206	844,064
2010	1,149,500	6.30	1,321,638	33.5	442,749	878,889
2015	1,185,400	6.30	1,362,914	35.0	477,020	885,894
2020	1,210,300	6.30	1,391,542	35.0	487,040	904,503
2025	1,223,100	6.30	1,406,259	35.0	492,191	914,068
Source: Fairfax County Draft Solid Waste Management Plan						

## 2.4.2 WASTE COMPOSITION

An estimate of waste composition for residential waste was developed based on sampling programs conducted in nearby jurisdictions or jurisdictions with similar characteristics. This included information from Montgomery County, Maryland; District of Columbia; Arlington County, and the City of Alexandria, Virginia. This level of information is appropriate for the planning effort. Table 2-10 provides estimated quantities of waste composition for the Town of Vienna. Table 2-10A presents amounts of waste collected in 2003 and the percentage of the waste stream for each item.

<b>Table 2-10 RESIDENTIAL WASTE COMPOSITION</b>	
<b>Component</b>	<b>Percent by Weight</b>
Newsprint	14.0
Corrugated Cardboard	4.0
Other Paper	22.0
Plastic	
- HDPE	0.5
- PET	0.4
- Other	5.3
Yardwaste	
- Leaves	9.8
- Brush and grass	15.2
Ferrous	3.7
Aluminum	1.3
Glass	8.7
Other	15.1
<b>Total</b>	<b>100.0</b>
Source: 1991 Solid Waste Management Plan for the Town of Vienna	

**Table 2-10A  
Summary of the Commonwealth of Virginia Locality Recycling Rate Report for Calendar  
Year 2007**

Component	Weight	Percentage
Paper	917,852	10.45%
Metal	762,334	8.68%
Plastic	48,450	0.55%
Glass	44,268	0.50%
Commingled	110,915	1.26%
Yard Waste (Composted or Mulch)	567,595	6.46%
Waste Wood	232,092	2.64%
Textiles	24,684	0.28%
Waste Tires	66,384	0.76%
Used Oil	52,886	0.60%
Used Oil Filters	4,427	0.05%
Used Antifreeze	3,685	0.04%
Auto Bodies	8,241	0.09%
Batteries	17,163	0.20%
Electronics	3,081	0.04%
Other	33,850	0.39%
Household Municipal Solid Waste	4,314,577	0.49%
Commercial Solid Waste	1,522,851	17.33%
Institutional Solid Waste	50,736	0.58%
Other	863	0.01%
<b>Total</b>	<b>8,786,932</b>	<b>100.00%</b>

Source: Commonwealth of Virginia Locality Recycling Rate Report for Calendar Year 2007

## **2.5 EXISTING SOLID WASTE MANAGEMENT**

### **2.5.1 COLLECTION PRACTICES FOR RESIDENTIAL AND COMMERCIAL MSW**

This section discusses the collection and transportation of solid waste from the point of generation in the Town of Vienna to the disposal facility. The transportation of solid waste can be accomplished in several ways. Wastes are hauled to the disposal site in the collection vehicle (direct hauling) or delivered to a transfer station. From the transfer station to the disposal site, wastes are further transported by truck. The form of transportation that is used is based on the method of collection and the distance to the processing or disposal facility.

#### **2.5.1.1 COLLECTION OF RESIDENTIAL AND COMMERCIAL SOLID WASTE**

The Town of Vienna provides collection of residential municipal solid waste (MSW) for 5,436 residences. MSW is collected from an additional 313 garden apartments by private haulers; commercial collection is done by private haulers. No commercial haulers are based in Vienna. All commercial haulers are required to have a permit from the Public Works Department in order to collect solid waste within the Town.

Curbside collection of single-family residential MSW occurs twice weekly. On the first day of collection the regular trash and yard waste is collected and once weekly on the second day brush, newspapers, and recyclables are collected. The Town has four trash collection crews, each consisting of one truck driver and two laborers. Solid waste is collected using four 25-cubic-yard packers.

Newspaper and recyclables are collected from all residential areas in the town, including those that do not have MSW collection.

The Town trash crews will pick up:

- Household trash and garbage, normally placed in metal and plastic containers or plastic bags.
- Grass clippings placed in clear plastic or kraft paper bags.
- Leaves placed in clear plastic or kraft paper bags (limited to 20 plastic bags per pickup day).
- Tree trimmings (maximum diameter of 1 1/2 inches) and bushes and brush, provided they are tied securely in bundles no greater than 4 feet in length.
- Cold ashes, if placed next to trash cans in separate containers.

Table 2-11 summarizes the method of collection of residential waste in the Town of Vienna. A review of the data indicates that the Town is operating an appropriate collection program for the level of service provided.

#### **2.5.1.2 TRANSPORTATION**

Direct hauling of solid waste, in a relatively small (6- to 8-ton) payload route-collection vehicle, is currently the most common transport method in the United States. Direct hauling is a cost-effective method of transporting wastes when the travel time (which usually implies distance)

from the point of truck capacity to the disposal site is short. Although distance to the point of disposal is an important consideration in the cost-effectiveness of a direct haul approach, travel time should also be considered.

<b>Table 2-11</b> <b>SOLID WASTE COLLECTION PRACTICES FOR</b> <b>THE TOWN OF VIENNA</b>	
Number of Units Collected/Week*	5,436
Number of Trucks Available	5 rear loaders
Number of Trucks Operating	4
Crew Size	3
Service	Once a week
Household Municipal Solid Waste**	5,838 tons
Number of Households Collected per Truck (based on 3 collection days per week, 156 days)	453 homes/day/truck
Amount of Waste Collected per Truck (based on 3 collection days per week, 156 days)	9.36 tons/day/truck
Amount of Waste Collected per Crew Member (based on 3 collection days per week, 156 days)	3.12 tons/day/crew member
Amount of Waste Collected per Household (based on 3 collection days per week, 52 weeks & 5445 Households)	41.24 lbs/week/household
*Town of Vienna, Virginia Department of Planning & Zoning Statistical Data February 11, 2010 **Commonwealth of Virginia Locality Recycling Rate Report for Calendar Year 2007	

The Town currently takes all residential household waste to the Fairfax County Division of Solid Waste Disposal and Resource Recovery Center located on West Ox Road (I-66 Transfer Station). The Town will continue to use the I-95 Resource Recovery Center for disposal of nonprocessable materials that bypass the Fairfax County Energy/Resource Recovery Facility, (I-66 Transfer Station) and require land filling. The remaining materials, which consist of items that can be recycled, bulky waste, or items that cannot be processed (nonprocessibles), are taken to the landfill or markets directly. The one-way hauling distance to the I-66 Transfer Station is approximately 10.54 miles, whereas the one-way distance to the E/RRF and I-95 Resource Recovery Center is approximately 25 miles. Because there is no difference in the tipping fee at the facilities, it is to the Town's advantage to use the I-66 Transfer Station. The Town of Vienna plans to continue to use the transfer station for transport of its residentially generated solid waste.

Future transportation needs are expected to remain constant or have a slight increase. The population of the Town of Vienna is expected to grow in the future; however, the growth will be

somewhat limited because Vienna is considered to be fully developed now and any future development will be through demolition of existing houses/structures and rebuilding on the same property. The volume of the waste stream is expected to increase slightly; however, recycling and new developments in packaging should help reduce the volume. If significant increases in the volume of the waste stream are experienced, the Town anticipates purchasing additional trucks to collect and transport the waste to the Fairfax County Transfer station. At this time if the volume of waste collected increases, the Town expects that the additional volume would be handled with additional trucks. No change or reorganization to the method of collection is expected. The Town of Vienna has very limited growth potential.

## **2.5.2 DEGREE OF CONTROL BY THE JURISDICTION**

In accordance with the Vienna Town Code Refuse Storage, Collection and Disposal standards and regulations Chapter 13A, Article 3, any private collector who wishes to engage in collection of refuse in the Town must obtain a permit from the Director of Public Works. After approval by the Director, an annual permit fee is paid to the Director of Finance or an authorized representative. Permits will not be issued unless the minimum standards are met. Permits expire one year from their date of issue and may be reissued for one year by the Director if he or she determines there has been compliance with the provisions of Chapter 13A, Article 3.

Private collectors or private citizens are not permitted to collect newspapers from residential areas without the express written authority of the Director of Public Works. Any person who violates any provision of Article 3, by performing a prohibited act or failing to perform a required or permitted act in the prescribed manner, will be found guilty of a misdemeanor, and will be punished by a fine. Local ordinances for the management of solid waste within the Town of Vienna are listed below.

- Vienna Town Code--Chapter 13A--Refuse Storage, Collection, and Disposal
- Vienna Town Code--Chapter 9, Article 6--Abandoned Vehicles
- Town of Vienna-Trash Regulations, December 2009

## **2.5.3 SPECIAL WASTE COLLECTION PROGRAMS**

The following section of the report discusses management of special waste generated within the Town of Vienna.

### **2.5.3.1 BULKY WASTES FROM HOUSEHOLDS**

The Town crews will pick up one dump truck load per property located in a residential zone as a part of the special pickup program. Because residents receive two free pickups per year, additional pickups must be arranged and there is a charge of \$75.00 per load for all items except brush. Additional loads of brush will cost \$25.00. Residents may call the Special Pickup Hotline at 703-255-5727 to arrange for a pickup. The amounts and type of debris are limited to the following:

- Discarded furniture, swing sets, and playground equipment.
- Sod and brush.

- 300 pounds of scrap metal per residence, small automobile parts such as engine blocks, transmissions, and tires. All tires must be removed from the rim.
- Trees and limbs of a diameter greater than 1-1/2 inches but less than 6 inches, and no longer than 8 feet.
- Owner-generated building materials that include the following items: wood, broken concrete, bricks or block, drywall, and paneling. Each residence is limited to 300 pounds of concrete per pickup.

For special pickups the town provides a five-person crew to collect bulky items. The crew includes one equipment operator, two truck drivers, and two laborers. Items are picked up with a front-end loader, and a single-axle dump truck is used for hauling. Bulky items that cannot be recycled are hauled to the I-95 Resource Recovery Center by one equipment operator.

### **2.5.3.2 LEAF AND YARD WASTE COLLECTION**

The Department of Public Works crews collect leaves that have been raked to the curbside during the months of October, November and December. A four-person crew consisting of one truck driver, one crew leader, and two laborers operate the leaf vacuum machines. The Town is divided into four areas for collection with scheduled dates for the specific locations. Daily operations include three leaf machines, operated by Town personnel. If workers are available additional leaf collection crews are used. Leaves placed in plastic bags are picked up on trash collection days; however, there is a limit of 20 bags per collection. Leaves are stored on Town property located on Beulah Road, and free leaf mulch is delivered in January, February, and March of each year to the citizens.

### **2.5.3.3 HOUSEHOLD HAZARDOUS WASTE**

Hazardous materials can be disposed of through the Fairfax County Hazardous Waste Disposal Program. The drop-off centers for household hazardous waste in Fairfax County and their hours of operation are listed below:

**I-66 TRANSFER STATION**  
 4618 West Ox Road, Fairfax, VA  
 Thursday: 1:00 PM - 5:00 PM  
 Friday: 8:00 AM - Noon  
 Saturday: 9:00 AM - 4:00 PM

**I-95 LANDFILL**  
 9850 Furnace Road, Lorton, VA  
 Thursday: 8:00 AM - Noon  
 Friday: 1:00 PM - 5:00 PM  
 Saturday: 9:00 AM - 4:00 PM

The following items are accepted at the drop-off centers: acids, aerosol sprays, asbestos products, automotive fluids, batteries, coal tar products, creosote products, driveway sealers, floor care products, fungicides, glue (solvent base), herbicides, inks & dyes, insecticides,

mercury products, moth balls, paint (oil base), paint thinner, pesticides, poisons, polishes, pool chemicals, rust removers, varnish & stains, weed killers and wood preservatives.

The following items are not accepted at the drop-off centers: ammunition (contact Fairfax Police Dept. 703-246-2253), illegal fireworks (contact Fire Prevention Division 703-246-4741), explosives, radioactive materials, compressed gas cylinders, and medical/infectious waste.

The Town of Vienna also offers collection of some household hazardous waste. Used motor oil, antifreeze, and batteries can be taken to the Northside Property yard, located at 600 Mill Street, N.E. Collections are held four times per year, from 8:00 am-2:00 pm, on the first Saturday in March, June, September, and December. Town of Vienna residents can drop off ammunition at the Vienna Police Department.

The Public Works Department will not pick up the following items:

- Gas Tanks
- Fuel Oil Tanks
- Mounted Tires (Town crews will pick up the tire and the rim as long as they are separated)
- Large Tree Stumps
- Paint Cans
- Propane Tanks
- Hazardous Materials
- White Goods

#### **2.5.3.4 RECYCLING PROGRAMS**

The Town offers single-stream curbside recycling, making it easier for residents to participate in the recycling program since they no longer need to separate their recyclables. Materials collected include mixed recyclable materials, newspapers, flattened cardboard, magazines, catalogs, junk mail, telephone books, and bundled brush. Recyclables are picked up on the second day of the scheduled route.

#### **2.5.3.5 ABANDONED VEHICLES**

In compliance with Article 6 of the Vienna Town code, abandoned motor vehicles are hauled to a private storage yard or garage. Removal of these vehicles must be reported to the Town Manager by the Police Department and notice given to the owner of the vehicle as promptly as possible. The owner must pay to the Town or the towing service all reasonable costs incidental to the removal and storage of the vehicle and locating the vehicle owner. If the owner fails or refuses to pay the costs or if the identity or whereabouts of the owner remains unknown after a diligent search has been conducted, the Town Manager may, after holding the vehicle for 30 days and after due notice of sale, dispose of the vehicle at a public sale, or have it hauled away by a private firm.

#### **2.5.3.6 LITTER CONTROL PROGRAM**



The Parks and Recreation Department empties the trash receptacles provided by the Town.

#### **2.5.4 SOLID WASTE DISPOSAL**

The Town currently takes all residential household waste to the Fairfax County Division of Solid Waste Disposal and Resource Recovery Center located on West Ox Road. The Town will continue to use the I-95 Resource Recovery Center for disposal of nonprocessable materials that bypass the Fairfax County Energy/Resource Recovery Facility and require landfilling. Once the I-95 Resource Recovery Center reaches capacity and is closed or is expanded under a new permit, the Town will continue to rely on Fairfax County for disposal of nonprocessable or bypass material through the disposal agreement with the County. Disposal of debris will continue at the Furnace Road Landfill, a private C/O landfill.

The Town of Vienna uses the Fairfax County I-66 Transfer Station for transfer of its waste from collection vehicles to the Energy/Resource Recovery Facility (E/RRF). The transfer station is located at the site of the closed I-66 Landfill at 4618 West Ox Road. The station has been operating since 1983. The transfer station receives refuse from the Cities of Fairfax and Falls Church, the Towns of Herndon and Vienna, and other areas within Fairfax County.

#### **2.6 OPEN DUMPS AND ILLEGAL DISPOSAL**

There are no open or illegal dumps in the Town of Vienna. Current information does not indicate the existence of any closed or inactive dumps within the Town. Considering the developed nature of the community, illegal dumping is not a problem. Illegal dumping is limited to a litter control problem. The Town Department of Public Works operates a street sweeper on a regular basis.

If in the future any land filling or transfer stations were proposed to be built in the Town of Vienna the proposed site would need all required approvals through the Town of Vienna's Department of Planning and Zoning. Such an approval process would be quite involved and require approval of all the Town's boards, commissions and the Town Council. It is not expected that any such activity would be permitted within the Town limits as the majority of the land is currently developed and zoned residential. If any such site were ever established the Town would follow all appropriate procedures and notifications to the Department of Environmental Quality.

#### **2.7 EXISTING OUTREACH PROGRAMS**

The Vienna Newsletter is currently used as the primary method for public education for the Town. Distributed on a monthly basis, the newsletter informs residents about recycling programs, drop-off locations, used oil disposal dates, and household hazardous waste collection days. The Town website can also be used as a resource and access is not limited to Town residents as in the case of the newsletter. The Town's Public Information Officer can also issue press releases to local newspapers.

### **Section 3 EVALUATION OF RECYCLING ALTERNATIVES**

This section of the plan contains a description of the potential recyclable materials which can be recovered from the residential waste stream, markets for the recovered materials, and an evaluation of the Town's ability to meet the State's recycling program goals. The recycling program focuses on the residential sector because Fairfax County has agreed to be responsible for implementing a commercial recycling program for Cities and Towns within the County.

The tonnages of recyclables generated by the Town of Vienna are not great enough to qualify for a contract with a final market. Local markets which act as collection/transfer stations are most likely the preferred method for disposal of recyclables.

### **3.1 IDENTIFICATION OF TARGET MATERIALS**

The availability of end markets, the evaluation of the current recycling program, and the ability to achieve the Virginia Department of Waste Management (DWM) goals for recycling will determine the materials that will be targeted as the primary household recyclables. The factors that influence the selection of a recyclable material include:

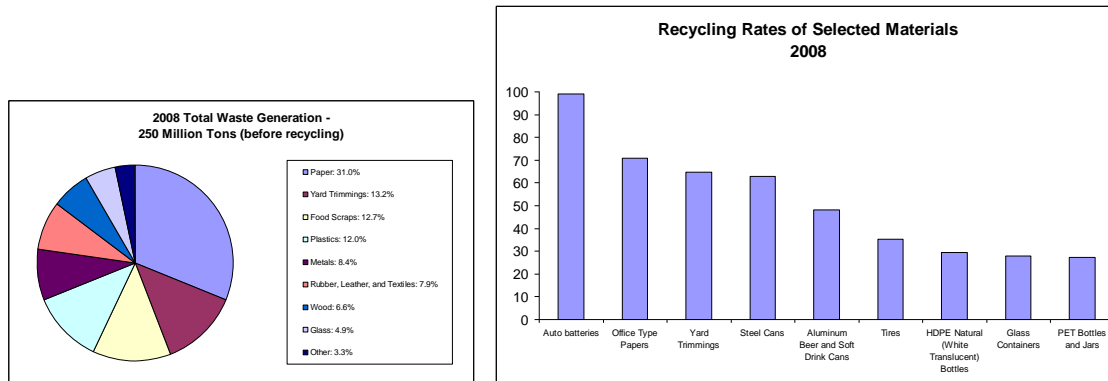
- Recyclability of the material
- Value of the material and stability of the end market
- Quantity of the material available from households
- Ease of identification and preparation by the resident (rinsing, sorting, etc.)
- Economic feasibility of collection and processing (weight-to-volume ratio, processing requirements, etc.)
- Environmental benefit of recycling and removal of potentially harmful materials from the waste stream

Although various materials may be recycled, the target recoverables were determined based on quantities, economics, and market end-users. Table 3-1 summarizes the current amount of material recycled for calendar year 2008, 53 percent. This material was collected through curbside pickup. The program only considers the waste collected by the Town. Other waste and recyclables collected by private haulers is managed as part of Fairfax County's program.

Based on the results presented in Table 3-1, the Town is currently meeting the Virginia Waste Management Board's goal of 25 percent. In order to maintain a high level of recycling, Vienna plans to take several actions, as discussed in Section 4.3.2 of this plan. The recyclables targeted for recovery by the Town are listed in Table 3-1.

<b>Table 3-1</b> <b>CURRENT RECYCLING PROGRAM 2009</b>	
<b>Principal Recycled Material (PRM)</b>	
Material	2009 (tons)
Paper	
Metal	34.04
Plastic	
Glass	
Commingled	
Yard Waste	1,009.54
Wood Waste	612.18
Textiles	
Other (Single Stream)	1,839.84
Other (Leaves)	1,871.56
Subtotal	<b>5,367.16</b>
<b>Supplemental Recycled Material (SRM)</b>	
Waste Tires	3.16
Used Oil	5.29
Used Oil Filters	.38
Used Antifreeze	.23
Abandoned Autos	
Batteries	1.6
Sludge	
Electronics	
Tree Stumps	
Subtotal	<b>10.71</b>
<b>Total Recyclables Collected</b>	<b>5,377.82</b>
<b>Municipal Solid Waste Collected</b>	<b>4,764.35</b>
Percentage Recycled	$\frac{5,377.82}{(5,377.82 + 4,764.35)} \times 100$ <b>= 53.02 %</b>
Source: Commonwealth of Virginia Locality Recycling Rate Report for Calendar Year 2009	

## 3.2 MATERIALS DESCRIPTION AND MARKETS



(2008 Waste Generation Rates, United States Environmental Protection Agency website, <http://www.epa.gov/epaoswer/non-hw/muncpl/facts-text.htm#chart1>)

### 3.2.1 NEWSPAPER

Old newspaper (ONP) accounts for approximately 14 percent of the residential waste stream. ONP is included in the majority of source separation programs because of its dependable high quantity found in households, its ease of preparation for recycling, and, until recently, its stable price. Residents may bundle or tie up the newspaper or place it in brown paper bags.

Reported recovery rates for curbside collection of newspaper range from 100 to 350 pounds per household, per year. On an annual basis over 13 million tons of ONP are generated in the United States with source separation programs recovering more than 2 million tons (Franklin Associates, 1987).

ONP may be recycled into a variety of thick paper products to include paperboard, tube stock, roofing felt, wallboard, and chipboard. Paperboard, otherwise referred to as cardboard, has a characteristic gray color because of the paper fibers, which retain ink from the newspaper inking process. Examples of paperboard products are cereal cartons, shoe boxes, and tablet backs.

Another use for ONP is in the manufacture of newsprint. Until recently, there were a limited number of paper mills capable of removing the ink and bleaching the recovered newspaper. Today, however, many mills are retrofitting their facilities to expand operations for accommodating the increased supply of ONP that has been generated by mandated recycling.

ONP may also be used in the manufacture of cellulose insulation. Newspapers are ground and mixed with fire-retardant and anticorrosion chemicals. However, due to lagging sales, this option currently shows declining markets.

### 3.2.2 CARDBOARD

Nearly 28.8 million tons or 217 pounds per person per year of cardboard, often referred to as old corrugated containers (OCC), are generated by retail and wholesale businesses in the United States. Approximately 18.5 million tons of cardboard are recycled on an annual basis because recycling is usually the most cost-beneficial disposal alternative (Green Net World,

<http://www.green-networld.com/tips/cardboard.htm>, [networld@westfield-ma.com](mailto:networld@westfield-ma.com), Last update: 11/09/1999). In the United States, corrugated containers are used in the shipping of almost every consumer product, and they account for 4 percent of the waste stream.

Cardboard is either shredded before being baled or baled without shredding, and then shipped to a recycling mill. At the mill the cardboard is blended with water, becomes a pulp, and is recycled into cardboard products. A variety of uses for recycled OCC include paperboard, linerboard, boxboard, and corrugating medium, which is a component of OCC.

### **3.2.3 HIGH-GRADE OFFICE PAPER**

The majority of high-grade paper is generated in the office environment where white ledger, computer printout (CPO) paper, and copy paper from duplicating machines is discarded. Of the estimated 81 million tons of paper products that are generated annually, 35.7 percent of that is recycled on a national basis (2001 Waste Generation Rates, United States Environmental Protection Agency website, <http://www.epa.gov/epaoswer/non-hw/muncpl/facts-text.htm#chart1>). The prices for high-grade paper are greater than the prices for any other wastepaper due to the high quality of the products manufactured from this recovered paper. Prices depend on grade and quantity.

After the paper is collected and transported to the recycling mill, it is blended with water to form a pulp and then the ink is removed. Recycled high-grade paper has many uses, some of which include tissue paper products, printing paper, new high grade paper, napkins, paper towels, writing paper, white paper liner on the recycled paperboard, and primary feedstock.

### **3.2.4 GLASS**

126 million tons of glass are used every year and of that 21.2% is recycled (2001 Waste Generation Rates, United States Environmental Protection Agency website, <http://www.epa.gov/epaoswer/non-hw/muncpl/facts-text.htm#chart1>). A standard curbside collection or drop-off item, glass can be recycled successfully because of dependable tonnage, stable markets, and high prices. Although glass represents a lower percentage of the waste stream than newspaper, it still accounts for approximately 8.7 percent of the waste stream. Between 50 and 150 lbs. of glass typically are recovered per household on an annual basis. The majority of end-users require separation of glass by color (clear, amber, or green) and the removal of metals, ceramics, and other foreign materials, which may be performed by residents or processed prior to delivery to a glass manufacturer.

Manufacture of glass requires glass sand, which consists mainly of silicon dioxide, a material with a characteristic high purity. Crushed glass, or cullet, a term used by industry, is an alternative source for all or part of the required raw materials. Waste glass gathered from intra-plant scrap generally accounts for 15 percent of the final product, and is therefore used as a substitute for raw materials.

Although recycling glass is a relatively simple process whereby glass is crushed, ground, mixed with raw materials, melted, and processed, the compatibility of cullet with the final product must be addressed. The chemical composition and the color of the glass are very important

characteristics in the re-manufacture of glass. Therefore, the type of cullet and the glass color should be derived from the type of product that is to be manufactured. Only one to five percent of mixed amber and green cullet can be used for the manufacture of clear glass. Amber glass production can use up to 5 to 10 percent of mixed color cullet, while green glass production can use up to 35 percent of mixed color cullet.

However, because clear glass containers represent approximately 70 percent of the glass in the waste stream, manufacturers prefer to accept color-sorted cullet. The collection of cullet is typically limited to a 150-mile radius from the glass manufacturing plant because cullet has a limited value and transportation for greater distances is not economically feasible.

Alternative markets for cullet include fiberglass manufacturers and building materials and asphalt industries. However, the market for recycled glass is limited in the fiberglass industry even though color sorting is not required.

### **3.2.5 METALS**

Classified as ferrous or nonferrous, metals come in various forms in the residential waste stream. 18 million tons of metals were disposed of in 2001 with steel cans being recycled at rate of 58.1% and aluminum cans being recycled at a rate of 49.0% (2001 Waste Generation Rates, United States Environmental Protection Agency website, <http://www.epa.gov/epaoswer/non-hw/muncpl/facts-text.htm#chart1>). Ferrous metals include steel, cast iron, tin-plated steel (cans), white goods (stoves or refrigerators), or bimetal (beverage containers with an aluminum top and steel sides). Although ferrous metals typically comprise only three percent of the overall waste stream, they are bulky and difficult to handle.

Aluminum, brass, and copper are nonferrous metals; aluminum accounts for approximately one percent of the residential waste stream.

#### **3.2.5.1 FERROUS METALS**

The primary targets for recycling ferrous metals include steel food and beverage containers, bimetal cans, and white goods. Because steel cans begin to rust immediately upon exposure to air they are generally coated with tin or plastic. Some steel cans contain aluminum lids, which is a contaminant of the scrap steel.

Separation of cans by metal type generally occurs in the household before curbside collection or during drop-off at the local centers. At the recycling centers these steel food and beverage cans are often shredded and baled, or transported to a scrap dealer for this preparation process. Magnetic separation of steel and other metals occurs in one or two stages during the shredding process.

It is necessary to send the tin-coated or bimetal cans to a detinning plant for processing into a clean scrap-metal product. Markets for scrap steel include steel mills, iron foundries, detinning plants, and copper-processing plants. These bimetal (tin/steel) cans have a limited market value because cleaning and sorting costs are incurred for the detinning process to remove inert materials, adhesive labels, and aluminum.

White goods are also a source of recyclable metals. Washing machines, dryers, and refrigerators are examples of household appliances that are typically collected on special pickup days and delivered to shredders. Steel mills will purchase bundles of fragmented scrap that have been shredded.

### **3.2.5.2 NONFERROUS METALS**

The major nonferrous metal for recycling is aluminum. The primary source of aluminum is used beverage containers (UBC). Because the production costs of aluminum from imported bauxite ore are much greater than the costs associated with the remelting of UBC for the production of new can stock, the aluminum industry is a strong market for recovered aluminum cans. The energy requirements to produce aluminum from UBC are 95 percent lower than those incurred when producing aluminum from raw materials.

Aluminum cans are the highest source of revenue on a per ton basis for curbside collection programs and multi-material drop-off centers. Approximately 2 to 5 lbs. of aluminum per household are recycled per year. Because aluminum cans are the most economically valuable component of the residential waste stream, targeting this material in a curbside collection program is critical.

### **3.2.6 PLASTICS**

Many types of plastics are recyclable. Plastics make up 11.1% of the waste stream and in 2001 were recycled at a rate of 35.6% for Plastic Soft Drink Containers (2001 Waste Generation Rates, United States Environmental Protection Agency website, <http://www.epa.gov/epaoswer/non-hw/muncpl/facts-text.htm#chart1>). Whether recycling is economically beneficial depends on the availability of the end user or market. Common plastic materials in the waste stream are:

- PET (polyethylene terephthalate): Familiar as 2-liter soft drink bottles.
- HDPE (high-density polyethylene): Familiar as milk and water jugs, juice containers, detergent bottles.
- LDPE (low-density polyethylene): Familiar as plastic film products, such as grocery and garbage bags.
- PP (polypropylene): Familiar as durable items, fibers, and diaper liners.
- PS (polystyrene): Familiar in the foamed form ("styrofoam"), used in fast-food packaging, hot cups, and meat trays. Also used in rigid and semi-rigid containers.
- PVC (polyvinyl chloride): Familiar in durable construction products, such as pipes and siding.
- Multilayer or barrier: Various plastics with different properties, combined in layers, familiar as squeezable bottles.

Currently, the most commonly recycled plastics are PET and HPDE beverage containers because they are easily identifiable and easily separated from the waste stream. Regional studies have found that about 6 percent of the waste stream by weight consists of plastics; however, only about 1 percent by weight of the waste stream is expected to consist of recyclable plastic

containers made of PET or HDPE. That 1 percent of the waste stream consists of about 60 percent PET and about 40 percent HDPE.

Although plastics are a rapidly increasing component of the waste stream, they are somewhat difficult to market because they have low weight-to-volume ratios and high preparation costs. Processing operations, including removal of adhesive labels, baling, grinding, chipping, cleaning, drying, and pelletizing, significantly affect prices and marketability of plastics. Furthermore, HDPE and PET plastic resins must be separated because manufacturers demand uncontaminated plastic scrap.

Recycled plastics are usually shredded and used as fiber fill for jackets, pillows, and sleeping bags, carpet construction, filter media, fence posts and boat piers, nursery pots and planters, plastic construction material, and as plastic drainage pipes. Other uses are industrial strapping, wall tile, textiles, flooring, commercial floor mats, taillight lenses, and other automobile parts.

### **3.2.7 YARD WASTES**

Regional waste composition studies have shown that approximately 25 percent of the annual average waste stream in the Metropolitan Washington, D.C., area is yard waste (leaves, grass, tree, and shrub clippings). This component of the waste stream can range from a few percent in winter to as high as 40 to 45 percent in the spring and fall. Grass and clippings comprise about 15 percent of the waste stream, and leaves make up about 10 percent.

The primary products from yard waste processing are compost and mulch. Compost is typically worked into the soil and mulch is usually placed on the surface.

Mulch is primarily used as a landscaping ground cover for borders, around trees, or on paths to conserve water, reduce weed growth, and prevent erosion. Mulch gradually decomposes; therefore, periodic reapplication is necessary. Some types of wood chips, such as cedar, cypress, and redwood, decompose less readily, and are therefore of greater value.

The lowest-quality product produced from yard waste is an uncomposted, shredded mixture of brush, leaves, and grass clippings. Its value is decreased because it is not composted and is not as contaminant-free as a wood mulch. Some of its uses are for daily landfill cover, land reclamation, and slope stabilization. Agricultural uses are unlikely because of the presence of weed seeds and other undesirable contaminants. Its major advantage is the low cost of production.

However, potential users could be very particular about the quality of any yard waste products they might purchase. To be highly marketable, products must be free of malodors, weed seeds, and foreign matter, have a soil-like appearance, and have a somewhat consistent particle size. Demand for products meeting these basic parameters is expected to be year-round, with peaks in the spring and summer.

Potential markets, such as sod farms, landscapers, nurseries, and soil vendors, are expanding. Sales of soil amendments and mulch products are slowly increasing and inventories of these products are generally low.



### **3.2.8 BATTERIES**

The household waste stream contains a limited number of automobile batteries because of the rebate incentives now available when purchasing a new battery. Customers can receive a rebate if they return their old battery when buying a new one. Lead is a heavy metal and the major constituent of automobile batteries. It is desirable from an environmental standpoint to remove batteries from the waste stream prior to disposal.

Vienna residents may dispose of car batteries during household hazardous waste collection days which are held four times a year. Lead-acid batteries are processed by a battery-reclamation facility where the lead is recovered. Uses for pure lead and lead alloys include fishing sinkers, net weights, solder, and hardware products.

### **3.2.9 USED MOTOR OIL**

More than 640 million gallons of motor oil were sold in 1997; 345 million gallons of that was sold to do-it-yourselfers (those who change their own oil), with the remaining going to the do-it-for-me service industry, which includes automotive service centers, fast-lubes, jiffy-lubes, garages and car dealers who change your oil for you.

According to a recent study, more than 50% of motorists change their own oil. In 1997 between 43 and 62 million gallons of used oil were collected and recycled by do-it-yourselfers. In the same year, local service station and automotive service facilities recycled 194 million gallons of oil. (American Petroleum Institute website, <http://www.recycleoil.org/Usedoilflow.htm>).

Before recycling or reuse, the oil may be pretreated to remove any potential contaminants such as metals, chlorinated compounds, or water. There are a wide variety of potential uses for waste oil; it may be reprocessed for use as coolants and cutting oils, burned as a fuel, and refined for use as a lubricant. Waste oil may be used as an asphalt extender, a flotation oil, or reused in industrial applications.

## **Section 4 FUTURE WASTE MANAGEMENT NEEDS/ALTERNATIVE DEVELOPMENT**

### **4.1 IDENTIFICATION OF FUTURE WASTE MANAGEMENT NEEDS**

According to the information presented in the Commonwealth of Virginia Locality Recycling Rate Report for Calendar Year 2003, approximately 14,790 tons of non-recyclable residential solid waste and 11,605.1 tons of recyclables were collected by the Town. It is expected that these quantities will not decrease in the future.

### **4.2 DISCUSSION OF HIERARCHY**

The options available to the Town of Vienna are limited because of economic and physical conditions. Alternatives must account for the degree of cooperation that can be expected from Fairfax County, the extent to which the Town has already implemented its own recycling programs, the degree of comparative risk in private and public sector options, the ability to site a disposal facility within the Town, and flexibility for implementing programs in the future.

Table 4-1 presents a list of potential options available to the Town for managing solid waste. Alternatives are based on the hierarchy developed by the DWM. The hierarchy defined by the DWM will assist in preventing a single-solution approach and favors an integrated system in which the first priorities for waste disposal are reduction, reuse and recycling. By preventing the generation of solid waste, the resulting disposal capacity and resources that would be required to collect and transport the material to the disposal facility can be reduced.

### **4.3 DISCUSSION OF SELECTED ALTERNATIVES IN ACCORDANCE WITH PLAN HIERARCHY**

Several of the options identified in Table 4-1 are extremely difficult or logistically impossible for a jurisdiction like Vienna to implement. The following section discusses the reason for selecting the various alternatives and then describes the details of each alternative.

<b>Table 4-1 OPTIONS AVAILABLE TO THE TOWN OF VIENNA ON THE BASIS OF DWM HIERARCHY</b>	
<b>Source Reduction</b>	<ul style="list-style-type: none"> <li>• Bottle Bill</li> <li>• Product and Packaging Legislation and Financial-Incentive Programs</li> <li>• Public Education</li> </ul>
<b>Reuse</b>	<ul style="list-style-type: none"> <li>• Leaf Collection and Free Mulch Delivery</li> </ul>
<b>Recycling</b>	<b>Residential Recycling</b> <ul style="list-style-type: none"> <li>• Curbside Pickup Programs</li> </ul> <b>Commercial Recycling</b> <ul style="list-style-type: none"> <li>• Town-Administered Program</li> <li>• County-Administered Program</li> </ul>
<b>Resource Recovery</b>	<ul style="list-style-type: none"> <li>• Local Facility (in the jurisdiction)</li> <li>• Fairfax County Facility</li> <li>• Contract with Private Facility</li> </ul>
<b>Incineration</b>	<ul style="list-style-type: none"> <li>• Local Facility (in the jurisdiction)</li> <li>• Contract with Private Facility</li> </ul>
<b>Landfill Disposal</b>	<ul style="list-style-type: none"> <li>• Fairfax County Landfill</li> <li>• Contract with Private Landfill</li> </ul>

### 4.3.1 SOURCE REDUCTION

This section describes source reduction programs that could be used by the Town to encourage waste reduction and recycling. These programs form the first part in the hierarchy of alternatives for solid waste management. Waste reduction and waste recycling include a myriad of activities aimed at reducing the quantity of waste to be disposed of in solid waste facilities. These activities either reduce waste generation or delay entry of the waste into the waste stream by extending the useful life of the products. The Town emphasizes source reduction and recycling in its solid waste planning because these activities prevent some or all of the costs of collection, transportation, and disposal of solid waste, as well as conserve resources and decrease reliance on landfills.

Recycling and source-reduction programs overlap in many areas. One way to distinguish between recycling and source reduction is that recycling encompasses methods directed at managing and recovering wastes after they have been generated, while reduction is aimed at reducing the amount of waste generated. Potential waste is diminished by changing manufacturing processes, the design of packaging, or consumer buying habits through a variety of policies and behavioral incentives. Policies for encouraging source reduction include tax

incentives, legislation on packaging, manufacturing requirements, and programs to change consumer behavior in ways that reduce waste.

Waste recycling activities, on the other hand, reuse materials to slow their entry into the part of the waste stream needing disposal and preserve raw materials used to produce goods. Reusing products is as simple as donating or selling old household appliances rather than discarding them or repairing torn clothing rather than discarding it. Separation of recyclables alone does not diminish the solid waste stream that needs disposal. Recycling involves a series of steps, including collecting, separating, preparing products to meet buyers' specifications, reselling the product, processing, and eventually reusing materials.

Source reduction and recycling will require fundamental changes in the way we produce goods, market products, and consume commodities. Major initiatives will be required to produce these changes, including promotional programs, financial incentives, and government legislation.

Some of the source-reduction programs are difficult to implement for a small jurisdiction acting alone. The logistics and effectiveness of such a local program are difficult to document. For example, local beverage-container legislation and local product and packaging bans are not an appropriate option for the Town of Vienna. The Town does not have the resources required to administer such a program. In addition, industry and business may not consider the number of consumers in Vienna high enough to warrant changing their products. Both the cost to administer and the resulting cost to the consumer would be high in comparison to other available options.

Financial-incentive programs, such as user fees or surcharges at the landfill, may also be difficult to implement. As discussed below, the primary disposal facility will be the E/RRF operated by Fairfax County. Since the only waste disposed of by Vienna is waste that the Town itself collects, there is no advantage to implementing a surcharge at the facility.

#### **4.3.1.1 OFFICE PAPER RECOVERY**

A program for recovering office paper in all municipal buildings has been implemented and will serve as an effective model for the private sector. Employees are given individual containers that are emptied into larger containers located in areas of high paper generation.

#### **4.3.2 REUSE**

##### **4.3.2.1 COMMITTEE FOR HELPING OTHERS**

A volunteer organization, the Committee for Helping Others (CHO), provides a program for the reuse of household furniture and appliances. The Town provides storage space for materials until a recipient can be identified.

#### **4.3.3 RECYCLING PROGRAMS**

##### **4.3.3.1 CURBSIDE PROGRAM FOR RECYCLABLES**

Mixed recyclable materials, newspapers, flattened cardboard, magazines, catalogs, junk mail, telephone books, and bundled brush are collected on the second day of the scheduled trash route.

A leaf collection program is operated in the fall. Leaves collected at curbside are mulched and delivered back to the citizens free of charge. Bundled brush and yard waste in clear plastic bags are collected on a weekly basis and delivered to the West Ox Resource Recovery facility.

#### **4.3.4 RESOURCE RECOVERY**

Waste-to-energy facilities produce clean, renewable energy through the combustion of municipal solid waste in specially designed power plants equipped with the most modern pollution control equipment to clean emissions. Trash volume is reduced by 90% and the remaining residue is regularly tested and consistently meets strict EPA standards allowing reuse or disposal in landfills. There are 89 waste-to-energy plants operating in 27 states managing about 13 percent of America's trash, or about 95,000 tons each day. Waste-to-energy generates about 2,500 megawatts of electricity to meet the power needs of nearly 2 million homes, and the facilities serve the trash disposal needs of more than 36 million people. The \$10 billion waste-to-energy industry employs more than 6,000 American workers with annual wages in excess of \$400 million (Integrated Waste Services Association website, <http://www.wte.org/waste.html>).

These facilities commonly are grouped into two categories: field-erected and modular. Both systems share these basic components:

- A waste-feed system
- A combustion chamber with a moving hearth to transport burning refuse and ash through the chamber
- A heat-recovery boiler and possibly a turbine-generator
- A system for air-pollution control to treat the gases from combustion (flue gases)

Field-erected incinerators typically have a limited amount of prefabrication. Units are prefabricated in modules that are shipped to the site for assembly and are usually sized to burn 300 tons per day or less.

The availability of markets for recovered energy can determine the viability of a WTE facility. Without revenue from the recovered energy, the cost of building and operating the facility can greatly exceed the cost of an alternative means of disposal. Energy markets are either steam or electricity customers. Because of the high cost of steam and condensate piping and the substantial heat losses that occur in steam transport, steam customers are usually located within 1 to 2 miles of the facility. A WTE facility that generates electricity is less restricted in terms of its proximity to a customer because the customer will be a utility company and connection to the utility power lines can be made at numerous points on the distribution grid. Although electric utilities as energy customers are less desirable than steam customers from the standpoint of capital investment and revenue, they tend to be more stable customers and are more likely to participate in long-term agreements.

The resource recovery alternatives available to the Town of Vienna for the management of solid waste are fairly limited. Listed below are some resource recovery alternatives:

- Local (in the jurisdiction) facility
- Contracting with a private facility
- Using the existing Fairfax County E/RRF

The ability to establish a waste-to-energy facility on industrial land within Vienna is very limited. In addition, a significant steam user is not expected in the area and the cost for a facility sized for local use only is expected to be significantly higher (\$60 to \$80 per ton) than other available resource recovery alternatives. For these reasons, a local (within the Town of Vienna) facility is not considered part of the Town's future management of solid waste.

Another alternative considered is contracting with a private waste-to-energy facility. The nearest facility, RESCO, is in Baltimore, Maryland, about 60 miles from the Town of Vienna. The facility has limited available processing capacity. In addition, transporting the material would require the construction and operation of a local transfer station. The establishment of such a facility would be difficult. The cost of transfer and the tipping fee for such an arrangement is expected to be higher (combined cost of approximately \$55 to \$65 per ton) than the cost of other resource-recovery options available and is not expected to be part of the Town's plan.

The third resource recovery option is to continue the use of the Fairfax County E/RRF. The Town of Vienna currently disposes of its waste through processing at the I-66 West Ox facility at a cost of \$39.95 per ton; the cost to citizens without a contract would be \$45.00 per ton. Fairfax County has agreed to continue accepting the waste from the Town of Vienna (Appendix 3).

#### **4.3.5 INCINERATION**

The number of options available for incineration as an alternative for solid waste management is fairly low. As with resource recovery, the establishment of an incineration facility within the jurisdiction would be difficult, and development of the project would be very costly. A private facility in Baltimore, Maryland, Pulaski Incinerator has the potential for being used, but the facility reportedly has limited capacity and the cost would be high because of the transportation.

For these reasons, incineration is not considered a future option for solid waste management for the Town of Vienna.

#### **4.3.6 LANDFILL DISPOSAL**

There will be a portion of the waste stream that requires disposal even after recycling and resource recovery. There are three landfill disposal alternatives identified for solid waste collected by Vienna. These alternatives include:

- Develop a local (within the jurisdiction) landfill
- Use the Fairfax County, I-95 Sanitary Landfill or private firm contracted by the County
- Contract directly with a private firm

Waste processed (ash) through the Fairfax County E/RRF will continue to be disposed of at the I-95 Resource Recovery Center. The landfill ceased accepting municipal solid waste (MSW) for land placement in December 1995. The only waste product currently buried is ash from

municipal waste incinerators. Landfill capping (closure of previously used areas) began in 1992. Capping has involved placing a complex geomembrane (LDPE) cap and drainage layers over 125 acres of the site. This has been the largest synthetic capping of a sanitary landfill in the world. To date, over \$25 million has been spent to complete this work (Fairfax County website, <http://www.co.fairfax.va.us/gov/dpwes/trash/dispadmin.htm>). The estimated capacity of the ash fill is more than 20 years. When the amount of waste generated within the service area exceeds the capacity of the E/RRF or the E/RRF is shut down, the Town will require landfill disposal capacity. About 7 percent of the waste stream that cannot be processed at the E/RRF will also require disposal.

Since the Town is primarily a residential area, the ability to establish a landfill within the jurisdiction is limited. In addition, the anticipated cost would be high because of the low tonnages generated. For these reasons, a local landfill is not considered part of Vienna's future solid waste management plans.

The second option, disposal at the Fairfax County, I-95 Sanitary Landfill, is the preferred method of solid waste disposal. This would include ash generated by the E/RRF, nonprocessable waste and by-pass waste. The Town of Vienna has developed an agreement with Fairfax County regarding landfill disposal. The agreement includes disposal of Town-collected waste following closure of the I-95 Landfill.

The third landfill disposal alternative would involve contracting with a private firm for landfill disposal of solid waste or debris waste. There are several private solid waste landfills available in the central Virginia area that have capacity and have expressed interest in entering into long-term contracts. Contact with these firms, however, revealed that the expected tipping fee, coupled with the need and the cost to establish and develop a transfer station, would not be as cost-effective as other solid waste disposal options.

#### **4.3.7 SUMMARY OF SELECTED ALTERNATIVES**

Table 4-2 summarizes the planned solid waste management options for the Town of Vienna.

<b>Table 4-2</b> <b>SUMMARY OF SOLID WASTE MANAGEMENT PLAN</b> <b>FOR THE TOWN OF VIENNA</b>	
<b>Source Reduction</b>	<ul style="list-style-type: none"> <li>• Public Education Program</li> </ul>
<b>Reuse</b>	<ul style="list-style-type: none"> <li>• Leaf collection and Free Mulch Delivery</li> </ul>
<b>Recycling</b>	<ul style="list-style-type: none"> <li>• Continue providing curbside pickup of recyclables to residents</li> <li>• Continue to provide curbside collection of leaves and brush</li> <li>• Commercial recycling managed through a County-administered program</li> </ul>
<b>Resource Recovery</b>	<ul style="list-style-type: none"> <li>• Operate under an agreement with Fairfax County</li> </ul>
<b>Incineration</b>	<ul style="list-style-type: none"> <li>• No action</li> </ul>
<b>Landfilling of Waste Collected by Municipality</b>	<ul style="list-style-type: none"> <li>• Operate under an agreement with Fairfax County</li> </ul>



## **Section 5 PLAN IMPLEMENTATION**

### **5.1 SUMMARY OF PLAN**

The Town of Vienna, through a variety of programs, is currently exceeding the Virginia Waste Management Board's requirement to recycle 25 percent of its waste. According to the information presented in the Commonwealth of Virginia Locality Recycling Rate Report for Calendar Year 2009, the Town's recycling rate was 53%. Approximately 4,764.35 tons of Town collected non-recyclable residential solid waste and 5,377.82 tons of recyclables were collected for a total of 10,142.22 tons of waste and recyclables collected and disposed of. Management of Town collected waste will consist of the following program:

#### **5.1.1 SOURCE REDUCTON**

The Town will implement public education programs to demonstrate to businesses and residents the ability to reduce the amount of waste generated and show support for the programs.

#### **5.1.2 RECYCLING**

Mixed recyclable materials, newspapers, flattened cardboard, magazines, catalogs, junk mail, telephone books, and bundled brush will be collected on the second day of the scheduled trash route. Motor oil, batteries, and antifreeze will be collected at the Northside property yard. Privately collected recyclables will be managed under the Fairfax County program.

#### **5.1.3 RESOURCE RECOVERY**

The majority of the Town's waste will be combusted at the existing Fairfax County Energy/Resource Recovery Facility. This will serve as the primary means for disposal of Town collected waste for the next 20 years. A disposal agreement has been developed with Fairfax County. The ability to use the Prince William County WTE for disposal will be monitored.

#### **5.1.4 LANDFILLING**

The Town will continue to use the I-95 Resource Recovery Center for disposal of materials requiring landfilling. Once the I-95 Sanitary Landfill reaches capacity or is closed, the Town will continue to rely on Fairfax County for disposal of material through the disposal agreement.

### **5.2 SCHEDULE OF IMPLEMENTATION**

The Town of Vienna will continue to operate curbside recycling and recycle office paper at the Town offices. Every effort will be made to encourage recycling at the source to help decrease the amount of waste going to the Resource Recovery Center.

## **5.3 PUBLIC INFORMATION AND EDUCATION PROGRAM**

A public information and education program for solid waste management and the recycling effort in the Town of Vienna has been implemented. The activities that are being implemented will complement and augment the additional actions contained in this section.

### **5.3.1 RECYCLING NEED AND EXISTING PROGRAMS FACT SHEET**

A brief fact sheet will be developed describing the need to recycle in the Town, noting where residents can bring materials, and what happens to materials and revenues generated by recycling. It is anticipated that this fact sheet would be included for distribution in the Vienna Newsletter.

## **5.4 EXPECTED COSTS AND FUNDING REQUIREMENTS**

Information on the current budget for the Town of Vienna Sanitation Division is presented in Table 5-1. Table 5-2 presents budget information on refuse disposal, and Table 5-3 presents budget information on leaf/brush pickup. All of these programs are funded through the Town's General Fund.

The solid waste management program proposed for the Town is an extension of the existing program, and it is expected the program's cost will continue to increase at approximately the rate of inflation. There does not appear to be a need for a significant increase in funding except for landfill disposal fees. The cost of disposal may increase at a rate greater than inflation if an out-of-County disposal facility is used by Fairfax County.

<b>Table 5-1</b> <b>BUDGET FOR SANITATION DIVISION</b> The Sanitation Division is responsible for collection of residential solid waste. Solid waste includes regular trash and recyclable items such as newspapers, glass, plastic, metal cans, brush and other yard waste.			
	FY07-08	FY08-09	FY09-010
<b>Salaries and Wages</b>	\$543,123	\$567,295	\$585,343
<b>Total for Sanitation Division</b> including overtime, benefits and supplies	\$853,805	\$873,799	\$905,780
Source: Town of Vienna, Virginia Adopted Budget for the Fiscal Year Beginning July 1, 2009 Through June 30, 2010			
<b>Table 5-2</b> <b>BUDGET FOR SOLID REFUSE DISPOSAL</b> The refuse disposal account provides for an accurate accounting of expenditures for contractual solid waste collection and disposal collection and disposal of solid waste by the Sanitation Division at Fairfax County's I-66 disposal facility, plus an accounting of expenditures for disposal of mixed recyclables at FCR Virginia			
	FY07-08	FY08-09	FY09-010
<b>Contractual Services</b> 1. AAA Disposal fees for condominium collection 2. Curbside recycling	\$41,482	\$43,734	\$43,734
<b>Services from Other Governments</b> Residential curbside refuse collection for 2804, 2806, and 2808 Hunter Road. Collection done by Fairfax County at a cost of \$300.00 per residence.	\$990	\$1,035	\$1,035
<b>Landfill Fees</b> Disposal of regular trash, yard waste and brush at the West Ox Transfer Station.	\$374,350	\$354,700	\$350,696
<b>TOTAL</b>	\$416,822	\$399,469	\$395,465
Source: Town of Vienna, Virginia Adopted Budget for the Fiscal Year Beginning July 1, 2009 Through June 30, 2010			

<b>Table 5-3</b> <b>BUDGET FOR LEAF PICKUP</b>			
This activity is responsible for the operation of the curbside leaf collection program in the fall.			
	FY07-08	FY08-09	FY09-10
Personnel Services	\$64,215	\$64,215	\$64,215
Employee Benefits	\$4,913	\$4,913	\$4,913
Contracts/Services	\$100	\$100	\$1,000
Landfill Fees	\$5,000	\$5,000	\$2,000
<b>TOTAL</b>	\$74,228	\$74,228	\$72,128
Source: Town of Vienna, Virginia Adopted Budget for the Fiscal year Beginning July 1, 2009 Through June 30, 2010			

## **Section 6 REPORTING REQUIREMENTS**

### **6.1 SUBMISSION OF THE SOLID WASTE MANAGEMENT PLAN**

The Virginia Code, at §10.1-1411, directs the Virginia Waste Management Board (Board) to promulgate regulations specifying requirements for local and regional solid waste management plans. The Board amended the Regulations for Solid Waste Management Planning (9 V AC 20-130-10 et seq.) effective August 1, 2001, and the amendment to the regulations removed the requirement for the five-year update to existing solid waste plans. However, section 9 VAC 20-130-110.B of the amended regulations states: "A complete, revised solid waste management plan in compliance with this chapter shall be provided to the department no later than July 1, 2004." The revised regulations can be found on the Department of Environmental Quality website at [www.deq.state.va.us/waste/wastereg130.html](http://www.deq.state.va.us/waste/wastereg130.html). For current guidance and frequently asked questions concerning solid waste management plans, visit the DEQ web site: <http://www.deq.state.va.us/waste/planning.html>.

### **6.2 YEARLY REPORTING REQUIREMENTS**

The Virginia Code, section 9 V AC 20-130-165.D, states that every city, county, and town in the Commonwealth, or solid waste management planning region approved pursuant to 9 VAC 20-130-180, shall submit to the department by April 30 of each year the data and calculations required in 9 VAC 20-130-120 B and C. Appendix II contains the Commonwealth of Virginia Locality Recycling Rate Report for Calendar Years 2003, 2002 and 2001.

## **Section 7 CITIZENS ADVISORY COMMITTEE**

A citizen's advisory committee was established to review the Town's SWM Plan.

Participants included Town residents, Ms. Gina Syverson and Ms. Carol Waters. Both participants conducted a review of the plan and their comments are as follows:

*Ms. Gina Syverson-* Asked about the Section 2.5.1.1 which stated that yard trimmings were collected on the second day of weekly collection. This is incorrect and the corrected paragraph from Section 2.5.1.1 is shown below:

Curbside collection of single-family residential MSW occurs twice weekly. On the first day of collection the regular trash and yard waste is collected and once weekly on the second day brush, newspapers, and recyclables are collected.

*Ms. Carol Waters-* Stated that she had no corrections to the SWM Plan. She stated that she appreciated the Town's personal service and especially liked the free mulch delivery available to Town residents.

## REFERENCES

CH2M HILL Solid Waste Management Plan for the Town of Vienna, 1991

Cerrato, D. S. Estimating Recyclables in the Commercial Waste Stream, Resource Recovery, August 1989.

CH2M HILL Solid Waste Recycling Feasibility Study. Submitted to the Rappahannock Regional Solid Waste Management Board for Stafford County and the City of Fredericksburg, Virginia, August 1990.

Commonwealth of Pennsylvania Department of Environmental Resources, Bureau of Waste Management. Estimating Composition and Quantities of Solid Waste Generation, Guide No.1 in a Series of Municipal Solid Waste Planning Guides.

Franklin Associates, Ltd. A Feasibility Study for an Expanded Recycling Program in Montgomery County, Maryland, November 1987.

Holtz, M. A. Used Oil in New England, May 1988.

Maquire Group. Fairfax County, Virginia, I-66 Transfer Station Expansion Feasibility Study, June 1988.

Metropolitan Washington Council of Governments, Round 4 Cooperative Forecasts, June 1988. Northern Virginia Planning District Commission (NVPDC). 1989 Regional Solid Waste Status Report, March 1990.

NVPDC correspondence regarding demographics, December 1990.

Windham Regional Commission. Solid Waste Planning Program (sic code), April 1990.

## **Appendix I PUBLIC PARTICIPATION**

## **Appendix II**

**COMMONWEALTH OF VIRGINIA LOCALITY RECYCLING RATE REPORT  
FOR CALANDAR YEAR 2003**

**COMMONWEALTH OF VIRGINIA LOCALITY RECYCLING RATE REPORT  
FOR CALANDAR YEAR 2002**

**COMMONWEALTH OF VIRGINIA LOCALITY RECYCLING RATE REPORT  
FOR CALANDAR YEAR 2001**



### **Appendix III LETTER FROM FAIRFAX COUNTY**

**Appendix IV SOLID WASTE REGULATIONS, TOWN OF VIENNA**

**Appendix V DEQ RECALCULATED RECYCLING RATE LETTER, AUG. 10, 2004**

**Appendix VI GLOSSARY OF TERMS**