

**RECOMMENDATIONS FOR THE
WASHINGTON TOWNSHIP
MATERIAL RECYCLING FACILITY
AND
YARD WASTE COMPOSTING AREA**

Washington Township
Franklin County, Pennsylvania



December 2001



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Table of Contents

Introduction.....	1
Background.....	1
Purpose.....	2
Scope of Work	2
Findings	2
Task 1: Visit/Tour the MRF and Composting Facility	2
Task 2: Review MRF and Composting System Design Plans.....	3
Task 3: Identify Potential Markets for Recyclable Materials	5
Task 4: Offer Recommendations for Implementing Improvements.....	8
Conclusion	10

List of Tables

Table 1: List of Bale Weights Recorded at Washington Township’s MRF	3
Table 2: 1999/ 2000 Recycling Totals for Washington Township’s MRF.....	5
Table 3: List of Current Buyers for Recycled Materials Serving Washington Township...6	
Table 4: Primary Markets for Washington Township’s MRF Facility.....	7
Table 5: Secondary Markets for Washington Township Recycled Materials	8

Appendices

- Appendix A: Employee List of MRF Operational Issues
- Appendix B: Market Spreadsheet for South Central Pennsylvania
- Appendix C: Regional Manufacturers
- Appendix D: Yard Waste Composting - Trouble Shooting Guide
- Appendix E: Composting – Tracking Sheets

Figures

- Figure 1: Proposed Storage Building Layout

Introduction

The SWANA Recycling Technical Assistance Program, in conjunction with the Pennsylvania Department of Environmental Protection (PA DEP), the Governor's Center for Local Government Services, and the Pennsylvania State Association of Township Supervisors (PSATS) has helped Pennsylvania local governments interested in achieving higher recycling rates since the fall of 1998.

Funding for technical analysis and a professional review of Washington Township's Material Recycling Facility (MRF) and composting area was provided by SWANA in conjunction with PADEP after approval of the Washington Township's Pennsylvania Recycling and Technical Assistance Application on September 21, 2000. In addition to facility recommendations, a substantial portion of the \$5,000 in professional services provided by the technical assistance grant was used to locate and identify potential recycling markets. All recommendations and research was provided by Gannett Fleming, Inc., one of only three environmental consulting firms selected by the Solid Waste Association of North America (SWANA) to give technical assistance to local communities in Pennsylvania.

Background

Designed by the current Washington Township Code Enforcement Officer, Gerald Zeigler, and constructed in 1996, Washington Township's Material Recycling Facility is the result of comprehensive planning that involved visits to over 15 similar facilities before finalizing the design of the MRF. Operated by Washington Township, the MRF facility separates co-mingled recyclable materials and paper for residents of Franklin County. Aluminum cans, tin/bi-metallic cans, glass, newspaper, cardboard, and plastics make up the majority of the volume received at the facility. White goods, tires, magazines, and aluminum and steel scrap are additional materials received and processed at the MRF. In 2000, the MRF recycled 3,522 tons of material or 46.7 percent of the total tonnage that crossed the transfer station scales located adjacent to the MRF. All non-recycled material is taken to the Blue Ridge Landfill in Scotland, Pennsylvania.

A small yard waste composting area is also located at the site of the Washington Township MRF. The composting area is a gated area less than 1 acre in size and is operated by Township personnel. All yard waste is collected, composted, and then redistributed by Washington Township as needed.

Since the MRF's construction in 1996, there has never been a professional evaluation of the recycling facility or the composting area. Washington Township Supervisors' input was essential to the final recommendations for this first-time evaluation. Township staff expressed current operational concerns, and also pointed out financial limitations that could influence the improvements that were feasible for Washington Township. Gannett Fleming provided technical support and recommended ways to improve storage space, to increase available markets, and to increase the efficiency of the recycling operation.

Purpose

Washington Township is interested in increasing the efficiency of their MRF and yard waste composting area. In addition to suggested facility design improvements and/or operational changes, the Township is interested in locating recyclable markets that may serve as outlets for current materials and also provide opportunities to expand into new markets.

Scope of Work

- Task 1:** Visit the Washington Township MRF and composting facility. Observe and record information on equipment, layout, space, and other factors contributing to the facility's performance.
- Task 2:** Review MRF and composting system design details in combination with information gathered during the tour of the MRF and composting facility.
- Task 3:** Locate regional markets that may serve as outlets for Washington Township's recycled materials.
- Task 4:** Offer recommendations for improving the operations of the recycling facility and composting area.

Findings

Task 1: Visit Washington Township's Material Recovery Facility and Composting System

Site Visits: To assist the Washington Township Supervisors in making improvements to their facility design and operation, Gannett Fleming staff visited and photographed the MRF and composting areas in October 2000 and February 2001. From these site visits and follow up phone calls, a list was produced of various employee facility and operational concerns. Some of these comments were very helpful in identifying issues; this list is presented in Appendix A.

MRF/Market Observations: Based on observations and discussions with facility employees, the following factors were considered while assessing the operation of the Material Recycling Facility and the available recyclables markets:

- ❑ The facility receives co-mingled recyclable materials from waste hauler's curbside pickup and County residents where no curbside collection is in place. Primary materials include: HDPE, colored HDPE, PET, aluminum cans, tin cans, newspaper, cardboard, and glass.
- ❑ The MRF will capture additional volume in the upcoming years, in addition to steady increases reflective of population growth, by pursuing additional markets for currently recycled materials and by pursuing new markets for specific materials not currently recycled.
- ❑ Decreasing the distances materials are transported to recycling markets can minimize freight costs and increase the net revenue generated by recyclables.

- ❑ There are many regional markets that have not been utilized by Washington Township and may offer better pricing and/or additional markets for materials processed by the MRF.
- ❑ Processing increased volumes will magnify current design and operation problems.
- ❑ The MRF needs to maximize efficiency by increasing storage space, by improving cross-dock movement, and by minimizing double handling of materials.

Yard Waste Composting Facility Observations: Based on observations and discussions with employees, the following factors were considered for the composting facility:

- ❑ The current site appears to be designed in general conformance with PADEP guidelines for low technology yard waste composting facilities.
- ❑ A confirmation of land required cannot be made until a confirmation of yard waste volume is made by the Township.
- ❑ One acre of land is required for every 3,000 cubic yards of yard waste processed (plus ingress/egress maneuvering area).

Task 2: Review of Existing MRF and Composting System Design Details

Material Recovery Facility: Currently, the facility processes between 2-3 tons/day of recyclable materials. The recycling equipment, supplied by Advanced Equipment Sales, is capable of processing up to 10 tons of material per day. Because average daily volumes are far less than the capacity of the existing equipment, the conveyors are usually run at half-speed during operation. Running the conveyors at this moderate speed created a balance in the number of personnel required to handle the volume processed during an 8-hour working day, and also allows for accurate picking and sorting of recyclables as they move across the elevated sorting line.

Processing and Equipment: Commingled recyclables are dumped onto a tipping floor with an eight-foot deep collection pit. An infeed conveyor belt angled at 30 degrees transfers the material from the pit to an elevated sorting platform. The sorting system includes a 30” wide by 56’ long sliderbed conveyor, overhead magnet, and a sorting platform. Since installation, an air classifier for the separation of aluminum cans has been removed and replaced by manual sorters because the automated system forced materials into incorrect bins. The sorting platform has also been modified to accommodate workers of varying heights.

Baled Material	Weight (lbs)
Aluminum Cans	662
Tin Cans	1,256
#2 Clear Plastic	1,147
#1 Plastics	914
Cardboard	1,200
Newspaper	1,660

Bales: Market standard bales 60 inches in length are produced for aluminum, tin cans, plastic, cardboard, and newspaper. The baler is capable of producing 3 to 4 bales per hour that weigh between 500 and 1,700 pounds depending on the material. Table 1 lists bale weights from actual bales produced at the facility on February 21, 2000.

Facility Dimensions and Storage: The entire facility is approximately 111 feet by 81 feet. The area designated for processing recycled material, including the sort conveyor, collection bins, baler, fluffer, glass crushers and open floor space is approximately 81 feet by 75 feet. The Washington Township Supervisors intended to use this floor space as the primary storage area in combination with materials that would be loaded directly onto trailers. With current volumes of materials processed at the facility, the existing floor space is insufficient for storage and processing. Bales must now be stored outside to allow for facility processing and safe operation.

It was initially thought that an expansion of the facility (for storage and/or addition of equipment) could be done by extending the building west from the existing entrance where large overhead doors are currently located. Although expanding the building capacity west was considered, and could benefit the facility by keeping processing and storage activities within the same structure, extending the west wall was not an option for the following reasons:

- ❑ Extending the west wall would limit space for trailers as they unload or move through the existing weigh station. Frequently, trailers must back into the open area (this space would be greatly reduced if the building expanded west as originally planned.)
- ❑ Financial limitations make a less expensive alternative such as a separate pole-barn type of storage structure more realistic and achievable.

A proposed building location west of the existing MRF was identified for construction of a freestanding materials storage building. Figure 1 shows the orientation of the recycling facility and the proposed storage building.

Recycling Efforts: Table 2 illustrates the 1999-2000 volume changes by material and shows an improvement in the recycling percentage for the 2-year period. In light of recent increases in volume (a 604 ton increase of recyclable tonnage from 1999 to 2000), the facility's limited storage space creates extra work for employees and slows processing.

Table 2 represents recyclable materials that enter the MRF and are first weighed at the Townships on-site transfer station scales. Split trucks used for co-collection of garbage and recyclables as well as recyclables-only collection trucks used for recyclables pick-up are weighed on the truck scales. Individual customers with bagged recyclables are not weighed at the transfer station, but these small volumes are accounted for in the baled weights that are tracked for marketing shipments of baled recyclables. All material entering the site that is disposed of at the landfill is weighed at the transfer station.

Table 2: 1999/2000 Recycling Totals for Washington Township’s MRF

Materials	1999 (tons/year)	2000 (tons / year)
Glass	645.49	795.83
Aluminum Cans	57.79	60.4
Newspaper	1006.39	1200.52
Plastic	197.41	216.83
White Goods	44.53	0.0
Scrap Metal	148.16	231.92
Scrap Aluminum	1.83	10.0
Batteries	6.00	2.46
Wood Chips	0.0	242.96
Cardboard	142.16	168.08
Magazines	0.0	0.0
Yard Waste	411.77	292.21
Office Paper	0.0	27.67
Tires	17.42	26.19
Metal Cans	239.97	247.20
<i>Recycled Total</i>	2,918.82	3,522.75
<i>Landfill Total</i>	3,905.18	4,013.30
<i>Transfer Station Total</i>	6,824.00	7,536.05
<i>Percent Recycled</i>	42.77%	46.74%

Composting System: Recently moved to reduce complaints about odor, the composting system is slightly less than 1 acre and is located in a wooded area west of the recycling facility. Last year, the composting area received and processed over 292 tons of yard waste. The compost pad is crushed stone and is sloped to allow site drainage. Brush is stored at the site entrance and is periodically chipped. The site design appears to conform to PADEP guidelines for low technology yard waste composting.

Task 3: Identification of Potential Markets for Recyclable Materials

Markets: Potential markets for Washington Township’s recyclables were located by using various sources. Some of these sources included: PADEP, the Internet, Sherry Clayton (Franklin County Recycling Coordinator), and references provided by contacted buyers. Table 3 lists the current buyers, location, products, and prices received for recycled materials currently marketed by the facility. Specifically, the table shows recycled materials that are distributed to locations in Pennsylvania, Maryland, North Carolina, and Georgia. Notably, none of these companies have entered into fixed price contracts with Washington Township. Additional recyclables market information collected during this study includes the spreadsheet of regional recycling markets provided by PADEP that is shown in Appendix B, and the listing of manufacturers that utilize certain recyclables is provided in Appendix C. The manufacturer information for Appendix C was gathered through contacts by phone and also via the Internet.

Unfortunately, the recycling market is very unstable and markets are typically unwilling to sign extended pricing and/or hauling service agreements with MRF's. Several rows in Table 3 have been shaded to point out the markets that are located the farthest distances from the facility. The hauling distances associated with the shaded markets may directly impact net revenues received due to costly freight charges that typically increase with the distance the recyclables are hauled.

Table 3: List of Washington Townships Current Buyers of Recycled Materials

COMPANY	COUNTY	CITY/ STATE	PRODUCTS PURCHASED/ PRICE (2000 – 20001)	Price Contracts Y/N
<i>Battery Outlet</i>	Franklin	Chambersburg, PA	Auto Batteries- \$1ea	N
<i>Conservit Inc.</i>	Washington	Hagerstown, MD	Dirty Aluminum Cans- \$.15/lb Aluminum Scrap-\$.15/lb Ferrous Cans- \$5/long ton Ferrous Scrap-\$34.66/ton	N
<i>Dixon Recyclers</i>	Lancaster	Lancaster, PA	Aluminum Cans- \$.48/lb Ferrous Cans- \$12/long ton Cardboard- \$25/ton Newspaper- \$57.50/ton	N
<i>Easy Products</i>	Rockingham	Reidsville, NC	Plastics #1- \$.135/lb Plastics #2 Clear- \$.165/lb Plastics #2 Colored- \$.105/lb	N
<i>Graham Recycling</i>	York	York, PA	Plastics #2 Clear- \$.16/lb Plastics #2 Colored- \$.06/lb	N
<i>Mason Dixon Farms</i>	Adams	Gettysburg, PA	Newspaper- \$50/ton	N
<i>Mohawk Industries</i>	Whitfield	Dalton, GA	Plastics #1 PET- \$.16/lb	N
<i>Nelson Miller</i>	Washington	Hagerstown, MD	Mixed Office Paper- \$5/ton Phone Books- \$5/ton	N
<i>Owens-Brockway</i>	Forsyth	Winston-Salem, NC	<u>Glass</u> Flint- \$50/ton Amber- \$40/ton Green- \$0/ton	N
<i>PA Cullet</i>	Jefferson	Corsica, PA	<u>Glass</u> Flint- \$50/ton Amber- \$35/ton Green- \$0	N
<i>PG Recycling</i>	Blair	Altoona, PA	Cardboard- \$45/ton Newspaper- \$25/ton	N

Table 4 below is a listing of “primary” markets that were researched and contacted by telephone. “Primary” indicates that these companies expressed a willingness to work with the Washington Township facility, were geographically sensible, and accepted materials and offered services that may benefit the facility. Critical to Washington Township, the markets were asked if they could potentially conduct business through fixed contract prices. Additional comments and specific details discussed about services are listed under the last column (*Additional Information*).

Table 4: Primary Potential Markets for Washington Townships MRF Facility

Company	Location Phone Contact	Materials Accepted	Contract Prices (Y/N)	Additional Information
<i>Environmental Solutions</i>	St. Thomas, PA (717) 369 – 2504 Wayne Mosley	All Electronics/ Computer Related equipment	N	www.esrelectronicrecycling.net : Lists products Can provide on site trailer (free) for electronics/ Computers
<i>Deibert's Recycling</i>	McConnelsburg, PA (717) 334-7661	Aluminum Cans- \$.40/lb Aluminum Scrap- \$.35/lb	N	Small operation: Do not pick up. Rarely contract prices.
<i>Georgetown Paper Stock</i>	Bladensburg, MD (301) 864-1200	Newspaper- \$10/ton Office Paper- \$100ton Magazines- \$10/ton	Y	Company can haul waste to their facility and set up trailers for collection. Accept baled materials only. Prices shown may not be current.
<i>Chambersburg Waste</i>	Chambersburg, PA (717) 261-3857	Aluminum Cans- \$.38/lb Aluminum Scrap- \$.30/lb Aluminum Siding- \$.20/lb Magazines - \$0 Loose Paper- \$40/ton Baled Paper- \$80/ton	Y	Prices shown reflect delivered price. Company can set up hauling service and provide trailers.
<i>NCB Commodities</i>	York, PA (717) 840-1844 Norman	<u>Baled</u> Office Paper- \$10/ton OCC- \$40/ton Mixed Computer- \$.06/lb	Y	Delivery/ hauling available. Can provide pricing on partial loads for low quantities.
<i>Harrisburg Waste Paper</i>	Harrisburg, PA (717) 236 – 7971 Kevin Freedman	<u>Baled</u> Magazines- \$60/ton* OCC- \$25 - \$30/ton Office Paper- \$100 - \$105/ton Newspaper- \$30/ton PET-\$.04/lb HDPE- \$.06/lb - \$.07/lb	N	Prices shown: full 20ton trailers loads. HWP can haul or stage trailers. Mixed loads @ lower prices.
<i>CSR Consolidated Scrap Resources, Inc.</i>	York, PA (717) 843-0931	<u>Baled</u> Steel Cans- \$15/ton Aluminum Cans-.47/lb <u>Gaylords</u> Copper- \$.52/lb Brass- \$.32/lb	Y	Pricing shown: Pricing offered on 2/16/01 for material picked up at facility.
<i>Sam Rostolsky & Son</i>	Lancaster, PA (717) 394-4424 Morton Rostolsky	Non-ferrous - Ferrous - Auto Batteries -	N	Small operation. Requested volumes for pricing.
<i>Beecher's Auto Salvage</i>	Fayetteville, PA (717) 352-2248 (717) 352-0042 fax Randy Beecher	Aluminum Cans - Steel/ Bi-metalic Cans - Appliances - Scrap metals - Batteries -	N	Requested volumes on products to provide appropriate pricing. Appliances must have freon removed

A list of “Secondary” markets was created for markets that were contacted but showed little or no present interest in becoming a buyer of recyclables from Washington Township. These companies may still be useful to Washington Township as markets change and/or existing contracts end. The Secondary markets available to Washington Township are presented in the following Table 5.

Table 5: Secondary Markets for Washington Township Recycled Materials

Company	Location Phone	Materials Accepted	Contract Prices (Y/N)	Additional Information
<i>Yorktown Paper Mills</i>	York, PA (717) 843-8061	Cardboard (OCC)	-	Exclusive Dealings with Newark Group (NJ)
<i>St. Jude Polymer Corp</i>	Frackville, PA (570) 874-1220	Plastics	Y	Prior Business Conflict
<i>DMC</i>	Hagerstown, MD (800) 347-5560	Electronic/ Computer	-	Refurbishing Company
<i>Mechanicsburg Recycling</i>	Mechanicsburg, PA (717) 761-7790 Louis Stenas	Aluminum Cans- \$.35/lb Brass- \$.35/lb Aluminum Scrap- \$.25/lb	N	Small Operation. Not interested in contracts at present time because of unstable market prices
<i>Reliable</i>	Lancaster, PA (717) 397-7695 Stanley Miller	Cardboard Plastics Drums	Y	Not interested. Currently have contracts in place
<i>Maryland Paper</i>	Williamsport, MD (301) 223-6550 Jeff Hooper	OCC Newspaper (pure or low % magazine mix only)	N	Already receive paper from Washington Twp MRF through PG recycling --Willing to work together in the future if PG ceases dealings

Task 4: Recommendations for Implementing Improvements

Materials Recovery Facility

- ❑ The collection areas designated for cardboard and newspaper should be widened from 25’ x 10’ to 25’ x 12’ (or wider) to reduce overflow of materials onto the dock.
- ❑ A low-cost leveler (rail I-beam) should be positioned to level co-mingles evenly across the belt and increase the sorting potential of the sort magnet.
- ❑ The unused air sort should be stored (or recycled), and removed from the operating area.
- ❑ Limited storage space is a primary factor responsible for slowing the current processing of the materials within the recycling facility. Without adequate storage space the material must be frequently double or triple-handled to create workspace. This interrupts recycling staff workflow. Additionally, the limited space for working staff is a potential safety hazard. Consequently, a separate storage building should be constructed and

located against the embankment on the west side of the existing recycling facility (see FIGURE 1) to create storage capacity for baled recyclables currently stored in the recycling facility's processing area and also on the macadam outside the recycling facility. The storage building should be approximately 100' X 80' to allow sufficient storage capacity for approximately 280 bales of recycled materials. The added storage capacity provided by a building of this size could allow for enough space to store all bales currently stored inside and outside of the existing recycling facility, and could also provide additional capacity for storing bales during periods when market prices are unprofitably low. Suitable ingress, egress, and loading dock capability and access should be provided.

- ❑ Gaps in the processing equipment should be identified and closed with steel or plastic sheeting to reduce time-consuming double handling of materials that fall into these openings. Problem areas initially identified include the tipping floor collection pit, the in-feed conveyor discharge, and the in-floor baler feed conveyor. A record could be kept to document how frequently the catch trailer located at the end of the in-feed conveyor is filled (dumped). This information could be used to track the efforts toward reducing missed materials, and to determine the effectiveness of any sheeting that would be added as a way to reduce the amount of material that falls through the openings and is subsequently re-handled.
- ❑ A new truck scale is needed. Existing scale is over 30 years old and is in bad structural condition. This scale is used for MRF and transfer station operations.
- ❑ A grant application should be prepared and submitted requesting funding to assist with costs for development of a project consistent with the recommendations outlined in this report.

Composting Area

- ❑ If not yet done, Washington Township should complete and submit the proper yard waste composting notification forms to PADEP.
- ❑ The gravel subbase should be maintained or paved to ensure clean and easy processing of the yard waste. A 902 grant should be submitted to PADEP for reimbursement of up to 90 percent of the total costs for paving or other modifications to the composting area.
- ❑ The Tracking Sheet provided in Appendix E should be used to monitor compost volumes processed.
- ❑ It is also recommended the Trouble Shooting Guide presented in Appendix D be referenced as a guide for operating the compost area.

Markets

- Washington Township should continue marketing efforts initiated by this project to locate alternative markets for current materials and also continue to find markets for new recyclable materials as they become available to buyers.
- The regional markets identified in this study should be contacted to determine up-to-date recyclables pricing, contract information, and for answers to related questions for marketing the materials processed by Washington Township's MRF (markets will typically request the volume of recyclables material).
- Markets identified for white goods, scrap metals, batteries, tires, and magazines that have been identified in this study should be contacted to determine current prices and the economics of initiating markets or expanding the markets for these materials.

Conclusion

Over the past two years, Washington Township MRF recycling percentages have increased from 42 percent to 47 percent. To continue this positive trend and to improve the entire recycling facility and composting operations, Washington Township should consider: building a new materials storage facility with building access improvements; constructing a new scale; making the recommended design changes to the recycling facility and composting area; and expanding their current recyclables market base. To implement these changes, Washington Township should seek 902 grant funding where appropriate as a means of making these modifications possible.

Appendix A
Employee List of MRF Operational Issues

Employee List of MRF Operational Issues

-Glass loading dock is too close to the baler. When a bale comes out of the baler it is not possible to get to the glass dock.

-Co-mingled material slides down gap in the pit of the tipping floor. A possible solution is to close off the gap between the pit and the conveyer belt. This equipment is serviced by :

Advanced Equipment Sales

Langhorne, Pa

(800)-572-9998

(215)-752-2027

-The drain in the tipping floor must be cleaned. This could be remedied with a steel plate over the drain.

This should be engineered so that the plate can be removed in heavy storms, and replaced when there is no rain.

-Washington Township could use a larger area for storage. It is possible to extend the warehouse by a 100 foot by 60 foot area. This would add approximately 6 to 8 more bays.

-A magnet is used to remove tin cans from the waste stream. This magnet only works on the left half of the conveyer belt. This magnet should be repaired or a stronger magnet purchased.

-There is a wire that runs off of the baler. This wire should be removed from the working area. The manufacturer of the baling equipment is:

BE equipment (215) 536-0700

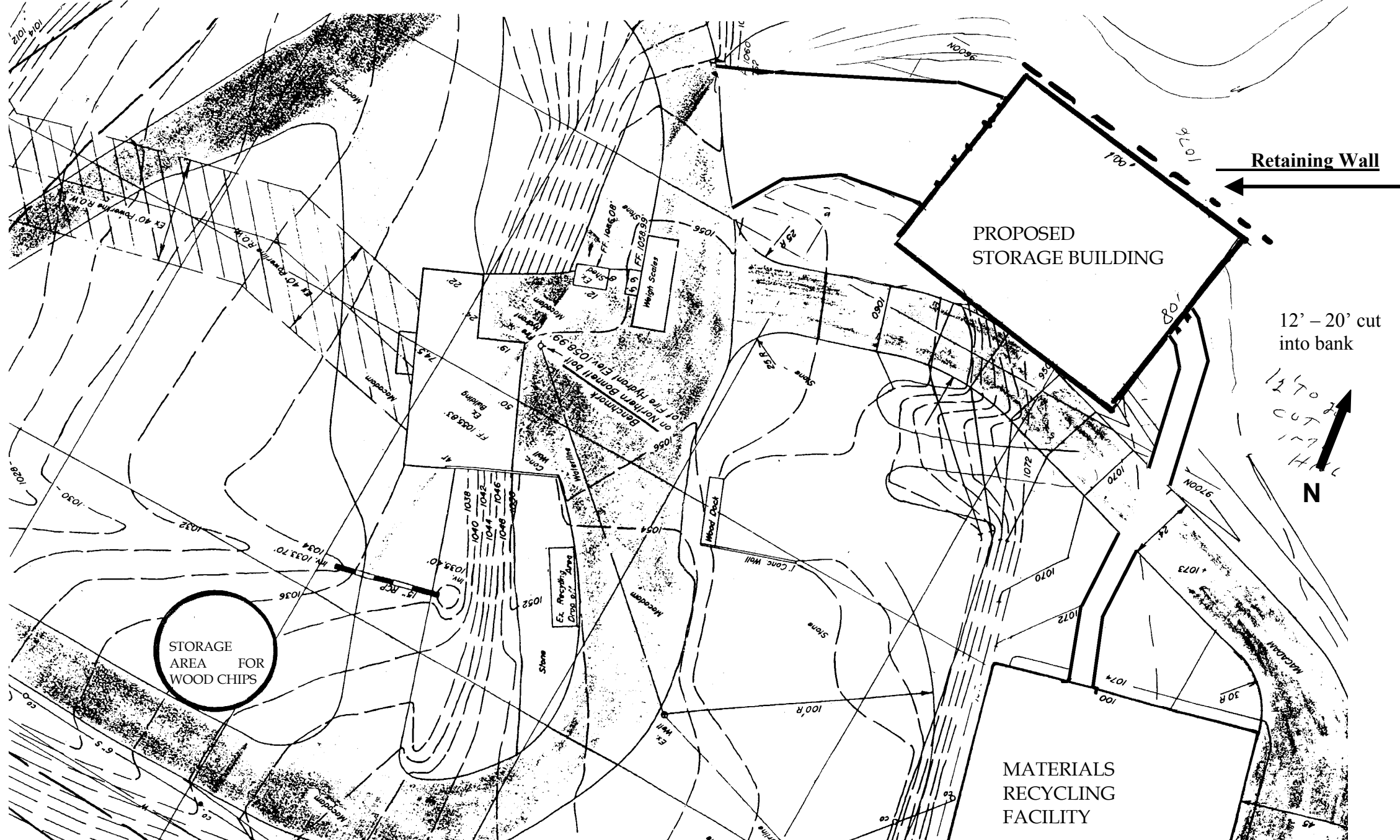
-Diesel trucks pull into the warehouse without proper ventilation. There are only CO sensors located downstairs. There should be sensors upstairs since this is where the workers are the majority of their shifts.

Additional Concerns:

-No contracts are available from buyers due to unstable market conditions

-Need a market for magazines

Figure 1
Proposed Storage Building Layout



Retaining Wall

PROPOSED
STORAGE BUILDING

12' - 20' cut
into bank

12' to 20'
CUT INTO BANK
N

STORAGE
AREA FOR
WOOD CHIPS

MATERIALS
RECYCLING
FACILITY