

Final Report

Wayne County  
**RECYCLING CENTER ANALYSIS**

Pennsylvania Department of  
Environmental Protection



May 2006





# WAYNE COUNTY RECYCLING CENTER ANALYSIS

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# EXECUTIVE SUMMARY

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The Pennsylvania Department of Environmental Protection sponsored an operational efficiency and cost evaluation, performed by R. W. Beck, Inc. of the Wayne County Recycling Center in order to identify ways that the facility, and others like it, could be made more financially sustainable over the long term. This report presents the results of that evaluation.

## Introduction to Facility

The Wayne County Recycling Center is among the first recycling centers constructed in Pennsylvania. It was developed when recycling was first becoming popular, and has managed to draw residential and commercial recycling tons, despite the fact that it serves only voluntary (not mandated) communities. The Center serves primarily drop-off sites and those residents and commercial entities that deliver recyclables to the facility. Only one municipality in the County, Honesdale Borough, has curbside recycling. The Center also processes those recyclables.

Most materials come into the Center partially sorted. Incoming fiber is further sorted to develop loose newspaper (ONP #8), chipboard, and mixed paper products. Plastic containers (#1 and #2 bottles) enter the facility primarily mixed, and are manually sorted by type of plastic. Metal cans are also sorted, using a belt magnet to pull the steel cans. There is no sorting line at the facility. Fiber grades are hand-sorted on the tip floor or as they are being emptied from the drop-off containers by unpaid state correctional inmates from Waymart and County prison work release laborers. A Human Resource Center worker is paid a wage of \$7.05 per hour to sort the plastics.

## Assessment Results

The Wayne County Recycling Center does an excellent job of utilizing its employees. The drivers/material handlers are capable of performing many functions, and move from task to task as they see what needs to be done. The Center also takes advantage of some cost savings strategies, such as using prison labor, and constructing 2-cubic-yard containers from wood and other materials, some of which is donated, and often using free labor from the prison or community service workers. The Center, however, processes a relatively small amount of tons per year, just over 3,000 including white goods (just over 2,000 excluding white goods). Despite this relatively small tonnage, the Center's operating revenues in 2005 exceeded operating costs by \$5,388. However, if Section 903 (Recycling Coordinator) and 904 (Recycling Performance) grants were not provided by DEP, operating costs would have exceeded operating revenues by \$36,190. In addition, the Center has received many grants for capital equipment. At current-day costs, amortizing equipment over its expected lifespan, the Center would also have an estimated annualized capital cost of approximately

\$64,864. The Center might operate more cost-effectively, on a cost-per-ton basis, if additional tons of recyclables could be processed, thus spreading fixed costs over additional tonnages. Because the County is relatively rural and recycling is not mandatory, acquiring more tons to supply the facility is challenging.

## Recommendations

Recommendations for enhancing Center operations, based on the site visit and subsequent analysis, are presented below for consideration.

### General Operations

- ***Recover additional OCC and other paper grades at high-volume drop-off sites (such as Lake Township, The Hideout, Waymart Borough, and Salem Township).*** One option would be to have some 20 cubic-yard containers constructed with four compartments for fiber clearly labeling these compartments for receipt of the following items: newspapers, mixed paper (magazines and junk mail), chipboard, and cardboard. Providing a convenient opportunity for residents to recycle cardboard is growing in importance, since residents are generating increasing amounts of corrugated cardboard, due to the growth in Internet purchasing and operation of home-based businesses.
- ***Reconfigure traffic flow to accommodate customers at a faster rate, and in a safer manner, particularly on Saturdays.*** Although the Center was not visited on a Saturday, laborers indicated that Saturdays at the Recycling Center can be extremely busy. To facilitate the flow of incoming traffic, consider placing several clearly labeled 2-cy-containers along the far side of the drive near the compost display. Residents could then enter in two lanes – the left lane going directly to the Center as is currently done, and the right lane depositing materials in an “extra” set of containers. The two traffic lanes should be marked with cones. One possibility is to establish a “fast lane” on the right-hand side for residents that have only fiber materials, and place just four containers – one for cardboard, one for newspaper, one for chipboard, and one for mixed paper, on the right-hand side of the lot. Clear signage would be critical to making this system work, but could help reduce wait time for customers. An additional laborer may be needed to assist the customers and to perform quality control on the materials deposited in the bins. Alternatively, drop-off containers could be placed along the side and emptied when full such as a divided roll-off container clearly labeled for newspaper, magazines and mixed paper, and cardboard (plus chip board, if a fourth compartment was constructed in the container). Sorted food and beverage containers could be collected in a six-compartment roll-off labeled for:
  - Green glass;
  - Brown glass;
  - Clear glass;
  - PET plastic;



- HDPE plastic; and
- Metal cans.

This configuration would eliminate the need to do a full sort on PET/HDPE plastics.

- ***Move the HDPE bin to the far right, when facing the incoming material storage bunkers from outside.*** This would enable the person manually sorting plastics to toss the larger materials into the HDPE bunker directly and sweep PET containers into a cart. PET containers, being smaller and generally a less prevalent portion of the material stream, would need to be emptied fewer times than a cart of HDPE bottles.
- ***Improve signage on the 2-cubic-yard bins used at the Center for drop-off, as well as on the drop-off containers.*** During the site visit, several residents were observed placing the wrong type of plastic in the bins, for example. This is likely due to the fact that the chasing arrow with the number on it, indicating the type of plastics allowable in the bin, was small and difficult to see. Research has shown that the best visuals include pictures of what should be placed in the container.
- ***Investigate means to collect and market used plastic bags.*** The Recycling Coordinator expressed interest in collecting this commodity, but seemed hesitant due to space constraints. Although it often takes a long time to collect a full load of these materials, demand for the material is high. The Center could store the plastic bags in the empty trailer that is currently unused. One of the chipboard Gaylord boxes (there were several at the time of the site visit) could be replaced with a box for plastic bags. The Center should contact end markets for this material to assess the viability of such a market. The County could also work with local grocery stores to collect these bags. As part of the research for this project, one end user of this material, AERT (of Springdale, Arizona), was contacted (479-756-7406). The contact there indicated that baled HDPE and LLDPE blends are currently bringing \$0.17 to \$0.21 per pound. This is a range of \$340 to \$420 per ton. Before embarking on such a project, the Center should produce a test bale to ensure that it can make bales to the specified density. Bale specifications for mixed loads are available at the following web site: <http://www.aertinc.com/MIX%20Specifications.pdf>.
- ***Investigate the extent to which it would be advantageous to sort incoming metal by selected grades to include copper, brass, and aluminum scrap and to market selected items such as lawn mowers and bicycles for refurbishing and resale.*** Performing metals upgrading will require dedicated labor but could pay off in increased revenue. Furthermore, the labor assigned to work the metal pile could also remove CFC containing components as required by state law.

## Safety/Loss Prevention

- ***Install a steel bar several inches below the top of the incoming material bay roof.*** This would help to prevent damage to the building resulting from fairly common circumstances in which a vehicle attempts to pull out of the incoming

## EXECUTIVE SUMMARY

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material storage bay without lowering its container. This measure could help prevent accidents and associated repair costs.

- ***Move forward with constructing bollards, located at the posts of the entranceways as is currently being considered.*** The purpose of these bollards is to protect the building from damage caused by vehicles backing up. Bollards are typically 8 inches or greater in diameter, and roughly three feet high. They should be of a sturdy material, such as steel-pipe filled with concrete, in order to adequately protect the building from damage due to vehicles.
- ***Install steel and/or concrete rails above the incoming glass storage bays.*** Currently there is no safety barrier between customers and/or employees tipping glass into the incoming glass bays and the bay itself. When empty, the drop would be approximately 17 feet.
- ***Restrict public access to the Center during times when drop-off containers are being tipped.*** For example, if a schedule could be developed such that Mondays were for servicing drop-off containers, and public access were limited to Tuesday through Saturday, the traffic situation could be better controlled. The Solid Waste Director agrees that this would be ideal, however says it would be challenging, given the need for flexibility and the tight schedule for drop-off collections.
- ***Install a “Slow” sign or “Caution, Workers” sign along the entry road to the Center.*** If that fails, a speed bump should be considered. During the site visit several residential vehicles were observed driving at a rate of speed inappropriate for the conditions, putting workers and other residents at risk.

### Materials Marketing

- ***Monitor market pricing and forces affecting market conditions by reading trade publications such as Recycling Today, Resource Recycling and Waste News as well as subscribing to services such as Waste News Commodity Pricing.*** Although the Center is in a more remote area and may be further from some markets, it is beneficial to know the direction the market is taking, and any resultant changes in commodities movement and pricing.
- ***Routinely contact at least three or four end markets to check pricing, when ready to sell a commodity.*** Although it is wise to be cautious with new vendors due to the risk of non payment, calling several vendors will help obtain better materials pricing.
- ***Market each material, periodically, to more than one market.*** Although this takes additional effort, and despite the fact that markets are currently strong, it is important to have an established relationship with more than one market for each commodity, should something happen to the predominant market.

# Section 1 INTRODUCTION

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## 1.1 Introduction

Since the adoption of Act 101 in 1988, the Pennsylvania Department of Environmental Protection (DEP) has provided grant funding opportunities for recycling programs and processing facilities throughout the Commonwealth. Numerous municipalities have benefited from the materials recovery facilities (MRFs) that have been established in urban, suburban and rural areas of Pennsylvania.

In order to further the financial sustainability of Pennsylvania's MRFs, the DEP sponsored operational efficiency and cost evaluations in selected materials recovery facilities in order to identify potential:

- Processing system improvements;
- Revenue enhancements;
- Collection program improvements; and
- Opportunities for recycling centers to work together.

Identifying such opportunities will help DEP maximize the return on investment of recycling grant funds. The DEP sponsored two such studies in 2005, and three in 2006. The Wayne County Recycling Center was one of the facilities that were evaluated in 2006. R.W. Beck and DEP would like to thank the Wayne County Recycling Center for participating in this study. This report presents the results of that evaluation.

### Objectives

The primary objectives of this project are to:

- Identify opportunities to improve operations and increase the efficiency of the Wayne County Recycling Center;

Identify opportunities too increase revenues and/or decrease risk from recyclables marketing;

- Identify best practices and potential solutions and improvements that may benefit other facility managers in Pennsylvania, such that they, too, can enhance their centers' operations.

The DEP sponsored two such studies in 2005, and three in 2006, including the Wayne County Assessment, the results of which are presented in this report.

## Section 1

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### Approach

The study approach included three project tasks:

- Task 1 – MRF Data Request;
- Task 2 – Conduct MRF Field Observation; and
- Task 3 – Prepare Report and Recommendations

Prior to conducting the kickoff meeting and field evaluation, R. W. Beck submitted a formal data request to the Wayne County Recycling Coordinator and Solid Waste Director. The data request encompassed the following operational and financial items:

- General facility information;
- Material quantity reports and material markets;
- Financial information;
- Operational data;
- Equipment data;
- Employee data;
- Residue and material contamination rates;
- Contracts/Ordinances; and
- Future plans.

On March 29-30, 2006, R. W. Beck's project team reviewed the Recycling Center operations and interviewed/queried key employees at the Recycling Center, including:

- The County Solid Waste Director;
- The County Recycling Coordinator; and
- One of the drivers/material handlers.

Field observations included all aspects of processing.

## Section 2 RECYCLING CENTER

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### 2.1 Background Information

The Wayne County Recycling Center is located in Berlin Township, near Honesdale, Pennsylvania. The facility was originally constructed in 1991. In 1996 a detached storage shed was constructed adjacent to the facility.

Honesdale Borough is the only community in Wayne County offering curbside collection of recyclables. Residents self-haul their waste to the transfer station (Beach Lake Transfer Station, in Beach Lake Pennsylvania, which is owned and operated by Waste Management), or hire their own hauler (there are 15 licensed haulers in the County). In addition, some residents burn their garbage. Most residents with curbside garbage collection pay a flat monthly fee for this service, as opposed to paying rates that vary with the amount of waste generated (Pay-as-You-Throw).

There are no communities in Wayne County that are mandated to recycle. Thus, all recycling taking place in the community is on a voluntary basis. Despite being rural and a non-mandated community, Wayne County's recycling rate for 2005 is estimated to be approximately 28 percent.

Table 2-1 provides a summary of basic background information for the facility.

**Table 2-1  
Wayne County Recycling Center Background Information**

Facility Address	66 Volunteer Drive, Honesdale, PA 18431
Facility Owner	Wayne County
Facility Operator	Wayne County
Hours of Operation	7:00 am – 4:30 pm Monday – Friday 7:00 am – 1:00 pm Saturday
Number of Bays	6 Receiving 5 Loading
Number of Scales	1 Truck Scale
Facility Operating Capacity	Unknown
Major Equipment	2 Balers Belt magnet Can crusher Can blower 2 Collection vehicles (roll-offs)
Types of Materials	HDPE and PET plastic bottles (combined);

Received	Magazines and junk mail (combined); Steel and aluminum cans (combined); Newspaper; Green glass; Clear glass; Brown glass; Chipboard.
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## 2.2 Description of the Recycling Center

The Wayne County Recycling Center is on a site of 182 acres, and covers approximately 12,760 square feet. The average daily throughput of the facility is almost 10.2 tons. The Center consists of the following space:

- 1,885 square feet of incoming materials storage (1,850 of which is uncovered);
- 5,290 square feet for processed material storage, including (4,330 of which is covered, and 2,880 of which is located in a detached building that was constructed in 1996).

The Solid Waste Director estimates that there is approximately enough incoming material storage for two days' worth of material, which is adequate, and for approximately five days' worth of processed material storage, which is also adequate. Processed newspaper and aluminum cans are stored loose, in trailers.

As part of a Countywide plan for improving energy efficiency in County buildings, the Recycling Center recently had energy-efficient lighting installed throughout the building, as well as a gas heating system with a programmable thermostat. An air circulating system was also installed to help regulate temperature and refresh the air in the Recycling Center. In addition, plastic curtains were installed in the bay area, to help insulate the building. Bay area doors and plant doors are closed when they are not in use, and programmable thermostats are programmed to a lower temperature when the Center is closed.

The Recycling Center receives recyclables that individuals bring to the on-site drop-off as well as commercial recyclables delivered directly by businesses, and materials from Honesdale Borough's curbside program. In addition, the County collects from the drop-off sites located throughout the County. There are 24 businesses and institutions that deliver materials to the site (including two schools) whose loads are weighed upon receipt. Of those, 17 are located in Honesdale Borough. Other businesses and institutions deliver materials, but simply place them with the residential drop-off materials without having them weighed. Some of the businesses/institutions known to be delivering significant quantities to the facility include:

- The State Correctional Institute (Waymart);
- The Wayne County Courthouse;
- HRC (Human Resource Center); and

- Top Notch (a hardware distributor).

These four entities, combined, provided 61 percent of the recyclables attributable to businesses and institutions in 2005.

The recyclable materials accepted at the Center include:

- Old corrugated containers (OCC);
- Old newspaper (ONP);
- Magazines, junk mail, and mixed paper;
- Chipboard;
- Steel and aluminum cans;
- Green, brown, and clear glass containers; and
- Plastic bottles (#1 and #2).

The County also allows residents to deliver scrap metal items to the center at no fee. Residents simply unload materials from their vehicles, often with the assistance of a prison or community service laborer.

In addition, the County is preparing to hold their first electronics collection event on April 21 and April 22. Envirocycle (of Halstead, PA) will be providing the service at the County Fairgrounds, located just outside of Honesdale. Rates to be charged to residents and businesses are described in Table 2-2.

**Table 2-2  
Wayne County Electronics Event Rates  
April 2005**

Item	Residential Rate	Commercial Rate
Computer Monitor	\$5.00	\$5.00
Computer CPU	\$5.00	\$5.00
Fax Machine	\$5.00	\$5.00
Television	\$5.00	\$5.00
Television 27" and greater, or wooden console	\$10.00	\$10.00
Large Office Copier	NA	\$10.00
Others, combined (e.g. mouse, keyboard, radio, copiers)	\$5.00	NA
Other Item (Not listed)	\$2.00	\$3.00

## 2.3 Equipment

Equipment utilized at the Wayne County Recycling Center is summarized in Table 2-3.

**Table 2-3  
Equipment Utilized at the Recycling Center**

Equipment Type	Manufacturer	Materials Handled	Condition
Roll-off Truck	2001 International 4900, with Ampliroll Hook-Lift System	All materials from drop-off	Good
Roll-off Truck	1991 Ford, with Ampliroll Hook-Lift System	All materials from drop-off	Good
Trailer	1979 Great Dane 710 TRP 45	Not currently used	Fair
Trailer	1980 Fruehauf	Aluminum cans	Fair
Trailer	1996 Fruehauf	Newspaper	Good
Horizontal Baler	1991 Selco HL 50	Cardboard	Good
Downstroke Baler	1995 Vertec 1060	Chipboard, PET, HDPE, steel cans	Good
Can Crusher	REM	Aluminum cans	Good
Can Blower	REM	Aluminum cans	Good
Belt Magnet	REM	Steel cans	Good
Skid-Steer	1991 Bobcat 742 B	All materials	Good
Skid-Steer	1993 Gehl 5625	All materials	Good
Skid-Steer	2005 Gehl 3935	All materials	Good

Although much of the equipment has been at the recycling center since it first opened, none is in need of substantial repair. One of the drivers/material handlers, who is a former mechanic, is capable of conducting minor maintenance and repairs including regular greasing. From time-to-time more in-depth repairs will need to be made, and will have to be handled by a private entity. There are at least two local companies capable of such repairs.

## 2.4 Labor

Employees/workers at the facility include seven full-time employees, a part-time employee hired through the Human Resource Center, and unpaid State Correctional Institute laborers and County prison work release laborers as well as community service workers. Brief descriptions of these employees' and laborers' roles are provided below.

### Facility Employees

Paid facility employees include:

- Solid waste director (half of whose time is devoted to recycling);
- Recycling coordinator (full-time);



- Clerk/typist (full-time – half of whose time is devoted to recycling);
- Four drivers/material handlers (full-time, all with CDL licenses – Class B is required); and
- Plastics separator (County human resource center employee, part-time – 21 hours per week.

Together, these paid, non-union positions account for an estimated \$162,467 per year in salary, and an additional \$43,866 in benefits (approximately 27 percent of salary costs, according to the County Commissioner). Some of the key roles of the individuals relative to the Recycling Center and recycling program are described briefly below.

### *Solid Waste Director*

- Supervise Solid Waste Department personnel;
- Prepare annual budget;
- Supervise budgets/expenditures;
- Interact with regulatory agencies;
- Provide status reports to County Commissioners;
- Interface with public and private sector to address issues pertaining to municipal waste;
- Oversee licensing of haulers;
- Prepare appropriate grant applications;
- Oversee daily operation of Recycling Center; and
- Keep current on appropriate regulations, legislation, technology, policies and issues impacting solid waste and recycling in the County.

### *Recycling Coordinator*

- Perform public education and outreach;
- Train new laborers;
- Market materials and monitor materials pricing;
- Oversee/monitor shipment of outgoing materials;
- Coordinate/assist municipalities with programs;
- Prepare technical reports;
- Implement and evaluate pilot programs;
- Serve as regional liaison; and
- Oversee daily operations of facility.

### *Solid Waste Department Secretary*

- Answer telephone inquiries about recycling programs;

## Section 2

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- Provide administrative support for Recycling Center; and
- Weigh vehicles and print weigh tickets.

### *Drivers/Material Handlers*

- Deliver and retrieve roll-off containers from remote drop-off sites;
- Separate and process various recyclable materials;
- Assist the public with questions regarding recycling;
- Load baled materials into trailers for transportation;
- Conduct daily cleanup of recycling center; and
- Perform basic mechanical repairs to equipment used at Center.

### *Plastics Separator*

- Separate PET and HDPE plastic bottles.

Unpaid labor working at the facility includes inmate laborers from the State Correctional Institute (approximately two per day) and County prison work release laborers (one to three per day). The inmate laborers and community service workers primarily:

- Assist residents with drop-off materials;
- Ensure materials in the on-site drop-off area are properly sorted (e.g., look through “green boxes” for contaminants and improperly sorted materials; and
- Manually sort newspaper and OCC when drop-off items are tipped.

Turnover among the regular staff at the facility is not an issue. The director has been employed by the Recycling Center for 13 years (and was a planner for the County before that), the Recycling Coordinator has been with the Center for 12 years, as has one of the drivers/material handlers, and the Center secretary has been with the Center since its opening in 1992. Each of the other drivers/material handlers have been at the facility for at least six years and the plastics sorter has been with the facility for about four and a half years.

In addition to regular staff, the Center has County prison work release laborers (low-security prisoners who are incarcerated and let out to work, in exchange for a shortened sentence), and community service workers (individuals who have are serving community service hours for a minor crime). The prison laborers tend to stay for a couple of months at a time, and community service workers are only available until their hours are served. On Saturdays there are two prison laborers working with a guard. Two processors/drivers also work on Saturdays. The number of community service workers varies from one to three per day.

There have been no issues with injuries or absenteeism at the facility.

### **Training**

Given that the drivers/material handlers have been at the facility for a long time, they do not receive any training on an ongoing basis. As new community service and

prison laborers come to the site, the Recycling Coordinator trains them. The Recycling Coordinator and Solid Waste Director are both involved in ongoing training through the Professional Recyclers of Pennsylvania (PROP).

## 2.5 Incoming Material Streams

Material streams delivered to the MRF include:

- Honesdale Borough residential curbside materials;
- Remotely located residential drop-off materials;
- Weighed commercial/institutional materials;
- Recycling Center residential/commercial drop-off material;
- School materials; and
- White goods.

The percent by source for incoming 3,003 tons of materials delivered to the Wayne County Recycling Center in 2005 are summarized in Figure 2-1.

Figure 2-1  
Source of Incoming Materials in 2005

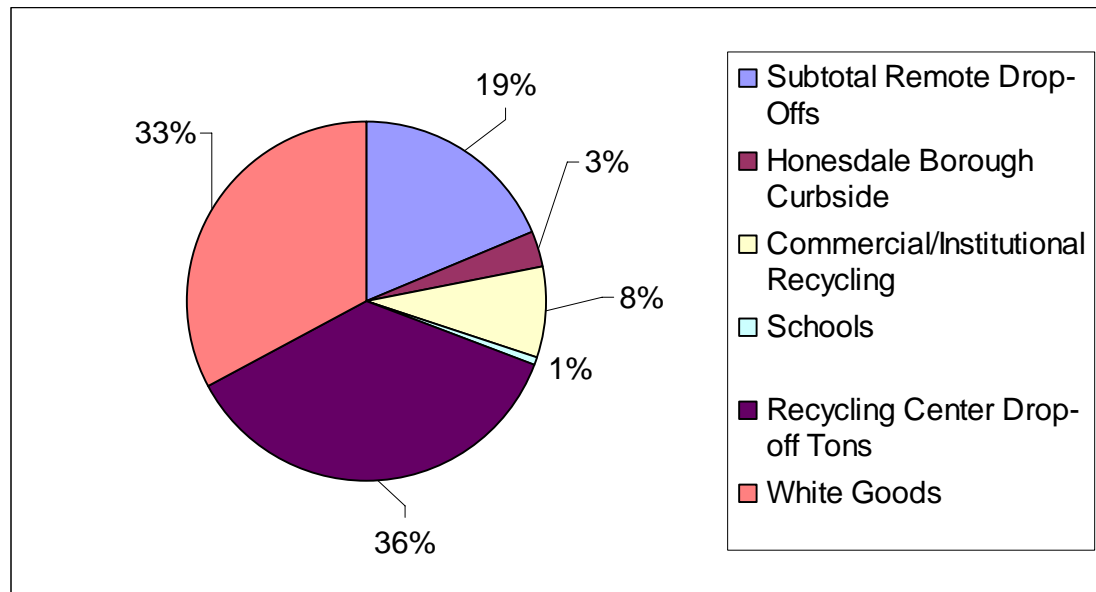


Table 2-4 provides detail regarding the total tons of material delivered to the Center by commercial establishments and institutions (other than schools) in 2005 that were weighed and recorded by entity

**Table 2-4  
Commercial and Institutional Recycling  
2005**

Commercial/Institutional Establishment	Tons Recycled
Top Notch	23.90
Wayne County Courthouse	22.79
Fowlers	9.12
Ed Schwartz	8.98
Stanton Office	8.14
Cordaro's	7.31
Northeast Medical	5.29
Wayne Memorial Hospital	5.20
Highlights for Children	3.55
Pratts Decorators	2.81
Wayne County Library	2.35
Bureau of Aging	1.98
Hotel Wayne	1.50
Nature's Grace	1.08
Wayne Industries	0.65
Day Bakery	0.54
Highhouse Oil	0.36
<b>Honesdale Borough Businesses/Institutions</b>	<b>105.55</b>
Waymart State Correctional Institute	76.64
HRC	29.47
The Pines	12.42
Tick Tocks	0.85
Case Tire	0.1
<b>Wayne County Businesses/Institutions</b>	<b>119.48</b>
<b>Total Business/Institutional Recycling</b>	<b>225.03</b>

### Remote Drop-Off Sites

All of the drop-off sites generally collect the same materials. Drop-off containers have six bins, which are labeled for:

- Newspaper;
- Green glass;
- Brown glass;
- Clear glass;

- Aluminum and Steel cans; and
- Plastics #1 and #2.

The drop-off sites are spaced well throughout the County, with an emphasis in the southern portion of the County, which is a more populated area. Some locations have an extra container with three bins for additional overflow materials, as needed. The County does not charge a processing fee to the communities – they consider it a service to the residents of the municipalities. The County owns two roll-off trucks that are used to collect the drop-off containers.

The remote drop-off sites are open for limited hours each week, because the County wants them to be attended in order to discourage illegal dumping of garbage. Municipalities arrange for volunteers to staff the sites. At times municipalities have trouble finding enough volunteers. There are 13 remote municipal drop-off sites, as well as a drop-off at a subdivision called The Hideout, in addition to the drop-off that is available at the Recycling Center when the Center is open.

Table 2-5 provides a summary of tonnages of materials delivered by municipality, via remote drop-off sites, relative to the Recycling Center.

**Table 2-5  
Tons Recycled At Drop-Offs  
by Municipality/Recycling Center - 2005**

Categories of Material	Tons/ Year	Hours Open per Year	Pounds per Hour
Bethany Borough	12.46	36	692
Damascus Twp.	13.89	48	579
Dreher Twp.	14.47	36	804
Hawley Borough	63.63	96	1,326
Lake Twp.	82.59	72	2,294
Lehigh Twp.	26.86	36	1,492
Manchester Twp.	11.42	36	634
Mount Pleasant Twp.	23.58	72	655
Oregon Twp.	3.37	48	140
Paupack Twp.	32.53	72	904
Preston Twp.	60.77	156	779
Salem Twp.	43.41	36	2,412
Sterling Twp.	10.65	36	592
The Hideout	113.40	NA	NA
Waymart Borough	54.05	36	3,003
The Recycling Center	1,097.70	806	2,724

As Table 2-5 indicates, the municipal drop-off sites collect varying amounts of material per each hour open – ranging from 579 pounds per hour to 3,003 pounds per hour (excluding the Oregon Township site, which is relatively new and was not available to residents for all of 2005). The Recycling Center, which is open most frequently, collects an average of 2,724 pounds per hour (excluding white goods). The Recycling Center’s per-hour tonnages are likely relatively high due to:

**Convenience** – residents and businesses can deliver materials at their convenience, five and a half days per week;

**Ability to accept large/commercial loads** – Commercial entities, if delivering large loads, must deliver to the Recycling Center where capacity is adequate; and

**Ability to accept cardboard** – The drop-off containers are not designed to accept corrugated cardboard.

The Waymart Borough site is an example of a highly utilized drop-off site, as are the Salem Township and Lake Township sites with respect to tons per hour open. However some centers (Preston Township and Hawley Borough) bring in more tonnage on an annual basis than the Lake Township site, but not as much tonnage per hour open.

## 2.6 Processing

Processing at the Wayne County Recycling Center consists of unloading, sorting materials, and, in some cases, baling materials. In addition, most materials are loaded into vehicles by Recycling Center staff. These processes are described more fully below.

### 2.6.1 Unloading

#### Remote Drop-Off Materials

County crews collect remote drop-off site containers once or twice monthly, leaving behind an empty drop-off container. The 20-cubic-yard drop-off containers have six openings, the first of which is larger than the other five. The configuration is as follows:

Newspaper	Metal Cans	Green Glass	Plastics #1 and #2	Brown Glass	Clear Glass
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Figure 2-2 shows a County collection vehicle with a roll-off container.

Figure 2-2  
County Collection Vehicle with Roll-Off Container



The County driver delivers the materials to the facility, and weighs in. The driver then opens the side of the container, and backs the trailer into the covered tip area near the newspaper unloading bay. Sorters (generally prison laborers, supervised and assisted as needed by a County driver/material handler) manually remove newspaper from the trailer compartment, placing newspaper directly in the newspaper storage bin below, corrugated cardboard in the corrugated storage bin below, chipboard in a Gaylord box located in the incoming material bay, and mixed paper in one of two 2-cubic-yard wooden boxes in the incoming material bay. Next, the vehicle is pulled out of the paper bay, and is backed into the metal cans bay. The vehicle is not re-weighed between tips of different material types. After the metal cans are tipped, they are pushed, using shovels and brooms, into the metal cans incoming storage bunker. The vehicle continues to pull in front of the appropriate bunker to deposit the glass and plastics, tipping each material in front of the appropriate bunker, until all compartments are empty.

### Commercial Loads

Commercial entities can deliver loads of materials directly to the facility. If an entity has a large quantity of a particular type of material, the driver is instructed to tip the material directly in the appropriate bunker. Similarly, loads of corrugated cardboard are tipped on the floor in front of the OCC storage bunker, where it is checked for contaminants and pushed or deposited into the OCC storage bunker. Some commercial entities are weighed, others are not.

### Residential Deliveries

Bins for residential materials are located along the perimeter of the tip floor for incoming materials. Residents pull their vehicle up close to the building, and unload the materials from their vehicles, placing them in labeled 2-cubic-yard tippable wooden containers, which are constructed on-site by the laborers or Gaylord boxes. Residents are asked to place materials in proper container in accordance with the following categories:

- #1 Plastics;
- #2 Plastics;
- Chipboard;
- Mixed paper/junk mail;
- Newspaper;
- Metal cans;
- Green glass
- Clear glass; and
- Brown glass.

Cardboard (OCC) is placed directly into the incoming material storage bunker for this material. Thus, the only materials from drop-off customers at the Center that need further sorting are metal cans. Residents are asked to take their plastic bags or other containers with them after they deposit recyclable materials. The prison laborers and community service laborers assist residents and check through the bins periodically, pulling out any materials that may have been mis-sorted.

### Honesdale Borough Curbside

The Honesdale Borough's vehicle has separate compartments or containers for:

- Brown glass;
- Green glass;
- Clear glass;
- Metal cans;
- Plastics;
- Magazines/junk mail (Separate container on top of plastics bin);
- Newspapers (Separate container at the rear of the truck).

Residents are asked to place materials in recycling bins, plastic bags, or garbage cans. Newspapers have to be tied or in brown paper bags, and magazines tied or in brown bags. Some residents also separate junk mail by placing it in plastic bags.



## White Goods

Residents can deliver white goods and scrap metal to the Recycling Center during Center hours. Items are unloaded from vehicles with the assistance of prison laborers and/or community service aids, or Recycling Center drivers/material handlers. The items are set out on a paved surface in close proximity to a 40 cubic yard roll-off container. As the drivers/material handlers have time, they load the materials, using a skid steer with a grapple attachment, into the roll-off container, which is located in a recessed alcove next to the building, such that the opening of the container is just above ground level. When the container is close to being full, the Recycling Center notifies the local scrap metal dealer, O'Connell, who removes the roll-off container.

Figure 2-3 shows the white goods that were seen at the Center during the site visit.

Figure 2-3  
White Goods Awaiting Loading



## 2.6.2 Sorting

Materials delivered directly to the facility by commercial entities and residents only require further sorting of metal cans, as described above, except for quality control, which is performed by prison laborers and community service workers. Drop-off and curbside materials require further sorting of fiber (newspaper, chipboard, and corrugated, from mixed paper), as well as sorting of plastics (#1 from #2), and cans (aluminum from steel).

## Remote Drop-Off Materials

Materials collected from remote drop-off locations are unloaded as described above, and sorted in the following manner:

### Fiber Materials

The fiber from the drop-off containers consists of commingled newspaper, magazines, junk mail, and chipboard. After it is tipped on the tip floor, it is hand-sorted on the floor by prison laborers. Chipboard is placed in a Gaylord box, newspaper is deposited into the ONP storage bunker, and mixed paper/magazines are placed in another Gaylord box.

### Plastics

Plastics #1 and #2 are commingled at the drop-off sites. After they are tipped into the incoming material plastics storage bunker, the human resource services employee opens a lift-gate at the bottom of the bunker, allowing plastic bottles to tumble forward onto a counter-height work area. The laborer then sorts plastics into #1 (PET) and #2 (HDPE). During the site visit the human resource services employee was out on sick leave, however another employee demonstrated how plastics are sorted. The sorter tossed the PET bottles directly into the adjacent bunker (which is for sorted PET) and loaded the HDPE bottles into a wheeled 2-cubic-yard cart. Figure 2-4 shows a demonstration of how the sorter sorts HDPE from PET.

Figure 2-4  
Plastics Sorting



### Metal Cans

Incoming metal cans are deposited in an incoming storage bunker. They are processed by opening a door, which allows the cans to enter a hopper leading to a conveyor. Along the conveyor, the cans are run under a belt magnet that removes the steel cans and drops them into a 2-cubic-yard wooden container. Aluminum cans continue on through a can crusher, and drop into a 2-cubic-yard wooden container. Steel cans are then delivered to a storage area until they are ready to be baled. The crushed

aluminum cans in the container are moved via a forklift, tipped into the hopper of a blower, and are blown directly into a trailer.

### 2.6.3 Baling

The following materials are baled at the Recycling Center:

- Steel cans;
- Mixed paper;
- Plastics #1;
- Plastics #2;
- OCC; and
- Chipboard.

The downstroke baler has an infeed conveyor and hopper. It is used to bale all materials except OCC. When the operators realize that there is enough material to bale, they use a forklift to move the 2-cubic-yard containers or Gaylord boxes to the baler, and empty the material into the hopper. During the site visit it was observed that all fiber bales were lined with cardboard, presumably to keep the bales intact during shipping. Steel wire is used to secure all bales.

The horizontal baler is used exclusively to bale OCC. It is hopper-feed, and is operated almost continuously. Only one operator is required to make bales. Table 2-6 provides a summary of baling information pertinent to the Wayne County Recycling Center.

Table 2-6  
Summary of Bale Information

Material Type	Steel Cans	Mixed Paper	Corrugated Cardboard	Chipboard	Plastics #1	Plastics #2
Baler Used	Downstroke	Downstroke	Horizontal	Downstroke	Downstroke	Downstroke
Time to Make Bale	½ Hour	½ Hour	½ Hour to 1 Hour	5 Hours	1½ Hours	2 Hours
Avg. Weight of Bale (Stated) <sup>1</sup>	1,500 – 1,600 lbs.	1,800 – 2,000 lbs.	1,500 – 1,600 lbs.	1,400 – 1,500 lbs.	1,200 – 1,300 lbs.	1,200 – 1,300 lbs.
Avg. Weight of Bale (Estimated) <sup>2</sup>	1,582 lbs.	1,595 lbs.	1,527 lbs.	1,327 lbs.	994 lbs.	1,040 lbs.
Average Number of Bales on Trailer (Stated)	28	24+	28	35	33+	33+

## Section 2

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Material Type	Steel Cans	Mixed Paper	Corrugated Cardboard	Chipboard	Plastics #1	Plastics #2
Average Weight per Load (Estimated) <sup>3</sup>	44,290	38,291	42,745	46,460	32,807	34,307

<sup>1</sup> Based on estimates provided by Recycling Center staff.

<sup>2</sup> Based on dividing average weight by number of bales, using average number of bales per load provided by Recycling Center staff.

<sup>3</sup> Estimated by dividing total weight sold by number of loads.

The HDPE bales, when made, are left in the baler overnight, in order to provide extra compaction. In general, a tractor trailer can handle a payload of up to 43,000 to 45,000 pounds, and keep in compliance with state and federal weight restrictions. Table 2-6 indicates that most commodities are shipping at near or full weight, with the exception of mixed paper, which appears to be slightly underweight, on average, and plastics, which are more significantly underweight, due to the relative poor compaction of the balers. However, given the relatively low quantity of plastics processed at the facility, and the fact that no other loads are underweight, it would not be cost-effective to secure a new baler simply to increase the load weight of plastics.

The average weight of each load of non-baled materials is summarized in Table 2-7.

**Table 2-7**  
**Summary of Average Load Weights for Non-Baled Items**  
**2005**

Material	Average Pounds Per Load
Clear Glass	48,300
Brown Glass	45,428
Green Glass	48,192
Newspaper	44,642
Aluminum Cans	6,637
White Goods	10,738

## 2.7 Loading Materials

### Aluminum Cans

As described above, aluminum cans are blown directly into a trailer. This requires just one laborer.

## Newspaper

Loose newspaper is loaded directly into a trailer using a skid steer with a bucket loader attachment. This requires just one laborer. The newspaper is added to the trailer gradually and shipped when almost full.

## Glass

When the glass bunkers are full, the Recycling Coordinator contacts the glass vendor and arranges for a pickup. The drivers/laborers empty the bunkers by using a skid steer with a bucket loader attachment and place the glass in the vehicle.

## 2.8 Materials Processed by Commodity Type

Table 2-8 shows the annual amounts of each commodity processed in 2005.

Table 2-8  
Amounts of Materials Processed  
2005

Material	Tons Marketed	% of Material by Weight
Aluminum	23.2	0.8%
OCC	406.1	13.5%
Clear Glass	193.2	6.4%
Amber Glass	113.6	3.8%
Green Glass	120.5	4.0%
Magazines/Mixed Paper	402.1	13.4%
ONP	468.7	15.6%
PET	49.2	1.6%
HDPE	51.5	1.7%
Steel Cans	88.6	2.9%
White Goods	993.3	33.1%
Farmer's Newsprint	70.0	2.3%
Chipboard	23.2	0.8%
<b>TOTAL</b>	<b>3,003.2</b>	<b>100.0%</b>

As Table 2-8 indicates, white goods constitute one-third of the materials processed at the Recycling Center. Of the typical "MRF" materials, ONP is the most significant material processed, in terms of weight, followed closely by OCC and mixed paper.

## 2.9 Residue Management

Residue at the Recycling Center is carried by front-end loader to an 8-cubic-yard dumpster located on the side of the building near the trailers. One source of residue is plastic bags used by residents in carrying their recyclables. The Recycling Coordinator indicates that there is no one drop-off site that is particularly known as a source of contamination.

The Wayne County Recycling Center generated 20.8 tons of residue in 2005. This is a residue rate of approximately 1 percent (excluding white goods), which is an extremely low residue rate. Residue rates of up to 2 percent are considered excellent, and up to 5 percent are generally considered average. The Center paid \$8,800 in pull/disposal fees in 2005 (\$164 per pull), plus an additional \$500, approximately, for overflow waste. The County goes out to bid every year for this service. Waste Management is the current service provider, and they normally come in considerably lower than other bidders (generally two to three other bids are received). Center staff indicates that non-recyclable plastics are a significant portion of waste being disposed at the center. During the site visit, a surprisingly low rate of non-recyclable items was seen in the plastics and other materials. In general, the contamination observed was bagged refuse and plastic bags used to carry recyclables, which were left behind by residents.

## Section 3

# RECYCLABLES MARKETING

### 3.1 Materials Markets

Wayne County relies primarily on spot markets for marketing their materials. The Center tends to sell materials to markets it has used in the past. The recycling coordinator is hesitant to change markets, due to the risk of non payment. The scrap metal dealer, O’Connell’s, is local (approximately eight miles from the facility). The next closest market is for aluminum cans, which is in Scranton, PA. Most materials are sold through brokers. The current markets are described in Table 3-1.

**Table 3-1**  
**Material Market Summary**

Materials	Average \$/Ton 2005	Most Recent Price (\$/Ton)	Published Price <sup>1</sup>	End Market(s)
Aluminum	\$1,204.98 (\$0.60/lb)	\$1,400 (\$0.70/lb – 1/31/06)	\$0.60 - \$0.70/lb. (1/31/06)	Fiegelman’s Recycling Scranton, PA
Cardboard	\$67.56	\$50.00 (3/9/06)	\$60.00 - \$65.00/ton (3/10/06)	Fox Run Recycling (Brokers)
Clear Glass	\$27.48	\$25.00 (1/20/06)	\$20.00 - \$25.00/ton (1/6/06)	Recycall Port Allegany, PA
Amber Glass	\$10.60	\$7.00 (2/15/06)	\$10.00 - \$12.00/ton (2/17/06)	Recycall Port Allegany, PA
Green Glass	\$6.39	\$4.00 (1/9/06)	\$0.00 - \$5.00/ton (1/13/06)	Recycall Port Allegany, PA
Mixed Paper	\$54.63	\$50.00 (3/1/06)	NA	Marcal Paper Mills Elmwood Park, NJ
ONP #8	\$60.48	\$60.00 (3/8/06)	\$70.00 - \$75.00/ton (3/20/06) <sup>2</sup>	Fox Run Recycling (Brokers)
PET	\$324.81	\$250.00 (\$0.125/lb – 1/12/06)	\$320 – 380/ton (1/13/06)	Fox Run Recycling (Brokers)
HDPE	\$476.81	\$560.00 (\$0.28/lb – 10/17/05)	\$540 – \$600/ton (10/17/05) <sup>2</sup>	Fox Run Recycling (Brokers)
Steel Cans	\$64.61	\$84.82 (1/10/06)	\$145 - \$150/ton (1/13/06)	Hill Top Enterprise Downington, PA

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Materials	Average \$/Ton 2005	Most Recent Price (\$/Ton)	Published Price <sup>1</sup>	End Market(s)
White Goods	\$16.46	\$20.00 (4/6/06)	\$50 - \$60/ton (3/28/06)	O'Connell's
Farmer's Newsprint	\$8.01	\$15.00	NA	Local Farmers
Chipboard	\$45.00	\$45.00 (9/14/05)	NA	Canusa Hershman (Broker)

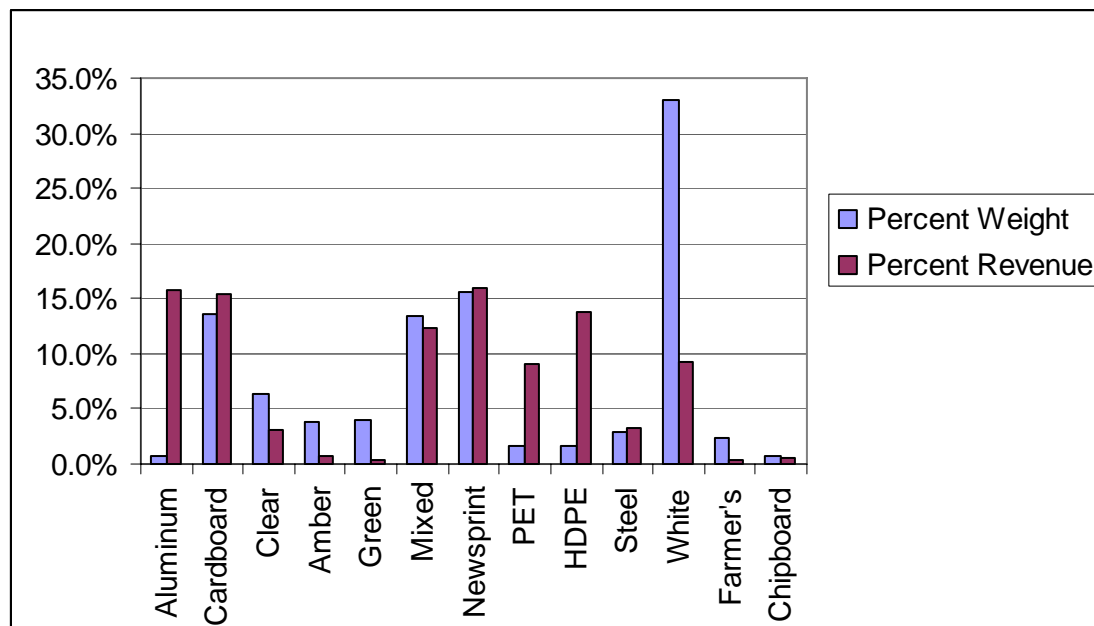
<sup>1</sup> Low and High Range for Northeast USA/Maritimes, as published in Waste News

<sup>2</sup> Price indicated is for baled ONP#8 – no price available for loose ONP #8.

<sup>3</sup> Price indicated is for colored HDPE – no price available for mixed HDPE

Figure 3-1 shows the Percent weight and Percent Revenue each commodity represents, per 2005 data.

**Figure 3-1**  
**Commodities by Percent of Total Weight and Revenue Received**  
**2005**



As Figure 3-1 indicates, the commodities providing the facility with the highest revenue are aluminum, newspaper, and cardboard (OCC). Relative to their weight, aluminum and HDPE are the strongest “performers,” followed by PET. Glass, of course, is relatively heavy and of low value.



### 3.1.2 Transportation

Most of the Center's commodity sales prices include transportation costs.

Fox Run Recycling places a newspaper trailer at the facility, and delivers an empty trailer when the trailer is full. There is no charge for this service, although commodity pricing may be slightly lower due to this fact. Before using Fox Run Recycling, the Center used other end markets that paid \$70, \$80, or \$85 per ton, but also charged transportation costs, which brought the net revenue down to closer to the \$50-per-ton range, according to the Recycling Coordinator.

The trailer used for aluminum cans is owned by the Recycling Center. Henderson hauls the material to Fiegelman's in Scranton. They charge the Center \$200 per pull, plus an 18 percent fuel adjustment (for a total cost of \$236 per pull). Fiegelman's then reimburses the Center for \$150 of this cost, for a net cost of \$86 per pull. Fees have changed recently, with increasing fuel surcharges, however in 2005 there were seven loads of aluminum cans delivered to Fiegelman's, with a net transportation cost of approximately \$574.

### 3.1.3 Contracts

Wayne County has only one contract in place for the sale of recycled materials. That contract, with Marcal, is for a mixed paper bale. This contract stipulates that mixed paper can include the following:

- Post-consumer magazines;
- Glossy newspaper inserts;
- Office paper (including fax paper, photocopy paper, white ledger, color ledger, NCR paper envelopes);
- Computer paper;
- Junk mail (including catalogs, coupons, sweepstake entries and envelopes with or without windows); and
- School paper (including notebook paper, construction paper and soft-covered workbooks).

Paper grades specifically **excluded** from the "Marcal mix" include:

- Newspapers;
- Cardboard;
- Cereal/pasta boxes;
- Paperback books;
- Carbon paper;
- Hard cover books;
- Express delivery envelopes;

- Yellow paged telephone books;
- Blue prints; and
- Plastic and brown paper bags.

The Contract stipulates that if Marcal collects the material, the minimum load hauled shall be 19 tons. The contract further stipulates that the generator agrees to provide a minimum of 40 tons, and a maximum of 52 tons per month. The County's loads of mixed paper average 19.15 tons per load, and on average the County provides Marcal with 33.5 tons per month. If the generator exceeds the maximum by more than 15 percent (which, on average, the County does), Marcal is not obligated to accept the additional tonnage at a price agreeable to both parties. According to the County's Recycling Coordinator, this has not yet been an issue. The price paid for the mixed paper freight-on-board (FOB) generator's dock has a floor price of \$28.00 per ton and a ceiling price of \$95.00 per ton. The payment index schedule is tied to the NE Paper Stock High Monthly "Mixed Paper" market prices. When the NE price falls below \$30 per ton, the County is still paid \$28 per ton. When the NE price reaches \$30 per ton and beyond, the County is paid that price per ton. When the NE price exceeds \$95 per ton, Marcal receives the "benefit" of the price beyond \$95 per ton. Thus, this contract allows the County and Marcal to "share" in the market risk.

Marcal reserves the right to reject loads that are "heavily contaminated" with excluded materials, listed above, with the generator being responsible for the removal and related transportation costs associated with the load.

### 3.1.4 Material Downgrades/Rejections

The Recycling Center indicates that it has had only one instance of downgraded material in recent years. This was over a year ago, for 12 pieces of ceramic and "an Old Spice bottle" being found in a load of glass in 2005.

## Section 4

# OBSERVATIONS AND RECOMMENDATIONS

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## 4.1 Observations

### 4.1.1 General Operations

The following observations were made during our site visit, or gleaned from the data provided.

- The use of unpaid laborers helps the Center operate more efficiently than it otherwise would. With an average of three unpaid laborers per week day and two on Saturdays, and assuming a pay of \$7.00 per hour, the Center is saving approximately \$13,000 per year in labor by using no-cost laborers.
- The laborers at the facility, particularly the drivers/material handlers, are effectively utilized. The laborers perform multiple functions, and appear to be adept at knowing what task needs to be done, when. The employees were working at a continuously steady rate, during our site visit.
- The Recycling Center is doing a good job of selecting commodity grades to market in most instances. Despite the fact that the Center does not have a sort line, it is able to cost-effectively produce a #8 grade of ONP. The Center's ability to make and market a mixed paper product is also commendable, as it allows the residents to recycle a wide variety of materials, but does not hinder the marketability of their newspaper. Similarly, accepting chipboard is a service to the residents, and enhances the Center's ability to increase recycling and hence avoid tip fees, though it is not a high-value commodity. Despite the fact that the Center does not have an incoming "storage bunker" for every commodity type, it has done a great job of developing a system for handling materials such as chipboard in Gaylord boxes and 2-cubic-yard containers until they are ready for market. The expanded covered storage area has been instrumental in allowing for this. One potential area for enhancing material revenues is to perform selected sorting of the white goods, consisting of recovering and sorting out higher grade metals such as copper, brass, and aluminum scrap. In addition, some items such as lawn mowers and bicycles may be marketable to local repair shops for refurbishing and resale.
- The material bales are relatively loose, and the plastics bales are not adequately dense to provide "full" loads of the highest payload possible. Given the quantity of plastics processed at the Center, however, it is not economically feasible to purchase a new baler for this purpose. When it is time to replace a baler, however, it is advisable that the Center consider a baler with significant psi and dual rams which would make more dense bales of plastics.

- While employees worked hard in processing material, and kept the incoming materials tip area clean, there was loose material such as cans and crushed glass in the processing area and in the baled materials storage shed, which was not cleaned up at the end of the previous day.
- The traffic flow at the Recycling Center is optimal for ease of processing – laborers do not have to move materials far in order to process – but is sub-optimal in terms of safety. Residents are backing in and out of the Center continuously, while County vehicles also must position themselves to tip in the same area (and drive out and back in again to tip each material type). Ideally, residential traffic would be separate from truck traffic, and would consist of residents driving forward to drop off material then through to the exit without having to back in or out of a position. Ideally, the citizen drop-off area would be located away from the scale and other truck traffic.
- Vehicles (primarily private residents' vehicles) were observed driving into the Recycling Center at a high rate of speed. The incoming road is up a hill and around a turn. It is difficult for drivers to see pedestrians and skid-steers that might be in their way until they make their way around the curve.

### 4.1.2 Materials Marketing

Because the Wayne County Recycling Center is not located close to a major highway interchange, transportation costs impact the prices the Center is able to receive for materials. It appears that many commodities have a higher regional published price than the prices the County is receiving (for example white goods, plastics, and steel cans); however, the regional published price is for the Northeast in general. Recycling facilities closer in proximity to end markets are likely to receive higher prices. Also, generators with a larger quantity are usually able to negotiate higher prices. The best way to ensure good pricing is to:

- Contact several vendors when preparing to sell a load of material;
- Maintain working relationships and sell end product to more than one vendor for each commodity, if possible;
- Continue to produce a high-quality end product; and
- Know the market – keep an eye on Waste News and other published pricing so that marketing decisions can be made based on current information.

While the Recycling Center seems to be doing relatively well, price-wise on fiber commodities, and excellent on aluminum cans and clear glass, regional average pricing suggests that it may be possible for the Center to negotiate higher prices for steel cans and scrap metal. The scrap metal prices being paid by the facility are more than 50 percent less than the average price for the region, and the price being paid for steel cans is approximately 40 percent below the region's average price.

It may also be possible for the Center to improve on its plastics markets. Although the Center sells relatively few loads per year, three loads of PET and three of HDPE, it

would be beneficial for the facility to determine whether low bale weights are causing an issue with plastics pricing, and to explore other markets.

## 4.2 Recommendations

### 4.2.1 General Operations

Recommendations for enhancing Center operations, based on the site visit and subsequent analysis, are presented below for consideration.

- ***Recover additional OCC and other paper grades at high-volume drop-off sites (such as Lake Township, The Hideout, Waymart Borough, and Salem Township).*** One option would be to have some 20 cubic-yard containers constructed with four compartments for fiber clearly labeling these compartments for receipt of the following items: newspapers, mixed paper (magazines and junk mail), chipboard, and cardboard. Providing a convenient opportunity for residents to recycle cardboard is growing in importance, since residents are generating increasing amounts of corrugated cardboard, due to the growth in Internet purchasing and operation of home-based businesses.
- ***Reconfigure traffic flow to accommodate customers at a faster rate, and in a safer manner, particularly on Saturdays.*** Although the Center was not visited on a Saturday, laborers indicated that Saturdays at the Recycling Center can be extremely busy. To facilitate the flow of incoming traffic, consider placing several clearly labeled 2-cy-containers along the far side of the drive near the compost display. Residents could then enter in two lanes – the left lane going directly to the Center as is currently done, and the right lane depositing materials in an “extra” set of containers. The two traffic lanes should be marked with cones. One possibility is to establish a “fast lane” on the right-hand side for residents that have only fiber materials, and place just four containers – one for cardboard, one for newspaper, one for chipboard, and one for mixed paper, on the right-hand side of the lot. Clear signage would be critical to making this system work, but could help reduce wait time for customers. An additional laborer may be needed to assist the customers and to perform quality control on the materials deposited in the bins. Alternatively, drop-off containers could be placed along the side and emptied when full such as a divided roll-off container clearly labeled for newspaper, magazines and mixed paper, and cardboard (plus chip board, if a fourth compartment was constructed in the container). Sorted food and beverage containers could be collected in a six-compartment roll-off labeled for:
  - Green glass;
  - Brown glass;
  - Clear glass;
  - PET plastic;
  - HDPE plastic; and

## Section 4

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- Metal cans.

This configuration would eliminate the need to do a full sort on PET/HDPE plastics.

- ***Move the HDPE bin to the far right, when facing the incoming material storage bunkers from outside.*** This would enable the person manually sorting plastics to toss the larger materials into the HDPE bunker directly and sweep PET containers into a cart. PET containers, being smaller and generally a less prevalent portion of the material stream, would need to be emptied fewer times than a cart of HDPE bottles.
- ***Improve signage on the 2-cubic-yard bins used at the Center for drop-off, as well as on the drop-off containers.*** During the site visit, several residents were observed placing the wrong type of plastic in the bins, for example. This is likely due to the fact that the chasing arrow with the number on it, indicating the type of plastics allowable in the bin, was small and difficult to see. Research has shown that the best visuals include pictures of what should be placed in the container. Figure 4-1 shows the signage on the drop-off containers.

Figure 4-1  
Signage on Drop-off Containers



Figure 4-2 shows signage from Ashland Borough's drop-off containers.

Figure 4-2  
Ashland Borough Recycling Signs



Photo Source: PA DEP

- ***Investigate means to collect and market used plastic bags.*** The Recycling Coordinator expressed interest in collecting this commodity, but seemed hesitant due to space constraints. Although it often takes a long time to collect a full load of these materials, demand for the material is high. The Center could store the plastic bags in the empty trailer that is currently unused. One of the chipboard Gaylord boxes (there were several at the time of the site visit) could be replaced with a box for plastic bags. The Center should contact end markets for this material to assess the viability of such a market. The County could also work with local grocery stores to collect these bags. As part of the research for this project, one end user of this material, AERT (of Springdale, Arizona), was contacted (479-756-7406). The contact there indicated that baled HDPE and LLDPE blends are currently bringing \$0.17 to \$0.21 per pound. This is a range of \$340 to \$420 per ton. Before embarking on such a project, the Center should produce a test bale to ensure that it can make bales to the specified density. Bale specifications for mixed loads are available at the following web site: <http://www.aertinc.com/MIX%20Specifications.pdf>.
- ***Investigate the extent to which it would be advantageous to sort incoming metal by selected grades to include copper, brass, and aluminum scrap and to market selected items such as lawn mowers and bicycles for refurbishing and resale.*** Performing metals upgrading will require dedicated labor but could pay off in increased revenue. Furthermore, the labor assigned to work the metal pile could also remove CFC containing components as required by state law.

#### 4.2.2 Safety/Loss Prevention

- ***Install a steel bar several inches below the top of the incoming material bay roof.*** This would help to prevent damage to the building resulting from fairly common circumstances in which a vehicle attempts to pull out of the incoming

material storage bay without lowering its container. This measure could help prevent accidents and associated repair costs.

- ***Move forward with constructing bollards, located at the posts of the entranceways as is currently being considered.*** The purpose of these bollards is to protect the building from damage caused by vehicles backing up. Bollards are typically 8 inches or greater in diameter, and roughly three feet high. They should be of a sturdy material, such as steel-pipe filled with concrete, in order to adequately protect the building from damage due to vehicles. Figure 4-3 shows the incoming materials unloading area.

Figure 4-3  
Incoming Materials Unloading Area



- ***Install steel and/or concrete rails above the incoming glass storage bays.*** Currently there is no safety barrier between customers and/or employees tipping glass into the incoming glass bays and the bay itself. When empty, the drop would be approximately 17 feet. Figure 4-4 shows the glass unloading area, where commercial entities with large quantities of glass are often instructed to unload their glass.



Figure 4-4  
Glass Unloading Area



- ***Restrict public access to the Center during times when drop-off containers are being tipped.*** For example, if a schedule could be developed such that Mondays were for servicing drop-off containers, and public access were limited to Tuesday through Saturday, the traffic situation could be better controlled. The Solid Waste Director agrees that this would be ideal, however says it would be challenging, given the need for flexibility and the tight schedule for drop-off collections.
- ***Install a “Slow” sign or “Caution, Workers” sign along the entry road to the Center.*** If that fails, a speed bump should be considered. During the site visit several residential vehicles were observed driving at a rate of speed inappropriate for the conditions, putting workers and other residents at risk.

### 4.2.3 Materials Marketing

- ***Monitor market pricing and forces affecting market conditions by reading trade publications such as Recycling Today, Resource Recycling and Waste News as well as subscribing to services such as Waste News Commodity Pricing.*** Although the Center is in a more remote area and may be further from some markets, it is beneficial to know the direction the market is taking, and any resultant changes in commodities movement and pricing.
- ***Routinely contact at least three or four end markets to check pricing, when ready to sell a commodity.*** Although it is wise to be cautious with new vendors due to the risk of non payment, calling several vendors will help obtain better materials pricing.
- ***Market each material, periodically, to more than one market.*** Although this takes additional effort, and despite the fact that markets are currently strong, it is

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important to have an established relationship with more than one market for each commodity, should something happen to the predominant market.

## Section 5 FINANCIAL SUMMARY

### 5.1 Annual Operating Costs

Table 5-1 provides a summary of annual operating costs for the Recycling Center.

Table 5-1  
Summary of Annual Recycling Center Operating Costs  
2005

Item	Amount
<b>Labor:</b>	
Employee Salaries <sup>1</sup>	\$162,467
Employee Benefits <sup>2</sup>	\$43,866
<b>Total Annual Labor Cost</b>	<b>\$206,333</b>
<b>General Operating Expenses:</b>	
Equipment Maintenance	\$37,879
Contracted Services	\$17,979
Materials and Supplies	\$13,713
Uniforms	\$1,979
Other	\$870
Fees/Dues	\$1,310
<b>Total General Operating Expenses</b>	<b>\$73,730</b>
<b>Building-Related Expenses:</b>	
Fuel, Light, Water, Sewer	\$18,223
Telephone	\$87
<b>Total Building-Related Expenses:</b>	<b>\$18,310</b>
<b>TOTAL ANNUAL OPERATING COSTS</b>	<b>\$298,373</b>

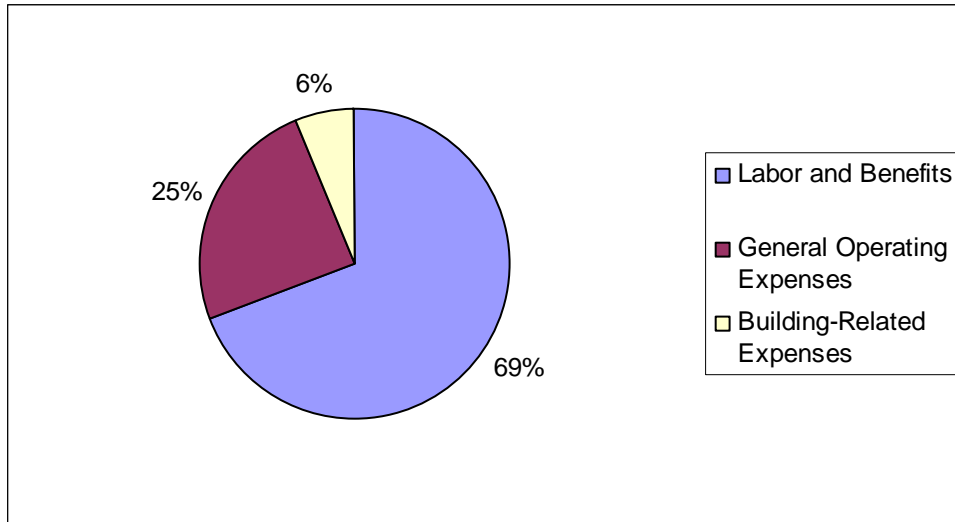
<sup>1</sup> Includes half of Solid Waste Director's time and half of Administrative Assistant's time, the other half attributable to Solid Waste.

<sup>2</sup> Estimated to be 27 percent of employee salary, per County Commissioner.

It should be noted that the Wayne County Recycling Center labor hours and some maintenance/repair costs include collection activities. Because the Center plays an integral role in the County's drop-off system, it would not be meaningful to isolate the costs associated with collecting these tons. Instead, when comparing to other facilities and MRF operations, it is important to be sure there is a clear understanding of what is

included in these costs. With annual operating costs of \$298,373, and processing 2,724 tons per year, the Center’s per-ton operating cost is \$109.53. Figure 5-1 shows the primary cost areas for operating the Wayne County Recycling Center.

Figure 5-1  
Primary Operating Cost Areas for Recycling Center



## 5.2 Annualized Capital Costs

To estimate annualized capital costs, the original purchase price of the Recycling Center and its equipment, where available, was escalated by 2.5 percent per year from the original purchase date, to estimate “current day” equipment purchase prices (replacement cost) for each capital item. This total for all items was \$64,864. The estimated current purchase price for the Recycling Center and its equipment were then individually divided by the expected lifespan of each capital item. Table 5-2 shows the results of this analysis.

Table 5-2  
Estimated Annualized Capital Costs

Capital Equipment	Estimated Current Purchase Price	Lifespan	Annualized Cost
Processing Equipment (Conveyors, etc.)	\$13,614	5	\$2,723
Initial Building	\$345,244	30	\$11,508
Land Associated Costs	\$161,646	30	\$5,388
Storage Shed	\$142,505	30	\$4,750
Can Equipment	\$12,033	12	\$1,003

Capital Equipment	Estimated Current Purchase Price	Lifespan	Annualized Cost
Trailer	\$9,601	20	\$480
Trailer	\$9,601	20	\$480
Trailer	\$9,601	20	\$480
Collection Vehicle with Lift	\$79,974	10	\$7,997
Collection Vehicle with Lift	\$70,134	10	\$7,013
Skid Steer Bobcat 742 B	\$17,814	7	\$2,545
Skid Steer Gehl 5625	\$22,934	7	\$3,276
Skid Steer Gehl 3935	\$18,311	7	\$2,616
Vertical Baler	\$58,711	12	\$4,893
Horizontal Baler	\$44,860	12	\$3,738
Containers (20)	\$89,606	15	\$5,974
<b>Total Annualized Capital Cost</b>			<b>\$64,864</b>

Total annualized costs reflect the annual amount of money the facility would pay toward capital costs, to ensure that it could replace capital, as appropriate. The annualized costs reflected in Table 5-2 assume that the Center would pay 100 percent of the cost of the items. The Center has been fortunate to have some equipment donated, and 90 percent of much of the equipment paid for with DEP recycling grants. If DEP paid for 90 percent of all of the capital, the Center's share of annualized capital costs would be \$6,486 per year. Although grants for equipment have been available in the past, the potential exists for that such funds may not be available in the future. Annualizing total capital costs excluding the impact of DEP grants gives the Recycling Center an indication of the level of revenues that would be required to make the Center financially sustainable in the long run if DEP recycling grants were not available. These figures apply to current-day pricing, and would need to be adjusted for inflation over time. It should be noted that revenues required to offset the capital costs shown in the above table (which does not include the DEP grants) would be considerably lower if:

- DEP recycling grants are available in the future for capital equipment replacement; or
- The service life of the equipment and facility is prolonged past the lifespan indicated (which is not uncommon with public facilities).

For example, without DEP recycling grants, total annual costs (operating and annual capital) would be \$363,337 per year, or \$120.98 per ton (based on 2005 tons). However, if DEP grants are available in the future and it is assumed that they cover 90 percent of capital costs, then annual capitalization costs in current dollars would be an estimated \$6,486 per year. Total annual costs, then (operating and capital) would be \$304,860 per year or \$101.51 per ton.

## 5.3 Revenues

Facility revenues attributable to the Recycling Center operations consist of:

- Hauler registration fees;
- Administrative fees;
- The sale of recyclable materials;
- Recycling Coordinator Grants; and
- Recycling Performance Grants.

From an accounting standpoint, grants for equipment are also considered to be revenues; however, they are excluded here because they have been discussed with capital costs above. This analysis does not mirror the County's accounting system in that the Solid Waste Director's entire salary comes from the solid waste budget, per the County system. In actuality, however, he spends half of his time dealing with MRF issues; therefore half of his salary is included as an annual expense in this analysis. It is also assumed in this analysis that all of the solid waste budgeted costs are covered by administrative fees, and the recycling budget receives remaining administrative fee revenues.

All refuse haulers operating in the County must register with the County. The registration fee is \$10 base fee per hauler, plus \$50 per each vehicle licensed to operate in the County. There are fifteen haulers registered in the County. In 2005 registration fees were approximately \$2,100.

The sale of recyclable materials resulted in revenues of approximately \$177,219 in 2005.

Administrative fees in the County are \$4 per ton of disposed waste. Total administrative fees for 2005 were approximately \$135,000.

Because the legality of administrative fees is being challenged in various counties in the Commonwealth, the DEP encourages communities to strive to seek additional funding sources. Charging municipalities and private entities for processing recyclables is one way to raise some revenue; however the County fears that charging a processing fee to commercial entities for recycling will discourage recycling, as it is not mandatory. There are no commercial haulers delivering recyclables to the County facility.

## 5.4 Recycling Center Profitability

Based on the costs and revenues described above, the Recycling Center profitability is as summarized in Table 5-3.

**Table 5-3  
Estimated Recycling Center Profitability  
2005**

Revenues	\$303,761
Operating Costs	<u>\$298,373</u>
Net Operating Revenue (Expenses)	\$5,388
2005 Recapitalization Requirement	<u>\$64,865</u>
Net Surplus (Shortfall)	<u>(\$59,477)</u>

Note: Revenues and costs are based on 2005 data.

As shown by the figures in the table above, the Center is operating in the black with respect to net operating costs versus revenue. However, if the Center desires to provide for recapitalization of equipment, it will need to find other sources of revenue to cover the costs of doing so. Implementing the recommendations identified in this report will help to improve operational efficiency and address some safety concerns that currently appear to put the Center at risk; however these recommendations are not expected to result in substantial operational cost savings, if any. A certain amount of labor is working at no cost to the County already, and the recommended changes are unlikely to reduce the need for existing labor. The Center could work to increase tonnage flow into the facility and to increase revenue from the sale of material both of which could improve per-ton net costs, but may also result in additional costs such as the need for more staff or a new baling system.