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**Recycling Technical Assistance
Project # 484
Snyder County
Solid Waste Authority**

**Comparison of Recycling
Center Options**

July 2010



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Introduction

The Recycling Technical Assistance Program is sponsored in partnership by the Pennsylvania Department of Environmental Protection (DEP) through the Solid Waste Association of North America (SWANA), the Pennsylvania State Association of Township Supervisors (PSATS) and the Department of Community and Economic Development (DCED) Governor's Center for Local Government Services. Qualifying municipalities wishing to enhance their recycling, composting, and waste reduction programs are provided with professional support to assist them achieve their goals and objectives.

Recently, Snyder County was the recipient of an Act 101 Section 902 Grant to be used for the construction of a recycling center and fork lift to be used in its operation. Absent from the award, but requested in the grant application were funds for a vehicle and additional roll-off containers. Because the grant was for the limited amount of \$327,000 the County is hoping to right size its program to make best uses of the funds and its current resources Therefore the County and the Solid Waste Authority are seeking support from the Technical Assistance Program to determine the material mix, anticipated volumes, and costs and potential revenues associated with the building and operation of a recycling center.

As the consultant selected to manage the project, Nestor Resources, Inc. is pleased to submit to the Snyder County Solid Waste Authority and the Snyder County Board of Commissioners our findings and recommendations. This report includes background data, resources and references, as well as explanations and justifications for the consultant's suggestions.

Background

Snyder County is situated on the western banks of the Susquehanna River in central Pennsylvania. Although it is about an hour's drive from the state capitol of Harrisburg, Snyder is a very rural county. Only one of its municipalities, Selinsgrove Borough, is designated as an urban area. The remainder of the County consists of small boroughs and townships with low population densities. According to the Center for Rural Pennsylvania, in 2008, Snyder County had a population of roughly 38,000 people. The majority of the population can be found in the eastern portion of the County. Only two major roadways provide access through the County. Route 11/15 handles traffic north and south, while Route 522 is the major artery traveling east/west.

Because time and distance are major cost considerations in developing a recycling collection program, transportation costs can prove to be prohibitive in rural areas. However, in spite of such obstacles the Snyder County Solid Waste Authority and several municipalities have managed to provide recycling

opportunities throughout the County. The purpose of this project is to assist the County in exploring the future potential of these programs.

Project Scope of Work

Task #1. Nestor Resources met with representatives from the County and the Solid Waste Authority to discuss the expectations and visions associated with development of the County's proposed recycling center. The consultant provided a brief overview of the issues, opportunities and constraints that must be considered in the planning and design for such a facility. Additionally, the consultant discussed with the County a budgetary target.

Task #2 Nestor Resources, Inc reviewed the historic waste generation and recycling data available from Snyder County. This information was compared to national and state trends to determine the current and projected level of material recovery that could be expected in the County's program. The consultant utilized this analysis to determine the processing and collection capacities that could be required for the proposed recycling center.

Task #3 Based on the information provided by the County and the consultant's experience in similar projects, Nestor Resources provided cost breakdowns of eight conceptual facility options designed to handle various collection and processing scenarios. The consultant presented the findings to the County and Solid Waste Authority representatives.

Task #4 Nestor Resources, Inc. prepared and submitted to the Pennsylvania Department of Environmental Protection (PADEP) for review and comment, a draft project report, which summarized the consultant's findings and recommendations. Based on the PADEP's input, the consultant revised and finalized the report. Both the Snyder County Solid Waste Authority and the Department were provided with the report in electronic format. In addition, a hard copy of the document was provided to the Authority.

Summary of Findings and Recommendations

This study presents an analysis of the reported materials recycled in Snyder County with regard to the feasibility of establishing a centralized material receiving and processing facility. The assessment was based on data for 2009 recycling quantities recorded on the county's RE-TRAC report to the PA DEP. The data was screened to exclude items not normally included in a recycling program such as scrap metal, oil and other industrial or special handling wastes. Also yard and leaf waste was generally excluded except where noted.

The following is a summary of the consultant's findings and suggestions for Snyder County:

- The current recycling collection programs are located to serve municipalities that include 75.1% of the 2009 county population. When the Mt. Pleasant Mills site is in operation, 89% of the population has access to recycling opportunities.
- The accessibility of recycling is admirable for a small rural county. Minimal growth is required to conveniently serve nearly all residents, particularly when the traffic flow of the population is considered in relationship to the existing sites.
- Snyder County's combined total quantity of material reported is relatively large considering that the program consists of primarily drop-off collection points. Thus, it is not expected that substantially more materials will be collected even if collection hours are expanded. Snyder County already ranks favorably when compared to state and national averages.
- The Snyder County Solid Waste Management Authority sites account for 30.5% of the reported residential recycling in the County. The other sites operated by the various municipalities account for over 68% of the total tonnage recycled. Selinsgrove collects 32.8% of the residential materials recycled; more than the combined total of all of the SWMA sites.
- At this point in time, the bulk of materials collected in Snyder County are sent to the Lycoming County Material Recovery Facility for recycling. No revenue is received for the materials and the transportation costs are partially paid by the SWMA or the municipalities. A few programs deliver material elsewhere and may be compensated for the sale of materials.
- Based on the hauling distance, the terms of the agreement, and prices from other Pennsylvania facilities recently evaluated by Nestor Resources, it appears that the value of the materials partially subsidizes the hauling cost to the Lycoming MRF.
- Whether the municipalities would be interested in eliminating or modifying their individual programs and directing material to a center in Snyder County is uncertain, particularly if it increased a municipality's costs or decreased its revenue.
- Eight cases were evaluated to determine the feasibility of SWMA constructing and operating a centralized recycling facility
- It appears that a centralized facility is attractive *only* if 1) the Solid Waste Management Authority controls all of the materials being recycled in the County, 2) recent high commodity prices persist, (particularly for newsprint)

and 3) the Authority is willing to take on expenses currently being paid by municipal programs.

Snyder County Recycling Program Analysis

In order to establish the potential success of a centralized recycling facility, it is necessary to understand some basics of the recycling industry. A first step is identifying how and what materials are currently collected. Equally important is knowing the amount of materials collected and who controls the destiny of those materials. Finally, understanding the steps required to add value to the materials and the overall associated expenses in the whole process are crucial.

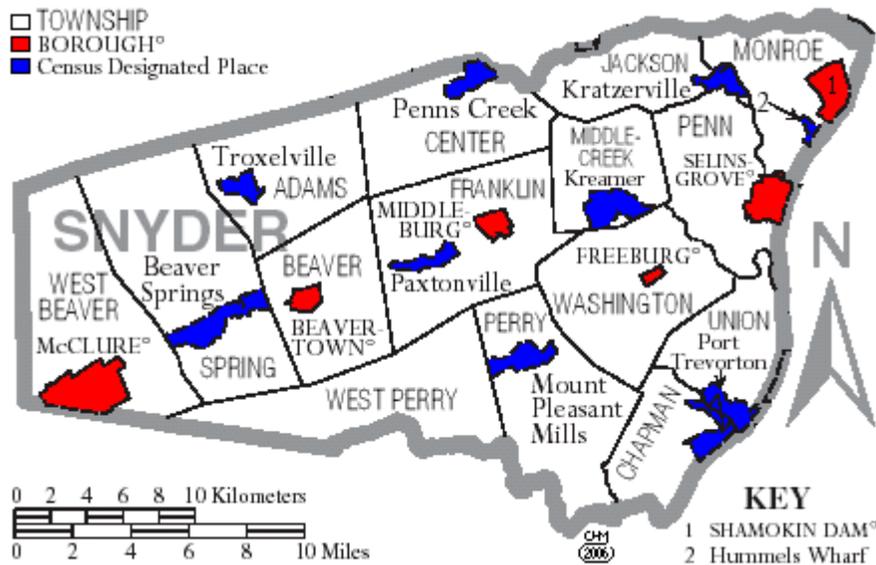
The Snyder County Solid Waste Management Authority has been contemplating the feasibility of operating a centralized recycling center for over a decade. Although a preliminary design was provided to the SWMA in a 1999 Recycling Technical Assistance Study, cost estimates for the operation of a facility were not included. Because Act 101, Section 902 grant funding covers only the purchase and/or construction of equipment or buildings, Snyder County desires to establish its ability to sustain the proposed center's operation for the short and long term.

This section reviews the current recycling activities in Snyder County. Additionally, it provides insight into the impact a centralized facility could have on current programs in a variety of scenarios. It also provides associated estimated cost projections based on a series of controlled assumptions.

Current Recycling Opportunities

There are 21 municipalities in Snyder County with the Borough of Selinsgrove being the only one mandated to recycle by Act 101. The current recycling programs are located to serve municipalities that include 75.1% of the 2009 county population. When the Mt. Pleasant Mills site is in operation, 89% of the population has access to recycling opportunities. The accessibility of recycling to the general population is admirable for a small rural county. It leaves minimal opportunities to grow, particularly when the traffic flow of the population is considered in relationship to the existing sites. Figure 1 shows the County and the location of the municipalities.

Figure 1 – Map of Snyder County and Municipalities



Source: US Census Bureau modified by Wikipedia

The collection programs which operate in Snyder County fall into three categories. First are sites operated by the Snyder County Solid Waste Management Authority. Next are drop-off sites sponsored by local municipalities or organizations. Finally there are municipalities that provide curbside collection service either with or without a supplemental drop-off site. Following is a description of the various programs and their most recent performance statistics.

Snyder County Solid Waste Management Authority Sites

A series of drop-off sites are operated in conjunction with the municipality and the Snyder County Solid Waste Management Authority. (SWMA) The SWMA has an agreement with Lycoming County to provide transportation, processing and marketing services for the following locations:

- Kreamer (Middlecreek Township)
- Middleburg / Franklin Township

- Penn Township
- Port Trevorton (Chapman & Union Townships)

In 2009 SWMA sites collected 203.8 tons of material from residential sources. Newsprint and magazines accounted for over 60% of the total. These sites accounted for 30.5% of the recycled material collected from residential sources in Snyder County. The municipalities serviced include 32.6% of the county population. The Middlecreek site collected 37.6 tons of material, the Middleburg site collected 58 tons, the Penn Township site collected 55 tons and the Union Township site collected 53.2 tons.

Some cardboard and other commercial materials are collected at the Penn Township site. These materials account for 3.3% of the commercial materials collected in the county.

Monroe Township

The Monroe Township site, although open only 5 hours per month, receives a relatively large volume of material. The Township accepts materials without regard to whether or not people reside in the Township or the County. Monroe Township contracts directly with Lycoming for transportation, processing and marketing. This site has been in operation since about 1990.

In 2009 the site collected 117 tons from residential sources, 17.5% of the total residential recyclable collection in the County. The Township includes 10.7% of the County population. The site also collected 751.03 tons from commercial sources, including 726.83 tons of cardboard. Monroe accounted for 26.8% of the commercial recyclable collection in the County and 25% of the total collected from all sources.

Selinsgrove Borough

This Borough is the only mandated community in Snyder County. Selinsgrove residents pay a quarterly fee on their water bill to cover recycling and the annual clean-up. Therefore, access to and use of the drop-off collection site is limited to Selinsgrove residents. Selinsgrove has an agreement with Lycoming County to transport and process its collected materials.

Residential collection from both drop-off and curbside collection is reported for the Borough. In 2009 the Borough reported collecting 1069.1 tons from residential sources and 377.5 tons from commercial sources, for a total of 1446.6 tons. The Borough accounted for 70.4% of the residential recyclable collection in the County, 13% of the commercial collection and 32.7% of the total collected from all sources. The Borough contains 14.1% of the county population.

The reported materials collected from Selinsgrove's commercial sources, included 273.6 tons of cardboard. The quantity reported from residential sources included 850 tons of leaf and yard waste. This was the only collection site to report these materials from residential sources, most likely because it is the only mandated community. If yard waste is not included in the analysis, the Borough accounted for 32.8% of the residential recyclable collection in the county, 13.5% of the commercial collection and 17.2% of the total collected from all sources.

Spring Township

This Township together with Adams, West Beaver & Beavertown Borough operates a combined recycling program. These municipalities use the local hauler Cocolamus to transport their roll-off containers which are used to collect glass & cans. Spring Township's municipal employees also haul a compartmented trailer used to collect plastics to a recycling outlet.

In 2009 this joint program collected 94.3 tons from residential sources, 14.1% of the total residential recyclable collection in the county and 2.7% of the total collected from all sources. No material was reported as being collected from commercial sources. The municipalities serviced contain 11.6% of the county population.

Shamokin Dam

A curbside collection program for plastics, glass & aluminum is provided in Shamokin Dam. Borough employees and trucks are used to provide the collection services. The material is transported to the City of Sunbury's drop-off site in Northumberland County. The Borough contains 3.8% of the County population.

Shamokin Dam did not report the results of its activities to Snyder County. Thus those figures were not included in the County's annual report. Therefore, the Shamokin Dam program was excluded from this analysis.

McClure Borough

After a period of inactivity, McClure Borough re-opened its drop-off site. Here users pay a set fee per car or per truck to use the drop-off container, which is on loan from SWMA. The Borough has an agreement with Pheasant Valley Recycling to transport the materials to a recycling outlet.

In 2009 the site collected 26 tons from residential sources, 3.9% of the total residential recyclable collection in the County and 0.7% of the total collected from all sources. No material was reported as being collected from commercial sources. The Borough represents 2.4% of the county population.

Selinsgrove Center

Located in Penn Township, Selinsgrove Center is a state operated institution for mentally challenged individuals. The Center operates a recycling center which accepts newspaper, office papers and OCC. In addition to local sources of material, other state operated facilities ship material to the Center for processing and marketing.

The Center is reported to be the source of 1,141.19 of cardboard included in the County-wide data. The materials reported as County-wide data accounted for only 1.3% of the residential recyclable collection in the county, but was 56.5% of the commercial collection and 45.8% of the total collected from all sources.

Mt. Pleasant Mills

Although currently closed, the Mt. Pleasant Mills site previously served Perry, West Perry Washington Townships and Freeburg Borough. These communities contain 13.9% of the county population. The SWMA has considered re-opening this drop-off site. The addition of the Mt. Pleasant Mills location would expand recycling opportunities so that they would be available to nearly all residents in the County.

Program Performance

Table 1 presents a summary of the current recycling program. The current drop-off and curbside collection programs directly serve 75.1% of the County population. If the site at Mt. Pleasant Mills were reactivated 89% of the population would be directly served. The current SWMA and municipal programs collect 98.7% of the reported residential recycling in the County. Other programs account for 56.5% of the commercial recycling reported. Over 90% of the material reported as commercial recycling is cardboard or wood waste. Analysis of the Snyder County recycling program was focused on residential recycling.

Table 1 – Recycling Program Statistics

<i>Snyder County Recycling Programs</i>				
<i>Recycling Program</i>	% of County Population Served	Percent of Residential Recycling	Percent of Commercial Recycling	Percent of Total Recycling
SWMA Sites	32.6%	30.5%	3.3%	8.5%
Monroe Township	10.7%	17.5%	26.8%	25.0%
Selinsgrove Borough	14.1%	32.8%	13.5%	17.2%
Spring Township	11.6%	14.1%	0%	2.7%
Shamokin Dam	3.8%	n/a	n/a	n/a
McClure Township	2.4%	3.9%	0%	0.7%
County-wide Data	100%	1.3%	56.5%	45.8%
Total Population Served	75.1%	100%	100%	100%
Mt Pleasant Mills	13.9%	closed	closed	closed

* Some totals may appear to be in error due to rounding

As indicated, the SWMA sites account for 30.5% of the reported residential recycling in the county. The other sites operated by the various municipalities account for over 68% of the total tonnage recycled. Figure 2 illustrates how the various locations contribute to the sum total of recyclables that are reported in Snyder County.

Figure 2 – Breakdown of Reported Residential Recycling by Location

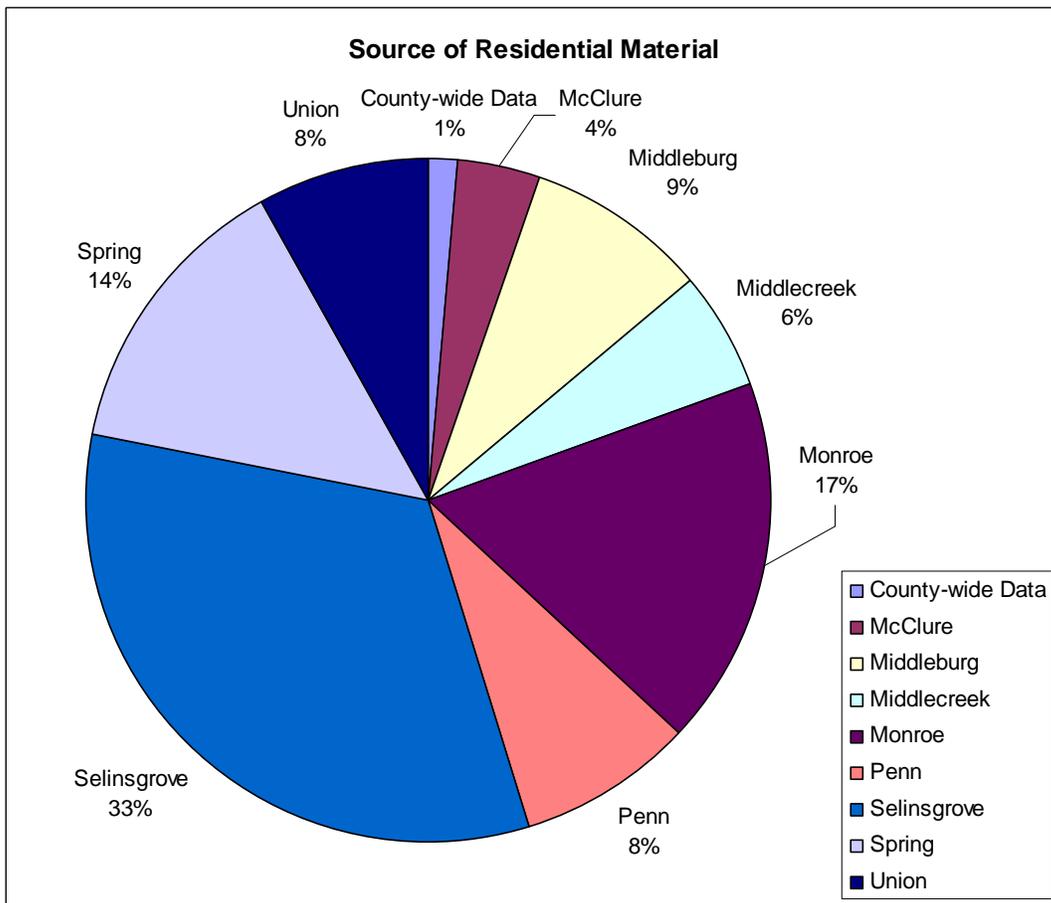


Table 2 presents more detail on the types and quantities of materials recycled by the SWMA and other locations. The column titled “Expected – tons” indicates the tons of the material that would be collected from residential sources if collected at the same rate as it is nationwide. As shown in the last two columns, the percent of expected is good when compared to reported state median values, especially considering that most of the material is collected at voluntary drop-off sites.

Table 2 – Comparison of SWMA Material Recovery to Other Programs

<i>2009 SWMA Material Recovery vs. Other Snyder County Programs</i>						
Material	Expected Tons	SWMA Drop-off Sites Tons	Other Snyder County Locations Tons	Total Tons	Total % of Expected	State Median % of Expected
Glass Containers	289	30.96	100.63	131.59	45.5%	53%
Aluminum Cans	74	3.04	7.6	10.64	14.4%	38%
Bi Metal Cans	154	13.16	19.79	32.95	21.4%	20%
Plastic #1 & #2	133	24.12	33.68	57.8	43.5%	8%
Newspaper	824	101.02	139.51	240.53	29.2%	32%
Magazines	67	28.69	63.03	91.72	136.9%	42%
Office Paper	134	0.74	11.2	11.94	8.9%	25%
Mixed Paper	400	0	8.7	8.7	2.2%	N/A
Corrugated Boxes	285	2.05	42.86	44.91	15.8%	62%
Total	2360	203.78	427	630.78		

State Median % of Expected as computed by Nestor Resources based on ReTRAC data

Proposed Recycling Center

In 2010, Snyder County was awarded an Act 101 Section 902 Grant for \$327,000 to construct a recycling center. A portion of the funds were also targeted for the purchase of a forklift. Lacking from the funds awarded were those intended to be allocated for the purchase of a vehicle and additional roll-off containers to provide SWMA the independence to transport materials from its drop-off sites and the recycling facility.

The County’s intent, as described on the grant application, was to provide for a central recycling location with sufficient storage to collect and allow accumulation of materials for bulk shipping. The hope was that this process could lower transportation costs. Additionally, depending upon where the materials were sent for recovery, it was thought possible to obtain some revenue from resale of the materials to offset the cost of transportation and processing. The County’s recycling program consists of several drop-off centers open only four hours a month. It is initially planned to operate the proposed center three days per week. The grant application indicates intent to eventually operate the facility five days per week.

Currently the bulk of materials collected in Snyder County are sent to the Lycoming County Material Recovery Facility for recycling. No revenue is

received for the materials and the transportation costs are partially paid by the SWMA or the municipalities, depending upon frequency of collection and ownership of the particular program. A few programs deliver material elsewhere and may be compensated for the sale of materials.

Originally it was planned to construct a new facility next to the county prison. Another option which recently presented itself is to renovate structures remaining from an old dairy farm close to the prison. Lastly, some consideration has been given to partnering with a local municipality that could offer easy access to residents travelling to work or shopping. If feasible it is intended to use prison labor or juvenile probation candidates to assist in sorting the materials.

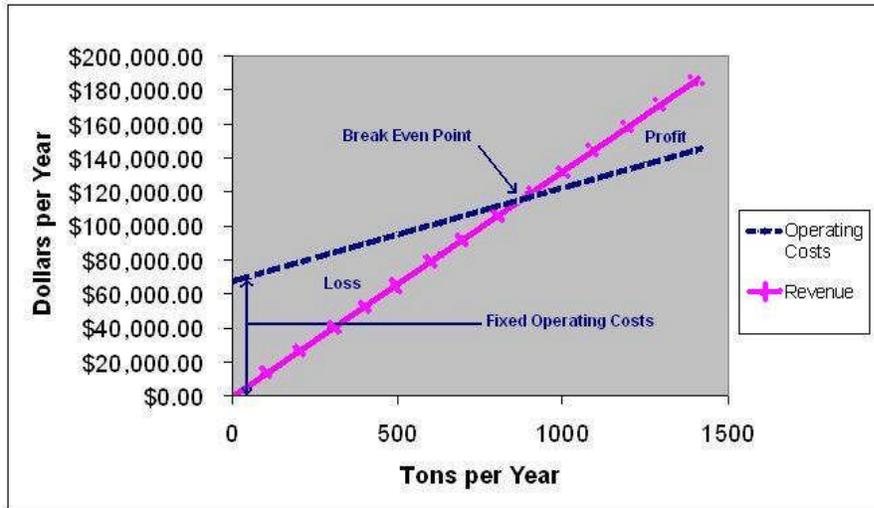
The Economics of Material Recovery Facility Operations

The principal consideration in evaluating the feasibility of a material recovery facility is determining whether the facility will be profitable, or if not, whether the expected losses are acceptable. In performing an evaluation, projected revenues from material sales are balanced against operating costs. Generally, revenue from material sales is directly related to the volume of material processed and sold. While material prices will vary from time to time, at any given point, the revenue obtained from material sales will equal the unit value of the material sold times the quantity sold.

Operating costs have a more complex relationship to material quantities. Total operating costs are the sum of two components: fixed operating costs and variable operating costs. Fixed operating costs are somewhat independent of the quantity of material processed and sold. Costs included in this category are capital recovery costs, utilities, and labor. While labor can be dependent upon material volumes, over a large range of volumes, labor costs are constant. Thus, if a facility is operated three days per week, labor costs are the same whether 100 tons per year or 1,000 tons per year are processed.

Variable operating costs are dependent upon material quantities and include factors such as transportation costs and residue disposal. The greater the quantity of material shipped or disposed, the greater the cost. Figure 3 graphically illustrates the relationship between operating costs, revenue and material volumes.

The figure illustrates that a breakeven point exists where operating costs balance revenues from material sales. At volumes below this point, the facility will operate at a loss. At volumes above this point, the facility will generate a profit. The figure also illustrates that the lower the tonnage of material processed is below the breakeven point, the greater the loss. Alternately, for volumes above the breakeven point, the larger the volume processed, the greater the profit.

Figure 3- MRF Economics

The location of the breakeven point and the amount of profit or loss will vary depending upon specific factors. However, the general relationship between material volumes, revenue and operating costs illustrated by the figure will remain unchanged regardless of the specific details of material volumes, market prices for materials processed and operating costs.

For Snyder County, Nestor Resources analyzed a variety of cases with different assumptions. However, in all of the cases, the amount of profit or loss expected is a function of the quantity of material processed. The lower the quantity of material processed, the lower the profit generated or the greater the loss incurred. These cases are described in detail in the next section of this report.

Evaluation of Operational Options

Before moving forward and formally accepting the Act 101 grant, the Snyder County Board of Commissioners thought it was prudent to examine the potential costs/benefits, if any, of constructing a new recycling center, versus making other modifications to the existing program. Several factors were evaluated in the comparative analysis. In many cases simplified assumptions regarding the relative costs of alternatives were made to facilitate the comparison. The factors evaluated and the assumptions made are discussed in the following paragraphs.

Available Materials

As noted above, SWMA sites account for 30.5% of the reported residential recycling in the County. The other sites operated by the various municipalities and organizations account for over 68% of the total tonnage recycled. It is worth noting that Selinsgrove Borough is a mandated community with a curbside and drop-off program. Selinsgrove collects 32.8% of the residential materials recycled; more than the combined total of all of the SWMA sites. Whether the municipalities would be interested in eliminating or modifying their individual programs is uncertain, particularly if it increased a municipality’s costs or decreased its revenue.

Currently, the total quantity of material reported is relatively large considering that the program consists of primarily drop-off collection points. Thus, it is not expected that substantially more materials will be collected even if collection hours are expanded. Snyder County already ranks favorably when compared to state and national averages.

Alternately, changes in the program that might reduce the convenience of the existing drop-off sites could reduce the quantity of material collected. Based on experience at other locations, it is not unreasonable to expect that limiting collection to a single centralized drop-off site could reduce the quantity of material collected to 50% of the current amount.

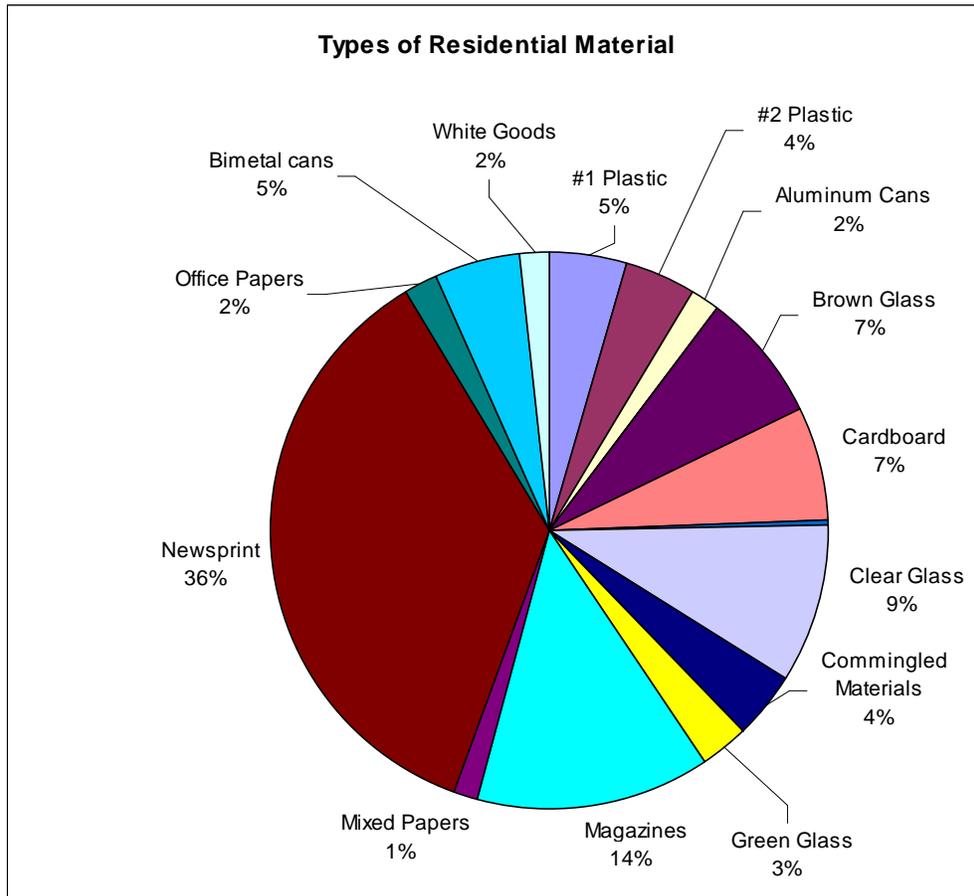
Value of Recycled Materials

Recycled materials are commodities and their values vary widely. Not only do they differ in worth based on types of materials, they also fluctuate in price based on demand and other market factors. A year or so ago with prices depressed and commodities were at about 66% of current values. In this evaluation the unit values shown in Table 3 were used.

<i>Table 3 - Unit Value of Recycled Materials</i>		
	Commodity Unit Price - \$/ton	Sorted Unit Price - \$/ton
<i>Clear Glass</i>	\$0.00	\$18.00
<i>Brown Glass</i>	\$0.00	\$25.00
<i>Green Glass</i>	\$0.00	\$2.00
<i>Newspaper</i>	\$90.00	
<i>OCC</i>	\$125.00	
<i>Magazines</i>	\$90.00	
<i>Office Paper</i>	\$175.00	
<i>Plastic #1 & #2</i>	\$50.00	\$400.00
<i>Aluminum</i>	\$1,300.00	
<i>Bi Metal</i>	\$225.00	

These commodity rates are based on a combination of market indexes, and rates realized by other Pennsylvania private and public facilities. Worth noting is that newspaper and magazines are major contributors to the total revenue. Recent unit prices for these materials are relatively high when compared to historic values. Therefore a downturn in that market could have a significant negative impact on the program. Likewise, a shift in the types of materials collected or directed to an alternative outlet could also have a less than desirable effect on income. Figure 4 shows a breakdown of the current composition of the materials reported from residential recycling efforts in Snyder County

Figure 4- Breakdown of Reported Residential Recycling by Commodity



For sale of the materials, all of the material will likely need to be sorted to separate plastic, aluminum, etc. and to remove residue for disposal. When material is collected at unmanned drop-off sites, whether intentionally or through mistaken good intentions, the likelihood that contamination exists is high. When material is collected at a centralized manned center, materials can be sorted as they are received by a process of visual inspection and container segregation. Of perhaps greater importance is the need to bale or densify materials before shipping to market. Plastics, metal cans, paper, and cardboard, can be marketed loose, but are not actively sought by end markets in that condition. Moreover,

the value decreases significantly and the transportation costs increase proportionately. Local outlets that will bale and further process the material may take the loose recyclables but at a decidedly lower price, or free. The Lycoming County Material Recovery Facility currently has the capability to sort and bale materials it receives from Snyder County's sites. Processing costs factor significantly into the net worth of the materials.

Glass and plastic are worth much more if sorted into sub categories of material. Glass has little or no market worth when all colors are mixed. Prices range from \$20 to \$30 per ton when clear and colored glass are sorted from each other. Plastic is worth about \$50 per ton when #1 and #2 remain unsorted from one another. The price has potential to increase to around \$400 per ton if plastics #1 and #2 are sorted from each other. Other factors must be considered also. At least one public MRF with limited sorting and processing capabilities has determined that the increase value does not outweigh the labor costs to further sort plastics.

Unlike plastic and glass, the value of the other materials is not significantly enhanced by sorting and separating into smaller sub categories.

At recent market prices and with glass and plastic sorted, income even if SWMA processes all material is about \$92,000, and only about \$29,000 for SWMA sites. When considering revenue from the sale of the materials, the quantity needs to be adjusted for the approximately 10% of the reported total tonnage that will be lost as residue. Thus, the expected revenue from the sale of sorted materials would be \$83,000 for all materials and \$26,000 for the material from SWMA sites.

Without Glass and Plastic sorted, the value is about \$68,000 and \$20,000. These prices do not included transportation costs.

It is important to note that because Snyder will have no baling or densifying processing capabilities, local outlets for loose materials must be found in order to secure even minimal revenue. It is quite possible that local markets would offer less than these projections.

Transportation Costs

Most material collected at the various SWMA and other locations is being shipped to the Lycoming County Recycling Facility for processing and resale. In 2009 Snyder County material from all sources was about 5% of the material handled at the Lycoming County MRF. Distance from central Snyder County to Lycoming County MRF is about 35 miles

SWMA has an agreement with Lycoming that allows for a predetermined number of hauls per quarter, currently 25, before any transportation charges are incurred. The current transportation budget is \$10K for materials from SWMA sites over and above the set frequency. Based on the hauling distance, the terms

of the agreement, and prices from other Pennsylvania facilities recently evaluated by Nestor Resources, it appears that the value of the materials partially subsidizes the hauling cost to the Lycoming MRF. The quantity of material recycled from residential sources at the SWMA sites in 2009 was 204 tons. Thus the transportation charges were about \$50 per ton.

Other sites in the County recycled 427 tons, for a total of 631 tons. It is assumed that transportation costs for these materials would be similar. Thus, total transportation costs are probably about \$31K.

If materials from the other sites are to be directed to a centralized location, transportation of materials from those sites to the SWMA center will need to be provided. Otherwise, the collected volume will likely decrease substantially. Assuming local transportation costs at \$25/ ton for all materials handled, the cost of local transportation would be \$16,000. Currently, the largest municipal program, Selinsgrove, has an agreement similar to SWMA, in which Lycoming hauls materials without charge as long as frequency is below a set limit. Redirecting this material could trigger a cost increase in this and other situations.

Consolidating materials prior to shipping increases load density and can reduce hauling costs. If the intent of SWMA was to eliminate remote drop-off sites and centralize collection, then materials could be consolidated to ensure full loads and reduce the frequency of collection. Based on an analysis conducted by Nestor Resources of potential savings for a similar scenario in Elk County by consolidating materials, transportation costs might be reduced there by 50% or a total savings of \$15,000. It is estimated that a \$5,000 savings in transportation charges could be realized if SWMA sites were eliminated and one central site was in operation.

Labor Costs

The new SWMA center is initially planned be open three days a week. Expense in labor at \$25 x 8hrs x 3 days week = \$31,000 /yr. Labor for administering a sorting program, even if convict labor is used at no cost to the program is estimated at \$25 x 8hrs x 1 day week = \$10,400 /yr. As mentioned previously Lycoming must consider the expense of processing the materials as well as transportation when it determines the value of a commodity.

Other Costs

Contamination is a reality in drop-off collection programs. Therefore disposal of unwanted materials must be considered in the operating cost of the proposed center. Residue disposal @ 10% of total is 20 tons for SWMA sites and 67 tons for all sites. Based on the cost of dumpster rental and disposal at other facilities at \$75/ton this cost is \$1,500 for SWMA sites and \$5,025 when all locations are included. Heat and utilities, insurance and other miscellaneous expenses, are estimated to be \$5,000 per year.

Capital Costs

Amortization on the grant is probably \$21,000 /yr. This figure assumes a 4.5% annual interest rate and 30 years to recover \$250,000 in building expenses and \$77,000 in paving and support facilities with a 20 year lifetime. Based on the limited monies and increasing competition projected for future Act 101 grants, Nestor Resources always strongly recommends that capital costs be considered in a cost analysis and budgetary process. However, it is not uncommon for local government entities to ignore this suggestion and gamble on their ability to adequately maintain, repair and replace structures and equipment.

Cases Evaluated for Cost and Revenue:

Eight cases were evaluated using the described assumptions to determine the feasibility of SWMA constructing and operating a centralized recycling facility.

It appears that a centralized facility is attractive only if:

- The SWMA controls all of the residential recycling materials,
- Current high market prices, especially for newspaper persist, and
- The SWMA is willing to assume, or be otherwise compensated for, transportation costs that are being incurred by the other programs.

More details on the cases analyzed are discussed below and summarized in Table 4.

Base Case Study 1

The current with cost shared by SWMA and others. Most materials are transported to the Lycoming County MRF for recycling with a portion of the transportation costs offset by the value of the materials. Cost of transportation by the SWMA is \$10,000 per year. Based on relative tonnages, the cost for transporting other's materials is estimated to be \$21,000 per year. Total shared net cost is \$31,000 per year.

Case Study 2

SWMA controls all materials, including those from all other municipal programs. The location and method of handling remains unchanged. SWMA would arrange for and cover all transportation and staffing costs. Total SWMA net cost is \$31,000 per year plus staffing costs.

Case Study 3

SWMA eliminates all of its existing drop-off sites and directs all users of SWMA sites to deliver materials to a central location. No sorting or other processing would occur on-site. However, other municipal programs would remain unchanged. It is expected that only about 50% of the current SWMA material would be collected but some consolidation of materials occurs. Thus transportation costs are reduced to \$2,500. The capital recovery cost is \$21,000 per year and staffing costs for 3 day per week operation are \$31,000 per year. Miscellaneous expenses are \$5,000 per year. Net cost for the SWMA is \$59,500 per year and for the other municipalities is \$21,000. Total shared net cost is \$80,500 per year.

Case Study 4

SWMA eliminates all drop-off programs, including those of the municipalities, and directs all residents to a central location without sorting or local transportation. Likewise, materials from curbside programs would be directed to the facility. It is expected that only about 50% of the prior material is collected and some consolidation of materials occurs. Thus transportation costs are reduced to \$7,250. The capital recovery cost is \$21,000 per year and staffing costs for 3 day per week operation are \$31,000 per year. Net cost for the SWMA is \$59,250 per year.

Case Study 5

SWMA controls the materials from its drop-off sites; arranges for and covers the cost of local transportation to center and to processors; arranges for and covers the cost of sorting.

Local transportation is expected to cost \$5,000 per year. Labor for administering a sorting program, even if convict labor is used at no cost to the program is estimated at \$10,400 /yr and residue disposal is estimated at \$1,500 per year. Miscellaneous expenses are \$5,000 per year. Some consolidation of materials reduces long distance transportation costs to \$4,000 per year. The capital recovery cost is \$21,000 per year and staffing costs for 3 day per week operation are \$31,000 per year. Value of the materials realized from sales is \$26,000. Net cost for the SWMA is \$51,900 per year. Based on relative tonnages, the cost for transporting other's materials is estimated to be \$21,000 per year. Total net cost is \$72,900 per year.

Case Study 6

SWMA controls all materials, including those of the municipalities; arranges for and covers the cost of local transportation to center; no sorting occurs on-site. Local transportation is expected to cost \$16,000 per year. Some consolidation of materials reduces long distance transportation costs to \$15,500 per year. The

Table 4 – Snyder County Options for Operation of a Recycling Center

<i>Table 4. – Summary of Cases Evaluated</i>						
Case	SWMA		Net SWMA Revenue or Cost	Others		Total Net Total Cost
	Cost	Revenue		Cost	Revenue	
Base Case 1– current scenario with cost shared by SWMA and others. Transportation and staffing costs.	(\$10,000)	\$0	(\$10,000)	(\$21,000)	\$0	(\$31,000)
Case 2 - SWMA controls all materials, handling unchanged. SWMA responsible for transportation and staffing costs.	(\$31,000)	\$0	(\$31,000)	\$0	\$0	(\$31,000)
Case 3 - SWMA consolidates its materials to central location without sorting or local transportation.	(\$59,500)	\$0	(\$59,500)	(\$21,000)	\$0	(\$80,500)
Case 4 - SWMA consolidates all materials to central location without sorting or local transportation	(\$59,500)	\$0	(\$59,250)	\$0	\$0	(\$59,250)
Case 5- SWMA controls its materials, handles local transportation to center, with sorting. Net Value of sorted materials as revenue.	(\$77,900)	+\$26,000	(\$51,900)	(\$21,000)	\$0	(\$72,900)
Case 6 - SWMA controls all materials, handles local transportation to center, no sorting.	(\$88,500)	\$0	(\$88,500)	\$0	\$0	(\$88,500)
Case 7 - SWMA controls all materials, handles local transportation to center, with sorting. Net Value of sorted materials as revenue	(\$102,400)	+\$83,000	(\$19,400)	\$0	\$0	(\$19,400)
Case 8 - SWMA controls all materials, handles ½ of local transportation to center, with sorting. Net Value of sorted materials as revenue. No capital recovery costs included.	(\$76,000)	+\$83,000	+\$7,000	(\$5,400)	\$0	+\$1,600

capital recovery cost is \$21,000 per year and staffing costs for 3 day per week operation are \$31,000 per year. Miscellaneous expenses are \$5,000 per year. Net cost for the SWMA is \$88,500 per year.

Case Study 7

SWMA controls all materials, including those of the municipalities; arranges for and covers the cost of local transportation to center; arranges for and covers the cost of sorting.

Local transportation is expected to cost \$16,000 per year. Labor for administering a sorting program, even if convict labor is used at no cost to the program is estimated at \$10,400 /yr and residue disposal is estimated at \$5,000 per year. Miscellaneous expenses are \$5,000 per year. Some consolidation of materials reduces long distance transportation costs to \$14,000 per year. The capital recovery cost is \$21,000 per year and staffing costs for 3 day per week operation are \$31,000 per year. Value of the materials realized from sales is \$83,000. Net cost for the SWMA is \$19,400 per year.

Case Study 8

Case 8 is similar to Case Study 7 but without capital recovery costs included in the budget. Then the net cost for the SWMA is -\$1,600 per year. That is, a profit of \$1,600 per year. If local transportation costs can be shared with the municipalities, the cost of local transportation might be reduced by 1/3, (e.g. 1/2 of 2/3 of the cost paid by the municipalities). Then net profit might be increased to about \$7,000 per year.

Cost Estimates for Operation as Proposed in the Grant Application

One of the functions of this project was to determine the costs of operating a centralized recycling center in Snyder County as was envisioned in the Act 101 Section 902 grant application. The grant proposal requested equipment for transporting material to the center to avoid what were perceived to be high transportation fees now being charged in some cases. The grant award did not include the requested transportation equipment and the cases evaluated in assessing potential for use of the grant funds did not include the operation as Snyder envisioned it. This section presents the operation as originally proposed by Snyder and shows that the costs incurred would likely exceed those currently experienced.

The following excerpt from the grant application describes the original proposal:

SWMA would like to open a permanent drop-off center for Snyder County. SWMA is applying for site preparation, cement pad for roll-offs, a building, roll-offs, signs, fencing and a truck to transport our roll-offs. SWMA is not applying for processing

equipment. The plan is to use Lycoming County's recycling center to process any recyclables that would need to be baled.

The drop-off is to be open a minimum of 3 days a week to maybe 6 days a week. Now our drop-offs are usually open 4 hours a month.

Currently the program is struggling with transportation costs for many of our drop-offs. Some areas of the county would like to be able to start a recycling drop-off, but because of transportation costs have choose not to open a drop-off or to only collect limited materials.

The estimated charges for material transportation to the Lycoming County MRF are partially covered by the revenue from material sales with additional charges above a limited number of pulls. In the analysis, Nestor Resources estimated that the cost for the additional charges were \$10,000 per year for SWMA and a total \$31,000 per year for Snyder County.

Table 5 presents an estimated cost for operating a recycling program as described in the grant application. As shown it is expected that the program would cost \$85,000 per year.

Alternately, Snyder might negotiate an arrangement with Lycoming County where Snyder transports material to the Lycoming County MRF and receives the value from material sales. In this case Snyder County costs would increase by an additional \$20,000 for transportation costs and residue disposal. The total cost to Snyder would be \$105,000 per year. If material sales generated \$83,000 per year, the net cost would be \$22,000 per year.

Table 5 Estimated Annual Costs for the Original Grant Proposal
SWMA Proposed Recycling Program Cost Estimate

Capital Recovery	\$33,400
Site: \$135,000, amortized for 25 years at 4.5% = \$9,100 per year	
Roll-offs: \$30,000, amortized for 10 years at 4.5% = \$3,800 per year	
Truck: \$162,000, amortized for 10 years at 4.5% = \$20,500 per year	
Labor for staffing center	\$31,200
24 hr/wk x 52 wk/yr x \$25/hr*	
Labor for Truck operation	\$10,400
8 hr/wk x 52 wk/yr x \$25/hr	
Expenses for Center operation	\$5,000
Expenses for Truck operation	\$5,000
\$100/wk x 52 wk/yr, say	
Total:	\$85,000

*Source: <http://www.bls.gov/news.release/ecec.nr0.htm>
 Bureau of Labor Statistics press release: WEDNESDAY, DECEMBER 9, 2009
 EMPLOYER COSTS FOR EMPLOYEE COMPENSATION-SEPTEMBER 2009

State and local government employers spent an average of \$39.83 per hour worked for total employee compensation in September 2009, the U.S. Bureau of Labor Statistics reported today. Wages and salaries averaged \$26.24 per hour worked and accounted for 65.9 percent of these costs, while benefits averaged \$13.60 and accounted for the remaining 34.1 percent.

Conclusions

For residents in Snyder County, recycling is generally available. If the Snyder County Solid Waste Authority were to reopen its drop-off site in Mt. Pleasant Mills, nearly 90% of the population would have access to either drop-off or curbside recycling. That is significant coverage for a county that is primarily rural.

Providing these services has been a collaborative effort on the part of the SWMA and several of the municipalities. Likewise, local private sector haulers and recyclers as well as the Lycoming County Resource Recovery Facility have made recycling possible. Careful consideration must be given to the delicate balance which exists between all of these participants and the current success of their joint efforts. If not well orchestrated, a change in one component of the overall system could have a rippling effect on the others.

This study presents a variety of operating scenarios for consideration by the SWMA and the Board of Commissioners. All but two of the case studies increase the current costs. It is anticipated that in many of the options lesser rather than greater quantities of recyclables would be recovered. All but one of the scenarios requires subsidies from the County or other sources and that option does not provide for future structural/equipment repair or replacement. In general, all of the options, even the one which could show a slight profit, are vulnerable to a shift in the commodities market and the mix of materials delivered for recycling.

Any of the case studies could be implemented. None are out of the realm of possibility. However, intergovernmental agreements and cooperation would be required as well as a willingness on the part of the County to subsidize the operation and some potential cost sharing with the municipalities.

Nestor Resources is confident that the background information provided in the report, along with the numerous options will assist the Snyder County Solid Waste Authority and the Board of Commissioners to determine whether or not to accept grant funding and move ahead with construction of a center. The findings will also help Snyder County to better communicate its intentions to potential municipal and civic partners.



Nestor Resources, Inc.