

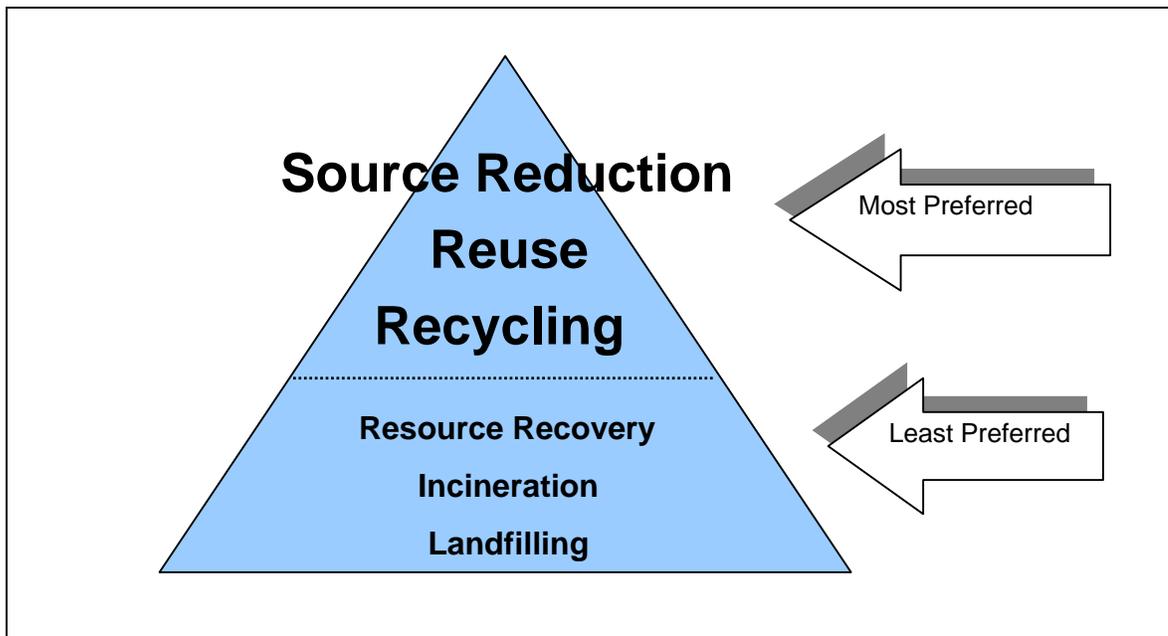
CHAPTER 4.0 CONSIDERATION OF THE SOLID WASTE HIERARCHY

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4.1 The Solid Waste Hierarchy

The Code of Virginia (Section 10.1-1411) and the Virginia Solid Waste Management Regulations (9 VAC 20-130-10 *et seq.*) require local governments to develop a comprehensive and integrated solid waste management plan. The Plan, at a minimum, must consider and address all components of the solid waste hierarchy for all types of nonhazardous solid waste generated in the region or locality (**Figure 4-1**). The solid waste management hierarchy ranks methods of handling solid waste from most preferred methods of source reduction, reuse, and recycling, in that order, to least preferred methods of energy/resource recovery/incineration and landfilling.

Figure 4-1: Solid Waste Management Hierarchy (9 VAC 20-130-30)



The Plan must provide an integrated solid waste management strategy that considers all elements of waste management during generation, collection, transportation, treatment, storage, and disposal. Finally, the Plan must describe how the mandatory recycling rate of 25% of the total municipal solid waste (MSW) generated annually will be met or exceeded (9 VAC 20-130-120 B & C).

No single waste management approach is appropriate for all communities. Integrated solid waste management uses a combination of techniques and approaches to handle targeted portions of the waste stream. It is important to realize that the portions of the hierarchy interact with each other and that change on one level will impact or influence another level. The highest level overall goal is

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waste reduction – the least expensive method of handling solid waste is not to generate it in the first place.

4.2 Source Reduction

At the top of the hierarchy and the most preferred method is source reduction or "waste prevention" programs designed to reduce both the toxic constituents in products and the quantities of waste generated. Source reduction can be a front-end waste management approach by designing and manufacturing products and packaging with minimum volume and toxic content so as to help ensure that the product has a longer useful life. For the individual consumer or household, source reduction means consuming and throwing away less. It can be as simple as declining an unnecessary bag for a small purchase or as elaborate as establishing a backyard composting program or choosing cleaning products that do not contain hazardous chemicals.

4.2.1 Current Status

Source reduction is difficult to quantify because the goal is to not produce or generate waste. Loudoun County has implemented programs to reduce waste at the point of generation. Loudoun County currently has procurement policies to purchase materials with a recycled content. The County Extension Office encourages grasscycling and backyard composting where allowed. Businesses, manufacturers, consumers and local governments have been encouraged to implement Pollution Prevention (P2) programs to eliminate or reduce wastes at the source of generation. Plant/landscape nurseries, for example, indicate they have reduced or eliminated toxic pesticides from their inventories and have substituted nonhazardous chemicals.¹

Yard trimmings make up approximately 13 percent of the national waste stream and in regions such as Fairfax, Virginia it is reported that yard trimmings amount up to 25 percent. Furthermore, 50 percent of yard trimmings are grass clippings.² Fairfax County, VA estimates that a single family home produces roughly one-quarter ton of yard trimmings annually. Loudoun County expects there to be 175,600 households in 2020,³ and using the Fairfax County generation estimate the Loudoun County Solid Waste Management Planning District (LCSWMPD) will require a facility capable in 2020 of processing 43,900 tons of yard trimmings annually.

4.2.2 Future Considerations

One policy option for the District to consider for waste reduction or minimization could be incentives or regulations to reduce the amount of vegetative waste (VW). Requiring land development site design standards that generate less VW and

1 OSWM. (July 2002). *Survey of Solid Waste Generation by Loudoun County Businesses*.

2 U.S. EPA. (July 1999). *Organic Materials Management Strategies*. EPA 530-R-99-016.

3 Loudoun County Department of Economic Development. *Housing, Population and Employment Forecast*.

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encouraging other recycling efforts such as backyard composting or grasscycling are two options. Furthermore, the market outlook for VW processing facilities could be assessed. Should the need exist for more vegetative waste processing capacity, such businesses could be recruited or developed by the District to meet local demand.

The District could consider a countywide Pay-As-You-Throw (PAYT) system for solid waste collection. Customers purchase stickers or special bags from the refuse collection firm and pay a set price for each bag of trash. The customer pays only for the amount of trash actually thrown away. PAYT programs have been implemented in jurisdictions where governments have contractual control over waste collection. According to the EPA, on average, PAYT communities reduce their waste by 14 to 27 percent, and increase recycling by 32 to 59 percent.⁴ It is uncertain how to implement a PAYT with private solid waste collectors controlling the solid waste collection system. Currently residents who use the Loudoun County Solid Waste Management Facility (LCSWMPF) for disposal have the option of using the **FastTrash** program and pay a flat rate (a modified PAYT program) for disposal of up to ten 33-gallon bags of garbage. As of 2002, **FastTrash** is available only on Saturdays.

Public procurement policies could be extended to include construction materials, vehicles, furniture, carpeting etc., along the Federal Comprehensive Procurement Guidelines (CPG) and the District could participate in "buy-recycled" programs. Buying recycled content goods helps "close the recycling loop" by putting the materials collected through recycling programs back into the marketplace as products.

4.3 Reuse

Reuse is a waste reduction strategy where a product is used for the same or new purpose without undergoing a physical change. Used clothing or goods to an outlet for distribution to others (Salvation Army, consignment stores) is a form of reuse.

Reuse practices are not currently identified or tracked in the District, so reuse quantities are difficult to estimate.

4.3.1 Current Status

The Loudoun County Government operates a Surplus Store for the sale of used goods and supplies. The Salvation Army and similar community stores collect useable goods for resale or distribution as necessary. Consignment stores in the District offer an outlet for resale and reuse of goods. Businesses surveyed in the OSWM 2002 Survey of Loudoun County Businesses indicated reuse of materials such as pallets and plastic bags within their operations. Reuse is hard to quantify because the "waste" materials are reused and solid waste is not generated.

⁴ Gordon, Jr., Hui. (May 1999). "Pay-As-You-Throw" Continues to Grow. *Waste Age*, May 1, 1999.

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The County has recently implemented a program to collect used liquid petroleum gas cylinders (propane gas) for retrofitting and reuse when possible.

4.3.2 Future Considerations

The District may consider reuse programs or incentives for activities such as:

- Too Good to Waste Program
- Waste Paint Exchange
- Construction Materials (windows, lumber, unused block/brick) exchange

4.4 Recycling

Recycling provides the opportunity to reclaim valuable resources and to minimize the amount of waste placed in landfills. Recycling diverts materials (such as metal, glass, plastic and paper) from final waste disposal back into the consumer market and contributes to considerable energy savings in the manufacturing of new products made from recycled feedstock. Recycling may also help defray potential cost escalation for solid waste collection and disposal.

4.4.1 Current Status

Currently some recyclable materials are collected by private waste collection services in the Towns, and in some neighborhoods or homeowners' associations (HOAs) in the District. Loudoun County operates Recycling Dropoff Centers (DOCs) for the collection of commingled containers, newsprint, magazines, phonebooks, and cardboard to cover gaps in the existing curbside collection program. Changes to Chapters 1084 and 1086 of the Codified Ordinances of Loudoun County should increase recycling by residents and proper handling of recyclable materials collected by the solid waste collectors.

Special wastes such as waste oil, antifreeze, automobile batteries, scrap metal, and tires are routinely collected at the LCSWMF. Household hazardous wastes (HHWs) and hazardous wastes from qualifying businesses are collected at special events staged throughout the District on periodic basis. The County has implemented special collection events for Christmas trees and electronics recycling. VW delivered to the LCSWMF is chipped to produce mulch that is free to LCSWMPD residents and can be used in a variety of ways.

The District's recycling rate in 2001 was 28% based on the inclusion of yard waste recycled at a private composting facility operating in the District. Currently, there is one permitted composting facility in the District. This facility accepts grass and leaves from commercial or governmental entities only. As previously stated under Source Reuse, yard trimmings account for 25% of the waste stream and diverting

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those materials from disposal could be significant. District businesses report recycling of materials within their own operations such as converting waste concrete to road aggregate or composting VW. Anecdotal information suggests the land clearing debris (LCD) generated in the District is recycled by the generation of wood chips for fuel or mulch, firewood and saw logs.

4.4.2 Future Considerations

- Establish a DOC in Purcellville to serve residents in the western portion of the District.
- Establish recycling opportunities for businesses in the developing sections of the District.
- Establish a monthly HHW collection program at a stationary location to meet the needs of District residents.
- Establish waste oil collection areas in the more populated sections of the District.
- Provide adequate yard waste management facility capacity to meet the code revisions which State yard waste will be collected as a recyclable material starting July 1, 2003.
- Consider a regional materials recovery facility (MRF) to process recyclable materials including C&D and business type wastes.
- Establish regular collection programs or sites for oil filters, fluorescent lamps/tubes, and electronics.

4.5 Resource Recovery

Also known as Waste-to-Energy (WTE), this level of the solid waste management hierarchy uses municipal waste combustion to produce energy. Ash is a by-product of this program and is usually landfilled. The County considered a multi-jurisdictional Waste-To-Energy project in the 1980's. The project was never developed due to economics and political disagreements. Current regulatory requirements on air emissions and flow control make this option cost prohibitive.

4.5.1 Current Status

Currently, some of the HHWs generated in District are fuels blended and transported to industrial kilns as an alternative fuel. A portion of the District's MSW is transported to a WTE in the Hampton Roads region of Virginia.

4.5.2 Future Considerations

Flow control measures and strict compliance with the Clean Air Act would make this option cost prohibitive. The ash generated as a by-product usually must be landfilled, may require analytical testing to determine that the ash is not a hazardous waste, and could require landfilling or disposal at a hazardous waste landfill.

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4.6 Incineration

Incineration is next on the hierarchy and is similar to WTE but energy is not generated as a result of the burn. Ash is produced, however, and may require analytical testing to determine whether the ash is hazardous in which case the ash must be disposed at a hazardous waste landfill.

4.6.1 Current Status

Currently, some of the HHWs generated in the District are incinerated for disposal (poisons and pesticides). Regulated medical wastes (RMW) are typically incinerated or autoclaved prior to disposal.

4.6.2 Future Considerations

Compliance with the Clean Air Act makes this option cost prohibitive and does not appear to be a viable option for the District.

4.7 Landfilling

A sanitary landfill is an engineered waste burial facility designed to minimize the possibility of environmental degradation to surface and ground water, soil and air. Landfills are designed and constructed with liners according to specifications set forth in Federal and State law and regulations. Operating landfills must maintain active environmental monitoring and media management programs such as leachate and gas extraction systems. Landfilling requires daily operation and maintenance of the active disposal area and also requires closure construction and post closure care for the inactive or closed areas. Landfilling is necessary to manage non-recyclable and noncombustible wastes and is the only actual waste "disposal" method in the hierarchy. If waste cannot be recycled, incineration then sanitary landfilling are the next preferred methods of treatment. While landfilling is the least preferred method in the hierarchy, it remains the most prevalent in many jurisdictions because it is the cheapest method of disposal.

4.7.1 Current Status

Based on information in solid waste collector/transporter reports and landfill operations reports, 68% of the MSW generated in LCSWMPD is landfilled and 32% is incinerated in Fairfax County. Of the waste that is landfilled, 59% of the waste is transported out of the District to Southeastern Virginia and approximately 9% is disposed of at the LCSWMF.

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4.7.2 Future Considerations

Virginia's landfill capacity is estimated at 32 years based on a 2002 report from The Department of Environmental Quality (DEQ). In 2001, the County completed construction of an additional cell that, at current waste flow, will last until 2006.

Figure 4-2: Loudoun County's Waste Hierarchy

