

**SWANA RECYCLING  
TECHNICAL ASSISTANCE STUDY**

**PROPOSED BRADFORD COUNTY FIBER  
PROCESSING FACILITY**



Prepared for:

**NORTHERN TIER SOLID WASTE AUTHORITY  
WEST BURLINGTON TOWNSHIP,  
BRADFORD COUNTY, PENNSYLVANIA**

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**HARRISBURG, PENNSYLVANIA**

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Figure 1: Existing Material Recovery Facility and Site Location for Proposed Fiber Processing Facility

Figure 2: Conceptual layout – Fiber Processing Facility

## SWANA TECHNICAL ASSISTANCE STUDY PROPOSED BRADFORD COUNTY FIBER PROCESSING FACILITY

### 1.0 INTRODUCTION

The Northern Tier Solid Waste Authority (NTSWA) operates two material recovery facilities (MRF's); one in Bradford County and one in Tioga County. The NTSWA also services Sullivan County through a multi-county integrated solid waste management system. Combined, the two processing facilities are expected to process 4,500 tons of recyclable materials in the year 2001.

Through the partnership with the Solid Waste Authority of North America (SWANA), the Pennsylvania State Association of Township Supervisors, and the Pennsylvania Department of Environmental Protection (PADEP), the NTSWA was awarded \$6,000 in technical assistance to be provided by Gannett Fleming, Inc. Gannett Fleming provided assistance to the NTSWA by developing a conceptual layout for a proposed Fiber Processing Facility that would be constructed at the NTSWA landfill site adjacent to the existing Bradford County MRF. The proposed facility would be used to bale, process, and store fibers such as cardboard, newspaper, magazines, office paper, and mixed paper. If constructed, the proposed facility would alleviate storage and operational problems that are primarily caused by processing and storing fiber in the existing Bradford County MRF, which has exceeded its processing and storage capacity. Gannett Fleming also made recommendations to NTSWA on potential improvements to materials processing methods at the Bradford County facility. This report contains the findings and recommendations of this study.

### 2.0 BACKGROUND

Over the last ten years the overall recycling program at NTSWA has matured. Through marketing efforts, hard work, and experience, the NTSWA has organized and developed a recycling program that currently collects aluminum cans, tin cans, plastic bottles (#1&#2), glass bottles and jars (clear, brown and green), cardboard, newspaper, magazines, mixed paper, office paper, textbooks and textiles. With the successful addition of materials such as textbooks and textiles, coupled with the annual volume increases for other recyclables (see Table 1), the NTSWA recycling program has expanded rapidly and the existing Bradford County MRF has outgrown its ability to process and store recyclable materials efficiently.

**Table 1: Bradford County Material Recovery Facility – Annual Recyclable Tonnage Increase**

Year	Recyclable Tons Processed	Tons Increased From Previous Year
2000	*2,450	+200
1999	*2,250	+475
1998	*1,775	+435

\*Tonnages are rounded and do not include all of the materials collected and processed by NTSWA shown in Table 3.

(Materials included in these tonnage calculations are: aluminum cans, tin cans, plastic bottles (#1&#2), glass bottles and jars (clear, brown and green), cardboard, newspaper, magazines, mixed paper, office paper, textbooks and textiles.)

### 3.0 RECYCLABLES COLLECTION

The NTSWA conducts a significant portion of the recycling collection and processing that takes place in Bradford, Tioga, and Sullivan Counties. The NTSWA provides curbside collection services to eight non-mandated municipalities throughout the three Northern Tier counties and assists with collection, processing and marketing of materials from many others. Curbside recyclables are primarily collected with specialized, compartmentalized curbside trucks, but packer trucks may be used to collect corrugated cardboard and other materials that can be difficult to handle. The NTSWA also services 39 public drop-off locations and approximately 35 in-house drop-off locations. Although the recyclable materials collected may vary slightly by municipality, the NTSWA primarily collects aluminum cans, glass bottles and jars, plastic bottles and jugs, tin cans, and newspaper through the curbside collection and drop-off programs. Magazines, mixed paper and office paper are also collected at the curb in some locations as well as from various commercial establishments and institutions. Cardboard collection yields the most volume per single commodity and is primarily picked up at local businesses.

Year 2000 tonnages for the recyclables collected by the curbside, drop-off, and cardboard collection programs are presented in Table 2. These tonnages represent total volumes for the materials (as listed) for the Bradford County and Tioga County facilities.

**Table 2: Recyclable Materials; Processed and Marketed**

<b>Materials Collected By Curbside/Drop-Off Programs</b>	<b>Total Tons Collected and Processed Year 2000</b>
Aluminum Cans	44.6
Glass Bottles and Jars	535.9
Plastic Bottles and Jugs	123.5
Tin Cans	202.5
Newspaper	692.8
Cardboard	1,193.6
Magazines and Mixed Paper	432.3
<b>TOTAL</b>	<b>*3225.2</b>

\*Tonnage represents recyclables after processing and marketing and does not include residue from initial collection.

Additional materials like clothing (textiles), textbooks and other recyclable materials (not typically collected by the curbside or drop-off programs) are collected through periodic drives or other programs organized by the NTSWA. Table 3 is a list of all the recyclable commodities generated and processed by the Tioga County and Bradford County facilities and includes the year 2000 volumes for each facility.

**Table 3: Year 2000-Marketed Recyclable Materials**

3A - Recyclable Volume Processed by Each Facility						
Commodity	Tioga County Processing		Bradford Co. Processing		Total Lbs.	Total Tons
	Pounds	Tons	Pounds	Tons		
Aluminum	19,410	9.71	69,726	34.86	89,136	44.57
Cardboard	685,080	342.54	1,702,150	851.08	2,387,230	1,193.62
Newspaper	409,360	204.68	976,250	488.13	1,385,610	692.81
Magazines	0	0.00	530,292	265.15	530,292	265.15
Mixed Paper	0	0.00	334,377	167.19	334,377	167.19
Plastic	73,929	36.96	173,051	86.53	246,980	123.49
Tin Cans	0	0.00	405,000	202.50	405,000	202.50
Clear Glass	184,694	92.35	404,286	202.14	588,980	294.49
Brown Glass	125,187	62.59	162,473	81.24	287,660	143.83
Green Glass	74,900	37.45	120,300	60.15	195,200	97.60
Appliances	313,700	156.85	536,150	268.08	849,850	424.93
Tires	0	0.00	694,960	347.48	694,960	347.48
Textiles	0	0.00	0	0.00	0	0.00
Scrap Metal	480	0.24	129,380	64.69	129,860	64.93
Used Oil	0	0.00	13,825	6.91	13,825	6.91
Batteries	0	0.00	0	0.00	0	0.00
Textbooks	27,020	13.51	0	0.00	27,020	13.51
Wood Waste	0	0.00	91,560	45.78	91,560	45.78
Office Paper	0	0.00	33,324	16.66	33,324	16.66
Freon	0	0.00	0	0.00	0	0.00
<b>Totals</b>	<b>1,913,760</b>	<b>957</b>	<b>6,377,104</b>	<b>3,189</b>	<b>8,290,864</b>	<b>4,145</b>

3B - Recyclable Volume Generated by Each Facility						
Commodity	Tioga County Processing		Bradford Co. Processing		Total Lbs.	Total Tons
	Pounds	Tons	Pounds	Tons		
Aluminum	19,410	9.71	69,726	34.86	89,136	45
Cardboard	685,080	342.54	1,702,150	851.08	2,387,230	1,194
Newspaper	409,360	204.68	976,250	488.13	1,385,610	693
Magazines	118,922	59.46	411,370	205.69	530,292	265
Mixed Paper	126,488	63.24	207,889	103.94	334,377	167
Plastic	73,929	36.96	173,051	86.53	246,980	123
Tin Cans	149,000	74.50	256,000	128.00	405,000	203
Clear Glass	184,694	92.35	404,286	202.14	588,980	294
Brown Glass	125,187	62.59	162,473	81.24	287,660	144
Green Glass	74,900	37.45	120,300	60.15	195,200	98
Appliances	313,700	156.85	536,150	268.08	849,850	425
Tires	0	0.00	694,960	347.48	694,960	347
Textiles	0	0.00	0	0.00	0	0
Scrap Metal	480	0.24	129,380	64.69	129,860	65
Used Oil	0	0.00	13,825	6.91	13,825	7
Batteries	0	0.00	0	0.00	0	0
Textbooks	27,020	13.51	0	0.00	27,020	14
Wood Waste	0	0.00	91,560	45.78	91,560	46
Office Paper	0	0.00	33,324	16.66	33,324	17
Freon	0	0.00	0	0.00	0	0
<b>Totals</b>	<b>2,308,170</b>	<b>1,154</b>	<b>5,982,694</b>	<b>2,991</b>	<b>8,290,864</b>	<b>4,145</b>

Source: NTSWA Annual Marketed Recycling Report

A total of 394,410 Pounds was transferred from the Tioga County facility to the Bradford County facility for processing.

#### 4.0 EXISTING BRADFORD COUNTY MATERIAL RECOVERY FACILITY

**Bradford County Material Recovery Facility (MRF):** The Bradford County MRF is located at the site of NTSWA Landfill located in West Burlington Township. When the facility was originally constructed in 1990 the NTSWA designed the Bradford County facility to process between 1,000 tons and 1,500 tons of recyclables per year. As described previously, the NTSWA recycling program has grown significantly since the time of original construction and the three-county program currently processes over 4,100 tons of recyclables per year. In year 2000, the Bradford County facility alone processed 3,189 tons (or 77 percent) of the 4,145 total tons collected by the NTSWA recycling program. The remaining volume was processed at a much smaller recycling facility operated by the NTSWA in Tioga County.

The Bradford County facility is the hub of the NTSWA recycling program because it processes most of recyclables collected by the recycling program and because of several other factors. The recycling facility is located at the NTSWA Landfill where landfill staff and nearby county prison staff (as available) are both used to assist with recyclables processing and associated tasks. The Bradford County facility has better access to major transportation routes than the Tioga County facility. Because of the proximity to these routes, the majority of marketing activities and hauling of NTSWA recyclable materials is conducted from the Bradford County facility. The Tioga County facility has a limited number of roads into its location, some of which are small or very rough. Consequently, haulers sometimes refuse to travel to the Tioga County facility for pickups or deliveries. Also, the administration offices of the NTSWA are located at this site. This allows for more efficient management of operations, coordination of work activities and staffing needs, scheduling of pickups and deliveries, and marketing of recyclable materials, and provides oversight for the entire NTSWA recycling program.

**Tioga County MRF:** The much smaller Tioga County facility processed the remaining 23 percent of total volume of materials collected by the recycling program in year 2000. Because of limited processing capabilities and limited staffing (only one full-time employee), the Tioga County MRF transfers materials (primarily paper products) to the Bradford County facility to expedite processing and final marketing of the materials (refer to Table 3).

#### 4.1 Bradford County MRF Processing Hindrances

Processing capabilities of tin cans, plastics, glass and other materials collected through the NTSWA recycling program appears to be adequate for these materials. However, processing is significantly hindered by interferences from fiber sorting activities, equipment processing capacity, storage needs, and other handling needs required to process the excessive volume of fiber material currently received at the existing recycling facility. In year 2000, the Bradford County Recovery Facility processed, baled, and stored 1,772 tons of fiber including: cardboard, newspaper, magazines, and mixed paper (refer to Table 3). The 1,772 tons of processed fiber accounted for 56 percent of the total volume (3,189 tons) of all NTSWA recyclables processed at the Bradford County facility in 2000. Additional volume began entering the Bradford County MRF in October of 2001 when the Tioga County facility began diverting all of its newspaper to the Bradford County site. This diversion of newspaper is not very large, but will increase the

Bradford County facility volume by approximately 200 tons per year based on the volume of newspaper processed by the Tioga County facility in 2000.

The large volume of fiber materials handled at the Bradford County facility slows the entire recycling operation as was observed by GF during the August site visit to the facility. GF observed slowed materials processing and throughput caused by:

- ◆ Limited indoor storage capacity: Bales, briquettes, and gaylords of recycled materials were stored in the recyclables processing area and directly outside of the recycling facility because of insufficient indoor storage. Bales stored inside the building were in the way of recycling processing activities and had to be moved frequently to enable processing and create floor space. Bales stored outside the facility restricted the movement of vehicles around the recycling facility.
- ◆ Restricted dock and floor space caused by gaylords filled with fibers that are stored on the floor until a sufficient quantity of material is available to make several bales. The accumulation of gaylords for fiber materials delayed recycling processing activities for other materials.
- ◆ A large amount of staff time was required to sort mixed loads of cardboard, newspaper, magazines, and mixed paper into gaylord containers that were stored on the dock floor near the baler prior to baling.
- ◆ The landfill has only one scale available for both landfill customers and for weighing recyclables. Recyclable materials collected in compartmentalized trucks are transported across the landfill scale up to 6 times to determine the weight for each recyclable material as each compartment is emptied. Often there was significant queuing behind landfill customers to complete the material accounting. Consequently, multiple weighing delayed material throughput and disrupted operation and processing flow.
- ◆ Roadway maneuvering space on the site and around buildings is limited. There is insufficient road access for recycling vehicles (and other vehicles) to load and unload materials optimally. Parking space for vehicles near the existing recycling facility is also limited.
- ◆ There is inadequate dock space for loading materials onto vehicles destined for market. Because multiple trailers cannot be loaded simultaneously, jockeys are forced to move trailers frequently to accommodate material loading.

## 5.0 PROPOSED BRADFORD COUNTY FIBER PROCESSING FACILITY

As described in the introduction of this report, the NTSWA requested technical assistance from Gannett Fleming to provide a conceptual layout of a fiber processing facility. The proposed fiber processing facility would provide storage for baled fiber and also remove all paper processing activities from the existing Bradford County Recovery Facility. Moving all paper processing and fiber baling activities from the existing recovery facility to a new fiber

processing facility will greatly improve the overall recycling operation/program and the recyclables throughput capacity for the NTSWA.

### 5.1 Gannett Fleming Site Visit

On August 08, 2001, Terry Keene, Marty Horn, and Steven Deasy of Gannett Fleming met with Lori Robson and Dave Terrill of NTSWA to tour and photograph the existing Bradford County MRF facility. There were two primary objectives of the site visit: 1) to determine potential site locations for the proposed fiber processing facility and 2) to identify processing hindrances at the existing recycling facility (refer to section 4.1).

### 5.2 Potential Site Locations for the proposed Bradford County Fiber Processing Facility

Based on observations from the site visit to the NTSWA landfill and based on discussions with the NTSWA, there were only two suitable locations for the proposed Bradford County Fiber Processing Facility. Site options were primarily limited because of the minimal amount of land available for constructing a facility at the NTSWA landfill site. The location of existing buildings, location of telephone and electric lines, existing traffic patterns, existing roads, a detention basin, property boundaries, and the existing steep grade were all limiting factors that influenced the location and layout of the proposed facility.

**Proposed Site Location 1:** In considering the above siting factors, GF proposed that the Fiber Processing Facility be located to the southwest of the existing MRF across from a miscellaneous storage building between the two existing utility poles (refer to Figure 1). The utility poles could be moved as needed during construction.

**Proposed Site Location 2:** The proposed Fiber Processing Facility could potentially be located between the existing Bradford County Material Recovery Facility and the Bale Storage building shown in Figure 1. Building the facility here would require the removal of at least one existing storage building.

### 5.3 Proposed Fiber Processing Facility - Conceptual Layout

The conceptual layout provided in Figure 2 of this report was designed for a facility that would be located at proposed Site Location 1; located along the access road to the existing recycling facility and across from a miscellaneous storage building. The conceptual layout design for the proposed facility takes advantage of the existing steep site grades and gravity through use of a two-level structure. The northern side of the proposed fiber processing facility (along the existing recycling road) would be accessed at or very near existing grade. Various collection vehicles would tip cardboard, newspaper, magazines, mixed paper and other fiber material directly into 10-foot-deep storage bunkers (see Figure 2). In some instances materials may need to be manually sorted into gaylords prior to tipping into the bunkers. After a large quantity of a particular fiber is collected in a bunker, a loader would move the material into a proposed 2-ram baler. Processed bales would then be moved to the storage area at the western end of the building. Stored bales would then be loaded directly onto trucks at the loading dock for shipping to markets.



## 6.0 CONCLUSIONS AND RECOMMENDATIONS

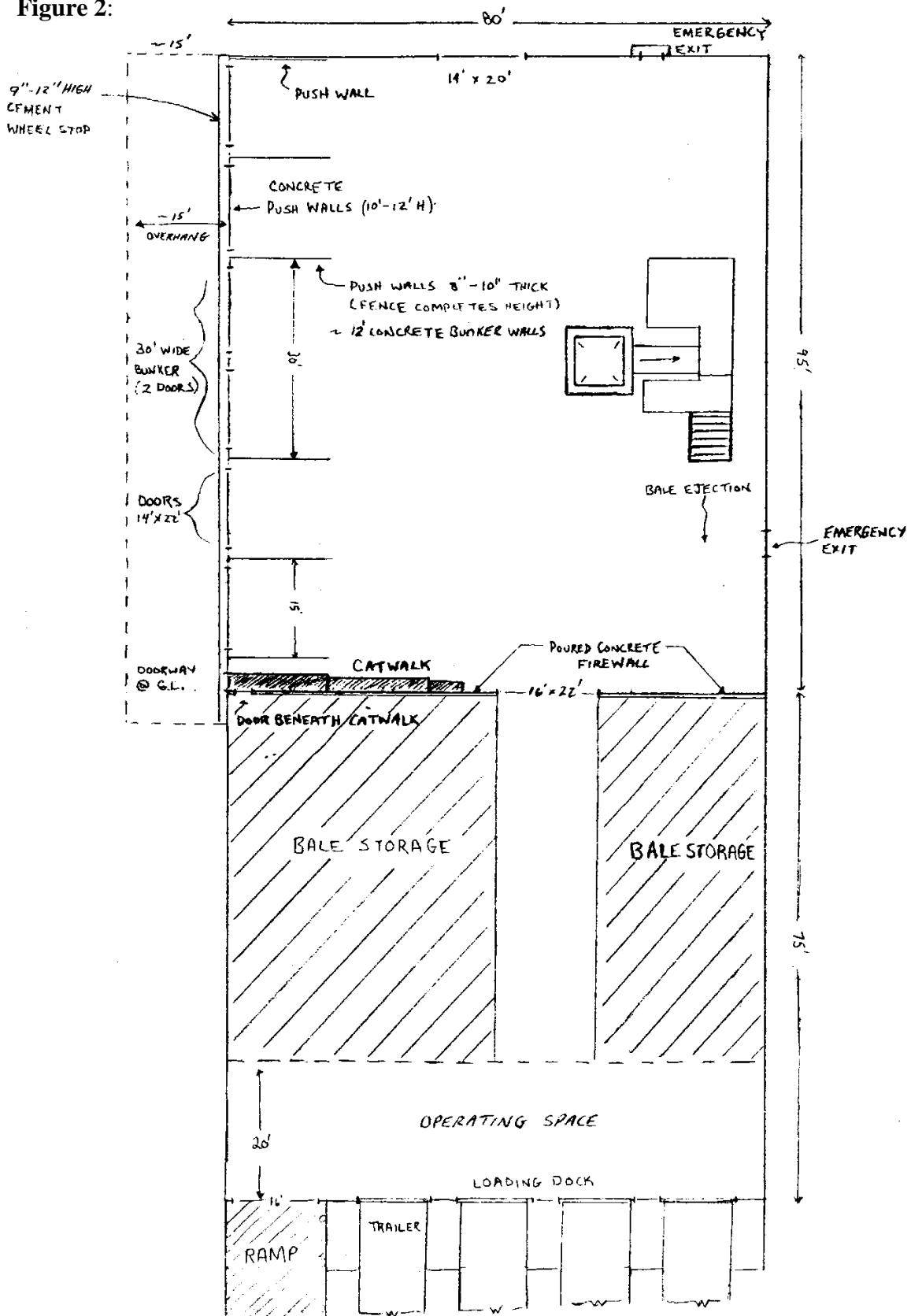
The annual increases in volume of materials (see Table 1), especially paper products, has exceeded the processing and storage capacity of the existing Bradford County Material Recovery Facility (MRF) and made it difficult for the NTSWA recycling facility staff to process and store materials efficiently. Improving the methods for receiving, processing, storing, and loading newspaper, cardboard, and mixed paper received by the recycling facility will directly reduce the time required to handle these paper products and will also facilitate the sorting, baling, and storage of plastics, steel and aluminum cans, and any additional materials accepted by the Bradford County MRF. The proposed fiber processing facility will provide the NTSWA storage for baled fiber and will also remove all paper processing activities from the existing Bradford County Recovery Facility. Moving all fiber processing and storage into the proposed Fiber Processing Facility will greatly improve the overall recycling operation/program for the NTSWA.

### RECOMMENDATIONS

- ◆ Separate the fiber processing from recyclable container processing in the existing Bradford County MRF by constructing a new facility for fiber processing and baled fiber storage.
- ◆ Continue using the existing Bradford County MRF building for containers and other non-fiber materials. Potentially, materials now stored outside the building could be moved inside to improve vehicle movement around the existing MRF.
- ◆ Utilize the Act 101, Section 902 grant program to apply for up to 90 percent of approved costs to complete the proposed Fiber Processing Facility construction project.
- ◆ Construct the proposed Fiber Processing Facility large enough to have sufficient processing capacity to accommodate anticipated future growth.
- ◆ Construct the storage area of the proposed Fiber Processing Facility large enough to store multiple loads of each fiber material and also provide sufficient storage capacity to accommodate fluctuating recyclables markets.
- ◆ Construct the proposed fiber processing facility to have multiple loading bays to expedite loading/shipping of recyclable materials.
- ◆ The NTSWA should continue to provide feedback to residential and commercial customers and continue to use education materials to minimize contamination in the mixed fiber loads that currently require sorting.

- ◆ A feasibility analysis should be conducted to determine an improved method for weighing and documenting recyclables received by the NTSWA at the Bradford County Facility.

Figure 2:



***FIGURES***