

November 30, 2005

Ms. Sarah Galloway  
City of Erie  
626 State Street, Room 507c  
Erie, PA 16501

Reference: **Final Recycling Technical Assistance Project Report  
Yard Waste Compost Site Evaluation**

Dear Sarah:

This letter report has been prepared as a summary of work conducted for the City of Erie (City) for the Recycling Technical Assistance Project completed by Gannett Fleming (GF). This project and evaluation was for the City's yard waste composting site and proposed compost storage building. This study was performed as part of the Recycling Technical Assistance program sponsored by the Pennsylvania Department of Environmental Protection (PADEP) and the Solid Waste Association of North America (SWANA). The evaluation and assistance to the City of Erie included the following work by GF:

- Developed/ provided a laminated yard waste composting field guide for use by staff at the compost facility.
- Conducted a site visit of the City's compost facility that included a follow-up meeting with City staff.
- Reviewed and provided recommendations for the proposed compost building storage facility site location and proposed storage building concept.
- Conducted a preliminary review of yard waste processing equipment needs.
- Provided guidance and general recommendations (summarized in this letter report) for the City's compost site operation.

**STUDY BACKGROUND**

The City of Erie (City) collects grass, leaves and trimmings weekly, April through October. Additional collections for leaves only are provided from October through November. The material is taken to the City's compost site where it is composted in windrows and processed (ground and screened) into finished compost material. The City has received Act 101, Section 902 Recycling Grants to construct a new building at the City's compost site. As proposed, the building will be used to store (and protect from rain and snow) compost material that is waiting to be screened, as well as finished compost material.

The City requested GF to recommend a location and confirm the concept for the compost storage building (prior to construction) in order to determine the building's suitability for its intended purpose. The City also requested recommendations for the proper placement of windrows, mixing of piles, and other recommendations that can optimize efficiency and the composting process.

### **Yard Waste Compost Facility Background**

The City's compost facility is located adjacent to the City wastewater treatment plant (WWTP). The WWTP entrance is also the entrance to the compost site. The site is "Permit-by-Rule" under the Municipal Waste Regulations. It is slightly less than five (5) acres and there is active composting on only about .25 acres. The small compost area is due to the excessive quantity of material waiting to be processed and screened. **Figure 1** illustrates the general layout of the compost site.

The site has a building for equipment storage and a small trailer for staff functions. There is electricity and water on site. Less than 50 percent of the total compost site area is paved. There are utility poles that bisect a portion of the yard waste stockpile area, which makes it more difficult to use the area effectively. There is a catch basin for stormwater toward the center of the site. A small berm was constructed to keep yard waste runoff from flowing into the nearby creek and an old drainage ditch.

### **Staff and Operation**

The compost facility is run by three heavy equipment operators. The City Public Works Department collects yard waste (and refuse) during night shifts and delivers material to the compost facility.

The City does not allow residents to deliver material directly to the site because security of the WWTP is a priority. The City does allow several agencies to drop-off material (e.g. Erie Housing Authority, Erie School District, etc.) There is no tip fee for these agencies. Incoming material is placed in mixed piles and then processed by a horizontal grinder. After grinding, the material is placed in windrows and turned once or twice weekly. The windrows are approximately 7' high, 12' wide and 150-200' long. With frequent turning, the windrows are ready for screening in two months. Screening is required to create a fine finished product, and to remove clear plastic in the material from winter collection of yard waste in plastic bags.

As reported by the City of Erie, the compost facility received the following quantities of material in 2004:

- ♦ Brush and grass plus one month of leaves = 13,476 tons
- ♦ Leaves only - 2 month collection = 3,217 tons
- ♦ Christmas Trees = 1.5 tons

The compost site operates as long as the weather is permitting. Long winters and excessive snow accumulation greatly reduce the amount of time during the year when the facility can

actively process and distribute material. Wet and fine material slows screening efforts. Finished product (i.e. screened compost) is loaded into vehicles and taken to four drop-off points. The compost drop-offs are first come - first serve for residents only. The finished material is not intended for lawn service companies and other vendors, but these companies take material since monitoring/ regulating is difficult at these drop-off points. The City tracks the quantity of material delivered to these locations. This material is in high demand. There is no charge to residents for finished compost.

## **Equipment**

The compost site utilizes a variety of equipment for maintaining the site and for processing and distributing yard waste material and finished compost. For the most part, equipment is left outside in the summer and stored in a building on site in the winter. The City's core yard waste equipment includes the following: a Scarab windrow turner; horizontal grinder; two (2) highlift loaders; a Tornado Star screen; a tandem dump truck and three pick-up trucks. Pictures of the primary processing equipment are shown below:







## **PROPOSED YARD WASTE STORAGE BUILDING**

Prior to the compost site walkthrough, GF discussed the proposed compost storage building with compost site staff and the design engineer. The proposed compost storage building is 60' x 110' x 26'. The facility would be primarily funded through \$174,000 in grant money from an approved Act 101, Section 902 Recycling Grant. As proposed, the building would be steel and constructed with a concrete floor, and would not have plumbing, heating, or electric. The City wanted guidance from GF to determine the final location of the building on the site. The building would be constructed to store material awaiting screening because wet material appeared to dramatically slow screening. It was determined by the City that the storage building would be effective in keeping adequate quantities of material relatively dry so that it could be processed more quickly by the existing Tornado Star screen. The building would also allow continued processing into the winter months so that the City was in a better position to handle incoming material in the spring.

### **Proposed Building Concept Evaluation**

A brief analysis determined that the proposed building could store roughly 1,500 – 2,500 cubic yards of material. This is substantially less storage capacity than would be needed for housing enough pre-screened “dryer” compost to enable on-going processing over the winter. Additionally, the slightly dryer material that is stored will be processed and then replaced by material already saturated by rain and snow. It is extremely cost-prohibitive to fit the facility with drying capability, so the facility will offer little assistance in keeping material dry for processing.

It was quickly determined that additional processing capacity was the primary need, not storage. Because much of the material on-site is wet and some of it is fine (already ground or partially composted), these factors must be considered when evaluating processing needs. GF focused our analysis on practical solutions tied to processing that will efficiently reduce the quantity of on-site material with a parallel goal to improve on-site capacity. With this understanding, we recognized the need to make recommendations to redistribute/ use the Section 902 funding for the storage building in a way to optimize processing, but not to allocate these funds to construct a compost storage building (refer to Recommendations Section). A storage facility will not effectively address the City’s compost site need to improving processing capacity for incoming yard waste and distribution of finished compost off site.

## **SITE VISIT OBSERVATIONS**

GF performed a site visit on August 26, 2005. Prior to the site visit, the City indicated the following concerns related to the yard waste compost site:

- ♦ Feasibility of the proposed storage building placement and concept
- ♦ Slight odors
- ♦ Orientation of windrows
- ♦ Contamination of finished compost (e.g. plastic)
- ♦ Distribution and sale of finished compost.

During the site visit, GF:

- ♦ Evaluated the proposed compost storage building concept and made recommendations to compost site staff and design engineer (reviewed above).
- ♦ Conducted a site walk-through to make observations and identify areas for improvement.
- ♦ Completed a Compost Site Evaluation Form (see **Appendix A**). This Form listed a number of compost site evaluation criteria, which received a positive (+), negative (-), or neutral (zero) rating.
- ♦ Attended a post walk-through meeting with compost site staff and City staff to offer recommendations and to answer questions.

### **General Site Observations and Equipment Observations**

- ♦ Approximately .25 acres of active windrows run east-west near middle of site (windrows are approximately 200' long).
- ♦ Over 60 percent of existing material has been stockpiled for over 2 years; a sizeable portion of it has already been ground using the horizontal grinder.
- ♦ 25-50 percent of material stored on site has passed through the grinder and may be screened with little additional composting.
- ♦ Equipment breakdowns combined with several recent storms has created an overflow of material.
- ♦ The Tornado star screen operates at a very low throughput.
  - Final screening is slow with only a small finished material stream that is good quality.
  - As much as 80 percent of the screened material is in the reject stream.
  - Plastic is bound in teeth and appears to prevent breakup of the clumped compost.
  - The belt appears to run too fast and may not allow adequate time for the material to break apart and be screened effectively.
- ♦ The “Beast” grinder has had some maintenance issues that has slowed processing.
- ♦ The catch basin is in middle of the operation and appears to be marginally functional.
  - It is very shallow and water ponds easily.
- ♦ The site is visible from road with little or no surrounding trees along Bayfront Parkway.
- ♦ Telephone poles with power have been struck in compost area.
- ♦ The site is level with a slight slope, which varies across the site.
- ♦ There is a security and guard at the gate of the WWTP and at the entrance to the compost facility.
- ♦ The flow of operation can be improved.
  - There is no defined incoming/ outgoing traffic flow.
  - Piles of material restrict movement throughout site.

- ♦ Currently, compost operations must be shut down if equipment breaks down; recently the Tornado Star screen was down for over 2 months.
- ♦ Plastic is abundant in the organic material processed. This comes from collecting yard waste material in plastic bags during winter collection.
- ♦ Some other contaminants (e.g. plastic containers, cans, etc.) are from residential curbside collection.
- ♦ Odors were minimal and the prevailing wind direction flowed from the southwest and away from sensitive areas.

## **Key Findings**

- ♦ **Compost screening capability is the greatest need**, and will continue to be needed, based on the quantity of incoming material from the collection program.
- ♦ Screening is the weakest link in the processing system.
  - The current screen is inadequate.
  - There is insufficient throughput to meet the processing demand.
  - The screen does not adequately process clumped and wet material.
  - When the screen is down for maintenance, all processing ceases.
- ♦ **Temporary on-site storage of yard waste consumes the site**, leaving less than adequate room for active composting, while prohibiting efficient use of the site.
- ♦ There is a great need to **process and distribute** the screened material to create space.
  - After creating space, the City can reevaluate other processing/operating efficiencies .
  - If adequate screening, processing and distribution is maintained, the site can meet the yard waste processing need of the City, but will be at or near capacity.
- ♦ Turning windrows once or twice a week creates material ready for screening in two months. This material can be screened and distributed to public immediately.
- ♦ The Scarab windrow turner works great.
- ♦ The quality of the pre-screen material is poor due to pieces of film plastic.
- ♦ Odors do not appear to be a problem.
- ♦ Grass usually arrives mixed, and grass handling does not appear to be a problem.
- ♦ **Plastic bags are a serious problem.** Plastic is obstructing the stars on the existing screener and decreasing screening performance. Plastic is visible throughout the site, in compost piles, and is reducing the quality of the finished product. The operational costs for handling/ removing plastic are unknown, but appear excessive.
- ♦ The Streets Bureau is available to distribute additional screened product as needed.
- ♦ On-site staff of two to three people is not adequate to operate an increased processing operation that will decrease the amount of stored material on site (additional staff are needed).

- ♦ 25-50 percent of material is ground and/or stabilized finer material, any suitable equipment that can minimize handling and processing of this material will be beneficial to overall site.

## **CONCLUSIONS AND RECOMMENDATIONS**

### **Conclusions**

The City of Erie's yard waste compost site is a valuable outlet for yard waste material generated by over 100,000 City residents and a number of local agencies. Generally, the yard waste composting and screening operation has a number of opportunities for improvement – the primary operational hindrance being inadequate processing capability. Although the existing site could adequately meet the City's yard waste composting/ processing needs, the site is currently very cramped and losing ground to incoming yard waste material. Much of the composting site is being used for temporary yard waste storage; very limited space is available for windrow composting, screening, or final product curing and storage.

The City is in an excellent position to make a number of relatively simple changes that will have a dramatic impact on the way the compost facility operates, and even in the way the facility will look over the next several years. Implementing the changes recommended in this report will greatly improve the processing/ screening capability of the compost operation, which is the primary cause of a number of issues at the facility. Redirecting previously approved Section 902 funds to procure processing equipment, rather than for constructing a storage facility (as originally intended), is a much more functional allocation of the grant funds that have been appropriated by PADEP. Implementing these recommendations will also greatly improve the quality of the finished compost product, making it a higher-value product for both residents and commercial users.

### **Recommendations**

From site visit observations, discussions with City staff, and from preliminary review of processing needs and equipment, GF provides the following recommendations:

#### ***Funding Recommendations and Site Improvements***

- ♦ The first recommendation is to submit a request to PADEP to restructure the existing Section 902 grant that has been approved for the compost storage building. The revised grant should redirect funding to **facilitate processing and expedite removal/ distribution of material**. This is **essential to create needed operating/ composting space**.
  - First priority should be the selection and purchase of high throughput **screening equipment** capable of processing the material currently on site as well as material that will be received throughout the year.
  - GF has conducted an evaluation of screening equipment, provided in **Appendix B**.
- ♦ Better screening equipment will allow City staff to perform final processing /screening of on-site materials, and allow removal to off-site uses and markets.



- ♦ After space is created on site, it is recommended that other site improvements (e.g., **re-grading, paving**, etc.) are completed. The City has the resources to do paving and grading at a reduced cost. These improvements will significantly improve the condition of the site, site layout and operations and could incorporate improved stormwater management. However, these improvements cannot be made until existing yard waste stockpiles are processed and removed from the site.

### ***Operational Recommendations***

- ♦ Improve overall operations by increased processing and rate of distributing material offsite.
- ♦ Additional paving and grading (recommended above) will significantly improve operations.
- ♦ GF provided a laminated compost operator's field guide to the City of Erie during the 8/26/05 site visit (see **Appendix C**). It is recommended this guide be used by composting site staff as needed.
- ♦ If grass is delivered to the compost site unmixed, add it to compost piles within 24 hours (for odor control).
- ♦ Create a plan to collect/ track data on operational costs, quantities (collected, delivered, screened, marketed, rejected). Tracking this information is necessary for identifying problem areas and optimizing the operation. Tracking material quantities may also be useful if the City begins charging for the material at some point in the future.
- ♦ Constructing a scale in the future may be very beneficial in tracking quantities of material. Scales cost approximately \$45,000 and may be a valuable investment over the long-term considering the volume of material and number of households served.
- ♦ The site layout and operational flow does not appear to be optimal. A revised site layout with improved operational flow is recommended, but is not within the scope of this project. It is recommended these issues are addressed after sufficient material has been processed and removed from the site. Operational flow should consider safety, entrance, exit and on-site traffic flow, stormwater management, material handling logistics and should incorporate planned site improvements such as grading and paving.
- ♦ Site re-grading and paving should also be added when sufficient material is processed and removed.
- ♦ After six months of processing and screening with new equipment, the City should evaluate the status/ quantity of material that remains on-site. At that time, the City should consider the need and value of securing a private contractor to assist with screening and processing of remaining stored material.
- ♦ It is recommended the City submit for a second Recycling Technical Assistance project for the City to obtain additional expertise and assistance for developing the conceptual site layout and other operational and design recommendations.

### ***Yard Waste Collection Recommendations***

- ♦ **Remove all plastic bags from the City's yard waste collection program.** They are problematic for compost site operations, and make it difficult to create a quality end-product.
- ♦ PADEP has indicated new regulations are currently being developed that will exclude plastic bags from compost operations. If biodegradable bags are used, they must meet ASTM Standard D6400. It is anticipated this regulation will be in place in the next year or two. Consequently, it is recommended the City modify its curbside yard waste collection program to prohibit the use of clear plastic bags currently used. Kraft lawn and leaf bags are a valid and commonly used substitute. They also decompose effectively, blend in with yard waste, and have adequate strength to carry most curbside yard wastes. Duro Bag Manufacturing Company is a vendor of lawn and leaf Kraft bags, which typically cost about \$.25 each if bought in bulk quantity. Although lawn and leaf bags are not cheap, they are very feasible when considering the operational issues and costs associated with handling plastic bags. The material quality and value will increase significantly when plastic is no longer in the finished material.

### ***Staffing Recommendations***

- ♦ GF recommends, at least temporarily, adding one (1) compost site general operator to expedite processing/ screening/ distribution of material. It is recommended this person be employed at least two weeks before arrival of new processing equipment (recommended in this report) to become familiar with day-to-day operations, safety, etc.
- ♦ As needed, City Street Department staff may be used to distribute finished product that is produced in greater quantities using new screening equipment.
- ♦ It is recommended that compost site staff are educated regularly on compost handling, processing, safety and general operating procedures. This may include site visits to other compost facilities in the Commonwealth. GF has developed compost training manuals and provided compost training and guidance to site operators. The Professional Recyclers of Pennsylvania (PROP) offers a Professional Certification program for compost operators.

### ***Equipment Recommendations***

**Appendix B** provides an evaluation of screening equipment that was conducted during this study. General equipment recommendations include:

- ♦ It is recommended that additional processing equipment be procured to meet the processing and operational needs identified in this report. This equipment should be capable of processing a wide variety of wet, fine and mixed yard waste.
- ♦ The existing Tornado Star screen should be adjusted and cleaned to optimize the throughput, although these adjustments will NOT adequately address the processing need. It appears belt speed may be too fast to allow efficient breaking of material, which is increasing the amount of reject material. Adjustments could include changing (slowing)

the belt speed and cleaning of stars by removing plastic and other clogged materials. We recommend contracting the vendor for assistance.

- ♦ It is recommended that vendor/ equipment demonstrations are done on-site to confirm capabilities of equipment.

### ***Other Recommendations***

- ♦ In the future, adding a simple drop-off area constructed of Jersey barriers (or something similar) just outside the entrance of the WWTP facility (or at another location) for residents and small commercial companies to take finished compost may be feasible. If a finished compost take-away area is implemented, a fee structure that is based on volume (i.e. cubic yards or vehicle type/ size) should be established for sale of finished material. Some composting facilities establish a fee structure where they charge when a loader or similar equipment is used to load a vehicle and don't charge for self loading of finished compost.
- ♦ This fee can be justifiable because the City is investing in generating a better finished compost product. Yard waste that is sold often has a higher demand than material given at no cost. The City is encouraged to offset annual operating costs with annual revenues generated by tip fees for incoming material and sale of finished compost product.
- ♦ It is recommended the City's compost operation develop "full cost accounting" procedures to document all costs associated with the operation (e.g. labor, benefits, fuel, equipment, utilities, quantities, expenses, etc.) of the facility. Pertinent data should be tracked in detail and compared on a regularly scheduled basis (e.g. quarterly).
- ♦ Remaining technical issues are related to equipment evaluations and procurement, site survey and re-grading, site paving, stormwater management, site layout improvements, permitting, and general operations (e.g. traffic flow, equipment placement, etc). The City should retain a consultant knowledgeable in assisting the City in these areas. Gannett Fleming can assist the City if requested.
- ♦ The compost site is visible from Bayfront Parkway. It is recommended that a line of trees are planted on the compost site property along the highway berm. The trees can serve as an attractive border that helps contain the site. Trees can also reduce odors traveling offsite by mixing odors with air and by forcing the odors higher and above sensitive areas.

### **SCHEDULE**

- ♦ The City should request PADEP approval of a revised allocation of Section 902 grant funds immediately.
- ♦ An on-site demonstration of equipment should be completed in the fall of 2005 for screening and bucket screen equipment.
- ♦ A final equipment selection should follow the demos and confirmation of equipment by the vendors.

- ♦ Targeted education of forthcoming changes to the yard waste program should be introduced in the fall of 2005 and be part of an on-going educational process for yard waste composting.
  - Separate composting information should be prepared and distributed to the public.
  - Introduce yard waste changes (e.g. replacing plastic bags with paper bags) to City Council (on-going).
  - Encourage backyard composting and grass-cycling.
- ♦ Equipment procurement for delivery in the winter of 2005/2006.
- ♦ Equipment start-up operations in the spring of 2006.
- ♦ In the fall of 2006, evaluate equipment and determine the need for contractor assistance.
- ♦ In the fall of 2006 to spring of 2007, bid and procure yard waste processing assistance if needed.

## FIGURES

[illegible]

BUREAU OF ENGINEERING DEPT. OF PUBLIC WORKS CITY OF ERIE CITY OF ERIE COMPOST FACILITY			
DATE	9/03	DESIGN BY	M. KUNLA
DRAWN BY	MLAVERY	DRAWER NO.	
FD. BK. #		DRAWING NO.	
SCALE	1" = 100'	SHEET	1 OF 1



## **APPENDICES**

**Appendix A**  
**Compost Site Evaluation Form**

**TABLE 1: CITY OF ERIE COMPOST SITE EVALUATION FORM**

<b>YARD WASTE SITE CRITERIA</b>	<b>COMPOST SITE RATING (+, 0, -)</b>	<b>ADDITIONAL COMMENTS</b>
Remote from residential areas (recommended at least 300-foot buffer)	+	Area is marginally buffered from residential; prevailing wind is away from households
Close Proximity to Yard Waste	+	Yard Waste is collected in the City of Erie where the site is located
Sufficient Size	0	Not currently, but adequate processing will create working space
Ownership/ Control of Site	+	The City of Erie public works department operates the site
<b>LAND</b>		
Vacant	NA	Existing site
Level to Moderate Slopes	+	Level to slight sloping
Good Drainage, no High Water Table	-	Soil Type Bb (beach sand stabilized (water table 0-24"))
Not within 100 feet of a Perennial Stream or within 300 feet of a Water Source	NA	PADEP Exemption – remain 40 feet from Garrison Run
Outside of Floodplain	NA	PADEP Exemption
<b>SENSITIVE AREAS</b>		
No wetlands	NA	Not checked during evaluation
No historic sites	+	None observed
No rare/endangered species	NA	Not checked during evaluation
No restricted lands	NA	Not checked during evaluation
No sensitive “receptors” nearby	+	Adjacent to WWTP
No sinkhole areas (within 100 feet)	+	None observed, not in karst topography
<b>ACCESS</b>		
Easy access for vehicles and equipment	+	Access via WWTP entrance & restricted access by public as desired
Control of access to unauthorized persons	+	Guard at WWTP prohibits unwanted public access
<b>UTILITIES</b>		
Water supply	+	On site
Stormwater Management	-	On site catch basin appears to function improperly and in way of operations
Power supply	+	On site
<b>PROPOSED COMPOST STORAGE BUILDING</b>		
Building Siting (location, access, etc.)	-	Determined building impractical due to volume of material; process need
Sizing	-	Determined building impractical due to volume of material; process need
Functionality	-	Determined building impractical due to volume of material; process need
<b>COMPOST SITE OPERATION</b>		
Site Flow & Efficiency	-	Flow & efficiency degraded by excessive material awaiting processing
Equipment & Staffing	-	Understaffed based on need to process and remove material on site
Material Availability to Public	-	Limited - final product produced slowly, delivery requires load/ delivery
End Product Quality	0	Contaminated with plastics; but used readily by residents

+ **Positive**0 **Neutral**- **Negative**

**Appendix B**  
Evaluation of Screening Equipment



## MEMORANDUM

---

**TO:** City of Erie  
**FROM:** Sean Sweeney, Staff Engineer  
**SUBJECT:** Screening Equipment for the City of Erie  
**DATE:** September 29, 2005

The City of Erie asked Gannett Fleming (GF) to analyze the City's yard waste composting system. The existing system is having difficulty processing moist/wet yard waste through existing screening equipment. Currently, mixed yard waste is sent through a grinder and then screened via a Tornado Star T54600 Star screen. The screen is currently rejecting approximately 80% of the material loaded into the hopper (GF estimate during an 8/26/05 GF site visit.)

GF reviewed screening equipment from a few manufacturers to determine if this equipment could meet the needs of the City's yard waste system. GF first considered types of orbital screeners that the City felt may be adequate in processing wet yard waste material. However, based on our review, there is no indication that an orbital screener is better suited for wet material than an appropriately sized trommel screen. Generally, trommel screens are effective in breaking clumped wet material because the material is tumbled in the screen for a longer period (as compared to orbital screens). Trommel screens are also the industry standard for many of the companies that rely on material screening to make money. **Slowed processing of wet yard waste material is alleviated by many compost/ mulch operations by bulking wet, dense material with woody material during grinding operations prior to screening.**

GF contacted the manufacturers of equipment that appears to be able to handle the material generated at the City's yard waste facility. Several criteria seemed to be key in addressing the existing process problem:

- 1) The screening equipment must be sized to handle the throughput desired by the operators. Setting screening speeds at higher rates than suggested in order to increase the processing rate can actually be detrimental to the throughput rate, i.e. a higher reject percentage. GF staff observed this situation during our site visit.
- 2) The screening process should impart energy into the waste material to break up clumps of soil-like material. If insufficient energy is imparted into the material through dropping, shaking, tumbling or rolling, clumps will not separate and the material will be rejected by the screens. The material passed through the existing Tornado with little breakage.
- 3) Screen size and screen material must be selected to provide durability, create the desired end particle size, and prevent screen clogging.
- 4) Some type of automatic screen cleaning system is necessary to remove plastics and prevent clogging of the screens; this is often done by a brush system.

GF contacted two manufacturers. Mark Labery represents Komptech Farwick of North America and markets their line of screeners, grinders and other heavy equipment. His operation is located outside of Cleveland, OH. One of Komptech's mid-level trommel screens would most likely be appropriate for this application. Sizing and screen choice should be done in consultation with Mr. Labery or another knowledgeable individual. Mr. Labery stated that he is willing to demo a unit at the City's site if they first visit his facility and select a unit that they feel will meet their needs. Komptech also manufactures a screener that separates plastic from the process stream; however it is an auxiliary piece of equipment to the trommel screen, adding additional cost. Given the large amount of plastics observed in the Erie yard waste piles, plastics removal equipment is recommended. His contact information is as follows:

Phone: 1-866-621-5362

Website: [www.neequip.com](http://www.neequip.com)

Contact Person: Mark Labery

The second manufacturer to respond to GF's inquiry was Allu based in Hackensack, NJ. Allu manufactures a bucket screener (Allu SM) that connects to a front end loader or an excavator. This system provides mobility and might allow for less transportation of material, thereby avoiding excessive material handling costs. This system requires an additional valve; quick connect hydraulic couplers; and auxiliary valve controls. The City is currently using a Dresser 520C and a Hyundai HL 750 rubber tired loader. It is unknown if these loaders possess the required connections. If they do not, there could be considerable additional cost to retrofit the loader for this application. The contact information for Allu is as follows:

Phone: 1-800-939-2558

Website: [www.allu.net](http://www.allu.net) (not functioning at the time of our investigation)

Contact Person: Mardi O.

Manufacturers of trommel screens may be contacted for guidance and equipment recommendations.

## Conclusion

It is believed that a Bucket screener, in combination with an adequately-sized trommel screen, will meet the City's yard waste processing needs. Because the material is fine and wet, mixing adequate bulking material is crucial prior to final screening. One vendor indicated that many compost operations that process wet leaves often select "finger screens". Finger screens were not reviewed in detail because prices start at over \$300,000 and appear to be generally oversized for Erie's need. A bucket screen may be effective for controlled mixing of materials. **Equipment selection should be confirmed with vendors and demos for all equipment are HIGHLY recommended.**

## Rough Equipment Costs

Mid-sized trommel – \$160,000 – \$250,000

Mid-sized trommel with plastic separator – \$180,000 per Mark Labery

Bucket Screen - \$20,000 - \$45,000



**Appendix C**  
Laminated Compost Field Guide (not included in on-line version of report)