



Borough of West Chester
Chester County Pennsylvania



**RECYCLING TECHNICAL ASSISTANCE
PROJECT #507
BOROUGH of WEST CHESTER
CHESTER COUNTY, PENNSYLVANIA**

JUNE 2013

***Sponsored by the Pennsylvania Department of Environmental
Protection through the Pennsylvania State Association of Township
Supervisors.***

Project Completed By:

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CONSULTANTS IN ENVIRONMENTAL RESOURCE MANAGEMENT

1.0 Statement of Problem

The Borough of West Chester (Borough) located in Chester County, Pennsylvania, requested and was granted Recycling Technical Assistance to evaluate the existing residential leaf and yard waste drop-off site and compost facility operations. Particular guidance was desired to assess and identify options for controlling a reoccurring problem of illegal/unauthorized use of its leaf and yard waste drop-off site. Environmental Resources Associates (ERA) was assigned to provide the requisite consulting services.

2.0 Background

The Borough has conducted a leaf and yard waste collection and compost program for more than two decades. The program is operated by the Public Works Department (PWD) and includes:

- ✦ Curbside leaf collection November-December.
- ✦ Curbside yard waste collection and tree limb chipping, once per month.
- ✦ A residential leaf and yard waste drop-off site.
- ✦ A compost facility, permitted under Pennsylvania Department of Environmental Resources Permit by Rule Guidelines.

2.1 Residential Leaf and Yard Waste Drop-off Site



The leaf and yard waste drop-off site is located at the rear of the PWD building's parking lot and consists of a 900 square foot concrete block collection bin. The site is not staffed or secured, the existing surveillance camera system is inoperable, and it is available 24 hours a day, 7 days a week.

Over the past several years, the Borough has experienced misuse of its residential leaf and yard waste drop-off site via the illegal dumping of materials. The Borough has attributed this situation to use of the site by unauthorized commercial sources.

Drop-off Site, Collection Bin This large volume of leaf and yard waste and various prohibited wastes has resulted in additional costs for disposal of unacceptable materials and to load, transport and process acceptable materials at its compost facility. The illegal dumping has predominantly occurred over weekends and at times has nearly filled the PWD's 12,200 square foot parking lot.

2.2 COMPOST FACILITY



The Borough's compost facility is located approximately 1 mile south of the drop-off site adjacent to the Borough's Goose Creek Wastewater Treatment Plant. The compost facility was developed in 1990 and is approximately 3 acres in size. Leaf and yard waste is delivered by PWD directly to the facility following curbside collections and on an as needed basis from the drop-off site by PWD employees.

Open-air aerated windrow processing technology is employed for the composting of leaf wastes. Leaves are formed into parabolic shaped windrows of approximately 8' high X 16' wide X various lengths. To minimize handling, incoming loads of

leaves are off-loaded where the windrows are to be formed. A wheel loader is used initially to form windrows. The wheel loader bucket lifts the organic material and allows it to cascade back onto the windrow several times. This type of windrow formation and turning provides for optimum mixing and loose deposition of the material, enhancing porosity and increasing airflow. This process is repeated to turn and aerate the windrows during the active decomposition process.

Brush and small diameter tree trimmings chipped during curbside collections are delivered directly to the compost facility and aggregated into piles. Tree trimmings collected at the drop-off site are transported to the compost facility for processing.

The compost facility has also experienced misuse relative to illegal dumping.

The persistent flow of large volumes of materials from the drop-off site has surpassed the Borough's limited labor and equipment resources and thus negatively affected the compost facility's materials handling and processing capabilities.

3.0 Project Scope of Work

☑ ERA met with Borough representatives to gather and review pertinent information relative to the Borough's existing leaf and yard waste drop-off site and compost facility. The objective of this review was to gain insight from relevant information and provide baseline data for use in subsequent evaluations. The meeting occurred on a Monday to allow ERA to observe the volume and types of materials deposited at the drop-off site over the preceding weekend.

ERA conducted a site visit/inspection of the Borough's drop-off site and compost facility.

Summarized below are ERA's initial comments and findings, based on an ensuing review of the data and information provided by the Borough and observations made during inspections of the respective operations.

Drop-Off Site

- 📍 As evidenced by the photograph taken on the Monday morning site inspection (see next page), the collection bin was filled past capacity. The materials were indiscriminately dumped on the parking lot and loaded into the collection bin by the Borough DPW personnel, to allow access to the lot by fellow employees.
- 📍 Based on the amount and variety of materials observed (landscaping and tree removal wastes and associated debris, and sawdust), ERA concurs with the Borough's conclusion that the materials are being illegally dumped by commercial sources.
- 📍 Borough estimates for 2011 show that approximately 3,766 cubic yards of leaves was collected through the curbside collection program and 3,744 cubic yards of material from the yard waste drop-off site. In view of the frequency of leaf and yard waste curbside collection services provided by the Borough, the volume of materials collected at the drop-off site is inordinately high, equal to the average total amount of material collected annually over the previous five years. This situation is noticeably attributable to the illegal dumping.
- 📍 Drop-off site access is restrictive during PWD normal operation hours when the parking lot is filled. This situation impedes ease of ingress and egress by residents and their ability to offload leaf and yard waste efficiently.

✦ The drop-off site is easily accessible via roadways on two sides of the parking lot, not readily visible to nearby residences and lacks security measures necessary to prevent illegal dumping. Considering the reoccurrence and escalation of illegal dumping, it is apparent that the drop-off site is recognized as such by commercial entities within the area.

✦ The drop-off site contains only limited signage relative to site usage or regulations.



Over Capacity Collection Bin



Variety of Materials and Debris

Compost Facility

✦ The access road to the facility site is paved and the entrance is gated; however, the site was not staffed at the time of the inspection and the gate was not closed or locked. ERA was informed that the site is left unsecured to allow access to areas adjacent to the site used for various purposes related to the PWD and Goose Creek Wastewater Treatment Plant operations.

✦ The facility site-working surface is constructed on a geotextile fabric liner covered with 6 to 8 inches of stone millings and gravel. The site has a slope of approximately 2%. The site's working surface and slope are highly conducive to proper operation of a compost facility offering a durable working surface and adequate drainage. However, because of normal site operations, depressions have resulted and several areas of ponded water were observed.

✦ At the time of the site visit, there were three windrows on site. The windrows were properly aligned parallel to slope.

✦ One of the windrows was composed of partially composted material and contained a limited amount of unprocessed brush and tree trimmings, non-compostable contaminants (beverage containers, plastic bags and rocks) and it was apparent from the abundant vegetative growth on the windrow that it had not been recently or frequently turned.

✦ The remaining two windrows were composed of mixed leaf, yard wastes, large volumes of brush and tree limbs and contained non-compostable contaminants (similar to those noted above). Although the windrows exhibited some level of decomposition, it was visually apparent that the mixed materials are placed into the windrows as delivered without benefit of separation or pre-processing, necessary for active biodegradation and efficient composting. To achieve active composting it is imperative to separate and chip or grind brush and tree trimmings to a size suitable for composting.

✦ Vegetation from adjacent woodlands (brush and tree saplings) has encroached on the site restricting equipment maneuverability in the vicinity where the windrows are formed and processed.

- ✦ No program exists for the routine monitoring and/or turning of windrows.
 - ✦ Three roll-off containers are stored on the compost site and serve no purpose for facility operations. The containers impede traffic flow, equipment maneuverability and take up valuable space.
 - ✦ A few large piles of landscaping and tree removal wastes (similar in composition to materials deposited at the drop-off site) were indiscriminately dumped on the compost site.
 - ✦ No definitive system is in place for estimating volumes of incoming feedstocks or for tracking volumes of products produced and distributed.
 - ✦ The compost site is accessible and evidence of illegal dumping was noted both at the compost site and on adjacent areas owned by the Borough.
- ☑ ERA met with the Township to present its preliminary findings relative to the Borough's primary concern of illegal dumping and to present options for addressing this problem.

Preliminary Findings

- ✦ The overriding impediment to the efficient and economic operation of the Borough's drop-off site and compost facility is illegal dumping.
- ✦ Illegal dumping has primarily occurred at the Borough's unsecured drop-off site. The illegal materials are large volumes of materials primarily composed of landscaping, tree removal wastes, and associated debris.
- ✦ Considering the volumes, composition and indiscriminant dumping of these materials, it is reasonable to conclude that the most probable source of these materials is from landscapers and contractors, who are prohibited from use of the drop-off site.
- ✦ Illegal dumping has negatively affected PWD's labor, equipment and financial resources. The Borough estimated that PWD employees dedicate in excess of 1,000 hours of labor to load illegally dumped materials at the drop-off site and transport the materials to the compost facility and to dispose of contaminants.
- ✦ Occasional illegal dumping of similar material also occurs at the unsecured compost site.
- ✦ The inordinately high volume of illegal materials integrated into the Borough's leaf and yard waste system has outstripped its capabilities to operate the compost facility effectively. This situation is in part due to the high content of woody waste (brush, tree limbs and large tree removal waste) included in the illegal material and the Borough's limited materials handling processing equipment.

Options

- ✦ It is ERA' understanding that the Borough is considering closing the drop-off site in an attempt to abate illegal dumping. Although this option may appear as expeditious and least costly, it may not resolve the problem. Without securing the parking lot, illegal dumping may continue. Additionally it would remove the only outlet available to residents for self-disposition of acceptable materials and potentially add additional cost to monthly curbside collections.

- ✦ Secure the perimeter of the parking lot with chain link fencing and lockable gates. Consider installation of a surveillance camera system as an additional deterrent to illegal dumping. Make the site available to residents on a regularly scheduled basis at convenient times and preferably open on weekends. Staff the site during operating hours to insure quality control and to identify residents. Consider dividing the collection bin into 2 compartments to allow for separation of leaf wastes and brush and tree trimmings by residents. Post additional instructional signage.
- ✦ Secure the collection bin with lockable gates and install a surveillance camera system as an additional deterrent to illegal dumping. Make the site available to residents on a regularly scheduled basis at convenient times and preferably open on weekends. Staff the site during operating hours to insure quality control and to identify residents. Consider dividing the collection bin into 2 compartments to allow for separation of leaf wastes and brush and tree trimmings by residents. Post additional instructional signage.
- ✦ Secure the compost site when it is not in operation or when PWD or other Borough employees are not present on adjacent areas.

ERA also discussed the imminent needs to revamp the compost site to include; culling and proper disposal of contaminants and separating the mixed materials contained in the existing windrows, in order to allow for their proper processing to generate marketable products.

The Borough informed ERA of its intent to secure the services of a private contractor who had previously provided similar services to assist in performing the current, necessary work efforts.

- ☑ ERA prepared a draft project report detailing its findings and recommendations and discussed these with the Borough. Based on comments and input provided by the Borough, a final report was prepared and submitted to PADEP.

4.0 Solutions

- ☑ Over the course of the project, ERA has worked closely with the Borough to identify and assess options and put into practice measures designed to achieve the goal of efficient and economic operation of the drop-off and compost facility. Particular emphasis was placed on resolving the primary impediment to this goal, that of illegal dumping.

To date the Borough has accomplished the following:

- ✦ The drop-off program operation has been modified and is now limited to the fourth Saturday of each month between the hours of 8am to 4pm. During the hours of operation, a DPW employee staffs the drop off site. The employee is responsible for monitoring the site to ensure individuals wishing to use the site are Borough residents and that all incoming materials being delivered are acceptable and free of contaminants. Materials delivered to the drop site are loaded into a dump truck and transported to the compost site the following Monday morning.
- ✦ When not in operation, the drop-off site is gated and locked.
- ✦ A new, digital surveillance camera system was installed at the drop-off site. To assist in identifying any violators, the system is monitored daily.

- ✦ Posted additional signage indicating there is no dumping allowed and that the area is under surveillance.
- ✦ The Borough has discontinued its curbside chipping of tree limbs to increase collection efficiency and reduce cost of its once a month curbside yard waste collection program. Tree limbs are collected in specified tied bundles and processed at the compost facility.
- ✦ The compost site is now locked when not operating or access to adjacent areas is not required.
- ✦ The Borough engaged the services of a mulch and soil-blending contractor to assist in processing the abundance of leaf and yard waste collected over the past few years, and for the proper disposition of all marketable materials. The contractor is responsible for providing the requisite equipment for the screening/separation of the mixed leaf and yard waste and the processing/grinding of woody waste. The Borough is responsible for separation and proper disposal of waste and contaminants. With the assistance of the contractor, the volume of on site materials has been reduced by approximately 50% over the past several months.

5.0 Conclusion and Recommendations

Based on the data and information provided by the Borough, ERA's observations and assessment of its existing drop-off site and compost facility, ERA offers the following conclusions and recommendations.

5.1 Conclusions

The modification of its drop-off site operation has effectively resolved the deficiencies associated with its previous operation.

Due to increased security at both the drop-off and compost sites illegal dumping has been curtailed. This effort resulted in a significant reduction of the influx of both acceptable and unacceptable materials.

The Borough has made admirable strides in addressing illegal dumping and improving systemic effectiveness; however, additional efforts are required to insure the efficient and economic operation of the respective sites.

5.2 Recommendations

ERA provides following recommendations to assist the Borough in achieving their objectives for the efficient and economic operation of their drop-off site and compost facility.

- ✦ Fill depression on the compost site to prevent future ponding.
- ✦ Continue and, to the extent practical, accelerate processing of windrows and woody material and deposition of materials at the compost site.
- ✦ Establish procedures for separation and pre-processing of mixed feedstocks, prior to windrow formation.
- ✦ To improve equipment maneuverability and ease of access for windrow formation, remove encroaching brush and tree saplings along the compost site boundary.

- ✦ Remove the three roll-off containers stored on the compost site to improve traffic flow, equipment maneuverability and restore valuable materials handling and processing space.
- ✦ Develop a system for estimating volumes of incoming feedstocks and tracking volumes of products distributed. To assist in this effort a sample feedstock and product log is included in Appendix A.
- ✦ To increase processing efficiency of incoming mixed feedstocks and aid in production of high quality marketable products (compost and mulch), consider the procurement of a trommel screen and grinder.
- ✦ Establish and implement a program for the routine monitoring and turning of windrows to maintain optimum decomposition and timely production of compost. To assist in this effort, a sample windrow-monitoring log is included in Appendix A.
- ✦ Apply for Act 101 Section 902 grant funding for eligible costs associated with upgrades to the drop-off site, needed improvements to the compost facility and procurement of processing equipment.

FEEDSTOCK AND PRODUCT LOG

Month - _____ Year- 2013

Vehicle	(M) (R) (C)	(M) (R) (C)	(M) (R) (C)	(M) (R) (C)	(M) (R) (C)	(M) (R) (C)	
Type	(P) (D) (T) (O)	(P) (D) (T) (O)	(P) (D) (T) (O)	(P) (D) (T) (O)	(P) (D) (T) (O)	(P) (D) (T) (O)	
Feedstock	(1) (2) (3)	(1) (2) (3)	(1) (2) (3)	(1) (2) (3)	(1) (2) (3)	(1) (2) (3)	
Product	(4) (5)	(4) (5)	(4) (5)	(4) (5)	(4) (5)	(4) (5)	
Date	Cubic Yards	Cubic Yards	Cubic Yards	Cubic Yards	Cubic Yards	Cubic Yards	Total
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
Total							

Vehicle – Municipal - (M), Residential - (R), Commercial - (C)
Type - Pickup - (P), Dump - (D), Trailer - (T), Other - (O)
Feedstock - Leaves - (1), Yard Waste - (2), Brush and Tree Trimmings - (3)
Product - Compost - (4), Woodchips - (5)

WINDROW MONITORING LOG

DATE:			TIME:				AIR TEMP: (°F) (°C)							
NAME:			WEATHER CONDITIONS: (RAIN, SUNNY, ECT.)											
WINDROW NUMBER	TEMPERATURE Measurement Points (every 50'ft, 100' ft)	WINDTEMPERATURE (°F) (°C)												
1)														
2)														
3)														
4)														
5)														
6)														
7)														
8)														
9)														
10)														
11)														
12)														
13)														
14)														
15)														
16)														
17)														

Moisture - Requires Excessive Adequate
 Odor - None Faint Strong

Site Observations and corrective actions:
