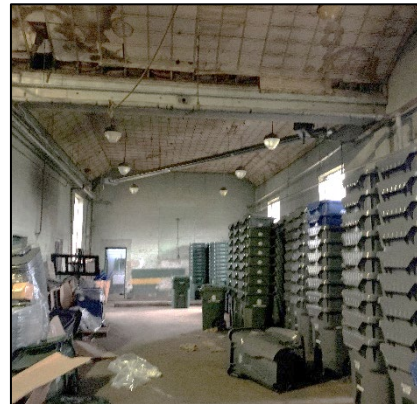


Preliminary Materials Recovery Facility Evaluation

Montgomery County Recycling Consortium
Abington Township
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SCS ENGINEERS

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1 PROJECT DESCRIPTION

Abington Township (Township) is an Act 101 mandated recycling community. The Township collects refuse and single-stream recyclable materials curbside from about 18,000 households every week. The Township also collects recyclable materials from small businesses and commercial properties. The Township is part of the Montgomery County Recycling Consortium (Recycling Consortium), which is comprised of seven (7) municipalities within Montgomery County. Recyclable materials collected by each community are consolidated at the Recycling Consortium's transfer station in Abington prior to transport to a processor in Birdsboro.

The Township and Recycling Consortium members have experienced problems at the transfer station, including long wait times to tip recyclables. Additionally, under the recently executed contract extension, the processing rate for recyclable materials increased from \$98.78 per ton to \$135 per ton. The cost to dispose of residue from recyclable materials also increased from \$80 per ton to \$84 per ton.

Recycling technical assistance was requested to evaluate the requirements for establishing a Material Recovery Facility (MRF) owned and/or managed by the Recycling Consortium. Conceptually, a MRF that provides material processing (i.e. baling) could potentially improve the Recycling Consortium's control over its recycling program. This project is one of several recycling technical assistance studies addressing recycling issues in Montgomery County.

2 SUMMARY OF WORK

This section summarizes the work activities performed as part of this recycling technical assistance project by key task. This project provides the Recycling Consortium with preliminary guidance and considerations pertaining to the development of a MRF in Montgomery County. This scope of work does not include detailed siting investigations, design or engineering services, or detailed cost analyses that may be necessary to inform important decisions regarding the development of a MRF. Implementing a MRF will require significant management and capital investments that could not be adequately addressed in this recycling technical assistance study.

Task 1 – Preliminary Site Assessments

The project team visited the existing recycling transfer station located at 1030 Fitzwatertown Road and the inactive Abington Township incinerator located at 995 Fitzwatertown Road. The project team visually inspected and assessed each site's suitability for MRF construction. Site characteristics evaluated include size, location, access, topography, and existing structures.

Task 2 – Facility Sizing Requirements

The project team received data on the types and quantities of recyclable materials collected as part of each consortium member's recycling program to develop planning level estimates for facility size. Based on current material quantities and growth projections, the project team estimated MRF sizing requirements for incoming storage, unloading, processing/baling, and bale storage.

Task 3 – Planning Level Cost Estimates

Based on the facility sizing estimates made as part of Task 2, the project team provided planning level capital cost estimates for the construction of a MRF for the consolidation and processing of recyclable materials prior to their transport to market. These planning level cost estimates are preliminary only. More detailed analysis is required to refine costs and technical specifications if the Recycling Consortium wishes to give serious consideration of MRF development.

Task 4 – Final Report

This report provides preliminary guidance relating to MRF considerations and development. The information, data, and estimates provided as part of Tasks 1-3 are detailed in this report.

3 CURRENT PROGRAM

SUMMARY

Abington Township operates a comprehensive recycling program. The Township provides curbside dual stream recycling services to residents using a fully-automated system. Recyclable containers, including plastic, metal, and glass, are collected commingled in one cart while cardboard, newspaper, office paper, and other paper materials are collected in a separate container. The Township uses a hybrid “Pay As You Throw (PAYT)” program with tiered pricing for different trash cart sizes. The PAYT structure encourages recycling by assigning a higher cost to customers/households that choose larger carts and generate more trash for disposal. This program is tied to an enterprise fund; a financial structure that rewards residential recycling efforts by keeping collection service costs affordable to tax payers.

Table 1 provides details on the quantities of recyclable materials collected by community and the number of households served. Abington Township’s recycling program services 18,200 households, which represents about 32 percent of households serviced by the Recycling Consortium. In 2019, Abington Township collected 2,909 tons of commingled containers and 3,135 tons of paper. Abington Township data is separated because the Recycling Consortium transfer station only accepts and transfers the commingled containers originating from Abington Township. Abington’s commingled containers are consolidated at the recycling transfer station and mixed with other Recycling Consortium communities’ single stream materials for processing at the Total Recycle MRF in Birdsboro. Paper collected by Abington Township is transported to their Public Works facility and loaded in tractor trailers for transport to Newman Paperboard in Philadelphia.

Table 1. Recycling Consortium Recycling Quantities (2019)

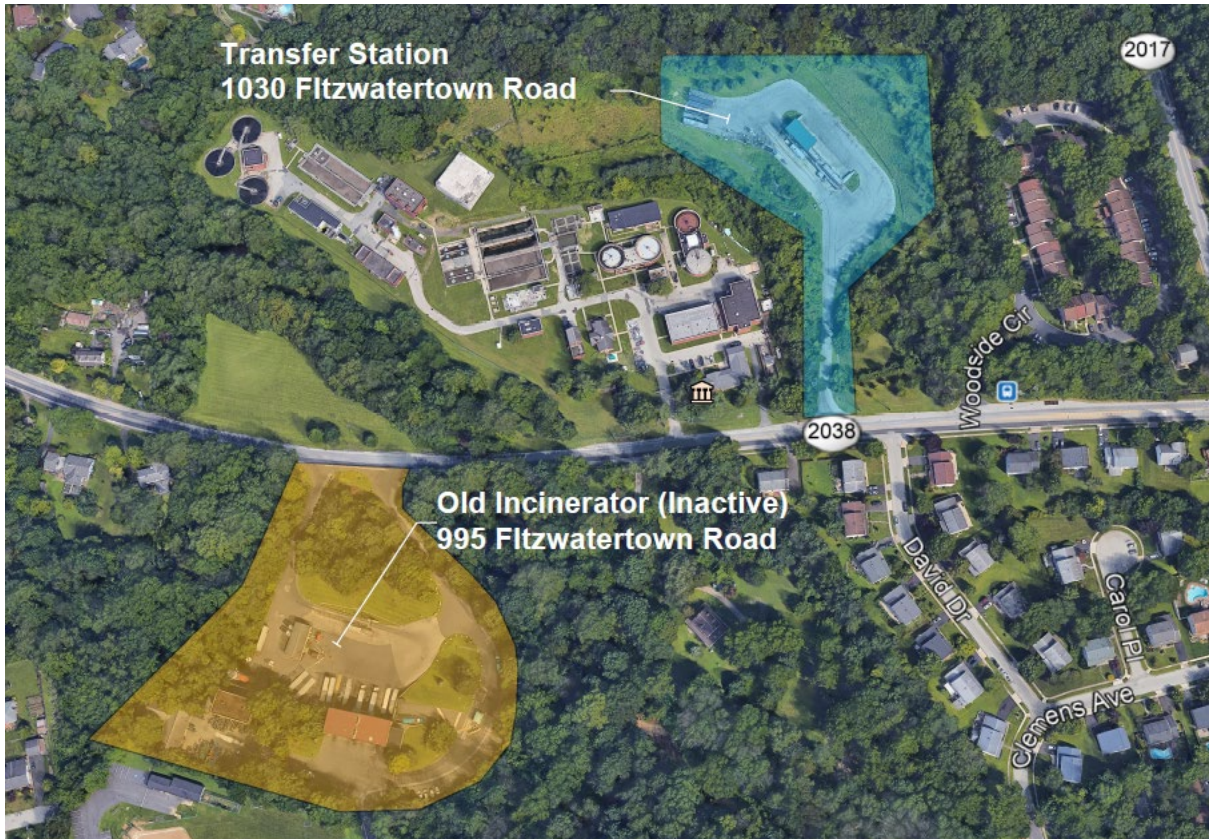
Recycling Consortium Member	Households Serviced	Recycling Totals (tons)	Annual Lbs./HH
Abington (commingled)	18,200	2,909.87	664.37
Abington (paper)	18,200	3,135.88	
Cheltenham	9,467	3,008.16	635.50
Hatboro	2,200	660.35	600.32
Springfield	6,900	2,221.59	643.94
Upper Dublin	8,500	2,802.98	659.52
Plymouth	4,900	1,265.09	516.36
Upper Moreland	7,200	2,029.41	563.73

Consortium Totals	57,367	14,897.45	611.96
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4 PRELIMINARY SITE ASSESSMENTS

The two prospective sites for MRF development are located in Upper Dublin Township and are across the street from one another as shown in the **Figure 1**.

Figure 1. Location Map



Source: Google Earth 2020

Note: The site boundaries shown do not represent actual parcel boundaries.

OLD INCINERATOR FACILITY ASSESSMENT

Figure 2 is an aerial view of the incinerator and trash transfer station. The old incinerator site was visited and assessed in December of 2020. Originally constructed in the 1960's, the incinerator building has not operated for over 50 years and serves as a storage and staging area for recycling containers and miscellaneous equipment. The property includes a municipal waste transfer building operated by Abington Township with trash hauling provided by Covanta Energy. Only trash originating and collected by Abington Township passes through this transfer station.

Figure 2. Incinerator/Trash Transfer Station (Aerial)



Source: Google Earth 2020

Based on the site assessment including considerations relating to size, location, access, topography, and existing structures, the 995 Fitzwatertown Road site is not a feasible option for MRF construction for the following reasons:

- **Prior Use** – Incinerator bottom ash contains toxic heavy metals like lead and mercury, as well as furans and dioxins. Investigating remediation requirements and the cost to scrub the site to be suitable for development was beyond the scope of this study, but is a consideration relating to the feasibility of developing an inactive incineration facility.
- **Size** – The minimum size recommended for the proposed MRF is 10,000 to 20,000 square feet. No existing feature or structure at the site is adequately sized for a MRF. Additionally, unique features including the burn pit further restrict the usable area. Expanding the tipping and processing areas would require significant costs.
- **Location/Access** - The location of the site is feasible for access by member municipalities and suitable for receiving packer trucks. Ingress, egress and staging of tractor trailers for outbound recyclables is constricted and would require significant site modification to create safe and efficient traffic patterns.

Existing Structures - The unique and incinerator-specific design is not well-suited for retrofit or conversion to a MRF. The site includes a truck scale and multiple structures that served the old incinerator area and the active trash transfer station as shown in **Figure 2**. The building structures are small, have confined and compartmentalized spaces, and have other features like combustion and ash chambers that are not easily nor cost-effectively modified into a MRF layout. Additionally, the orientation of the

buildings in relation to one another on the site is limiting when considering compatibility for efficient traffic flow, equipment and material storage, and staging 48' to 53' trailers that may be docked and staged in a yard. Significant demolition is probable.

RECYCLING TRANSFER STATION FACILITY ASSESSMENT

Figure 3 is an aerial view of the recycling transfer station located at 1030 Fitzwatertown Road. The transfer station site has a loop flow traffic pattern for recycling vehicles to dump on an elevated concrete pad. Materials are then pushed and compacted into 100-yard transfer trailers. There are no other structures on the property.

Figure 3. Recyclables Transfer Station (Aerial)

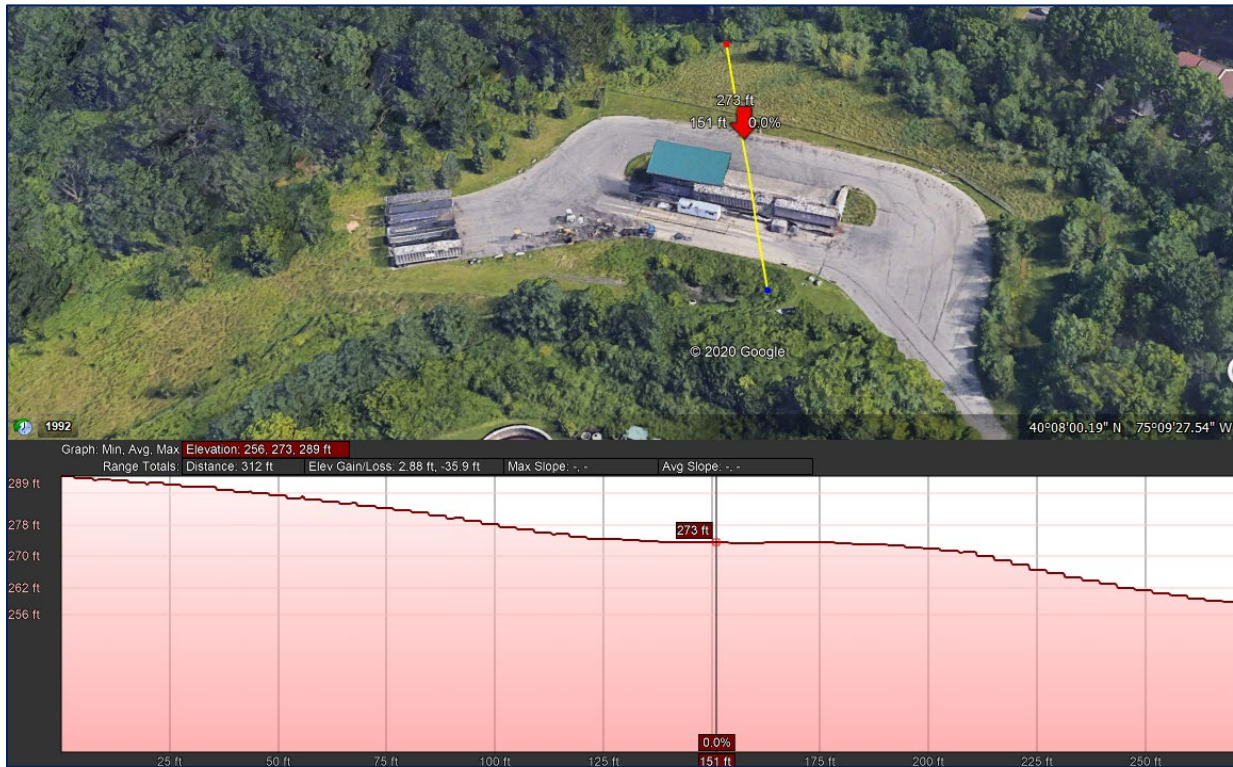


Source: Google Earth 2020

Based on site assessment findings and considerations relating to size, location, access, topography, and existing structures, the recyclables transfer station site appears to be a suitable site for development of a MRF but would require a more thorough evaluation to confirm. Site features that may make this a viable site include the following:

- **Prior/Existing Use** – The transfer station property is currently used for recyclable materials transfer. The development of a MRF at this location is compatible with the existing use with the addition of material sorting and processing (i.e. baling separated materials).
- **Size** – While the total square footage required for a MRF will be dictated by final design, it appears the total area of the property is sufficient to accommodate MRF infrastructure. This includes paving and roadways to promote efficient traffic flow and a detached or attached area for bale storage. None of the structures on the site restrict the area that could be developed if the transfer station is demolished.
- **Location/Access** - The location of the site is feasible for access by member municipalities and suitable for receiving packer trucks. Ingress, egress and staging of tractor trailers for loading and transfer of outbound materials appears sufficient and can be addressed in coordination with the MRF facility design. For example, separating tipping and processing areas would streamline traffic flow.
- **Existing Infrastructure/Structures** - The transfer station infrastructure is minimal and can be demolished to allow design and construction to be based on an empty site.
- **Topography** – The transfer station property is sloped as reflected in **Figure 4**. Site grade is commonly integrated within MRF design and can even offer functional advantages. When incorporated effectively within MRF site and facility design, the slope can be utilized to:
 - Separate processing and tipping areas;
 - Separate and improve traffic flow;
 - Support gravity feed of materials;
 - Allow flush docks for trailers and top loading of trailers.

Figure 4. Transfer Station Topography/Grade (Aerial)



5 FACILITY SIZING AND THROUGHPUT

It is necessary to analyze the types and quantities of recyclable materials expected to be received, stored, processed, and shipped by the proposed MRF as a basis for “sizing” the facility. Sizing is not limited to building footprint or property area. More critically, it relates to the required processing capacity or “throughput” of the MRF system including equipment, sort technology, compactors, balers, rolling stock and other equipment supporting the processing rates. MRF processing throughput is often measured as a rate, such as tons per hour and tons per operating day. Assuming a Monday – Friday (5-days per week) schedule, there are 260 operating days per year. Operating days are usually reduced by 5 or 10 days to allow for regularly scheduled annual MRF maintenance, which may be 1 or 2-week duration.

Facility processing rates are affected by many different factors. Front-end sorting technologies, staffing levels, length or number of operating shifts, belt speeds, and contamination levels can drastically change MRF processing rates. Usually, a facility should be sized conservatively since an undersized MRF can lead to costly retrofits, equipment add-ons, or adding staff sooner than desired. Facility throughput has important economic considerations. For example, is the facility being designed to serve the Recycling Consortium members only, or do economics improve if the facility is designed to accept additional materials from other generators? It is the current assumption that the MRF would serve only the seven (7) member municipalities and there have not been noticeable increases in annual tonnages in recent years.

The current annual quantity of recyclables collected by Consortium communities is 15,000 to 20,000 tons. This is the quantity of material that would be processed at the potential MRF. It is assumed the 3,100 tons of paper that is collected by Abington Township and transported to Newman Paper could be redirected to the MRF. Generally, these quantities require a relatively small-scale MRF considering many MRF's process over 50,000 tons per year. The material projections in **Table 2** are based on historic quantities of materials collected and extrapolated over a 10-year period based on anticipated population growth. Accounting for population growth alone only yields tonnage increases of about 1,000 additional tons by year 2029. Actual sizing and throughput are highly contingent upon final design, equipment, staffing and operating details. Preliminary sizing and throughput parameters and related considerations are included below.

- Annual MRF Throughput: 15,000 to 20,000 tons per year.
- Total MRF Building Footprint Estimated: 18,000 to 27,000 square feet.
 - Processing Area: 10,000 to 15,000 square feet
 - Tip Floor: 8,000 to 12,000 square feet.
- Separate or Attached Building for Bale Storage (may be necessary): 2,500 – 5,000 square feet.
- Minimum MRF processing rate: Four to six tons per hour.

Table 2. Projected MRF Processing Tonnage (2019 – 2029)

Consortium Member	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Consortium Member
Abington Township ^[1]	6,046	6,077	6,114	6,152	6,189	6,227	6,265	6,305	6,345	6,385	6,425	Abington Township ^[1]
Cheltenham	3,008	3,024	3,042	3,061	3,080	3,098	3,117	3,137	3,157	3,177	3,197	Cheltenham
Hatboro	660	664	668	672	676	680	684	689	693	697	702	Hatboro
Springfield	2,222	2,233	2,247	2,261	2,274	2,288	2,302	2,317	2,331	2,346	2,361	Springfield
Upper Dublin	2,803	2,817	2,835	2,852	2,870	2,887	2,905	2,923	2,942	2,960	2,979	Upper Dublin
Plymouth	1,265	1,272	1,279	1,287	1,295	1,303	1,311	1,319	1,328	1,336	1,344	Plymouth
Upper Moreland	2,029	2,040	2,052	2,065	2,078	2,090	2,103	2,116	2,130	2,143	2,157	Upper Moreland
Recyclables Tons Total	18,033	18,127	18,238	18,349	18,461	18,574	18,688	18,806	18,925	19,045	19,165	Recyclables Tons Total
<i>Total Households Served</i>	<i>57,367</i>	<i>57,664</i>	<i>58,017</i>	<i>58,372</i>	<i>58,729</i>	<i>59,088</i>	<i>59,450</i>	<i>59,826</i>	<i>60,204</i>	<i>60,584</i>	<i>60,967</i>	<i>Total Households Served</i>

[1] Includes commingled and paper streams.

Sources: Abington Public Works Department: 2019 households and material tonnage; Pennsylvania State Data Center for the Center for Rural Pennsylvania: Population escalation factor; MSW Consultants: 2020-2029 waste and household projections.

Note: Projections assume 2019 per-household capture and generation rates will remain constant through the planning period.

6 PERMITTING AND PLAN CONSIDERATIONS

State and local permitting requirements relating to MRF development must be given careful consideration and can impact feasibility, implementation schedules, and costs. Based on experience with similar projects and input from Abington Township's engineer, the following permitting and plan considerations are provided for the proposed MRF:

- **Permitting** - Pennsylvania and DEP do not regulate or require permits for recycling facilities; county and local zoning, permitting and plan (or planning) requirements take precedent.
- **Zoning** - The building(s) and site features shall meet zoning regulations and criteria and address conditional use or variances; refer to the Township Zoning Officer.
- **Building Codes and Compliance with Uniform Construction Code (UCC)** - Meet building code requirements and address key considerations like fire suppression and ADA compliance; addressed by the Building and Code Official.
- **Environmental Compliance** – Requires Phase 1 and 2 environmental assessment considerations and reports, including confirmation the site is cleared for construction.
- **Operating Licenses** - Confirm required operating licenses that may be issued by the County Health Department or others to assure operating compliance.
- **Traffic** - Confirm road upgrade requirements for ingress/egress movements along Fitzwatertown Road, which may require traffic study.
- **Land Development Approval/Plan** - Development and construction plans require Township approval, including reviews by the local and County Planning Commissions and approval by the Board of Commissioners.

7 PLANNING LEVEL COSTS

It was not possible to accurately provide MRF capital and operating costs in this preliminary study. Additional financial analysis is required to more accurately understand capital and operating costs of a MRF. The planning level cost estimates in **Table 3** assume the following:

- 1) The transfer station site is selected for MRF construction;
- 2) Facility that processes 15,000–20,000 tons of material per year is constructed;
- 3) Facility is operated by 11 persons (eight sorters, two operators, and one manager); and
- 4) The Consortium outsources the operation of the MRF to a private operator at a processing fee of \$85-95 per ton.

The initial capital costs range from \$2.0 – 2.2 million and the annual operating costs are estimated to be about \$1.5 - 1.7 million (**Table 3**). Cost estimates do not include planning, permitting, legal, or environmental costs to obtain project approvals by local agencies.

Table 3. Planning Level MRF Costs

Parameter	Value
Annual Throughput (tons)	15,000 – 20,000
Processing/Tipping Space Required (SF)	18,000 – 27,000
Capital Equipment Cost ¹	\$2.0 - 2.2 million
Annual O&M Cost ²	\$1.3 - 1.9 million

¹ Includes mechanical sortation and processing and baling equipment for single stream materials; does not include building capital costs.

² Annual O&M costs assume MRF operation is outsourced via contract at a fully-loaded cost to the Recycling Consortium of \$85 to \$95 per ton for 15,000 to 20,000 tons of materials. Other alternatives, like hiring staff to operate the facility were not analyzed.

8 FINDINGS/RECOMMENDATIONS

This section provides the findings and recommendations for the Recycling Consortium’s consideration pertaining to MRF development.

FINDINGS

- Developing a MRF at the Old Incinerator Site is Not Preferred** – It is the project team’s preliminary opinion that the old incinerator/waste transfer site is not suitable for MRF development considering the limited area available for development, prior use issues, restricted vehicle access, demolition costs, and other potential development risks (e.g., remediation).
- Recyclable Materials Transfer Site is Potentially Suitable for a MRF** - The recyclable materials transfer station located at 1030 Fitzwatertown Road is a potential site for MRF development. The site is large enough, contains limited infrastructure, and site access should support the proposed MRF operations (to be confirmed by traffic study expected to be required in development plans by local agencies).
- Consortium Owned MRF Provides Greater Control of Recycling Costs and Options** - Dramatic rate increases experienced by the Recycling Consortium in 2020/2021, escalating material processing and waste disposal costs in Pennsylvania and nationally, and market conditions have made it increasingly difficult to effectively manage costs and vendor compliance through competitive procurement .
- High Commercial Real Estate Values in Montgomery County** – Vacant lots zoned commercial and commercial lots in Montgomery County are expensive and costs of \$500,000 to over \$1M per acre are common depending on many factors. Considering these high costs of land, it is likely more feasible to develop a MRF on a pre-owned property than to buy land as part of MRF development.
- MRF Development is Costly and Takes Time** – The development of a MRF is a significant investment in the future of the Consortium’s recycling program. Planning, permitting, and constructing a MRF will take significant time (likely several years) and come at a significant

cost. The Consortium will need to continue with procuring contractor services for transfer station operations, material hauling, and material processing.

- **Results of 2021 Consortium Procurement Should Clarify Urgency of MRF Development Analysis** – The Recycling Consortium has the opportunity to restructure their recycling procurement scope of services according to the findings in the report titled “Procurement Considerations for Transfer Station Operations, Material Hauling, and Material Processing and Marketing.” Should the Consortium implement the recommendations in this report to procure facility operations, transportation, and processing of materials, the potential exists to allow for greater competition by more vendors that may provide more favorable pricing for the Consortium than current rates. The results of the 2021 procurement should clarify the urgency with which the Consortium should commission a comprehensive MRF feasibility study.

RECOMMENDATIONS

The Recycling Consortium should consider the following recommendations as it evaluates MRF Development:

- **Consider a More Detailed MRF Investigation (Transfer Station Site)** - The Recycling Consortium should hold several meetings to review MRF development and vote to explore MRF development in more detail. If the Recycling Consortium votes to commence detailed MRF investigations, a scope and schedule for subsequent investigations should be developed with input from local agencies including Planning Commissions, Township staff, consultants and others. Planning actions should be sequenced to minimize costs and planning efforts. For example, prioritize a task like environmental investigations early to identify issues that would stop the project. This will minimize unnecessary planning expenditures.

Developing a MRF is potentially a way to control rapidly escalating recycling costs by assuming a more active role to improve transportation efficiency and increase commodity values for separated and baled material. At minimum, there is justification for the Recycling Consortium to take a hard look at assuming a more direct role in materials consolidation, transfer, and processing to include MRF development and even operation.

- **Explore Market Opportunities and Facility Sizing Options** - The Recycling Consortium should evaluate the feasibility for developing a MRF designed to manage only the Recycling Consortium’s recyclable materials and a facility designed with additional capacity that might result in greater economies of scale. Owning a MRF with extra capacity allows the Recycling Consortium to become a “market participant.” As a result, the Recycling Consortium could offer processing services to municipalities, accept spot market loads of materials, and respond to bids for processing services. The net result could be reduced costs for the Recycling Consortium. This requires taking an in-depth analysis of potential market opportunities and confirm impacts and benefits from sizing the facility to process more tons per year and what steps could be implemented to mitigate negative impacts.

- **Issue Notice of Interest:** Release a notice of interest to identify a list of potential vendors that express interest in developing/operating a MRF at the transfer station location. This can be released publicly, and sent directly to known prospects like Covanta, Waste Management, Cougles Recycling, Inc., JP. Mascaro & Sons, Republic Services, and others.

A request for response relating to future MRF development and operation could be incorporated within pending procurement documents relating to transfer station operation, hauling and recyclables processing services.

9 CONCLUSION

Considering transportation distances and travel times from the Recycling Consortium member municipalities to regional single-stream processors combined with rapidly escalating material processing costs, the continued operation of the transfer station and the development of a MRF should be considered carefully by the Recycling Consortium. Recent evidence by the Recycling Consortium and as experienced by many other municipalities regarding waste and recyclables service contracts is indicative that the Recycling Consortium may need to increase its control over its recycling operations, hauling, and processing in order to curb and better manage these costs now and in the future. Developing and operating a MRF requires extensive additional planning and development of a sound financial strategy.