

**SWANA RECYCLING  
TECHNICAL ASSISTANCE STUDY  
FINAL REPORT  
ACT 101 RECYCLING AND COMPOSTING GUIDANCE**

Prepared for:

**WRIGHTSVILLE BOROUGH  
YORK COUNTY, PENNSYLVANIA**



Picture by Eric Oberdorff

Prepared by:

**GANNETT FLEMING, INC.**



**HARRISBURG, PENNSYLVANIA**

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**FIGURES**

Figure 1 - York County Map

Figures 2, 2a, 3 and 4 – Compost Site Procedures and Composting Schematic & Schedule

**APPENDICES**

Appendix A – PA DEP Yard Waste Composting Guidelines (1997)

Appendix B – Turned Windrow Technology

**SWANA TECHNICAL ASSISTANCE STUDY  
FOR  
WRIGHTSVILLE BOROUGH**

**FINAL REPORT**

**ACT 101 RECYCLING AND COMPOSTING GUIDANCE**

**1.0 INTRODUCTION**

Through the partnership with the Solid Waste Authority of North America (SWANA), the Pennsylvania State Association of Township Supervisors, and the Pennsylvania Department of Environmental Protection (PADEP), the Borough of Wrightsville (Borough) was awarded \$6,000 in technical assistance to be provided by Gannett Fleming, Inc. (GF).

The Borough requested assistance from GF to provide information and guidance on implementing a new curbside recyclables and waste collection program. Although the Borough is not mandated to provide curbside recycling by Act 101, the Borough is still interested in implementing a recycling program that is compliant with Act 101 requirements. Implementing a municipal waste and recyclables collection system that is consistent with Act 101 will help the Borough ensure waste collection, curbside recycling, and the yard waste collection program is managed properly. Additionally, the Borough recognizes that compliance with PADEP and Act 101 requirements will prove favorable to the Borough when applying for Act 101 funding to support related programs.

**1.1 Scope of Work**

Gannett Fleming worked with the Borough of Wrightsville to develop the following four tasks:

- Task #1** GF staff will work with the Borough to gather pertinent background information from the Borough, and as needed from Hellam Township. Specific project needs and/or problems associated with this project will be identified and considered.
- Task #2** GF will outline the relevant components of Act 101 and identify potential inconsistencies in the existing waste collection and recycling collection program. This task will include evaluation of existing ordinances.
- Task #3** GF will provide general compost site criteria and composting guidance information.
- Task #4** GF will prepare and provide the Borough with a summary report of findings.

## **2.0 BACKGROUND**

The Borough is home to 2,223 residents based on 2000 Bureau of Census data. The Borough is located on the eastern edge of York County (Figure 1). Because the Borough's total population does not exceed 5,000, the Borough is not mandated under Act 101 to provide a curbside recycling program for its residents. Although not mandated by Act 101, the Borough voluntarily implements a comprehensive collection and recycling program that includes refuse collection, residential recycling, commercial recycling and yard waste collection services. The program continues to expand as new opportunities and services are identified.

## **3.0 EXISTING WASTE COLLECTION SERVICES**

In the past, the curbside collection services for refuse and recyclable containers was done via contract with a local private hauler. More recently, on January 1, 2002, Wrightsville Borough Municipal Authority (Authority) began providing waste collection and recycling services for the Borough. The existing waste collection program is described in the following sections.

### **3.1 License for Collection And Disposal**

The Authority provides municipal waste collection services under a license (Resolution No. 2004-1) that was awarded to the Authority by the Borough. Although the Borough does not have a solid waste and recycling ordinance, the requirements for collection and removal of refuse in the Borough are spelled out in the terms and conditions of the licensing documents, as defined in the Specifications For Collection and Removal of Refuse in the Borough of Wrightsville. The contracted entity (currently the Authority) is required to provide recyclables collection in addition to trash service. Recycling requirements are also outlined in the Specifications. Under the current scenario, the Authority pays monthly installments to the Borough as a condition of the license. The license extends for a period of one year (currently January 1, 2004 through December 31, 2004). The Borough and Authority have the option to renew the license agreement for an additional year.

### **3.2 Curbside Collection Program**

The Authority currently provides curbside municipal waste collection services twice per week for Township residents, plus a small area in Hellam Township. Residential refuse is collected on Tuesdays and Fridays (or other days as agreed upon) and recyclables are collected once per week on Tuesdays. The Authority also provides curbside yard waste collection services on a seasonal basis. Refuse and recyclables are to be collected from households between 6:00 a.m. and 7:00 p.m. on the collection days. The Authority is required by terms of the contract to provide one "clean-up" day per year. The clean-up day is operated from 8:30 a.m. to 11:30 a.m. The Authority provides three compactor vehicles (40 cubic yard minimum) for drop-off collection of large items from Borough residents. The Authority bills the Borough for the cost of the compactors and the tipping fees for disposal of the material.

## 4.0 RECYCLING

Although not mandated to recycle by the Municipal Waste Planning, Recycling and Waste Reduction Act of 1988 (Act 101), the Borough currently implements a relatively comprehensive curbside recycling program. The Borough provides weekly collection (Tuesdays) of the following Act 101 materials from residential households and small businesses:

- Clear glass
- Colored glass (green and brown)
- Aluminum
- Steel/ Bimetallic cans
- Newsprint
- Plastic bottles

After collection, commingled containers and newsprint are taken to Recycle America Alliance in York, Pennsylvania for processing and marketing. As reported by the Borough of Wrightsville, the Borough collected 117 tons of residential and commercial commingled recyclables in 2003.

### 4.1 Recycling Ordinance

The Borough is currently pursuing the development of a recycling ordinance to help support implementation of the recycling program. A recycling ordinance will be required by the Borough if it wishes to receive the same “priority” as mandated communities for Act 101 funding. An example of a Request For Proposals (RFP) for curbside collection of residential municipal waste and collection of recyclable materials and a corresponding draft recycling ordinance is available on the PADEP website at [www.dep.state.pa.us](http://www.dep.state.pa.us) (keyword: “recycling technical assistance”). The RFP and ordinance were developed by Alternative Resources, Inc. (ARI) under the recycling technical assistance report entitled, “Act 101 Recycling Program – Kennett Township”.

### 4.2 Yard Waste

The Authority collects leaves and yard waste seasonally (on a weekly schedule) from over 1,100 households, churches, and businesses. Leaves are currently collected in the fall using a dump truck with a tow-behind leaf collector. Yard waste (i.e. grass clippings, brush, shrubbery, garden residues, tree trimmings) is collected seasonally on a weekly schedule. After collection, leaves and yard waste are taken to a yard waste processing site in Columbia Borough, Pennsylvania in Lancaster County. As reported by the Borough of Wrightsville, the Borough collected the following tonnages in 2003:

Leaves – **135 tons**  
Yard Waste – **128 tons**

White goods (i.e. washers, dryers, refrigerators, stoves, and freezers) are collected at a residential drop-off location once per year, or residents can request a curbside pick-up for these materials for a charge.

The Borough’s existing solid waste ordinance does not specifically identify recycling requirements. As stated previously in this report, the Borough’s municipal waste and recyclables

collection contract includes recycling requirements for the contracted hauling service (currently the Authority). As required by the contract, the Authority provides weekly recyclables collection services to all households that receive municipal waste collection.

### 4.3 Commercial Recycling

The Borough does not require commercial establishments to recycle. Some of the commercial establishments located in the Borough privately subscribe with one of several local private haulers for recyclables collection. Businesses that do recycle typically contract independently for collection of cardboard and/or office paper (and/or other materials).

If the Borough wanted to implement a commercial recycling program consistent with a mandated recycling community, it would need to follow the Municipal Waste Planning, Recycling and Waste Reduction Act of 1988 (Act 101). Act 101 requires commercial, institutional and municipal establishments located in Pennsylvania’s mandated municipalities to recycle the following materials (as a minimum):

- High-grade office paper
- Aluminum
- Corrugated paper
- Leaf waste

In both mandated and non-mandated communities, an ordinance may be used to require mandatory recycling from establishments of any number of recyclable materials as specified in the municipality’s solid waste and/ or recycling ordinance or regulations. Some of the other recyclable items that can be recycled (in addition to those listed above) may include glass, newsprint, plastics, and/or steel and bimetallic cans, and food waste.

Even in municipalities that have been mandated for a long time, commercial business may not recycle all or any of the materials designated by Act 101. It will be the Borough’s responsibility to educate the commercial businesses (and as necessary, the haulers) of their recycling responsibilities. In mandated communities, establishments are responsible for arranging for the collection and recycling of designated Act 101 materials, unless another arrangement or agreement fulfills the Act 101 requirements.

It is important for commercial, institutional and municipal entities to provide written documentation to the municipality as to the type and weight of materials recycled annually. Act 101 mandated municipalities are further required to submit annual recycling reports to their host County for PADEP record.

## 5.0 ACT 101 REQUIREMENTS FOR MANDATED COMMUNITIES

The following sections outline the Act 101 requirements for mandated curbside recycling communities. As reviewed in this report, Wrightsville Borough is not a mandated community. The Borough does not currently have a recycling ordinance in place, but is interested in operating its recycling program in a manner that is consistent with Act 101. The Borough wants to ensure that it remains eligible for Act 101 grant funding. A key component to having prioritization for receiving Act 101 funding is that the municipality is either an Act 101 mandated community or that the municipality has a “mandatory recycling program”. A

“mandatory recycling program” is a municipal recycling program that has implemented a solid waste and/ or recycling ordinance that requires recycling of at least three Act 101 designated materials. In order for the Borough to receive the same Act 101 grant funding “priority” as a mandated municipality, the Borough must implement a recycling ordinance. The municipal waste regulation pertaining to “priority” is presented below:

**Act 101 Section 902 (d) Priority** - Each municipality, other than a county, which establishes and implements a mandatory source separation and collection program for recyclable materials shall be given the same priority with municipalities subject to the requirements of section 1501 for grants under this section.

It is noted that a "mandatory program" is not defined by Act 101 or the Municipal Waste Regulations. The term is used in Section 902 (d) regarding grant priority. The section compares non-mandated municipalities to those mandated by Section 1501.

### **5.1 Definitions (§ 271.1)**

For clarification in the development of a collection program that may include leaf and yard waste collection, the definitions for leaf waste and yardwaste are provided below. Although yard waste collection are not required by Act 101, it is necessary to understand the municipal waste definition of this material when developing a recycling ordinance and/or RFP.

*Leaf waste*—Leaves, garden residues, shrubbery and tree trimmings, and similar material, but not including grass clippings.

*Yard Waste* – Leaves, **grass clippings**, garden residue, tree trimmings, chipped shrubbery and other vegetative material.

*Occupied dwelling*—A permanent building or fixed mobile home that is currently being used on a regular or temporary basis for human habitation.

### **5.2 Program Elements (§ 272.421)**

The source separation program shall include, at a minimum, the following elements:

- (1) An ordinance or regulation adopted by the governing body of the municipality, in accordance with § 272.422 (relating to municipal ordinance).
- (2) A scheduled day during which separated materials are to be placed for collection at the curbside. Collection shall be at least once per month for materials other than leaf waste. Collection for leaf waste shall be scheduled as appropriate. If no curb exists, separated materials shall be placed at a location similar to the curb where they may be collected easily.

- (3) A system, including trucks and related equipment, that collects recyclable materials from the curbside or similar location at least once per month from each residence or other person generating municipal waste in the municipality.
- (4) A public information and education program, in accordance with § 272.423 (relating to public information and education).
- (5) Provisions for the recycling of collected materials.

### **5.3 Municipal Ordinance (§ 272.422)**

- (a) The ordinance or regulation adopted by the governing body of the municipality shall contain the following requirements:
  - (1) Persons shall separate at least three materials from municipal waste generated at their homes, apartments and other residential establishments, and shall store the materials until collection. The three materials shall be designated in the ordinance, and shall be chosen from the following:

▪ Clear glass	▪ High-grade office paper
▪ Colored glass	▪ Newsprint
▪ Aluminum	▪ Corrugated paper and plastics
▪ Steel and bimetallic cans	
  - (2) Persons shall separate leaf waste from municipal waste generated at their homes, apartments and other residential establishments until collection, unless those persons have otherwise provided for the composting of leaf waste.
  - (3) Persons shall separate high grade office paper, aluminum, corrugated paper and leaf waste generated at commercial, municipal or institutional establishments and from community activities, and store the materials until collection. The ordinance may designate additional materials for recycling.
- (b) The ordinance shall allow an owner, landlord or agent of an owner or landlord of multifamily rental housing properties with four or more units to comply with its responsibilities under this subchapter by establishing a collection system for recyclable materials at each property. The collection system shall include suitable containers for collecting and sorting materials, easily accessible locations for the containers and written instructions to the occupants concerning the use and availability of the collection system. Owners, landlords and agents of owners or landlords who comply with the ordinance under this subsection are not liable for the noncompliance of occupants of their buildings.
- (c) The ordinance shall exempt persons occupying commercial, institutional and municipal establishments within its municipal boundaries from the ordinance if the following requirements are met:

- (1) The persons have otherwise provided for the recycling of materials that they are required by this subchapter and the ordinance to recycle.
- (2) The persons annually provide written documentation to the municipality of the amount of municipal waste generated as well as the type and weight of materials that were recycled in the previous calendar year.
- (d) Nothing in the ordinance or regulation may impair the ownership of separated materials by the persons who generated them until separated materials are placed at curbside or similar location for collection by the municipality or its agents.

#### **5.4 Public Information and Education (§ 272.423)**

- (a) A municipality subject to this subchapter shall establish a comprehensive and sustained public information and education program concerning recycling program features and requirements. As part of this program, a municipality shall, at least 30 days prior to the initiation of the recycling program and at least once every 6 months thereafter, notify persons occupying residential, commercial, institutional and municipal premises within its boundaries of the requirements of the ordinance. This notice shall include an explanation of how the system will operate, the dates of collection, and responsibilities of persons within the municipality and incentives and penalties.
- (b) The governing body of a municipality may place an advertisement in a newspaper circulating in the municipality, post a notice in a public place where public notices are customarily posted, including a notice with other official notifications periodically mailed to residential taxpayers, or utilize a combination of the foregoing.

#### **5.5 Implementation (§ 272.424)**

- (a) Except as provided in subsection (b), a municipality shall implement its responsibilities for collection, transportation, processing and marketing materials under this subchapter in one or more of the following ways:
  - (1) Collect, transport, process or market materials as required by this subchapter.
  - (2) Enter into contracts with other persons or license other persons for the collection, transporting, processing or marketing of materials as required by this subchapter. A person who enters into a contract or is licensed under this subsection shall be responsible with the municipality for the implementation of this section.
- (b) Nothing in this subchapter requires a municipality to collect, transport, process and market materials or to contract for the collection, transportation, processing and marketing of materials from an establishment or activity if the following are met:
  - (1) The municipality is not collecting and transporting municipal waste from the establishment or activity.

- (2) The municipality has not contracted for the collection and transportation of municipal waste from the establishment or activity.
- (3) The municipality has adopted an ordinance as required by this subchapter, and the establishment or activity is in compliance with this subchapter.

### **5.5.1 Preference (§ 272.425)**

In implementing its recycling program, a municipality shall accord consideration for the collection, marketing and disposition of recyclable material to persons engaged in the business of recycling on September 26, 1988, whether or not the persons were operating for profit.

### **5.6 Leaf Waste Requirements for Mandated Municipalities**

Mandated municipalities are required to provide for the collection of “leaf waste” for residents as described by the corresponding regulations presented in section 6.0 of this report.

“Leaf waste” is defined as leaves, garden residues, shrubbery and tree trimmings, and similar material, but not including grass clippings. Collection of other yard waste materials (e.g. grass clippings), is not required by the Act 101 recycling mandate, but is often included with mandated curbside recycling programs.

In mandated communities, drop-off recycling or drop-off systems for leaf waste are not an option in terms of replacing curbside collection for residential, commercial, institutional or municipal establishments. Drop-off sites are optional in the sense that they can supplement a curbside collection system.

### **6.0 BURNING ORDINANCE & 902 GRANT REVIEW PROCESS**

The Borough currently has an open burning ordinance in place (Ord. 88-3, 6/6/1988, §4; as amended by Ord. 98-4, 9/14/1998). In short the burning ordinance prohibits any person (i.e. individual, partnership, association, corporation, department, bureau, agency, or other legal entity) from burning material in the open. The ordinance also establishes penalties for violators including a fine not to exceed \$1,000 and term of imprisonment not to exceed 30 days.

In the past few years, PADEP has emphasized the importance of establishing a burning ordinance so that Act 101 materials targeted for recycling programs are not burned. PADEP’s position on burning, as understood by GF, is that PADEP discourages municipalities from authorizing the burning of Act 101 designated materials - and the implementation of anti-burning ordinances are encouraged. However, PADEP will not find fault with municipalities who do not have anti-burning regulations in place, unless burning complaints are brought to the attention of PADEP.

After review of the Borough’s ordinance, it appears that the Borough has meet all PADEP burning requirements (and thus burning requirements should not negatively impact the Borough’s Section 902 grant application in this grant round or upcoming grant rounds). The

following section has been provided to clarify PADEP’s review process for Section 902 grant applications and burning considerations.

## **6.1 Act 101 Section 902 Recycling Grant Application Guidelines**

Assuring compliance with the terms and conditions of Act 101, the rules and regulations promulgated thereunder, other pertinent statutes and the Department's policies and grant guidance are key components of the Department's grant review process. The Act requires certain municipalities ("mandated municipalities") to recycle certain items and provide for the collection and composting of leaf waste. As such, any mandated municipality that allows the materials that are part of its municipal recycling program, including leaf waste, to be managed in a manner other than recycling or composting is in violation of Act 101. The Act also establishes the grant requirements for those communities not mandated to recycle. However, Act 175 states that the Department "shall not prohibit the award of any grant to a county or municipality that has adopted an ordinance allowing the limited burning of yard waste." Since grant funding is awarded on a competitive basis, the following guidelines have been developed to assure that a common understanding exists between the Department and municipalities regarding section 902 grant program requirements.

### **6.1.1 Non-mandated municipality requesting a section 902 grant:**

Programs required by the municipality:

1. DEP Regional Planning and Recycling Coordinators will review recycling ordinances and other mechanisms submitted with the grant application to ensure compliance with Act 101, especially section 902(b)(3).
2. The recycling ordinance or other mechanism need only be applicable to that part(s) of the municipality that is being served by the recycling program.
3. It will be assumed that a municipality that does not have an ordinance or other mechanism that addresses burning is not authorizing the burning of the materials that are part of its recycling program - unless the Department has evidence to the contrary. This evidence could include complaints or other information gathered by the Department.
4. The grant application should confirm that the municipality does not have an ordinance, regulation or other mechanism authorizing the burning of the materials listed in section 1501(c)(1)(i) and (iii) (except for leaf waste) that are part of its recycling program and that the municipality will enforce its recycling ordinances and regulations. Applications from municipalities that have adopted an ordinance allowing for the limited burning of yard waste will be evaluated on a case-by-case basis to ensure that, to the greatest extent practicable, sufficient effort has been made to operate the program according to the intent of sections 1501(c)(1)(ii) and (iii) regarding the separation and composting of leaf waste.
5. The regional office should not recommend a grant until the municipality has adopted any necessary modifications to its ordinances or regulations in relation to these guidelines.

## 7.0 YARD WASTE AND LEAF WASTE COLLECTION AND COMPOSTING GUIDANCE

### 7.1 Yard Waste Collection

There are generally two basic methods used to collect leaves: loose collection or containerized collection. Loose collection is not appropriate for general yard wastes such as grass clippings. Loose collection of leaf waste can be accomplished using a vacuum loader or front-end loader. Vacuum loaders can be purchased with a box to hold the collected leaves or can be used with dump trucks or boxes built by municipal workers. While a front-end loader with the standard bucket attachment is not particularly efficient at collecting leaves, it is commonly used because it is readily available in many municipalities. There are several types of special "pincer" type buckets that can be attached to a front-end loader to improve its suitability for yard waste collection. In many yard waste programs, front-end loaders are used in conjunction with dump trucks or garbage packers.

Containerized collection is the method used when yard waste is placed in a bag or plastic container by a resident and placed at the curbside for collection. Standard, non-degradable 30-gallon plastic bags are commonly used by residents for containerized collection. Removal of the bags by hand at some point in the collection or composting process is a drawback to the use of such a system.

Another option for containerized collection is the use of plastic bins. The use of reusable plastic bins is becoming a popular method of collecting yard waste. Yard waste can be collected by municipal crews or by a municipally-contracted private hauler. Municipalities may provide drop-off locations for other yard waste (e.g. brush, tree trimmings).

### 7.2 Composting Yard Waste and Leaf Waste

The practice of a landfill or resource recovery facility (incinerator) accepting "truckloads composed primarily of leaf waste" is a violation of Act 101, Section 1502(a). Composting of yardwaste and leaf waste is a natural disposal/ recycling alternative for many municipalities. In general, composting is not allowed without a PADEP municipal waste permit. Leaf waste composting, however, is allowed as a "Permit By Rule", provided the process is approved by PADEP. PADEP has developed guidelines for an acceptable leaf waste composting process under the Permit By Rule program. The PADEP Guidelines for Yard Waste Composting Facilities (effective date September 1, 1997) apply to yard waste composting facilities of less than five acres that adhere to certain siting, design, and operational requirements in the Guidelines (**Appendix A**).

The Municipal Waste Management Regulations (Title 25 Pa Code, Section 271.103(h)) allow yard waste composting facilities to operate under a "permit-by-rule" if they comply with the Guidelines. Compost facilities between five and fifteen acres in size may be allowed to operate under a PADEP General Permit (GP) for composting facilities, provided the proposed activities are consistent with the GP and approved by PADEP. For the 5-15 acre compost sites, PADEP requires the submittal of Form 27, "Acceptance of General Permit Conditions", as part of this process. PADEP then makes a "Determination of Applicability" based on the information provided by the applicant requesting approval to operate under the GP.

The PADEP Yard Waste Composting guidelines also address land application of yard waste and composting of grass clippings. Typically, land application involves spreading leaves, or other yard waste material, on farm fields where it is tilled into the soil. Grass clippings can make up one-third to one-half of all yard waste. The PADEP guidelines enable grass clippings to be processed with other yard wastes at a Permit By Rule yard waste composting site, as long as compliance is maintained with specified operating restrictions. The most significant restrictions for grass composting is that grass cannot be processed at a rate of more than one-part grass to three-parts other yard waste.

Yard wastes can be composted with nearly any other organic waste including waste paper, sewage sludge, animal manures, and food processing wastes. Yard wastes, particularly leaves, are a desirable complement to high-moisture, high-nitrogen wastes such as sludge and manure. The commonly used method of composting known as “turned windrow technology” is presented in **Appendix B** for reference.

Wrightsville anticipates submitting a Section 902 (Act 101) grant application in 2005 to request funding to help with implementation of a compost site.

### **7.2.1 Composting Process Options**

The composting process requires heat, water, and oxygen to proceed properly. The various approaches to composting can be ordered into the following four general categories:

**No Technology ("sheet composting")** - The material is spread over a field and allowed to decompose naturally without further intervention. The PADEP has given verbal consent to a number of previously existing yard waste collection programs that deposit their leaves on farm fields or at nurseries that use this method.

**Low-Level Technology (Windrow Method)** - This is the most common method of leaf composting, and the method specified in the PADEP Guidelines (described below). This method usually produces compost in approximately 12-18 months.

**Medium Technology (Aerated Static Pile)** - The yard waste material is piled over perforated piping. The material is aerated by blowing air out of the pipe and into the pile or by drawing air through the pile and into the pipe. This method produces compost in less than 12 months.

**High Technology (In-Vessel Method)** - Material is composted in a fully enclosed, mechanical system. All of the environmental factors that affect the decomposition process can be controlled, allowing the first stage of composting to be completed in a very short period of time. In-vessel composting is generally applied to composting of more general municipal solid waste and sewage sludge rather than yard waste alone.

The design and operating considerations for a low-technology leaf composting facility are discussed below. The discussion notes the PADEP guidelines, where applicable. **Figures 2-2 through 2-4** illustrate the composting method and **Figure 2-5** presents a schematic of the process schedule. The process is also adaptable to leaf and grass co-composting. Grass clippings can be

added to existing leaf compost piles from the previous autumn. This mixing benefits both the grass and leaf composting process.

- (a) Siting: Zoning, access roads, water supply, soil grade and drainage characteristics must be considered. A buffer zone, needed for odor control, should be sized according to the closest neighbor and PADEP guidelines on isolation buffer distances. The PADEP guidelines require a minimum of one acre of site for each 3,000 cubic yards of vegetative material being processed.
- (b) Windrow Size: PADEP guidelines require the pile to be 6-8 feet high and 12-16 feet wide. The pile can be extended to as great a length as desired.
- (c) Pile Building: Front-end loaders are used to build the piles. PADEP recommends that piles be built within two days of the delivery of material to the site. If grass clippings are being composted, to avoid odor problems they should be incorporated the day received and at a leaf to grass ratio no lower than 3:1.
- (d) Moisture: The moisture content should be maintained at approximately 50 percent. Water should be added, if needed, when the piles are being formed and when they are being turned. The PADEP guidelines support this moisture level.
- (e) Pile Turning: Piles are usually turned with a front-end loader or with specially designed mixing equipment. Turning is necessary for wetting the outer edges, re-aerating the material, and insuring that all material is exposed to the high temperatures characteristic of the center of the pile. Piles are turned at least every two months; however, more frequent turning will increase the rate of decomposition. The PADEP guidelines require a minimum of two turnings per year. With incorporation of grass, more frequent turning is required; during some periods, daily or semi-weekly turning may be necessary.
- (f) Curing: In late summer the material is combined into large curing piles to make room for the next leaf deliveries. Curing allows for further decomposition, and can be for as little as one month to as much as one year. Curing piles usually do not emit any odor.
- (g) Shredding and Screening: Shredding and screening are optional finishing steps that provide for a uniform end-product, thereby enhancing the market value of the material. Both processes, however, are labor-intensive and increase capital and operational costs.

### 7.2.2 Compost Distribution

Clean yard waste compost is a commonly marketed compost material that usually has many local end users. Finished compost can be made available to residents, nurseries, landscapers, and farmers. Compost can be used as a soil amendment. Municipal crews can use it for reseeding, to hold soil moisture, and for landscaping projects. Municipal programs usually have to expend some effort and resources in notifying potential users of the compost's availability. Given the high transportation costs relative to the compost's value, the compost users generally will be located close to the compost source. Without advanced finishing steps such as screening and bagging, municipal market value for most composted material is minimal.

## 8.0 CONCLUSIONS

Wrightsville Borough, although not an Act 101 mandated community, has implemented a comprehensive and expanding curbside program for commingled recyclables for nearly 15 years. The Borough has also provided a leaf collection program for 35 years. The Borough wishes to continue to provide a comprehensive and beneficial waste collection and recycling program for its residents and to expand the level of service if possible. Recently the Wrightsville Borough Municipal Authority (Authority) began providing curbside refuse and recyclables collection services (including yard waste and leaves) through a license agreement with the Borough.

The Borough plans to develop a yard waste composting facility to improve the existing yard waste collection program to benefit the public. The Borough submitted a Section 902 grant application for grant round 2004/2005 for a wood chipper, dump truck, clam bucket (for a loader), and a leaf box.

Unfortunately there is a limited availability of Act 101 recycling grant funding available. This makes recycling grant submittals very competitive. In 2004-2005 there were 200 grant applications submitted to PADEP totaling nearly \$50 million dollars. Limited funding means that many municipalities applying for Act 101 funding may be denied funding, delayed funding, or may only receive partial funding in response to their Section 902 grant application.

Based on GF's evaluation, the Borough's municipal waste and recycling program is consistent with most aspects of Act 101.

## 8.1 Recommendations

The following recommendations include general recommendations as well as indicate areas of the collection program that may need to be further evaluated or revised in order to ensure the Borough's collection system is consistent with Act 101 and PADEP guidelines. GF reviewed the Borough's collection system to identify inconsistencies with Act 101. GF recommendations based on this evaluation are:

### LICENSE FOR COLLECTION AND DISPOSAL

- It is suggested the Borough reevaluate and confirm the legal basis of the license program currently in place as the mechanism to secure the Authority as the party to provide collection and disposal of residential municipal waste. This confirmation is recommended because the concept of "dual licensing" (i.e. where both a municipality licenses as well as the host county licenses), has recently been challenged in the court system – with the decisions supporting that a county alone can implement a license program. In this case, York County has a hauler license program. In fact, the City of York ceased its licensing program in 2003, as advised by their solicitor. GF cannot act in place of a solicitor to give final recommendations on this legal issue.

### RECYCLING ORDINANCE AND ACT 101

- It is recommended the Borough implement a mandatory recycling ordinance that requires residents to recycle at least three designated Act 101 materials. The current program

collects a number of Act 101 recyclables. It is recommended the ordinance is consistent with Act 101 requirements. The full Act 101 document is available on the PADEP website: <http://www.dep.state.pa.us/>), and the required content of the municipal ordinance is provided in Section 5.4 of this report. Implementation of a recycling ordinance appears to be the only way the Borough can receive the same Act 101 funding “priority” as mandated recycling communities. Act 101 funds can be an excellent resource in improving recycling programs and may be essential for the successful implementation of the Borough’s proposed yard waste composting site. Additionally, the ordinance coupled with proper administration and enforcement, can be a useful mechanism in implementing the recycling program.

- Based on GF’s understanding of PADEP’s position on burning, and based on GF’s review of the Borough’s existing open burning ordinance, it appears the burning ordinance satisfies PADEP burning requirements. It is not recommended the Borough make any changes to the open burning ordinance at this time (unless PADEP requirements change and warrant such a revision). The Borough’s continued compliance with Act 101 burning requirements may contribute to a favorable PADEP review when applying for Act 101 recycling grant funding.
- The Borough should review (with the board and others) and reference the Act 101 regulations and guidance presented in this report. The information describes the proper implementation of a mandated recycling program, yard waste/ leaf waste collection, and composting procedures.

## EDUCATION

- It is recommended the Borough emphasize the educational component of the recycling program. The Borough may educate residents and businesses on responsibilities related to waste collection and recycling in the Borough. Education should be ongoing and may include the development and/or use of educational newsletters, brochures, and other sources of media that are available.
- Education efforts/costs may be added as a line item in the Borough’s budget to ensure that education is ongoing and effective, and that costs are documented. In order to lower recycling education costs through shared resources, and for general guidance, the Borough could request assistance (as it is necessary) from the York County recycling coordinator, or other County recycling coordinators. Many recycling resources are also available on the PADEP website ([www.dep.state.pa.us](http://www.dep.state.pa.us)).

## FUNDING

The Borough submitted a Section 902 Grant Application for the 2004-2005 grant round. Primarily, the grant request was for yard waste collection/ processing equipment (e.g., woodchipper, dump truck, leaf collection box, clam bucket for loader) to support improving the yard waste collection program.

Some specific funding recommendations include:

- If the Borough is denied funding for the 2004-2005 application round/ submittal, it is recommended the Borough resubmit (and revise as necessary) the application. It is noted that PADEP is more favorable to grant applications that demonstrate funding will be used for joint-municipal projects. Therefore, it is recommended the Borough yard waste application and the proposed yard waste program and compost site clearly illustrate benefits to the Borough plus one or more additional municipalities.
- Because grant funding is not guaranteed, the Borough should not rely on grant funding as the support mechanism for its recycling programs. As the Borough continues to expand, it may become necessary for the Borough to work with a solicitor to investigate the use of an administrative fee (or a related fee system) to support the administration and implementation of its services and programs.
- If the Borough implements a yard waste processing and compost facility that produces finished yard waste material, it is recommended the finished material be sold, and not given away free of charge. GF experience has found that selling finished yard waste material actually improves the interest in the product when compared to the same material that is given away for free. Additionally, recovering revenues supports a more sustainable recycling program.

#### 902 RECYCLING PROGRAM GRANT

- The Borough should continue apply for Section 902 grant funding for up to 90 percent reimbursement for costs associated with purchasing recycling equipment and recycling containers, and for educational outreach.

#### 904 PERFORMANCE GRANT

- It is recommended the Borough apply annually for the 904 Performance Grant award. The Section 904 grant program provides funding based on the amount of eligible Act 101 recyclable materials that are collected and documented (documentation must meet PADEP requirements) for a given year. Information on recycling Performance Grants is available on the PADEP website ([www.dep.state.pa.us](http://www.dep.state.pa.us)).

#### 901 PLANNING GRANT

- As the Borough continues to develop its curbside refuse collection and recycling programs and investigates future yard waste and recycling programs, the Borough can apply (through York County) for 901 Planning grant funding for 80 percent of approved costs for conducting related studies, surveys, investigations, research and analysis.



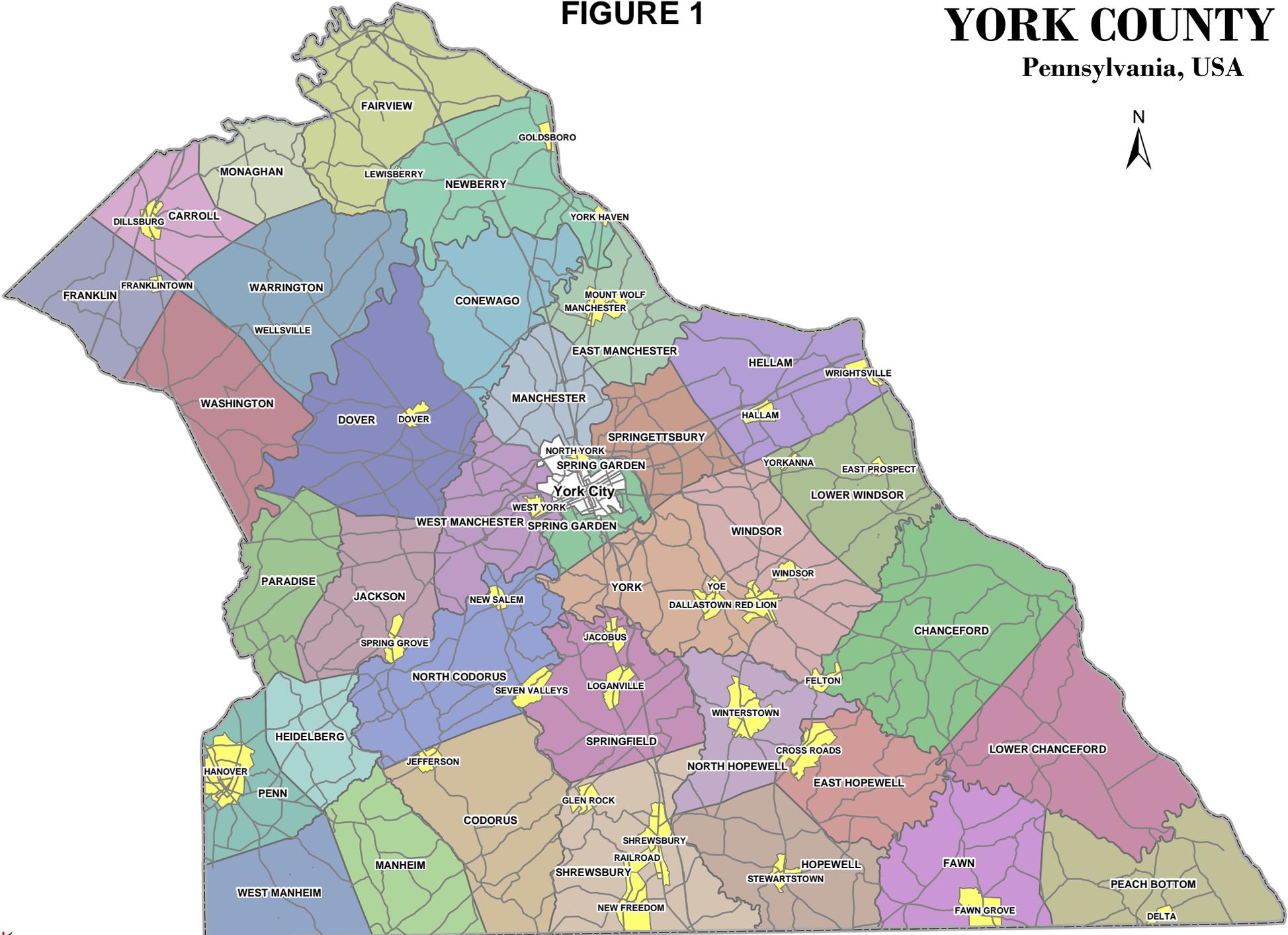
**FIGURE 1**

York County Map

FIGURE 1

# YORK COUNTY

Pennsylvania, USA



**FIGURES 2, 2a, 3 & 4**

Compost Site Procedures  
Composting Schematic and Schedule

# FIGURE 2

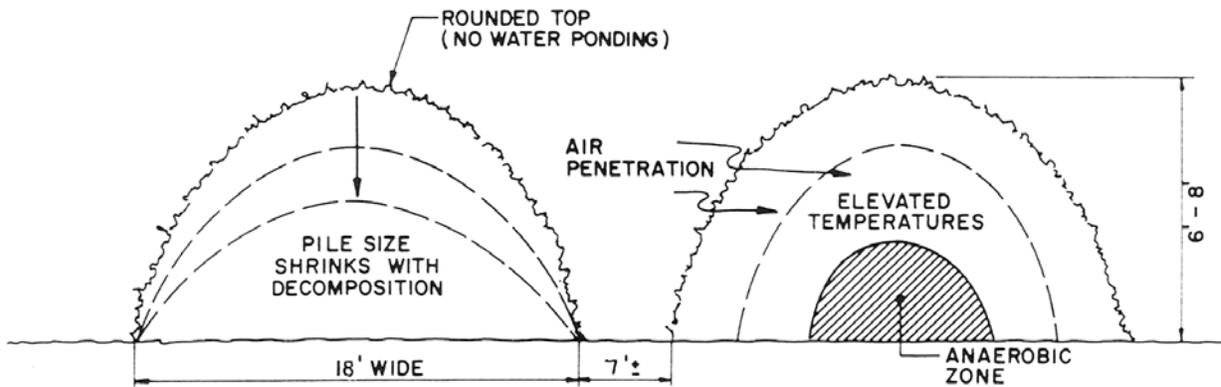
## COMPOST SITE PROCEDURES



STEP 1. LEAF DELIVERY



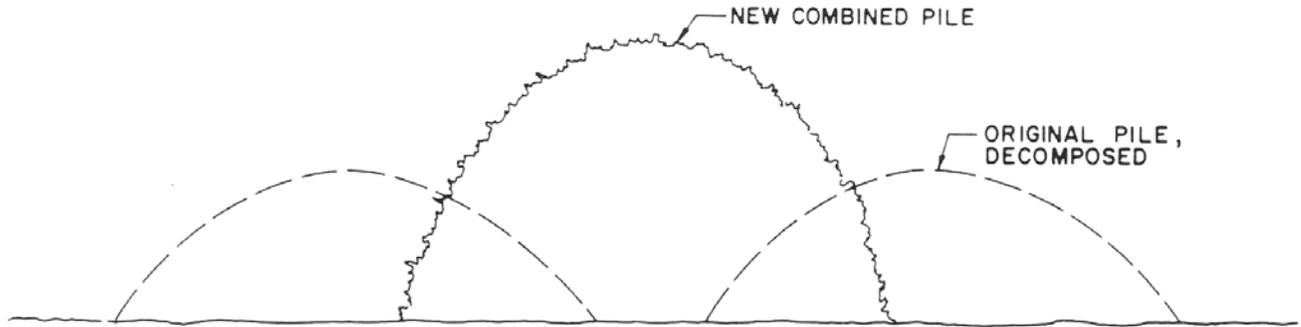
STEP 2. PILE CONSTRUCTION



STEP 3. COMPLETED PAIR OF WINDROW PILES

**FIGURE 2a**

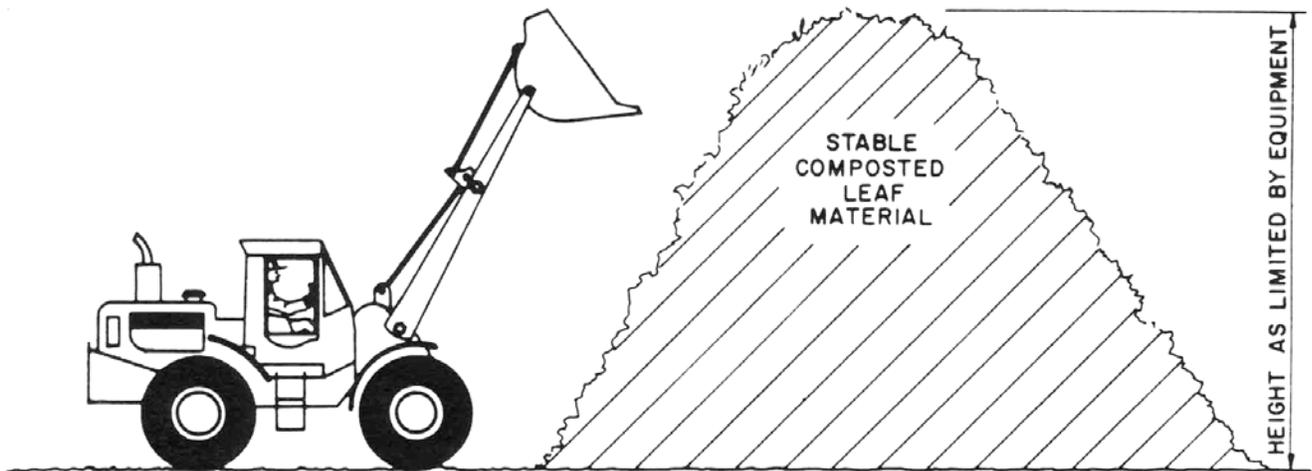
**SITE PROCEDURES-CONTINUED**



**STEP 4. COMBINING PILES**



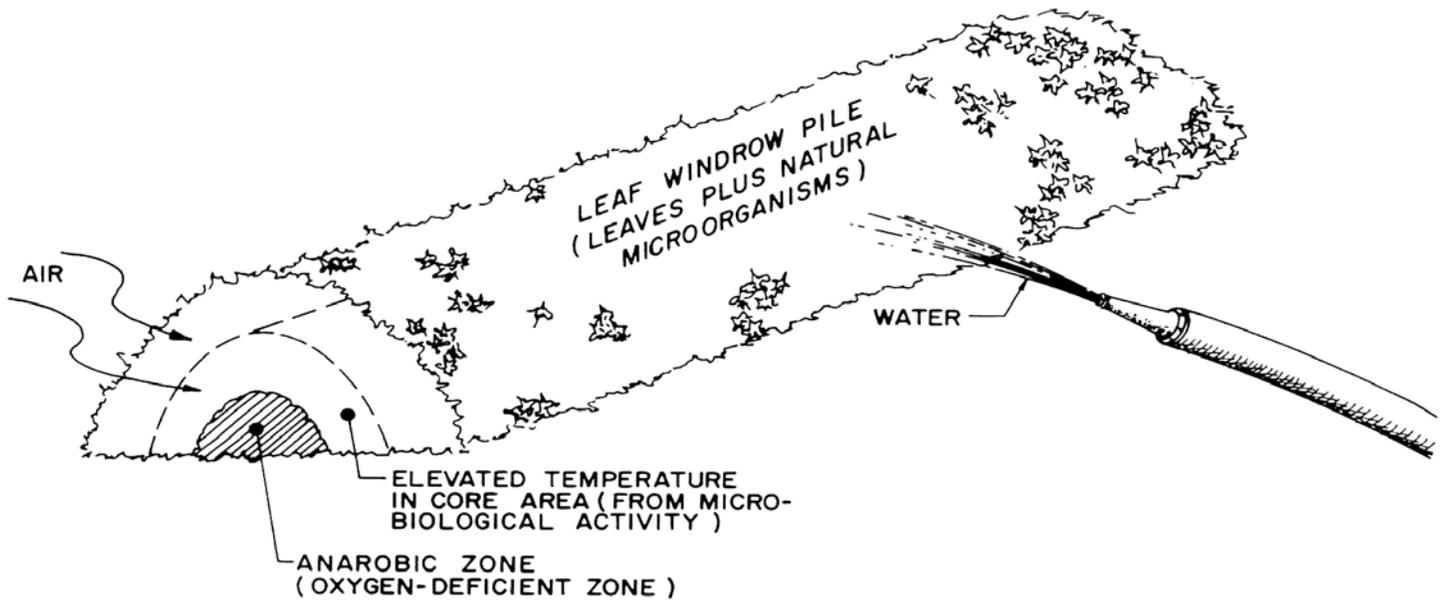
**STEP 5. TURNING PILE IN PLACE**



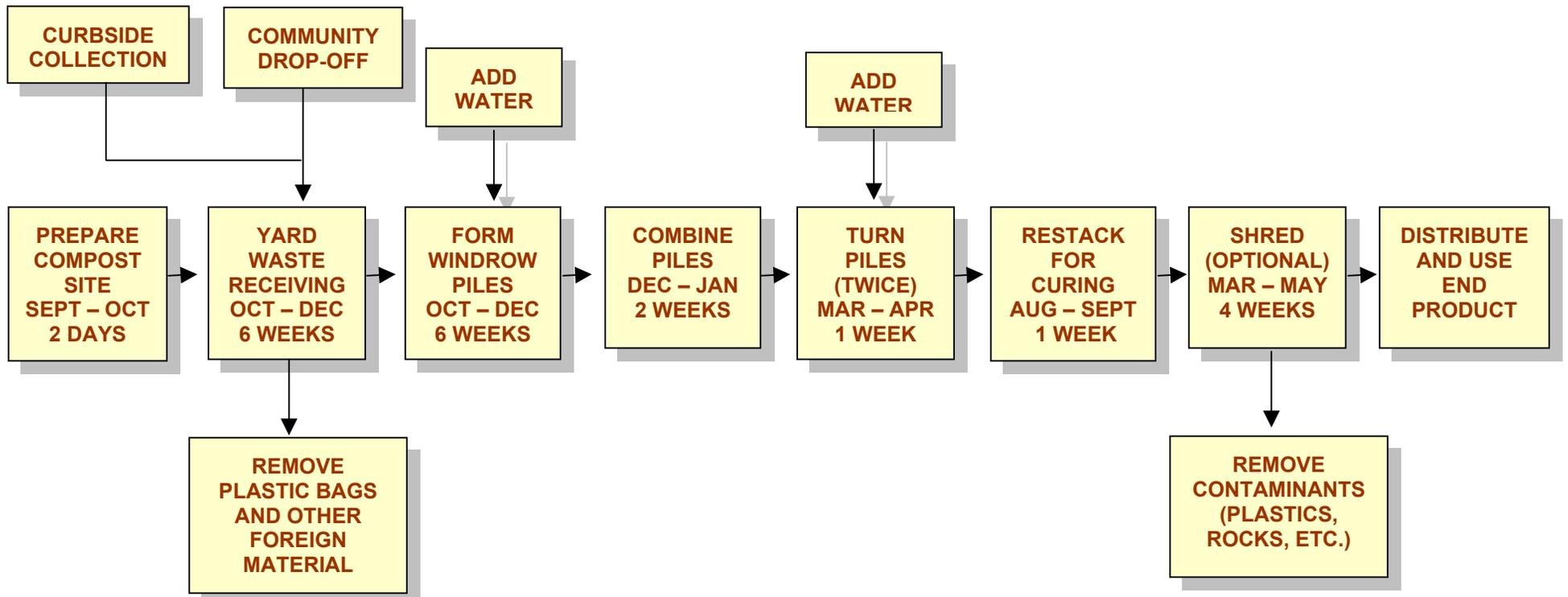
**STEP 6. COMBINE AND RESTACK MATERIAL FOR FINAL CURING**

FIGURE 3

LEAF COMPOSTING PROCESS



**FIGURE 4  
SCHEMATIC OF LEAF  
PROCESS OPERATION  
LOW-LEVEL TECHNOLOGY (12-18 MONTH PROCESS)**



**APPENDIX A**

PADEP Yard Waste Composting Guidelines (1997)

**DEPARTMENT OF ENVIRONMENTAL PROTECTION**  
**Bureau of Land Recycling and Waste Management**  
**Division of Municipal and Residual Waste**

**Document Number:** 254-5403-100

**Title:** GUIDELINES FOR YARD WASTE COMPOSTING FACILITIES

**Authority:** Solid Waste Management Act (35 P.S. §§ 6018.101 et seq.) and regulations at 25 Pa. Code Chapters 271, 281, and 285 (the “municipal waste regulations”).

**Effective Date:** September 1, 1997

**Policy:** It is the Department’s policy to provide a person, municipality, or county with the information necessary to operate a yard waste compost facility.

**Purpose:** The purpose of this document is to provide instructions and operating procedures for the operation of a yard waste composting facility operating under permit-by-rule.

**Applicability:** This guidance applies to all persons, municipalities, and counties who own or operate a yard waste composting facility operating under 25 Pa. Code Section 271.103(h) Permit-By-Rule.

**Disclaimer:** The policies and procedures outlined in this guidance are intended to supplement existing requirements. Nothing in the policies or procedures shall affect regulatory requirements.

The policies and procedures herein are not an adjudication or a regulation. There is no intent on the part of DEP to give the rules in these policies that weight or deference. This document establishes the framework within which DEP will exercise its administrative discretion in the future. DEP reserves the discretion to deviate from this policy statement if circumstances warrant.

**Page Length:** 15

**Location:** Volume 6 Tab 27

**Definitions:** The definitions listed below are found in 25 Pa. Code Section 271.1.

**“Yard Waste”:** Leaves, grass clippings, garden residue, tree trimmings, chipped shrubbery, and other vegetative material.

**“Yard Waste Composting Facility”:** A facility that is used to compost leaf waste, or leaf waste and grass clippings, garden residue, tree trimmings, chipped shrubbery, and other vegetative material. The term includes land affected during the lifetime of the operation, including, but not limited to, areas where composting actually occurs, support facilities, borrow areas, offices, equipment sheds, air and water pollution control and treatment systems, access roads, associated on-site or contiguous collection and transportation activities, and other activities in which the natural surface has been disturbed as a result of or incidental to operation of the facility.

**GUIDELINES FOR YARD WASTE  
COMPOSTING FACILITIES**

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Land Application of Leaf Waste Form .....	14

## **INTRODUCTION**

Composting has been demonstrated to be an effective waste management technique that can produce a useful end-product while diverting a portion of the wastestream from disposal. It has been estimated that yard wastes--including leaves, trimmings, grass, and related yard debris--can comprise up to 18 percent of the municipal waste stream, with a greater percentage realized in some municipalities on a seasonal basis.

Certain yard waste composting facilities are eligible for permit-by-rule under Section 271.103(h) of the municipal waste regulations if they comply with these guidelines. Section 271.103(h) provides that a person, municipality, or county that operates a yard waste composting facility that is less than 5 acres, other than an individual backyard composting facility, shall be deemed to have a municipal waste processing permit-by-rule if the person, municipality, or county meets the requirements of Subsections 271.103(a)-(c)(relating to storage, PPC plan, daily records, financial assurances, and inappropriate activity), and the facility is operated in accordance with these guidelines on yard waste composting.

These guidelines have been established to promote yard waste composting and reuse in the Commonwealth while providing protection to human health and the environment. Health or environmental problems, resulting from the improper operation of a yard waste composting facility operated under Section 271.103(h), will be treated in the same manner as health or environmental problems at other solid waste management facilities.

More than 250 municipalities and counties in the Commonwealth are conducting yard waste collection and composting programs. In an effort to increase awareness of the benefits of composting and to promote the proper environmental and technical practices involved, the Department has designated several of these facilities as yard waste composting demonstration sites. Many of the other sites also present backyard composting demonstrations for homeowners. The Department has developed a reference manual, brochures, and educational videos to provide further information. To learn more about these and other related resources, contact your DEP regional office or the world wide web site (<http://www.dep.state.pa.us>).

Yard waste composting operations must comply with these guidelines to comply with Section 271.103(h) of the municipal waste regulations. Please contact your DEP regional office for further information.

## DEP REGIONAL OFFICES

<p><b>REGION 1:</b></p>	<p>DEP SOUTHEAST REGION  Lee Park, Suite 6010  555 North Lane  Conshohocken, PA 19428  Telephone: (610) 832-6212  Counties Served:  Bucks, Chester, Delaware,  Montgomery, and Philadelphia</p>	<p><b>REGION 4</b></p>	<p>DEP NORTHCENTRAL REGION  208 West 3<sup>rd</sup> Street, Suite 101  Williamsport, PA 17701  Telephone: (717) 327-3653  Counties Served:  Bradford, Cameron, Center,  Clearfield, Clinton, Columbia,  Lycoming, Montour, North-  umberland, Potter, Snyder,  Sullivan, Tioga, and Union</p>
<p><b>REGION 2:</b></p>	<p>DEP NORTHEAST REGION  2 Public Square  Wilkes-Barre, PA 18711  Telephone: (717) 826-2516  Counties Served:  Carbon, Lackawanna, Lehigh,  Luzerne, Monroe, Northampton,  Pike, Schuylkill, Susquehanna,  Wayne, and Wyoming</p>	<p><b>REGION 5:</b></p>	<p>DEP SOUTHWEST REGION  400 Waterfront Drive  Pittsburgh, PA 15222-4745  Telephone: (412) 442-4000  Counties Served:  Allegheny, Armstrong, Beaver,  Cambria, Fayette, Greene,  Indiana, Somerset, Washington  and Westmoreland</p>
<p><b>REGION 3:</b></p>	<p>DEP SOUTHCENTRAL REGION  One Ararat Blvd.  Harrisburg, PA 17110  Telephone: (717) 657-4588  Counties Served:  Adams, Bedford, Berks, Blair,  Cumberland, Dauphin, Franklin,  Fulton, Huntingdon, Juniata,  Lancaster, Lebanon, Mifflin, Perry,  and York</p>	<p><b>REGION 6:</b></p>	<p>DEP NORTHWEST REGION  230 Chestnut Street  Meadville, PA 16335  Telephone: (814) 332-6848  Counties Served:  Butler, Clarion, Crawford, Elk,  Erie, Forest, Jefferson, Lawrence,  McKean, Mercer, Venango, and  Warren</p>

## **TECHNICAL GUIDANCE FOR THE OPERATION OF A YARD WASTE COMPOSTING FACILITY UNDER PERMIT-BY-RULE**

A person, municipality, or county that operates a yard waste composting facility under permit-by-rule shall comply with these guidelines, as required by 25 Pa. Code Section 271.103(h).

### **General Requirements**

The following operational information must be submitted to the Department on the attached Yard Waste Composting Facility Application Form:

- a. The name, address, and telephone number of the operator of the facility.
- b. The sponsoring municipality or county (where applicable).
- c. The location of the facility, including identification of the site by outlying perimeter site boundaries on a United States Geological Survey 7.5 minute topographic map.
- d. Proof that the operator has the legal right to enter the land and perform the approved activities.
- e. A general site plan drawn to scale for the facility indicating the following:
  - i. The location of access roads and gates in relation to public and private roads, wells, and property lines.
  - ii. The location of the tipping area.
  - iii. The location of the processing area, including compost piles and windrows.
  - iv. The location of storage and curing areas.
  - v. Surface water controls.
- f. The operational narrative describing:
  - i. The yard waste collection methods that will be employed by the facility.
  - ii. The methods that will be utilized at the facility to construct compost piles.
  - iii. The proposed dimensions of compost piles and windrows at the facility.

- iv. The source of supplemental water that will be used to maintain an optimal 50 percent moisture content of compost piles or windrows at the facility.
  - v. The proposed method of turning windrows, the turning frequency for composting at the facility and the method for determining that frequency.
  - vi. The proposed duration of the composting process, including curing time, storage time, and the proposed term of compost distribution.
  - vii. A plan for the marketing and distribution of the finished compost.
  - viii. A residue disposal plan, including the location of disposal sites.
  - ix. Provisions for emergency response.
  - x. A public information and education program.
- g. The projected volume of material that will be processed by the facility during the calendar year.

### **Siting Restrictions**

Yard waste composting operations, including storage, composting, and curing, shall not occur in the following areas or the following distances, unless the operator takes special precautions and receives written authorization from the Department:

- a. In a 100-year flood plain.
- b. In or within 300 feet of an exceptional value wetland.
- c. In or within 100 feet of a wetland other than an exceptional value wetland.
- d. Within 100 feet of a sinkhole or area draining into a sinkhole.
- e. Within 300 feet measured horizontally from an occupied dwelling unless the owner has provided a written waiver consenting to the facility being closer than 300 feet.
- f. Within 50 feet of a property line, unless the operator demonstrates that only curing of compost is occurring within that distance.
- g. Within 300 feet of a water source.
- h. Within 3.3 feet of a regional groundwater water table.
- i. Within 100 feet of a perennial stream.

## **Access Control**

1. A gate or other barrier shall be maintained at all potential vehicular access points to block unauthorized access to the site.
2. Access to the site shall be limited to those times when an attendant is on duty.

## **Operational Requirements**

1. No person, municipality, or county shall bring to or receive any material at a yard waste composting facility other than shrubbery and tree trimmings that have been shredded or chipped, unless shredding or chipping is provided at the facility, leaves, grass, and similar related yard debris.
2. The Department may prohibit the use of grass clippings at a yard waste composting facility if the grass clippings cause or contribute to nuisances, or if the site is adversely affecting, or has potential to adversely affect, the citizens or environment of the Commonwealth. Grass clippings shall not be brought to or received at a yard waste composting facility unless:
  - a. Grass clippings delivered to the yard waste composting facility in bulk, bags or other collection containers are emptied of all grass clippings within 24 hours of delivery to the facility.
  - b. Grass clippings are incorporated into the windrows of partially composted leaves or other yard waste within twenty-four (24) hours of delivery to the facility.
  - c. Grass clippings are incorporated into the partially composted windrows of partially composted leaves or other yard waste at a ratio not to exceed one part grass clippings to three parts yard waste, by volume.
3. No more than 3,000 cubic yards of yard waste shall be placed, stored, or processed on any acre of a facility where composting activity occurs or is planned to occur.
4. A person, municipality, or county operating a yard waste composting facility shall, for the duration of yard waste composting activities, identify the operation by posting and maintaining signs that are clearly visible at the junction of each access road and public road. The signs shall be easily seen and read. They should be constructed of a durable, weather-resistant material. The sign wording shall include the name, address, and telephone number of the person(s), municipality(ies), or county(ies) operating the facility, the operating hours, and the materials that can be received by the facility.
5. Each yard waste composting facility shall be operated in a manner which results in the active biological decomposition of the vegetative material received.

6. Yard waste compost piles or windrows shall be constructed and maintained as follows:
  - a. The compost area shall be constructed in a well drained area with a workable surface and slope of 2-4 percent to prevent ponding and control surface water.
  - b. The size of the compost piles or windrows should not exceed eight feet in height or sixteen feet in width unless the composting technology can adequately manage the compost piles, and is approved by the Department.
  - c. Compost piles or windrows shall be constructed within one week following receipt of compostable material at the facility.
  - d. During the active composting process, the optimal moisture content of the windrows or compost piles shall range from 40 to 60 percent to promote decomposition.
  - e. All surface water shall be diverted away from tipping, processing, composting, curing and storage areas. Surface water controls shall be based on a 24-hour precipitation event to be expected once every 25 years. Proper drainage must be maintained to prevent ponding and excessive moisture.
  - f. To promote decomposition, compost piles and windrows shall be turned and reconstructed at least once every three (3) months. A higher turning frequency may be required, depending on the composting technology unless the composting technology requires more intensive management.
7. The operator shall maintain sufficient distance between windrows or piles to allow the proper use of equipment during the deposit, removal, and turning of the compost.
8. The operator shall establish an adequate frequency for inspecting the facility to detect hot spots in any composting, curing or storage areas, dust or litter accumulation, surface water accumulation, erosion or sedimentation, vectors, odors, and other problems. The operator shall take prompt, necessary corrective actions.
9. The operator shall not allow compostable materials or residues to be blown or otherwise deposited offsite.

### **Residue Disposal**

1. The operator shall not allow non-compostable residues or solid waste other than yard waste to accumulate at the facility, and shall provide for proper disposal or processing.

2. Yard waste and other municipal waste received at the facility that are not suitable for composting shall be removed weekly and disposed or processed at a permitted municipal waste facility.

### **Nuisance Control**

1. The operator shall not cause or allow the attraction, harborage, or breeding of vectors.
2. The operator shall not cause or allow conditions that are harmful to the environment or public health, or which create safety hazards, odors, noise, or other public nuisances.

### **Emergency Response**

1. Adequate space shall be maintained to allow the unobstructed movement of emergency personnel and equipment.
2. The operator of each yard waste composting facility shall immediately contact local police or fire departments or other appropriate state or local emergency response agencies in the event of fire, spill, or other hazards that threaten public health, safety, and welfare, or the environment, and whenever necessary in the event of personal injury.

### **Air Resources Protection**

1. The operator shall implement fugitive dust control measures.
2. No person, municipality, or county shall cause or allow open burning at the facility.

### **Water Quality Protection**

1. The operator shall manage surface water and control erosion and sedimentation in accordance with the requirements of 25 Pa. Code Chapter 102, Erosion Control.
2. The operator shall not cause or allow a point or non-point source pollution discharge from or on the facility to any surface waters of the Commonwealth.



5 Please address the following items: (attach additional sheets if necessary)

- Provide a complete list of source(s) of yard waste to be received.
- Describe how the yard waste will be collected and received at the facility.
- Describe the method for inspecting incoming yard waste and for removing unacceptable material.
- Describe the windrow construction methods including equipment to be used.
- Describe the windrow size: Initial dimensions will be \_\_\_\_\_ wide x \_\_\_\_\_ high x \_\_\_\_\_ length.
- Describe the source of supplemental water which will be used to maintain an optimal 40 to 60% moisture content of compost piles or windrows.
- Indicate the frequency of windrow turning \_\_\_\_\_  
Indicate the temperature range to be maintained \_\_\_\_\_  
Indicate the method of windrow turning \_\_\_\_\_
- Describe the method for determining turning frequency.
- Describe the approximate duration of the composting cycle: (in days)  
Describe the composting process:  
Describe the curing period for compost:  
Indicate the time required for storage and distribution:  
Indicate the total time required for composting operation:
- Describe the marketing and distribution plan for the finished compost product.

- Describe the residue disposal plan and identify the disposal or processing site(s) to be used.
- Describe the plan for emergency response (fire, police, etc.).
- Outline the public information and education program (attach samples of literature if available).

## LAND APPLICATION OF YARD WASTE

A municipality or county that collects yard waste and delivers it to any person to land apply as part of a normal farming operation, shall comply with the following guidelines in order to comply with the permit-by-rule requirements of 25 Pa. Code Section 271.103(h).

### General Requirements

1. A municipality or county must notify the Department with the following information:
  - a. Sponsoring municipality or county.
  - b. Responsible official/contact person, including name, address, and telephone number.
  - c. Location, including identification of the site on a U.S.G.S. 7.5' topographic map.
  - d. Operational plan:
    - i. A general site plan must be included which contains the following information for land application sites:
      - A. Access road
      - B. Tipping area
      - C. Surface water controls (tipping area only)
      - D. Farm soil conservation plan and nutrient management plan.
    - ii. The operational narrative must include a description of each of the following:
      - A. Operational hours for receiving yard waste
      - B. Land application and incorporation frequency
      - C. Plan for removal of yard waste from bags
      - D. Spreading and incorporation methods and frequency
      - E. Source of leaves and grass clippings.
    - iii. Volume of yard waste processed during the previous year or expected to be processed during the first year of operation.

## **Operational Requirements**

1. All surface water shall be diverted away from the tipping or storage area. Proper drainage must be maintained to prevent ponding.
2. Yard waste should be delivered to the farm in bulk. Where bags or other containers are used for collection, the bags or containers must be emptied of all yard waste delivered to the farm by the end of each day.
3. The Department may prohibit the use of grass clippings at the farm if the grass clippings cause or contribute to nuisances, or if the site has the potential to adversely affect the citizens or environment of the Commonwealth. Grass clippings shall not be brought to or received at a farm unless:
  - a. The grass clippings are delivered to the farm in bulk. Where bags or other containers are used for collection, the bags and containers must be emptied of the grass clippings delivered to the farm by the end of each day.
  - b. The grass clippings are to be spread in layers not to exceed six (6) inches in depth within one (1) week of delivery to the site.
  - c. Grass clippings mixed with manure and stored in an acceptable manure storage facility may be stored for up to 120 days, provided the storage of the material does not create a nuisance or environmental impact.
4. The operator shall not allow compostable materials or residues to be blown or otherwise deposited offsite.
5. No yard waste may be disposed of in waters of the Commonwealth.

## **Residue Disposal**

1. The operator shall not allow non-compostable residues or solid waste other than yard waste to accumulate at the farm, and shall provide for proper disposal or processing.
2. Yard waste and other municipal waste that is received at the farm, that is not suitable for land application, shall be removed weekly and disposed or processed at a permitted municipal waste facility.

## **Nuisance Control**

1. The operator shall not cause or allow the attraction, harborage, or breeding of vectors.
2. The operator shall not cause or allow conditions that are harmful to the environment or public health, or that create safety hazards, odors, noise, and other public nuisances.

**Air Resources Protection**

1. The operator shall implement fugitive dust control measures when necessary.
2. No person, municipality, or county shall cause or allow open burning at the facility.

**Water Quality Protection**

1. The operator shall manage surface water and control erosion and sedimentation in accordance with the requirements of 25 Pa. Code Chapter 102, Erosion Control.
2. The operator shall not cause or allow a point or non-point source pollution discharge from or on the facility to any surface waters of the Commonwealth.

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF LAND RECYCLING AND WASTE MANAGEMENT

**LAND APPLICATION OF YARD WASTE FORM**

Please familiarize yourself with the Pennsylvania Department of Environmental Protection GUIDELINES FOR LAND APPLICATION OF YARD WASTE prior to filling out this form.

1. Sponsoring Municipality or County (Name and Mailing Address) Telephone Number

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- 2 Name of Farm \_\_\_\_\_ Contact Telephone Number \_\_\_\_\_  
Contact Person at Farm \_\_\_\_\_  
Property Owner's Name \_\_\_\_\_  
Address of Farm \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
(Include Access Road Name and Legislative Number)  
State \_\_\_\_\_ Zip Code \_\_\_\_\_  
City-Borough-Township \_\_\_\_\_  
County \_\_\_\_\_

Attach a U.S.G.S. 7.5 map identifying the yard waste site boundaries outlined on it.

3. Total acres of farm land application area. \_\_\_\_\_
4. Volume of yard waste to be received annually in cubic yards. \_\_\_\_\_
5. Prepare and include in this application a general site plan\* for the facility which illustrates the location of the following items:  
access roads in relation to the nearest public road  
tipping area  
surface water controls (tipping area only)  
fields proposed for land application.
- \* Please note that a hand drawn sketch which includes site dimensions is acceptable. An engineer's drawing is not required.

6. Please address the following items:

- A complete list source(s) of yard waste to be received.
- Describe the method for inspecting incoming yard waste.
- Describe the plan for rejecting or disposing of unacceptable materials and residuals.

- Provide the name and location of the disposal or processing site for unacceptable materials and residuals.
  
- Attach the farm soil conservation plan and nutrient management plan.
  
- Describe the volume of yard waste processed during the previous year or expected to be processed during the first year of operation.
  
- Please provide an operational narrative which includes a description of each of the following:
  - Operational hours for receiving yard waste
  - Land application and incorporation frequency
  - Plan for removal of yard waste from bags
  - Spreading and incorporation methods and frequency
  - Source of leaves and grass clippings.

**APPENDIX B**

Turned Windrow Technology

## APPENDIX B

### TURNED WINDROW SYSTEM TECHNOLOGY

Although there are three main types of composting systems (i.e. mechanical reactor, static windrows, and turned windrows), the turned windrow system is the conventional yard waste composting method and is common to many Pennsylvania municipal compost operations. The term “turned” refers to the method of aeration used in this windrow system. The basic idea of the turned windrow system is to accelerate the compost process by building the compost pile/windrow, tearing it down, and rebuilding it. The turned windrow system is used primarily for yard wastes. The following information deals with the operational requirements of the turned windrow method. Figure 2 through Figure 4 in the report illustrate the site procedures and compost process.

Key aspects of windrow construction and turning are described below.

#### Construction

Windrow construction should occur within one week, but preferably within 1-2 days of delivery of the yard wastes. If several different types of waste are to be composted together, they should be thoroughly mixed. Grass clippings are sometimes placed on top of an existing windrow pile and incorporated into the pile. PADEP guidelines require grass clippings to be incorporated in partially decomposed windrow piles within 24 hours of grass delivery, at a ratio of no less than 3 parts leaves to 1 part grass. Mixing of yard wastes can be performed using a front-end loader, but when mixing with grass clippings, which tend to mat together, use of a windrow turner is recommended.

Watering during the pile construction period is important. Water should be added to reach the desired moisture content (between 40 and 60 percent moisture for leaf composting).

The form and shape of the windrow affects several key conditions of the composting process. For instance, if the piles are too large, oxygen cannot reach the center of the pile. If the piles are too small they will not reach optimum temperatures. The ideal windrow size varies with the substrate and with seasons of the year. In general, windrows of autumn leaves can be constructed 6 to 8 feet tall and 12 to 18 feet wide at the base; these piles may be built to 8 to 10 feet tall in mid-winter months. Larger or smaller piles can create problems for leaf composting operations. Windrows of grass clippings with leaves may need to be smaller, often only 5 feet high and 10 feet wide (however, with a 3:1 minimum ratio of leaves to grass, reduction of the windrow pile size is probably not necessary).

Keep in mind that many factors influence the size and number of piles including; seasonal volumes, equipment limitations, frequency of turning (i.e. increased/ decreased composition), moisture content, type(s) of material, etc.

In some Pennsylvania counties, municipalities share the use of the windrow turners, grinders, and other yard waste equipment among neighboring municipalities (via agreements). The municipalities gain use of equipment that would otherwise be too expensive to purchase and diffuse the overall cost for the equipment owner by sharing the operating and maintenance cost responsibilities. Annual use costs per municipality are very reasonable. For sites using a Scat-type mechanical turner, a windrow pile size of 6 feet high by 18 feet wide is optimal.

When constructing the windrow, care should be taken not to drive on or compact the material. The material should be allowed to cascade down from the bucket of a front-end loader to form a loose pile. Space permitting, it is recommended windrows be constructed in pairs for later **combining** of piles (if a Scat turner is used, a 7-foot clearance between piles is necessary for equipment passage). Allow approximately 15 feet to 25 feet between sets of pairs. Typically, the piles can be combined after 2-4 months from receiving yard waste and adding it to the windrows. The piles will have experienced significant size reduction during the 2-4 month period. Combining the piles will mix the yard waste, creating a larger single pile that will usually improve the overall composting process.

### **Turning**

The main goals of turning the compost pile are to promote decomposition by moving material from the outside to the inside of the pile, and to “fluff” the material so it will be more porous, allowing air to move freely through the pile. Turning the piles increases the rate of decomposition by mixing of materials and exposing new surface areas.

Turning frequency should be based on temperature, since temperature reflects decomposition taking place in the pile. Whenever temperatures drop below 90EF or exceed 140EF, turning should be performed. If the compost is staying within the 90E to 140EF range by itself, turning can still help accelerate decomposition. Windrows may be turned within 1 to 2 weeks after initial windrow construction. Windrows composed entirely of leaves may only need to be turned a few times a year, and should be left alone during winter months, as severe cold weather may decrease the decomposition rate. Windrows including grass clippings in the substrate will require more frequent turning to prevent odors caused by anaerobic conditions. However, if a 3:1 leaves: grass ratio is maintained, this should not be a major issue.

Should anaerobic conditions become apparent, turning the pile will temporarily add oxygen but will also create offensive odors. Before turning, try to identify the cause of the problem so remedial action can be taken as the pile is being turned. Turning of piles during breezy days with preferred prevailing wind directions will help dissipate offensive odors safely.

Although several types of equipment are available for turning windrows, front-end loaders may be the only equipment necessary for smaller composting facilities. When turning the piles with a front-end loader, let the compost cascade out of the bucket so that the materials drop through the air to keep it as loose as possible. As in initial construction, when turning/reconstructing the piles, care should be taken not to compact the material.

Windrows may only need to be turned 3-4 times between initial fall delivery (pile construction) and the middle of the next summer.

### **Curing**

After a period of 8-10 months, decomposition in the windrows has slowed substantially. At this time, the material can be moved from the windrow composting area and stacked 10-12 feet high in curing piles (height limited by the capabilities of the site's front-end loader equipment). The material will slowly continue to stabilize. Further turning of the pile should not be necessary at this time, as long as the material stacked is stable due to proper windrow decomposition.

### **Screening**

Often, finished yard waste compost is used as a mulch, soil amendment or conditioner, without further processing. To improve product quality, a mechanical screen or shredder may be used to size-reduce and/or size-separate various grades of material. This can improve demand and potential end-uses of the material.

### **Limitations**

There are two potential limitations associated with the turned windrow system. These are odors and pathogens. Odors can periodically be a part of the composting process, even with appropriate operating procedures. Proper site and operations management will minimize odor occurrences. Pathogens are generally applicable to operations that involve the processing of wastewater sludges or residues from other animals, and should not be an issue in yard waste operations.

## **8.1 Monitoring Procedures**

The key elements for successful composting include moisture content, oxygen, temperature, pH and substrate. These environmental factors work together to provide the desired extent and rate of decomposition. Frequent monitoring of the compost piles is important, as the pile characteristics are clues to the composting process. Good record-keeping practices allow the operator to study the monitoring results and better address problems and concerns. Standard

monitoring parameters and record-keeping requirements are summarized below. At a minimum, the following parameters should be monitored:

**Moisture** - Water is essential to the survival of microorganisms. Excessive moisture, however, inhibits the flow of oxygen and anaerobic conditions start to develop. The optimal moisture content for leaf composting should be between 40 and 60 percent; this is about the consistency of a wrung-out sponge...the leaves should feel damp but with only a drop or two of water expelled when tightly squeezed. Leaves very often require water at the start of the composting process. As a rule of thumb, dry leaves initially need about 20 gallons of water for every cubic yard of leaves.

**Temperature** - As a key environmental factor affecting biological activity, the temperature should be monitored frequently; temperature readings should be taken at least two times per week along every 65 to 75 ft section of the pile. It is important to monitor temperatures and turn the compost when temperatures exceed 140EF to prevent problems. Turning the compost whenever temperatures get above or below the optimum range (90 - 140EF) will help produce a high quality compost in the shortest possible time. When the compost temperature drops below 70EF (21EC), the composting process is nearly complete.

**Appearance** - Visual inspection of the windrows should be conducted. Items of concern include ponding water and leachate discharges; pile reconstruction or turning may be necessary. When turning the piles, look to see whether the moisture content of the material looks uniform, or if portions are too wet or too dry; watering and/or mixing/turning methods may need to be modified. Look to see whether the decomposition looks uniform, or if portions look like they did when received while other portions look decomposed; again, watering and/or mixing/turning methods may need to be modified.

**pH** - Decomposition takes place most efficiently under neutral pH conditions, so the pH of the material should be monitored periodically. It is common for the pH to be low (down to 5.0) during the early stages of decomposition; then the pH begins to rise to near neutral conditions. By keeping the pile in an aerobic state, via proper turning methods, leaf composting operations should not present a pH (acidic) problem. Testing for pH can be done on-site with a soil pH testing kit.

**Odor** - Foul odors will develop under anaerobic conditions, and the rate of composting slows dramatically under anaerobic conditions. An adequate supply of oxygen is crucial to efficient composting. Should anaerobic conditions become apparent, turning the pile will temporarily add oxygen, but will also intensify offensive odors. Before turning, try to identify the cause of the problem so remedial action can be taken as the pile is being turned. For instance, problems other than lack of oxygen may include windrows that are too large and failure to construct windrows soon enough (i.e., storing leaves).

## 8.2 Record-keeping

Good record-keeping provides the operator of composting operations with readily available site-specific data. Such data can be used to better manage site operations and to address problems which may arise. Records should be kept for all windrows constructed. Information to be collected should include, but is not limited to, the following:

Initial Data (to be recorded upon pile construction)

- type and quantity of materials used as substrate
- method of size reduction
- method of mixing
- amount of water added and method of watering
- date of windrow construction
- size and shape of windrow

Process Data (to be recorded periodically or during turning as recommended)

- temperature (3-6 foot long temperature probe)
- pH
- moisture content
- oxygen levels (if equipment is available)
- odor
- texture