

**LEBANON COUNTY  
MUNICIPAL WASTE MANAGEMENT PLAN  
NON-SUBSTANTIAL REVISION  
2020 to 2030**

**PART I: PLAN SUMMARY  
Draft 4**

Prepared by

GREATER LEBANON REFUSE AUTHORITY  
Lebanon, Pennsylvania  
Lawrence D. Taylor, PE  
Project Manager

2020





## REFERENCES

1. Lebanon County Municipal Waste Management Plan; 2000 To 2010, Part I: Plan Summary: David L. Giefer, Ph.D., MBA, PE
2. Lebanon County Municipal Waste Management Plan; 2000 To 2010, Part II: Supporting Attachments: David L. Giefer, Ph.D., MBA, PE
3. Lebanon County Municipal Waste Management Plan; 2000 To 2010, Part III: Exhibits: David L. Giefer, Ph.D., MBA, PE
4. Guidelines for the Development and Implementation of County Municipal Waste Management Plan Revisions: Document No. 2212-504 / January 2, 2010
5. Municipal Waste Management Agreement; County of Lebanon and the Greater Lebanon Refuse Authority, 7 May 2009
6. United Haulers Assn. v. Oneida-Herkimer Solid Waste Management Authority, 127 S.Ct. 1786 (2007): United States Supreme Court
7. Lebanon County Municipal Waste Management Plan; 2010 to 2020, Part I: Plan Summary
8. Municipal Waste Management Agreement; County of Lebanon and the Greater Lebanon Refuse Authority, 3 October 2019

## **ACKNOWLEDGEMENTS**

The purpose of the Advisory Committee is to provide input, suggestions, and advice to the Waste Management Plan as it is developed. The input provided was invaluable; the individuals noted below are thanked for their service to the County.

## Advisory Committee

<u>NAME</u>	<u>AFFILIATION</u>	<u>REPRESENTING</u>
Mr. John Barry	JJC Investments	Private Waste Community
Mr. Jon Beers	S. Lebanon Township	S. Lebanon Twp.
Mr. Bill Behney	GLRA Board Member	Richland Borough
Mr. Clifford Berger	GLRA Development Relations	Bethel Twp.
Mr. James Cantrell	GLRA Development Relations	Swatara Twp.
Ms. Julie Cheyney	Lebanon County Planning	Lebanon County
Ms. Roberta DeSantis	GLRA Development Relations	Millcreek Twp.
Mr. Tom Embich	GLRA Board Member	Annville Twp.
Ms. Candy Falger	Harrisburg Area Community College	Higher Education
Mr. Ed Fogelsanger	GLRA Development Relations	South Annville Twp.
Ms. Angie Foltz	GLRA Development Relations	W. Cornwall Twp.
Ms. Robin Getz	Lebanon County Municipal Bldg	Lebanon City
Ms. Bonnie Grumbine	GLRA Board Member	North Lebanon Twp.
Mr. Steve Johnson	Waste Management	Private Waste Community
Mr. Nick Jovich	Trigon Plastics	Industry
Mr. Barry Ludwig	GLRA Board Member	Myerstown Borough
Ms. Amy Mazzella di Bosco	Greater Lebanon Refuse Authority	Lebanon County
Mr. Chez Morton	Waste Industries	Private Waste Community
Ms. Heidi Neiswender	GLRA Development Relations	North Londonderry Twp.
Mr. Bob Reazor	Reazer's Disposal	Private Waste/Recycling Community
Mr. Jack Rudegair	Weidle Sanitation Service	Private Waste Community
Mr. Randy Sattazahan	Sattazahn Refuse	Private Waste Community
Mr. Larry Taylor	Greater Lebanon Refuse Authority	
Mr. Terry Tobias	TNT Sanitation	Private Waste Community
Mr. Joel Washok	PennWaste	Recycling Community
Mr. Todd Zuckerman	CSR-Brandywine	Recycling Community

## Municipalities & Townships of Lebanon County<sup>1</sup>

<b>Municipality/Township</b>	<b>Greater Lebanon Refuse Authority Representative</b>
Annville Township	Thomas Embich/Joseph Viozzi (Alternate)
Bethel Township	Clifford R. Berger
Cleona Borough	Elizabeth Lindsay
Cornwall Borough	Vacant
Cold Spring Township <sup>2</sup>	
East Hanover Township	Frankleen Gibson
Heidelberg Township	Christine Horst
Jackson Township	Robert R. Confair
Jonestown Borough	Paul Bird
Lebanon City	Robin Getz
Millcreek Township	Roberta DeSantis
Mt. Gretna Borough	Karl Kerchner
Myerstown Borough	Barry Ludwig
North Annville Township	Brent McFeaters
North Cornwall Township	Jean Long
North Lebanon Township	Bonnie Grumbine
North Londonderry Township	Heidi Neiswender
Palmyra Borough	Eric Adams
Richland Borough	William Behney
South Annville Township	Edward Fogelsanger
South Lebanon Township	John Poff
South Londonderry Township	Charles Olt
Swatara Township	James W. Cantrell, Jr.
Union Township	Larry Herr
West Cornwall Township	Angie Foltz
West Lebanon Township	LuAnn Horn

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<sup>1</sup> See ATTACHMENT 1 for records of motions from each municipality.

<sup>2</sup> Represented through Union Township

**Approved for Submission**  
**Lebanon County Board of County Commissioners**

<b>Title</b>	<b>Representative</b>	<b>Signature</b>
County Commissioner	Robert J. Phillips	_____
County Commissioner	William E. Ames	_____
County Commissioner	JoEllen Litz	_____
County Administrator	Jamie Wolgemuth	_____

**Approved**  
**Pennsylvania Department of Environmental Protection**

<b>Name</b>	<b>Title</b>	<b>Signature</b>
_____	Waste Management Program Manager	_____

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## LIST OF ATTACHMENTS (WMP 2020 PLAN SUMMARY)

1. Ordinance No. 61: Lebanon County Municipal Waste Management Ordinance
2. Municipal Waste Management Agreement between Lebanon County and Greater Lebanon Refuse Authority

## CALCULATION AND CORRESPONDENCE LOG

**DISCIPLINE:** Waste Planning PAGE NO. 1 OF 2

**PROJECT:** LEBANON COUNTY WASTE MANAGEMENT PLAN (Minor Revision)

SUBJECT:	CALC. NO. or Date	REV. NO.
Memorandum: To Board of the Authority re: Waste Management Plan; Advisory Committee	30 August 2018	
Memorandum: To County Commissioners re: WMP	20 Mar 18	
Lebanon County Commissioners letter to Department of Environmental Protection	April 11, 2018	
Department of Environmental Protection to Lebanon County Commissioners	April 16, 2018	
Municipal Notification Letters	July 5, 2018	
Memorandum, Waste Management Plan; Advisory Committee	5 March 2019	
Lebanon County Ordinance No. 61	3 October 2019	
Municipal Waste Management Agreement	3 October 2019	
ADVISORY COMMITTEE MEETING MINUTES	27 February 2019	
ADVISORY COMMITTEE MEETING MINUTES	9 October 2019	
ADVISORY COMMITTEE MEETING MINUTES		
Municipal Officials Meeting Invitation		
Municipal Officials Meeting Minutes		
Memorandum: Farm Burning Study	1 November 2011	
Memorandum: Open Burning in Lebanon County	31 May 2017	
GLRA Waste Characterization Evaluation	WMP-001 (2020)	0
Lebanon County MSW/Recycling Estimate	WMP-011 (2020)	0
Lebanon County Pop./MSW/Recycling Estimate	WMP-016 (2020)	0
Electric Generation (Check Title)	WMP-026-CALC	0
Task 3 Report – Design of a Waste Mining/Redeposit Plan into the Lined Cells	WMP-010-RPT	0

Conceptual Design – Piggyback Expansion and Waste Mining Study (Report)	WMP-011-RPT	0
Future Tip Fee (Gate Rate) Analysis	WMP-012-RPT	0
Technical Memorandum; Pro Forma Economic Analysis and Model of Waste Management and Recycling Options	WMP-038-CALC	0

## GLOSSARY OF ACRONYMS USED

ADV	Average Daily Volume
BOD	Biochemical Oxygen Demand
BTU	British Thermal Unit
DCRA	Covered Device Recycling Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFM	Cubic Feet per Minute
CPI	Consumer Price Index
CPO	Computer Print Out
C/N	Carbon to Nitrogen Ratio
C&D (or C/D)	Construction and Demolition
DEP	Department of Environmental Protection
DO	Dissolved Oxygen
EDIN	Economic Development Information Network
EPA	Environmental Protection Agency
EPP	Energy Power Partners
GLRA	Greater Lebanon Refuse Authority (as identified in this plan, the GLRA can be considered as any entity given the responsibility for waste management planning in Lebanon County)
HDPE	High Density Polyethylene
HGOP	High Grade Office Paper
HHW	Household Hazardous Waste
kW	kilowatt (1000 watts)
LDPE	Low Density Polyethylene
LMR	Lebanon Methane Recovery
LFG	Landfill Gas
mgd	Million Gallons per Day
MRF	Material Recovery Facility
MSW	Municipal Solid Waste
NA	Not Available
NALTS	Natural Aquatic Life Treatment System
NPV	Net Present Value
OCC	Old Corrugated Cardboard
ONP	Old Newspaper
PET (or PETE)	Polyethylene Terephthalate
PVC	Polyvinyl Chloride
PACT	Powdered Activated Carbon Treatment
PAYT	Pay-as-You-Throw
POTW	Publicly Owned Treatment Works
PP	Polypropylene
PPL	PPL Utilities

PS	Polystyrene
RCRA	Resource Conservation and Recovery Act
RFP	Request for Proposal
TPD	Tons per Day
TPY	Tons per Year
VOC	Volatile Organic Compound
WARM	EPA Waste Reduction Model
W/E	Waste-to-Energy
WMP	Waste Management Plan

## FOREWORD

In 1990 Gannet Fleming authored the original Waste Management Plan (WMP) as required by Act 101 for the management of Lebanon Counties Municipal Solid Waste (MSW). The end result of that process was the delegation by the County to the Greater Lebanon Refuse Authority the responsibility for MSW management, disposal, and planning. In 1997 through 2000 a major revision to this plan was undertaken by the Greater Lebanon Refuse Authority through Dr. Dave Giefer. That revision was written to provide a comprehensive blueprint for future decisions by the County, by the Waste Services Providers for the County, and by each municipality within the County. Act 101 requires that the Waste Management Plan be reviewed every ten years, revised as necessary, and capacity for the MSW anticipated to be generated be identified and assured for the duration of the next ten year planning period. Dr. Giefer's thorough approach was sufficiently robust to allow the review of his data, analysis, and projections and selectively modify those areas of the plan that required adjustment. The revision covering the period from 2010 to 2020 was therefore classed as a Minor Plan Revision and relied on the detailed analysis contained within the 2000 Waste Management Plan (WMP 2000). This revision continues to rely on that detailed analysis supplemented by the efforts of SCS Engineers supplying a "Pro-Forma" economic analysis of various solid waste management options to confirm the most cost-effective solid waste management option for the next ten-year period. As a result, this revision is also classed as a Minor Plan Revision.

For the past twenty years the municipalities within the county have considered the guidance and suggestions within the WMP and made their decisions based on their own unique situation. The Greater Lebanon Refuse Authority (GLRA) has and will continue to provide assistance to those communities that request assistance in implementing programs suggested by the WMP. This is the direction supplied by the municipal representatives on the Board of the Authority from your municipalities to the staff of the GLRA.

It must be emphasized that while the plan revision was spearheaded by the Greater Lebanon Refuse Authority, this was done as an agent of the County Commissioners. In balancing the different views of the various stakeholders this perspective was maintained; the end result must be in the best interests of Lebanon County. Please review the summary from both the perspective of your individual municipality, as well as that of the County.

With the extensive participation and modification of WMP 2000 this plan required few changes or modifications. Each municipality remains free to continue to implement the recommendations which are best suited for their unique needs and philosophy. Sufficient information was included in WMP 2000 to allow informed decisions on issues that should be seriously considered now and into the future. It is believed that this flexibility allows individual communities to control what happens within their borders as much as possible.

On a larger scale, the plan continues to provide the mechanism for Lebanon County to meet our collective obligations under the provisions of Act 101 in a manner which is environmentally sound. At the same time, Lebanon County residents, with municipal representation on the Board of Authority of the facility where their wastes are disposed, are assured capacity for disposal of their wastes for the term of the plan. This again assures local control of solid waste management practices in Lebanon County since citizens and municipalities control implementation of the plan once it is approved.

It is requested that each municipality review the plan and ask for clarification on any issues which concern you. Finally, it is requested that you act to approve the Lebanon County Municipal Waste Management Plan, Non-Substantial Revision for the years 2020 to 2030. After you have voted, please forward a copy of the motion record to the Greater Lebanon Refuse Authority along with any recommendations.

COUNTY COMMISSIONERS:

Robert J. Phillips	_____	Dated	_____
William E. Ames	_____	Dated	_____
Jo Ellen Litz	_____	Dated	_____

## EXECUTIVE SUMMARY

This Municipal Waste Management Plan was prepared in accordance with the requirements of Act 101 of 1988, the “Municipal Waste Planning, Recycling, and Waste Reduction Act”, and the most recently published Guidance Document prepared by the Department of Environmental Protection. The function of this revision to the Waste Management Plan for Lebanon County is to respond to the requirements of Act 101 and the Guidance Document<sup>3</sup>, to review the data and analysis of the previous Solid Waste Management Plan, and to update those areas which require it.

Originally authored in 1990 by Gannett Fleming, Inc. out of Harrisburg, the Waste Management Plan (WMP) underwent a major revision, published in March of 2000, authored by Dr. David Giefer (WMP 2000). A minor revision to that plan was accomplished in September of 2010 covering the period from 2010 to 2020 that relied heavily on his original research, documentation, and data. This Minor Plan Revision covering the period from 2020 to 2030 again builds on his work and in much of the document, remains his work.

Act 101 calls for comprehensive, integrated waste management plans. According to this Act, the plan should propose the optimal complementary use of a variety of management technologies, including waste reduction, waste diversion (recycling), waste processing, and waste disposal. Prior to preparation of WMP 2000 an in-depth economic evaluation was performed to assess the benefits of using individual waste processing technologies or various combinations of technologies (including waste reduction methods such as incineration and composting, and waste diversion by recycling with material recovery facilities) for processing Lebanon County waste. Economic evaluation of these waste management technologies provides a basis for establishing optimal economic and environmental waste management approaches in Lebanon County. In preparation for this plan revision a “Pro-Forma Economic Analysis” was conducted by SCS Engineers to look at the same strategies for dealing with Lebanon County Waste in order to confirm that optimal economic and environmental management decisions continue to be followed and implemented.

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<sup>3</sup> Guidelines for the Development and Implementation of County Municipal Waste Management Plan Revisions, 254-2212-504 / January 2, 2010

Act 101 delegates to counties the power and duty to prepare and implement plans for the processing and disposal of municipal waste generated in the County. Act 101 also delegates the responsibility and authority for the collection and transportation of municipal waste and source-separated recyclables to local municipalities. To implement the plans, the Act accords to counties the authority to adopt ordinances and regulations that direct the flow of waste to designated processing and disposal sites. The Act specifically allows counties to delegate their power and duty for municipal waste planning and implementation to another body, such as a municipal authority.

The Greater Lebanon Refuse Authority (GLRA) is composed of representatives from twenty-five municipalities and has been delegated the responsibility to provide for the management of the wastes generated in Lebanon County. County Ordinance #15 was originally implemented to provide a legal basis for the waste management agreement between Lebanon County and the GLRA. This ordinance superseded any municipal agreement regarding waste management in the County once implemented. As a part of WMP 2020, this Ordinance has been updated and re-issued as Ordinance #61, Lebanon County Municipal Waste Management Ordinance, to cover the next ten year period of the planning process.

Although the GLRA is composed of representatives from each of the County's organized municipalities, the ultimate approval for waste management still resides with each of the municipalities. The GLRA has established a staff with responsibilities to directly manage the ongoing operations of waste disposal at the GLRA landfill site and report to the Board of Authority. In addition, the GLRA staff has been given the responsibility to provide for waste management planning and recycling coordination to support Act 101 requirements. Since the GLRA has provided this service to Lebanon County for the past 60 years, it is the intent of this waste management plan that the GLRA be maintained as the waste management service provider in Lebanon County for the duration of this plan. The Waste Management Plan of March 2000 (WMP 2000) provided a template on which to view decisions in waste management, and recommended actions by the GLRA. The timeline for implementing some of the suggested actions in that plan was influenced by challenges to the flow control of waste in the period from 2000 to 2010, and thus to the economics on which many programs would be based. The US Supreme Court eventually ruled on a similar case, upholding flow control as a method government entities can use to develop and fund solid waste management systems based on certain criteria. WMP 2000 thus remains as a template for Waste Management decisions for this planning period.

Current population trends within the County appear to be on track with the population trend predicted by WMP 2000. In fact, population growth for Lebanon County closely approximates a straight line from 1900 through the present. This trend, and the analysis of waste within the County from WMP 2000 refreshed for WMP 2020, are the basis for projecting waste generation and recycling. In 2019 the GLRA processed approximately 130,000 tons of waste. Another 90,000 tons of material was recycled from the County, with the trend throughout the past decade being a steadily increasing amount of material entering the recycling markets instead of reaching land disposal.

The waste management planning effort that culminated in WMP 2000 was initiated with a detailed characterization study of the waste received at the GLRA landfill site and a review of the various processing technologies available to process this waste. The results of the study determined that a considerable quantity of recyclable material was being disposed of in the GLRA landfill. A detailed economic feasibility study was then initiated to determine whether there was an economic advantage for the recycling of materials that could be diverted from landfill disposal.

The feasibility study evaluated methods of processing Lebanon County waste including composting, incineration, use of a material recovery facility (MRF), and combinations of these facilities. It also evaluated the implementation of various operations such as waste hauling, landfill gas disposal, inactive landfill recovery, impact of flow control, types of MRFs to be considered for processing recyclables, and target markets for recycled materials. The economic evaluation was prepared for a feasibility period based on a short-term (10-year) duration covering the years 2000 to 2010. A 50-year evaluation was also made to establish long-term economic benefits to the County as a result of implementing various programs.

This analysis was mirrored in the Pro Forma Economic Analysis accomplished by SCS Engineers to validate the current status of the industry, markets, and economic conditions for the next ten-year period. The results of this study indicated that implementation of facilities to process waste generated in Lebanon County by composting, incineration, or a large scale Material Recycling Facility (MRF) were not economically feasible. The GLRA continues to believe that recycling is critical not only to the preservation of landfill space, but more importantly to the environment. GLRA has aggressively pursued education with the result of increasing recycling at the source. While detailed studies of the current waste stream have not been conducted, visual characterization of the waste leads to the conclusion that there is

still recyclable materials in the waste stream that could be recovered. The concept of a MRF remains a consideration for future study; detailed waste characterization is recommended prior to moving forward with this consideration.

A concern of WMP 2000 was that wastes diverted from the landfill through recycling would reduce the amount of revenues collected from the tipping fees needed for operation of the landfill and for maintenance of other waste management activities in the County. Over the past decade the data suggests that recycling can increase at the same time as population increases with no adverse effect on operational cash. The data additionally indicate that the growth of Commercial Waste and Construction Demolition Waste (C&D) currently provide assurance that operational revenues will be provided for regardless of any increase in recycling efforts.

The MSW management model remains relatively unchanged from that reported in WMP 2000; private haulers generally collect waste disposal fees directly from the residents and businesses in the County and use this revenue to pay for collection costs, recycling costs, and waste disposal costs (through the landfill tipping fee). The landfill tipping fee in turn is utilized by the GLRA to pay landfill operational costs, debt reduction, costs for maintenance of inactive landfills, waste management plan administrative costs, and costs related to the support of recycling in Lebanon County. The County residents thus indirectly pay for the costs to manage and dispose of wastes, administer the waste management plan, and support recycling throughout the County.

In response to the flow control challenge the GLRA changed their business model slightly to position themselves to survive a loss of flow control. Currently they offer a rebate to large volume customers who bring all of their waste to the GLRA, maintain a credit account with the GLRA, and respect the regulations promulgated under the County Solid Waste Management Plan. It is anticipated that this program will continue.

The GLRA bears the responsibility and the burden for supporting Countywide recycling. Should the burden of supporting Countywide recycling increase a similar change in the method for charging for recycling support would be required. Currently, the revenues for these programs are included in the GLRA tipping fee.

In spite of the economic drawbacks associated with increases in recycling, it is the intent of this plan to promote the continued implementation of recycling programs in support of waste

diversion efforts. The revenues to implement these programs will be obtained by adjustment of fees (as needed) that are currently paid in Lebanon County for waste collection and disposal.

The various programs to be implemented as part of this waste management plan and the corresponding implementation dates are summarized in Table B of this executive summary, superseding Tables B and C from previous summaries. These programs are further detailed in Figure 17 in Section 8. The Waste Management Plan for Lebanon County was implemented in 2000, currently provides direction to the GLRA and the County, and will continue to be utilized, evaluated, and modified as necessary to remain a viable tool through 2030 to support the needs of the residents of Lebanon County.

The following summarizes programs identified by the plan.

- To promote proper waste management in Lebanon County, the GLRA staff is considered a centralized source of waste management information for the County. The GLRA staff provides guidance for waste disposal to commercial and industrial establishments as requested. This service benefits organizations in the County that generate waste whether or not it is acceptable for disposal at the GLRA landfill. This centralized information program allows the resources of the GLRA to be utilized as a public service by those without the resources to understand or keep current on the growing field of waste management. This effort is currently underway and should continue to the year 2030 and beyond.
- Programs to evaluate methods to divert waste from landfill disposal should continue to be evaluated, implemented as appropriate and continued if already in place and successful.
  - The first of the diversion programs involved efforts to determine how to increase the amount of materials recycled in Lebanon County. These ongoing efforts have been focused on the individual municipalities in the County, and on the educational process involving schools of all levels, civic organizations, and general outreach. This includes recommendations for possible ordinance modifications and standardization of recycling methods within each municipality. Currently DEP requires the adoption of a “Waste Ordinance” covering waste collection, a “Burn Ordinance” banning burning of recyclable

materials, and a “Recycling Ordinance” for eligibility for Act 101 Funding and publishes templates of those ordinances for municipal use. A recycling cost awareness program is ongoing within the County to identify the costs of recycling in the County.

- Waste Management Plan 2000 evaluated the use of neighboring counties to provide processing of waste to minimize the quantities disposed at the GLRA landfill. Although the economic feasibility study for Lebanon County determined implementation of an incinerator in Lebanon County to be unfeasible, one of the most viable technologies for out-of-county waste processing is incineration. This option was re-evaluated in the Pro Forma Economic Analysis by SCS Engineers and determined not to be cost effective at this time. This option will continue to remain as a possibility for future considerations. It should be noted that currently the GLRA has constructed all permitted landfill space and has less than 5 years of capacity remaining as of 1 January 2020.
- Use of a MRF is the last of the waste diversion programs to be considered. WMP 2000 recommended that a MRF be considered for implementation only if the programs to improve source recycling are proven to be unsuccessful. Data collected for WMP 2010 suggests that recycling is happening in increasing quantities. Currently market conditions would appear to preclude the construction of a large scale MRF, an option that was evaluated in the Pro Forma Economic Analysis and found to be uneconomical. As market conditions and technology change this technology will continue to be considered.
- The County waste disposal program will continue to include licensing, enforcement of Act 90 Provisions, flow control management, landfill disposal, landfill gas recovery and disposal, and leachate processing.
  - Licensing programs were initiated in 2001 however conflicting Court opinions forced the modification of the program following the implementation of Act 90.
  - Flow control continues and works in conjunction with the licensing program, rebate programs, and recycling cost awareness programs.

- Waste disposal at the GLRA landfill will continue during the planning period represented by this WMP. Currently all permitted disposal area has been constructed; as noted the GLRA has less than 5 years of capacity as of 1 January 2020. The Pennsylvania Department of Environmental Protection (DEP) does not allow the submission of permits for expansion unless there are less than 5 years of remaining capacity. A Permit Expansion has been submitted and is currently in the permitting process.
- WMP 2010 recommended continued evaluation of the recovery of existing GLRA landfill sites at the GLRA facility. Site recovery, if feasible, would have aided in minimizing land use and resource consumption resulting from landfill expansion in Lebanon County. This study was conducted; however, the conclusion was that the cost of this operation would be prohibitive, and that the potential impact on the local community would be unacceptable.
- Education programs are currently a part of the waste management planning efforts in Lebanon County. These should continue for the period covered by this WMP. An additional education program was considered to educate municipal personnel on the County waste management programs and methods of enforcement. This program is implemented as the opportunity arises and will continue. Added to the education programs will be education on the environmental and health impacts of open burning.
- Recycling opportunities are currently available to 86% of the population in Lebanon County in mandated communities, voluntary mandated communities, and in communities with drop-off centers. Despite the loss of recycling markets in China in 2018, recycling in Lebanon County has maintained its overall diversion rate.
- Emergency disposal planning has taken place in an effort to assure that waste can be collected and disposed in Lebanon County for most credible emergency situations. GLRA purchased roll off containers and a vehicle to supplement private firms in the collection of wastes for small emergencies such as tornados, floods, and other emergency events. For large scale disasters State and Federal resources will be utilized as available to supplement resources available within Lebanon County. This planning continues to evolve to meet the needs of the County.

- An Emergency Recycling Plan should be developed to support the recycling programs in place throughout the County in the event of a loss of market outlets.
- Future planning efforts should be undertaken to evaluate waste management once all available “brown field” sites (those already utilized for waste disposal) have been utilized. These future evaluations must, by necessity, consider a “green field” waste disposal option.

**TABLE A  
LEBANON COUNTY  
MUNICIPAL WASTE MANAGEMENT  
IMPLEMENTATION FOR 1990 TO 2000**

<u>TASK OR FUNCTION</u>	<u>Original Dates</u>	<u>Status</u>
1. Landfill Ownership and Operation	continuing	Ongoing
2. Waste Flow Control	Year 0 (1990)	Ongoing
3. Licensing	Year 0 (1990)	Complete
4. Establish and Collect User Fees	continuing	Ongoing
5. Study of Municipal Solid Waste Compost	completion by Year 5	Complete
6. Begin Procurement of Compost Facility	Year 5	Complete <sup>4</sup>
7. Municipal Wastewater Sludge Disposal Oversight/ Possible Study	Year 0	Complete
8. Septage Management Oversight	Year 0	Complete
9. Recyclables Processing and Marketing Contract	Commence 8/90	Complete
10. County-Wide Drop-Off Recycling	Commence 9/90	Complete
11. Public Education - for waste reduction, recycling, MSW management, household hazardous waste management, etc.	Commence earlier of plan approval or receipt of grant	Ongoing
12. Technical Guidance on Reduction and Recycling to municipalities, businesses, and institutional establishments	continuing	Ongoing
13. Monitoring and possible assistance in recycling/ disposal of special items, such as white goods, tires, used motor oil	Year 0	Ongoing
14. Monitoring of the Management of other municipal wastes, such as infectious waste	Year 0	Ongoing
15. Municipal Waste Planning	continuing	Ongoing
16. Annual Report to DEP	continuing	Ongoing

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<sup>4</sup>Only Greenwaste is composted.

**TABLE B**  
**LEBANON COUNTY**  
**MUNICIPAL WASTE MANAGEMENT**  
**STATUS & IMPLEMENTATION SCHEDULE FOR 2020 TO 2030**

<u>WMP SECTION</u>	<u>TASK OR FUNCTION</u>	<u>IMPLEMENTATION DEVELOPMENT DATE</u>
8.0	Waste Management Plan Implementation	2000
2.0	Waste Management Program Reviews	Annually beginning 2000
3.0	Waste Diversion Programs	
3.1	a. Recycling Programs	
	County Recycling Promotion Programs	Ongoing
	Municipality Programs	Ongoing
	Ordinance Evaluation & Changes	Ongoing
3.2	Recycling Cost Awareness Program	
5.2	b. Out-of-County Diversion Processing	
	Divert Incoming MSW (Incin or Compost)	Evaluated 2019
3.3	Divert From MRF	Evaluated 2019
	c. MSW Processing Program (MRF)	
4.0	Waste Disposal Program	
4.1	a. Landfill Disposal Program	Implemented - Continuing
4.2	b. Hauler Licensing Program	Implemented; moderated by Act 90, Continuing
4.3	c. Establish Flow Control	Implemented - Continuing
4.4	d. Landfill Gas Recovery & Disposal	Implemented - Continuing
4.5	e. Leachate Treatment Program	Implemented - Continuing
5.1	Landfill Recovery Program	Completed: 2016
5.3	Next Generation Landfill Planning & Design	Permit Application Submitted 2018
5.4	Third Generation Planning	2025
6.0	Education Program	
6.1	a. Recycle Education Program	Implemented - Continuing
6.2	b. Hauling Enforcement Education	Implemented - Continuing
7.0	Emergency Disposal Plan	
	a. Natural Disaster Emergency Plan	Evaluate and Revise; 2021
	b. Facility Emergency Plan	Implemented – Continuing

<u>WMP SECTION</u>	<u>TASK OR FUNCTION</u>	<u>IMPLEMENTATION DEVELOPMENT DATE</u>
	c. Recycled Material Emergency Processing Plan	In Process
9.0	Programs Considered and Not Recommended Green Waste Collection Program b. Centralized Waste Collection c. PAYT Program d. Contract Hauling	Re-evaluate: 2027
10	Sustainability of Recycling	Ongoing
11	Open Burning	Research and Report: Current



# SECTION 1

## 1.0 Introduction

### 1.1 Purpose

This Waste Management Plan Non-Substantial Revision for Lebanon County (subsequently identified as WMP 2020) is submitted to respond to the requirements of Act 101 of 1988, entitled the “Municipal Waste Planning, Recycling, and Waste Reduction Act” and the current Technical Guidance Document, “Guidelines for the Development and Implementation of County Municipal Waste Management Plan Revisions”, January 2, 2010. The WMP for Lebanon County was originally authored in 1990 by Gannett Fleming, Inc. in response to the requirements of Act 101. This act requires a revision to the Waste Management Plan every ten years. In March of 2000 a major revision to this plan was published, authored by Dr. David Giefer, that looked at waste management in Lebanon County in great detail. The blue print that he developed (WMP 2000) has served as the basis for management decisions since then. Waste Management Plan 2010, (WMP 2010), as a result of the detail of WMP 2000 was only required to be a minor revision as a direct result of the level of effort and care taken with the preparation of WMP 2000. As a minor revision it built on his work and even now in much of this document, is his work. Similar to WMP 2010 WMP 2020 focuses effort only on those areas which require updating to maintain optimal economic and environmental waste management in Lebanon County. Recognizing the passage of time that may have impacted economic decisions SCS Engineers was contracted to review the economic modeling and develop a “Pro-Forma” analysis of the various options available for the next ten-year plan.

The GLRA, with facilities located approximately 3 ½ miles north of the city of Lebanon on Russell Road (just off Heilmandale Road), manages the disposal of solid waste for Lebanon County. Currently, as required by the WMP, municipal wastes generated in Lebanon County (and only wastes from Lebanon County) are disposed of in the GLRA landfill. The GLRA landfill receives around 112,000 tons of household, commercial, industrial, and construction/demolition waste annually (based on an annual average for the years 2010 to 2019, without AutoFluff). Currently the existing permitted site is expected to reach capacity in about 4 years, or sometime in 2023. Efforts to evaluate waste management options were undertaken as early as 2010, with a landfill expansion permit submitted in the summer of 2018. While the Waste Management Planning process is a 10 year plan, the PA Department of Environmental Protection will not accept a permit

expansion unless there is less than 5 years of capacity available on an existing permit.

Decision-making for waste management planning is difficult because of newly developing concepts and technologies, the broadening of social awareness concerning waste management, and the value of resources. Without the effective decision-making guidance that results from good planning, the implementing action for more efficient waste management may be put off until it is no longer responsive to the needs of a community. The approach followed by the GLRA, acting for the County, is to develop a dynamic waste management plan with an updating mechanism that will allow the waste management system to be modified to keep consistent with changes in social values, concepts, technologies, regulations, and costs.

This waste management plan was written and revised with the intent of continuing to provide program guidance for Lebanon County during the next ten years rather than absolute direction. Programs can be implemented, adjusted, or placed on hold if it is decided to be in the best interests of municipalities or in the best interest of Lebanon County.

## **1.2 Background**

Lebanon County is located in southeastern Pennsylvania and is expected to have a population of approximately 140,000 in 2020 (based on the 2010 census and Census Bureau estimates). The County is economically diverse, with a mix of agriculture, industry, and commerce. Agriculture is an important economic activity in the County, with approximately 43 percent of the County's 363 square miles estimated to be in agricultural use in 2006. Lebanon County's approximately 55,000 households (in 2010) are contained within 26 municipalities. The single largest municipality, the City of Lebanon, contains approximately 26,000 residents, or 19% of the total population.

The Greater Lebanon Refuse Authority was incorporated in 1959 and has allowances for 25 Board Members. (Cold Springs Township, with its limited population, is represented by Union Township.) The Board of the Authority consists of various committees with the Development Relations Committee forming the backbone of the Advisory Committee for the purposes of reviewing the WMP. The Advisory Committee is increased in numbers during the revision process to bring in the viewpoints of the hauling and industrial communities as well as other interests as appropriate and required.

Act 101 delegates to counties the power and duty to prepare and implement plans for the processing and disposal of municipal waste generated in the County. The responsibility and authority for the collection and transportation of municipal waste and of source-separated recyclables is delegated to local municipalities. To implement the plans, the Act accords to counties the authority to adopt ordinances and regulations that direct the flow of waste to designated processing and disposal sites. The Act specifically allows counties to delegate their power and duty for municipal waste planning and implementation to a municipal authority such as the Greater Lebanon Refuse Authority.

Per an agreement with the Lebanon County Commissioners, the GLRA has been delegated the power to provide for the management of the wastes generated in Lebanon County. In addition, the GLRA has been given the responsibility for providing waste management planning to support Act 101 requirements.

The GLRA waste disposal facilities are located on an approximately 500-acre site that is north and west of the city of Lebanon, Pennsylvania. A ten-year average (2010 to 2019) of MSW receipts is approximately 112,000 tons, annually. Of this quantity, approximately 48% is from residential sources, 28% from commercial sources, 15% from construction/demolition sources, and 4% from residual sources. The area in the County from which the waste is collected consists of 26 different cities, townships, boroughs, and one military training base. The wastes generated in Lebanon County were the only source of waste considered in this WMP with the exception of AutoFluff. AutoFluff was used from 2012 through the end of 2019 as a substitute for daily cover soil. This effort was discontinued due to its impact on maintenance and equipment. The tonnage referenced above excludes AutoFluff which, although counted as a residual waste for reporting purposes, displaced soil usage under a Beneficial Use Permit issued by the Department of Environmental Protection.

### **1.3 Objective & Scope**

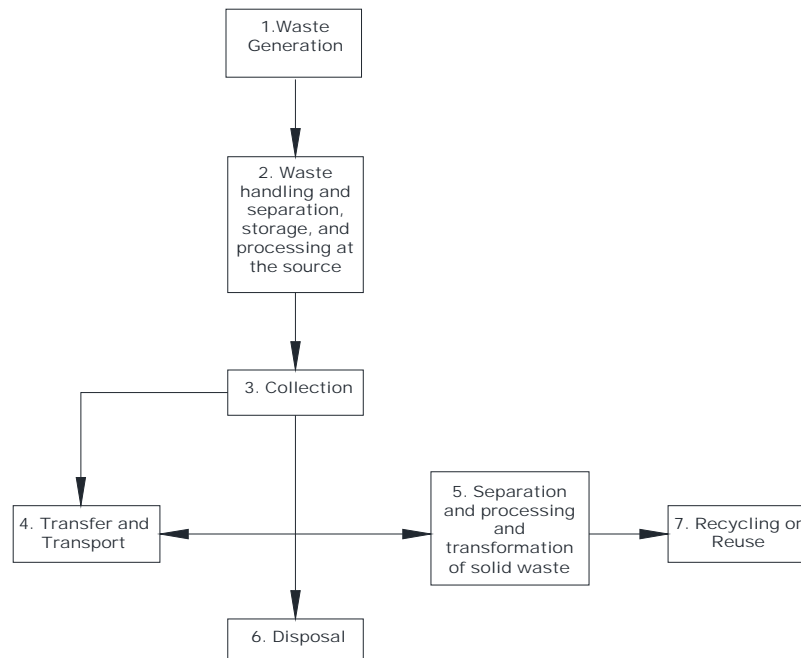
A combination of economic, social, political, and technical factors forms a series of issues that must be addressed when considering waste management planning. Figure 1 illustrates the interconnection of waste management concerns to include: waste generation, waste handling and separation, storage and processing at the source; waste collection; waste transport; waste separation and processing; waste disposal; and future liability for disposed

waste. This WMP defines and establishes objectives, policies, and programs that use these factors to provide a plan to manage municipal solid waste (MSW) generated in Lebanon County. The following briefly summarizes concepts inherent in the functional elements of Figure 1.

*Waste Generation (Box 1).* Waste generation consists of the activities in which materials are identified as no longer being of value and are either thrown away or gathered together for disposal. Waste generation is an activity that is not controllable at the County level.

*Waste Handling and Separation, Storage, and Processing at the Source (Box 2).* Waste handling and separation, storage, and processing at the source consist of all the handling and separation activities associated with management of wastes until they are placed in storage containers for collection. Handling also includes the movement of loaded containers to the point of collection. The best place to separate waste materials for reuse and recycling is at the point of generation. Normally, the cost of providing storage for solid wastes at the source is borne by the homeowner or apartment owner in the case of individuals, or by management in the case of commercial and industrial properties. Processing at the source involves activities such as compaction, composting, and recycling.

**Figure 1: Functional Elements of a Waste Management System**



*Collection (Box 3).* Collection consists of the gathering of solid wastes and recyclable materials and subsequent transport of these materials to the location where the collection vehicle is emptied. This location may be a recycling facility, a transfer station, or a landfill disposal site. Collection and transportation together account for a significant portion of the cost of solid waste management.

*Transfer and Transport (Box 4).* This consists of the transfer of wastes from smaller collection containers to larger transport equipment and the subsequent transport of the wastes to a processing or disposal site. The transfer can take place at a transfer station.

*Separation, Processing, and Transformation of Solid Waste (Box 5).* Separation, processing, and transformation of solid waste consists of the recovery of separated materials, the separation and processing of solid waste components, and the transformation of solid waste. This step occurs primarily in locations away from the source of waste generation. Processing would include the separation of bulky items, separation of waste components by size using screens, manual separation of waste components, size reduction by shredding, separation of ferrous metals using magnets, volume reduction by compaction, and combustion. Transformation processes are used to reduce the volume and weight of waste requiring disposal and to recover conversion products and energy. The organic fraction of MSW can be transformed by a variety of chemical and biological processes. The most commonly used chemical transformation process is combustion (incineration), which is frequently used in conjunction with the recovery of energy in the form of heat. The most commonly used biological transformation process is aerobic composting. Anaerobic composting is also used with methane gas generated as a by-product.

*Disposal (Box 6).* The final element of a solid waste management system is disposal. Historically within Lebanon County the disposal of solid wastes is by landfilling.

*Recycling or Reuse (Box 7).* Separated recyclable materials are sold in the recyclable materials market.

## **1.4 Organization of the Waste Management Plan**

The organization of the WMP is in three parts. The first part is a summary description of the programs to be implemented in Lebanon County up to the year 2030. The second part

is the original supporting information that corresponds to DEP interim guidelines for preparation of waste management plans as required by Act 101 (1988) utilized in the preparation of WMP (2000). The third part contains documents related to the approval and issuance of the WMP (2000). The WMP contains descriptions of the programs to be implemented in Lebanon County up to the year 2030. The only part of the WMP undergoing revision is Part I, although an appendix has been prepared containing revisions to specific portions of Part II and as a supplement for Part III containing updated documents. Part I is divided into sections illustrated by figures 2 and 3 that describe:

1. Introduction
2. Lebanon County Waste Management Program
3. Lebanon County Waste Diversion Program
4. Lebanon County Waste Disposal Program
5. Lebanon County Land Resource Consumption Evaluation Program
6. Waste Reduction and Diversion Education Programs
7. Emergency Disposal Plan
8. WMP Implementation Schedule
9. Programs Considered and Not Recommended
10. Sustainability of Recycling
11. Burning Issues
12. Township Motion Record

Part II of the WMP contains attachments that correspond to the requirements of the “Interim Guidelines for Preparation of Act 101 Municipal Solid Waste Plans” issued by the Bureau of Waste Management of the Pennsylvania Department of Environmental Protection (DEP). Part II consists of the following attachments.

- |                |          |  |
|----------------|----------|--|
| Attachment 1:  | Task 1:  | Description of Waste   |
| Attachment 2:  | Task 2:  | Description of Facilities  |
| Attachment 3:  | Task 3:  | Estimated Future Capacity  |
| Attachment 4:  | Task 4:  | Description of Recycling Program   |
| Attachment 5:  | Task 5:  | Financial Factors: Selection and Justification of Municipal Waste Management |
| Attachment 6:  | Task 6:  | Location of Facilities   |
| Attachment 7:  | Task 7:  | Implementing Entity Identification   |
| Attachment 8:  | Task 8:  | Public Function  |
| Attachment 9:  | Task 9:  | Implementing Documents   |
| Attachment 10: | Task 10: | Orderly Extension  |
| Attachment 11: | Task 11: | Method of Disposal Other Than By Contracts                                   |
| Attachment 12: | Task 12: | County Ownership   |
| Attachment 13: | Task 13: | Other Information  |
| Attachment 14: | Task 14: | Non-Interference: Facilities Developed Pursuant to Sub-                      |

## County Plans

### Attachment 15: Task 15: Public Participation

Part III of the plan contains documents that were prepared separate from the plan, but are related. These are:

- Exhibit 1: Guidelines for WMP Preparation
- Exhibit 2: Calculation Log for WMP
- Exhibit 3: Report Log for WMP
- Exhibit 4: Correspondence Related to WMP Preparation
- Exhibit 5: WMP Advisory Board Meeting Minutes
- Exhibit 6: Site Trip Reports

### **1.5 Issues for Future Consideration**

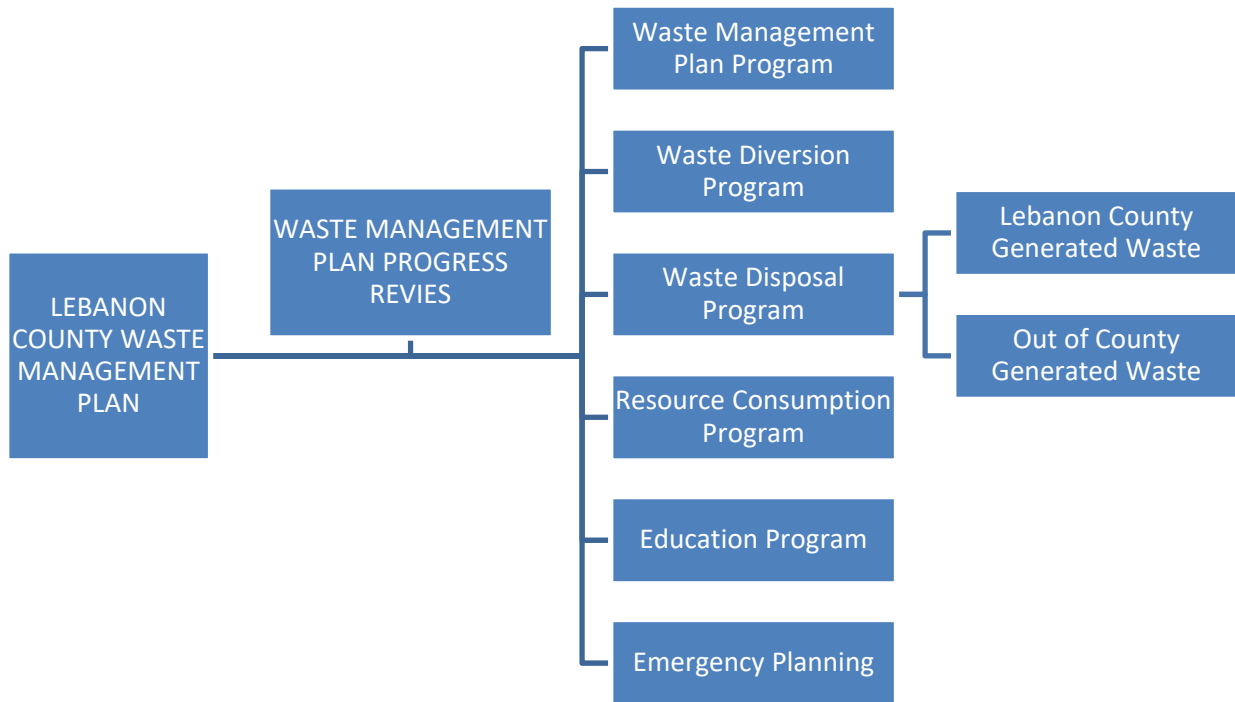
During preparation of the WMP (2000) for Lebanon County, several issues, not included as recommendations in the plan, were identified that are worth noting for future consideration. These issues remained under consideration during the period from 2010 to 2020, and should continue to be considered during the period from 2020 through 2030. They include, but are not limited to, the following.

- County Waste Generation Database. The GLRA has been established by the County to provide for waste management. To facilitate GLRA's waste management efforts, a program that collects County waste generation data would help provide the GLRA with accountability and monitoring of wastes. This program would consist of periodic data collection to create a database containing information on all the waste generated and disposed of in Lebanon County (sewage sludge and industrial waste disposal would be included). The database should identify, as a minimum, the waste generator, the quantity generated, and the means of disposal. While the concept of this database is good, the successful compilation of that data would require the individual haulers to provide the information to the scalehouse for recording. As Lebanon County consists of independent subscription waste collection, individual haulers would be reluctant to provide their customers names for what could become public knowledge and risk having their customers targeted by their competitors. Captured for this edition of the WMP has been the ten-year history of residual waste from Lebanon County being disposed of at other facilities. Residual Waste is not

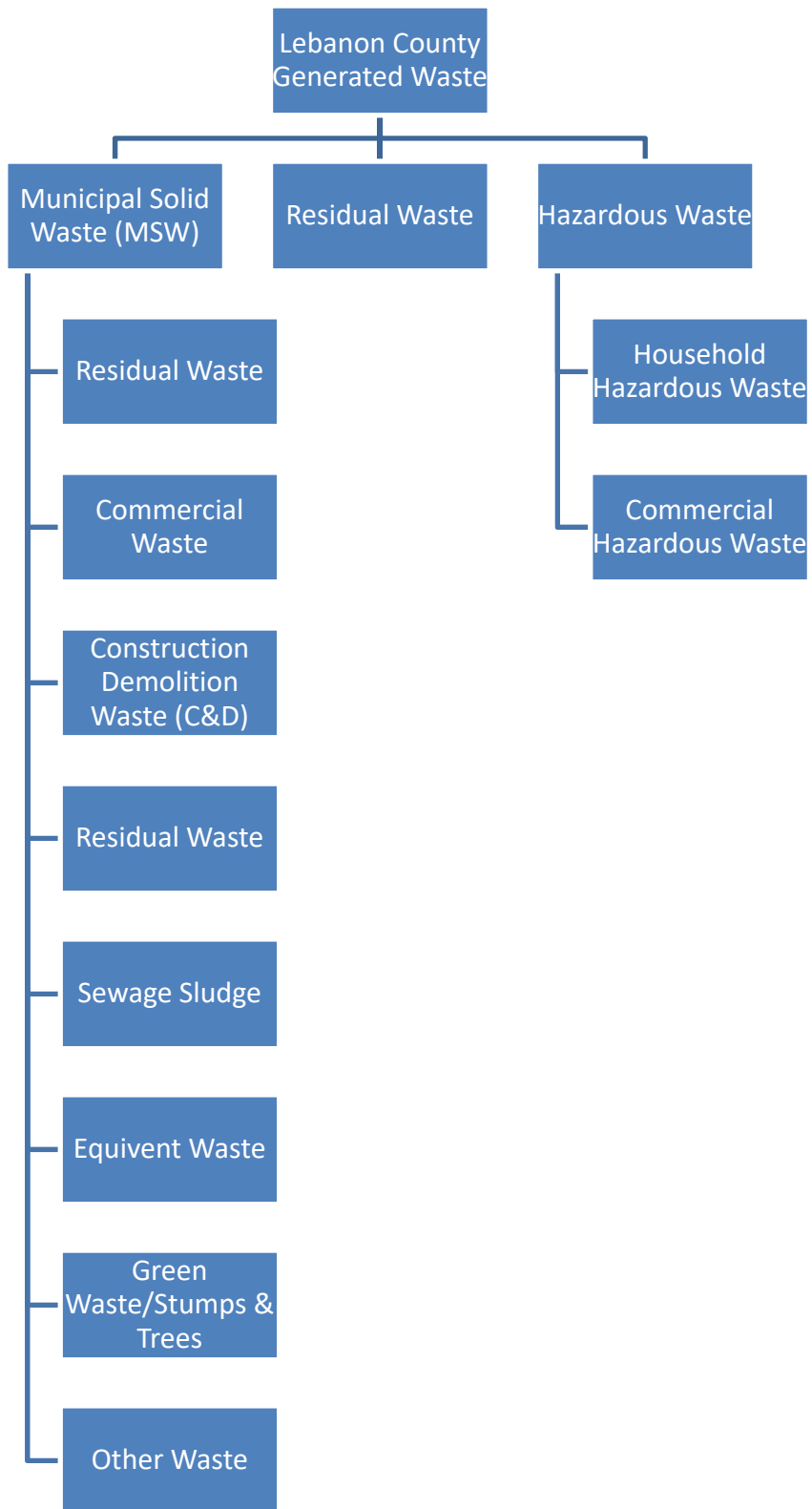
flow controlled, but its generation and disposal is a component of waste management that adds to the overall understanding of Lebanon County waste streams. (See Figure 6)

- Forwarding Facility for Landfill Disposal. The waste that is currently delivered to the GLRA landfill site is hauled directly by commercial haulers to the disposal face of the landfill for dumping. This creates significant on-site traffic and potential safety problems for individuals traveling onto the landfill site. Construction of a “forwarding” facility would allow waste to be received onto a tipping floor at a single on-site location. The GLRA staff would then move the waste to the face of the landfill for disposal with on-site vehicles. This issue remains under review pending successful expansion of the current facility.
- MRF for Source Separated Materials. Source separated materials are not currently processed by the County. WMP 2000 recommended that a MRF be considered to process commingled material if the source recycling program is not successful. This issue was evaluated by the Pro Forma Economic Analysis but currently has been determined to be not economically viable in Lebanon County. This item will remain as an issue to consider during the next planning period.
- Dedicated Entrance Road Access: During the last Major Permit Revision the most significant issue of the Harms vs Benefits Analysis was the concern of the residents of the Heilmandale Community that truck traffic was a “Harm” to the residents of this community. Providing for a separate access road would remove all Harm from consideration in future permitting actions. The viability of this issue was placed on hold after considering the currently permitted disposal capacity and the cost involved in acquiring the right-of-way for a dedicated access road from Route 72.
- Future Disposal Capacity: On December 31, 2019 the GLRA had approximately 4 years of landfill disposal capacity remaining. A permit expansion application was submitted in accordance with the regulations when less than 5 years of disposal capacity remained. Assuming that the permit expansion is approved, the GLRA will have an additional permitted

capacity of approximately 15 years. Efforts should continue to identify future capacity and to take steps to acquire it.



**Figure 2: Overall Organization of Waste Management Plan**



**Figure 3:** Detail of WMP Organization for County Generated Waste Forms

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## SECTION 2

### 2.0 Lebanon County Waste Management Program

#### 2.1 Responsibilities

The historical intent within Lebanon County is to maintain waste processing and disposal of Lebanon County generated waste by the most economical and environmentally responsible means. The belief of the Advisory Committee and the GLRA is that the interests of the residents of Lebanon County are best served if local municipalities maintain control of waste disposal. To this end, the GLRA organization consists of representatives from the twenty-five organized municipalities and maintains the responsibility to manage the disposal of solid waste generated within Lebanon County. In addition, the County Commissioners have delegated waste management in Lebanon County under Act 101 to the GLRA. Waste management responsibilities, although managed by the GLRA, are considered to be the responsibilities of the municipalities/townships. These include:

- Management of the processing and disposal of municipal solid waste generated within Lebanon County,
- Management of the landfill disposal site in Lebanon County,
- Management of all County-level programs (as part of WMP implementation) to promote recycling of wastes generated within Lebanon County.
- Management of Disposal Capacity Assurance

The GLRA recommends that the municipalities/townships include programs directed at increased recycling of solid wastes generated in their jurisdiction as the most environmentally conscious choice for their community as well as to preserve landfill space. The GLRA, based on historical background, current expertise, and pro-active efforts, is the logical choice for coordinating municipality/township waste recycling management. The remainder of this section will identify the organization of the GLRA. A description of the waste generated in Lebanon County is also presented.

#### 2.2 Organization of Lebanon County Waste Management Entities

The twenty-five member board of the GLRA is composed of representatives from each of the incorporated municipalities and townships in Lebanon County. These

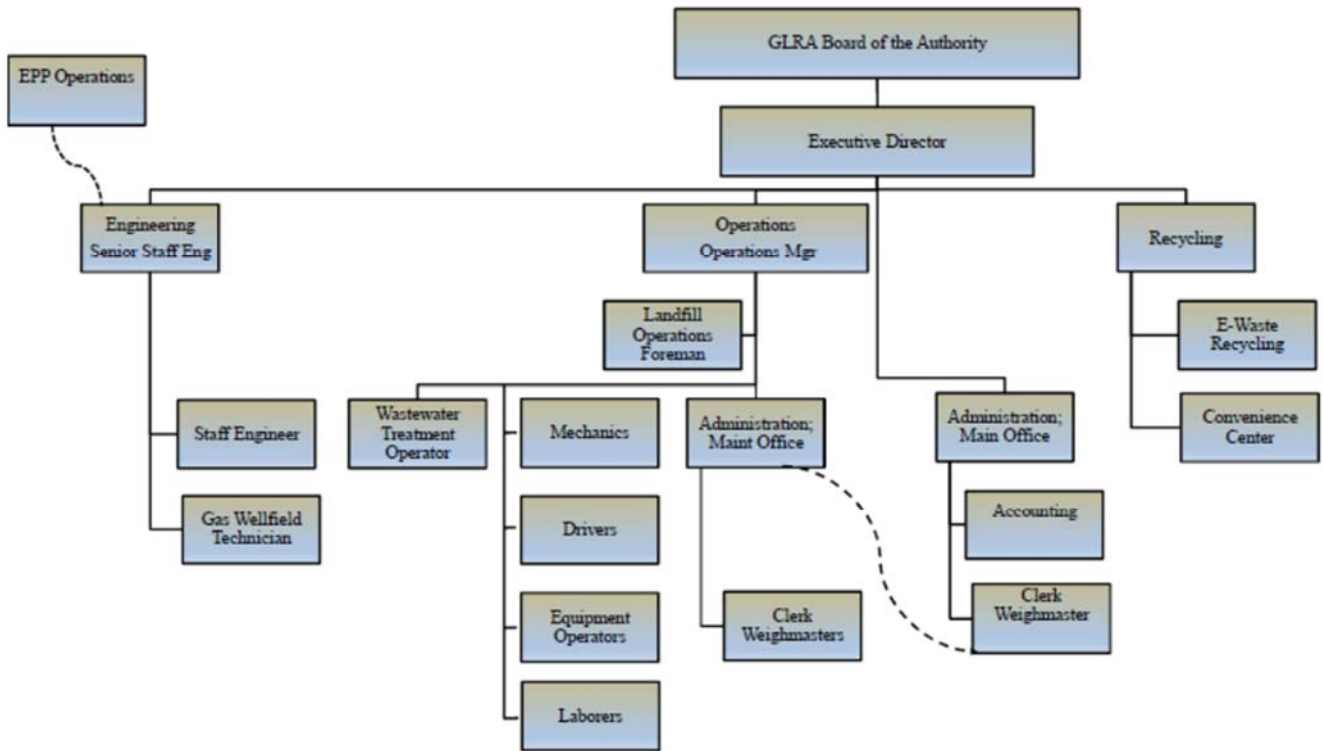
municipalities/townships, with the respective populations and population projections, along with the waste generated or projected in each, are identified in Table 1.

**Table 1: Lebanon County Municipalities & MSW Projections**

Municipality/Township	Pop. 2000	Pop. 2010	2020 Projected Pop.	2030 Projected Pop.	MSW (2000 Actual)	Landfilled MSW (2010 Actual)	Landfilled MSW (2020 est)	Landfilled MSW (2030 est)
Annville Township	4,518	4,767	4,950	5,177	2,309	3,833	4,495	4,701
Bethel Township	4,526	5,007	5,228	5,468	4,096	3,140	4,748	4,966
Cleona Borough	2,148	2,080	2,172	2,271	1,665	1,808	1,972	2,063
Cold Spring Township	49	52	55	57	8	3	50	52
Cornwall Borough	3,486	4,112	4,295	4,492	1,693	1,767	3,900	4,079
E. Hanover Township	2,858	2,801	2,919	3,053	1,442	2,276	2,651	2,773
Heidelberg Township	3,832	4,069	4,239	4,433	1,197	1,268	3,849	4,026
Jackson Township	6,338	8,163	8,633	9,029	3,128	4,342	7,839	8,199
Jonestown Borough	1,028	1,905	1,989	2,081	1,430	1,252	1,807	1,889
Lebanon City	24,461	25,477	26,203	27,406	29,240	27,442	23,795	24,886
Millcreek Township	2,921	3,892	4,062	4,248	549	1,612	3,689	3,858
Mount Gretna Borough	242	196	203	213	511	349	185	193
Myerstown Borough	3,171	3,062	3,195	3,341	3,675	6,159	2,901	3,034
N. Annville Township	2,279	2,381	2,484	2,598	611	1,171	2,256	2,359
N. Cornwall Township	6,403	7,553	11,927	12,474	2,980	2,479	10,831	11,328
N. Lebanon Township	10,629	11,429	7,915	8,278	3,317	7,775	7,187	7,517
N. Londonderry Township	6,771	8,068	8,454	8,842	3,344	3,851	7,677	8,030
Palmyra Borough	7,096	7,320	7,609	7,958	7,022	8,165	6,910	7,227
Richland Borough	1,508	1,519	1,586	1,659	790	873	1,440	1,506
S. Annville Township	2,946	2,850	2,967	3,103	1,070	412	2,694	2,818
S. Lebanon Township	8,383	9,463	9,870	10,323	5,548	7,971	8,963	9,374
S. Londonderry Township	5,458	6,991	7,554	7,901	2,086	5,703	6,860	7,175
Swatara Township	3,941	4,555	4,735	4,952	1,250	2,001	4,300	4,497
Union Township	2,590	3,099	3,194	3,340	1,943	4,155	2,900	3,033
W. Cornwall Township	1,909	1,976	2,021	2,113	1,124	1,035	1,835	1,919
W. Lebanon Township	836	781	812	850	1,921	730	738	772
<b>TOTAL</b>	<b>120,327</b>	<b>133,568</b>	<b>139,272</b>	<b>145,663</b>	<b>83,949</b>	<b>101,568</b>	<b>126,470</b>	<b>132,273</b>

**Notes:** 1. Source: US Census Data  
 2. Units are tons/year; Source: GLRA waste estimate calculations for total MSW generated. Excludes recycled quantities not reported by municipalities.  
 3. Cold Spring Township is not an Organized Township and, therefore, is not directly represented on the GLRA Board

Representatives from these municipalities meet monthly to review the GLRA business operations. As shown in figure 4, an Executive Director is appointed by the GLRA to



**Figure 4: Organizational Chart**

provide management of day-to-day operations. Figure 4 illustrates the responsibilities for each operational activity that is currently a part of waste management at the GLRA landfill site. Table 2 summarizes the responsibilities of each of the management functions represented by Figure 4.

<b>Table 2 Waste Management Responsibility Matrix</b>	
<b>Organization Function</b>	<b>Responsibilities</b>
Executive Director	Provides the interface between the GLRA Board of the Authority and the GLRA operations staff to assure that the mission of the GLRA is achieved. Directs the day-to-day administrative activities of the GLRA landfill site, and assures that technical issues are properly addressed and regulatory requirements are met. Also

**Table 2  
Waste Management Responsibility Matrix**

Organization Function	Responsibilities
	responsible for establishing and monitoring budgets.
Landfill Operations Manager	Directs the day-to-day operational activities of the GLRA landfill site. This includes all site operations involving wastewater treatment, site monitoring, equipment operations, composting activities, maintenance facility, landscape maintenance, waste collection vehicle onsite supervision, and measuring/recording incoming waste receipts.
Engineering/Technical Support	Responsible for Facility Engineering and technical analysis of waste management issues that require evaluations for decision making by the GLRA. In addition, provides the technical interface between site operations and outside engineering organizations. This includes limited design interface to support day-to-day activities. Assists in support and direction of Landfill Gas Technician. Also responsible for the review of the status of implementation of the Lebanon County Waste Management Plan and the need for modification of the WMP.
Recycling Coordinator	Responsible for the promotion of recycling of waste generated in the County to support the requirements of Act 101, and in county-wide aggregation and reporting of recycling data. In addition, provides an administrative oversight to County compost operations, the operation of recycling drop-off centers located in the County, the County Household Hazardous Waste Program, and the Electronics Waste Program.
Wastewater Treatment Plant Operator	Responsible for onsite groundwater monitoring, NPDES discharge facilities and monitoring, maintenance of the onsite wastewater pre-treatment facility in an operational ready condition, if needed. This includes routine equipment tests and the performance of any onsite laboratory water analysis. Assists Landfill Gas Technician as required.
Landfill Operations Foreman	Directs the day-to-day operational activities of the GLRA landfill site. This includes all site operations involving equipment operations, maintenance facility, and landscape maintenance.
Administrative Support	Provides clerical support to all operations. This includes scalehouse data accumulated from the incoming waste collection vehicles, payroll/billing and other accounting activities, training coordination, sampling data collection, and correspondence preparation/filing.
Landfill Gas Technician	Responsible for overall function and monitoring of landfill gas collection system. Interfaces with EPP personnel on a daily basis

<b>Table 2 Waste Management Responsibility Matrix</b>	
<b>Organization Function</b>	<b>Responsibilities</b>
	and assists as required. Assists Wastewater Treatment Plant Operator.
EPP LFG to Energy Facility	EPP Utilities Landfill Gas to Energy Facility transforms the LFG generated by the Landfill into energy and places it into the electrical grid. While not under the operational controls of the GLRA, they function as part of the team responsible for management of LFG.

### **2.3 Waste Management Oversight**

Wastes generated in Lebanon County are designated as “acceptable” or “unacceptable” for disposal in the GLRA landfill in accordance with the permit conditions of the Waste Management Permit No. 101544 issued by the Department of Environmental Protection. The determination of the method for disposal of the “unacceptable” portion of the waste generated in Lebanon County is currently the responsibility of the waste generator. To better support “total” waste management in the County the GLRA, as recommended in the previous WMP, plays an active role in providing waste management technical support for waste disposal of any waste generated in the County when requested regardless of the acceptability of the waste for disposal at the GLRA landfill. This does not take away the responsibilities of the waste generator, but does provide technical assistance in the selection of the waste disposal alternatives.

This support by the GLRA consists of recommendations for either recycling, processing for disposal and, as necessary, providing assistance for the disposition of the waste and, if needed, in getting approvals from DEP for waste disposal. If a new waste is produced by an in-county waste generator the first effort by the waste generator should be to contact the GLRA. If the waste is a new form of waste for Lebanon County then the GLRA will provide assistance to the generator of the new waste to find an appropriate method of recycling, processing, or disposal.

Within the class of wastes designated as acceptable are those waste streams once identified as “Type S” Residual Waste, or “Municipal-Like” Residual Waste. Changes in regulations by DEP required the development of a more detailed characterization plan by the GLRA for approval by DEP to allow the continued acceptance of this category of material.

Currently materials approved under this category are classed simply as Residual Waste. The process developed under this characterization plan thus further supports the technical assistance task noted earlier by providing for the submission and permitting of waste streams from the County for disposal at the Lebanon facility.

Residual Waste, including Residual Waste identified as acceptable under the GLRA Waste Characterization Plan, is not flow controlled and may leave the County for appropriate facilities outside of Lebanon County. DEP records (See Figure 6) indicate that a substantial amount of Residual Waste is correctly exported from the County to facilities approved to accept Residual Waste.

## **2.4 Plan Implementation Progress Review**

The schedule for implementation of the waste management plan is presented in Figure 17. The content of the WMP is intended to provide adequate information to set program direction and sufficient detail to allow municipalities/townships an understanding of the programs recommended to be implemented. Information within the WMP specifically identifies programs for the management of Lebanon County wastes to the year 2030. Once approved this revised waste management plan supersedes any other waste management planning document in Lebanon County.

GLRA personnel and an Advisory Board (County representatives) aided in the preparation of the WMP to the extent that the information contained in the completed document has been understood and agreed to prior to submission of the final draft of the document for approval. With this approach implementation is an extension of WMP preparation. An annual program of monitoring and evaluation of the WMP progress is desired to assure that the strategy laid out in the plan is being accomplished, that program goals and objectives are reassessed as necessary, and that continued community involvement is achieved. **The Advisory Committee for WMP 2020 has agreed to serve in this capacity and tentatively agreed to meet in January of each year for a review.** The **Project Manager for the WMP** is tasked with assuring that in addition to the Development Relations Committee of the GLRA adequate community representation is continued.

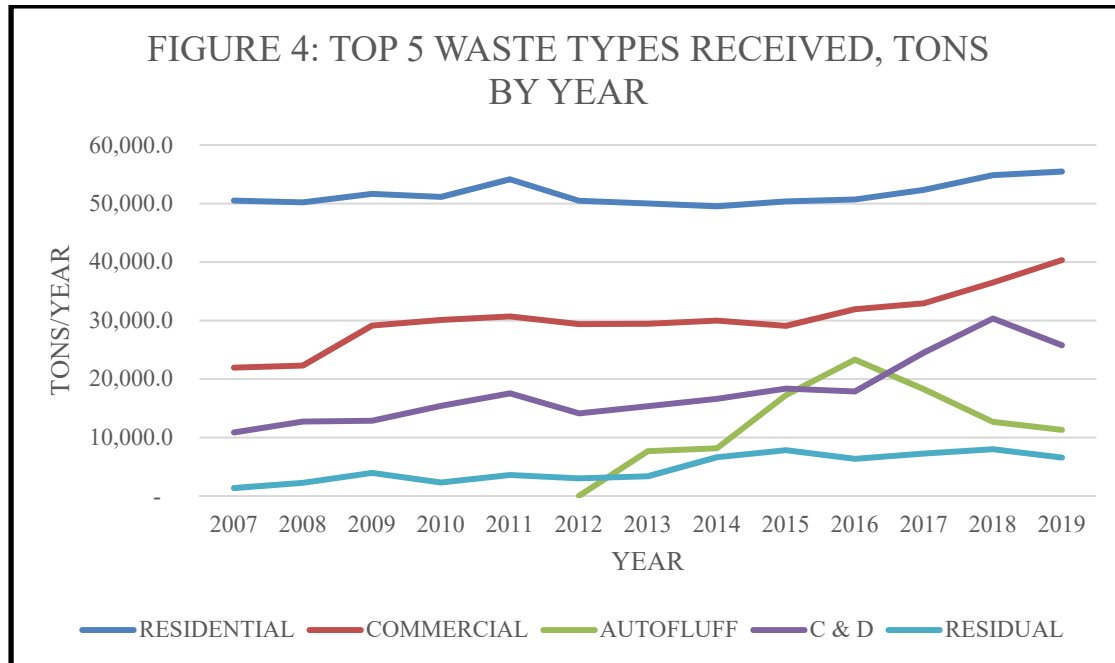
## 2.5 Lebanon County MSW Description

**TABLE 3: LEBANON COUNTY MSW TRENDS 1990 - 2019**

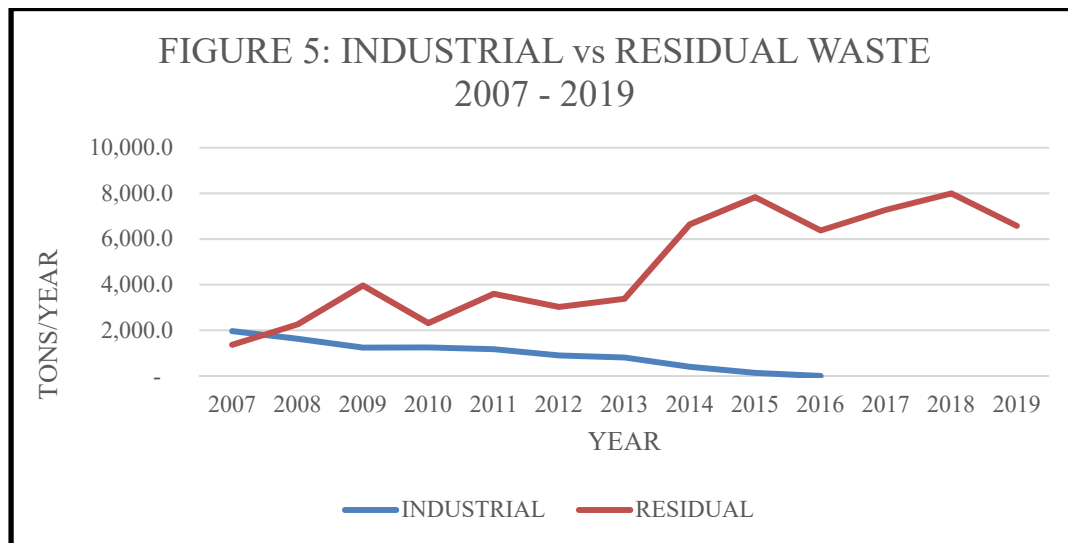
Waste Description	1990-1999	2000-2009	2010-2019
Residential	58.0%	53.0%	46.4%
Commercial	21.0%	27.0%	28.6%
Industrial	5.0%	4.0%	0.5%
C & D	16.0%	15.0%	17.5%
Residual		1.7%	4.8%
Annual Tonnage (Average)	75,300	93,000	111,982

Table 3: Lebanon County MSW Trends 1990-2019

A ten-year average (2010 to 2019) of MSW receipts is approximately 112,000 tons annually. The percentage of Residential Waste in this time period (See Table 3) is approximately 46%, followed by Commercial at 28%, Construction/Demolition at 18%, Residual at 5%, and Industrial at 0.5%. The same analysis of the previous ten-year average (2000 to 2009) of MSW receipts is approximately 93,000 tons, annually. Of this quantity, approximately 53% is from residential sources, 27% from commercial sources, 15% from construction/demolition sources, 2% from residual sources, and 4% from industrial sources. A ten-year average (1990 - 1999) of MSW receipts at the GLRA landfill was approximately 75,300 tons, annually. Of this quantity, approximately 58% was from residential sources, 21% from commercial sources, 16% from construction/demolition sources, and 5% from industrial sources.



A narrower view point of the top 5 waste types from 2007 through 2019 (Figure 4) indicates that while Residential Waste remains fairly uniform, Commercial and C&D Waste have both increased sharply since 2015, with Residual Waste showing a gradual increase by comparison. Figure 5 compares the change in Residual Waste with the Change in Industrial Waste. While Table 3 indicates an average of 0.5% over the previous ten year period, in reality Industrial Waste has vanished from the waste receipts at the scalehouse as noted in Figure 5.



While not a component of waste management within the county by the GLRA, there is a

substantial component of Residual Waste that is delivered to other facilities outside of the County as a non-flow controlled element of Lebanon County waste. Figure 6, derived from Department of Environmental Protection data, illustrates the total amount of residual waste generated within Lebanon County.

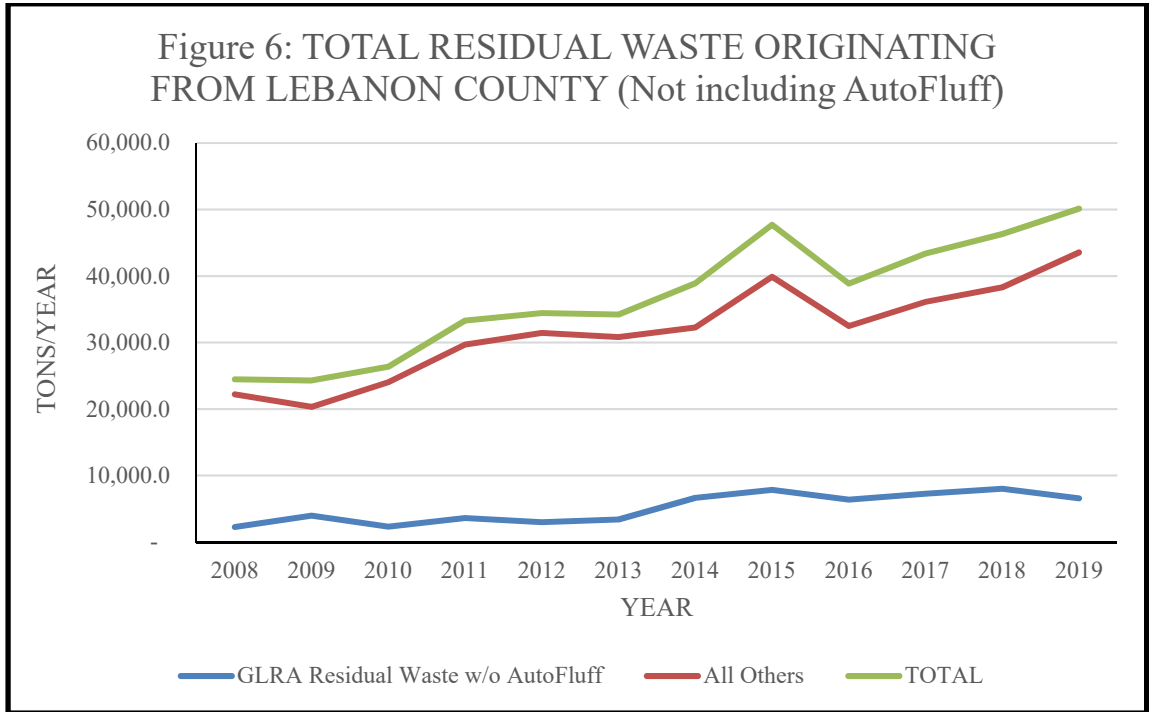
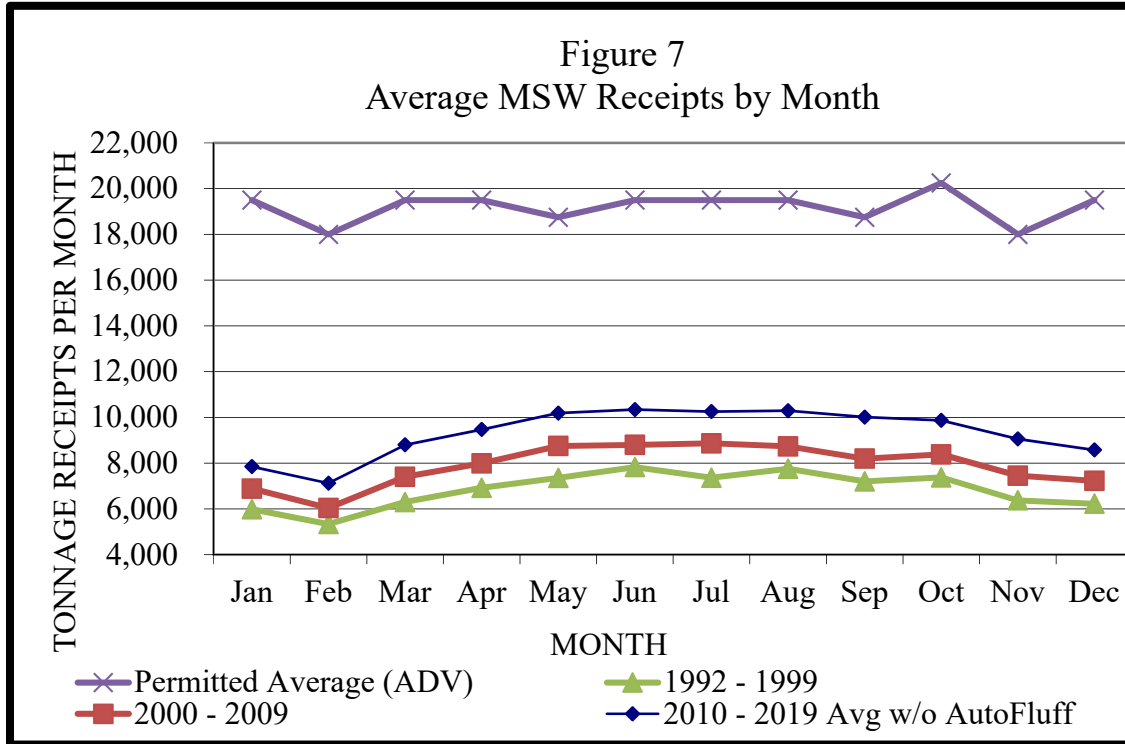


Figure 6: Total Residual Waste Originating from Lebanon County

Waste receipt quantities vary seasonally, increasing in March/April and decreasing in October/November of each year (see Figure 7)<sup>5</sup>.

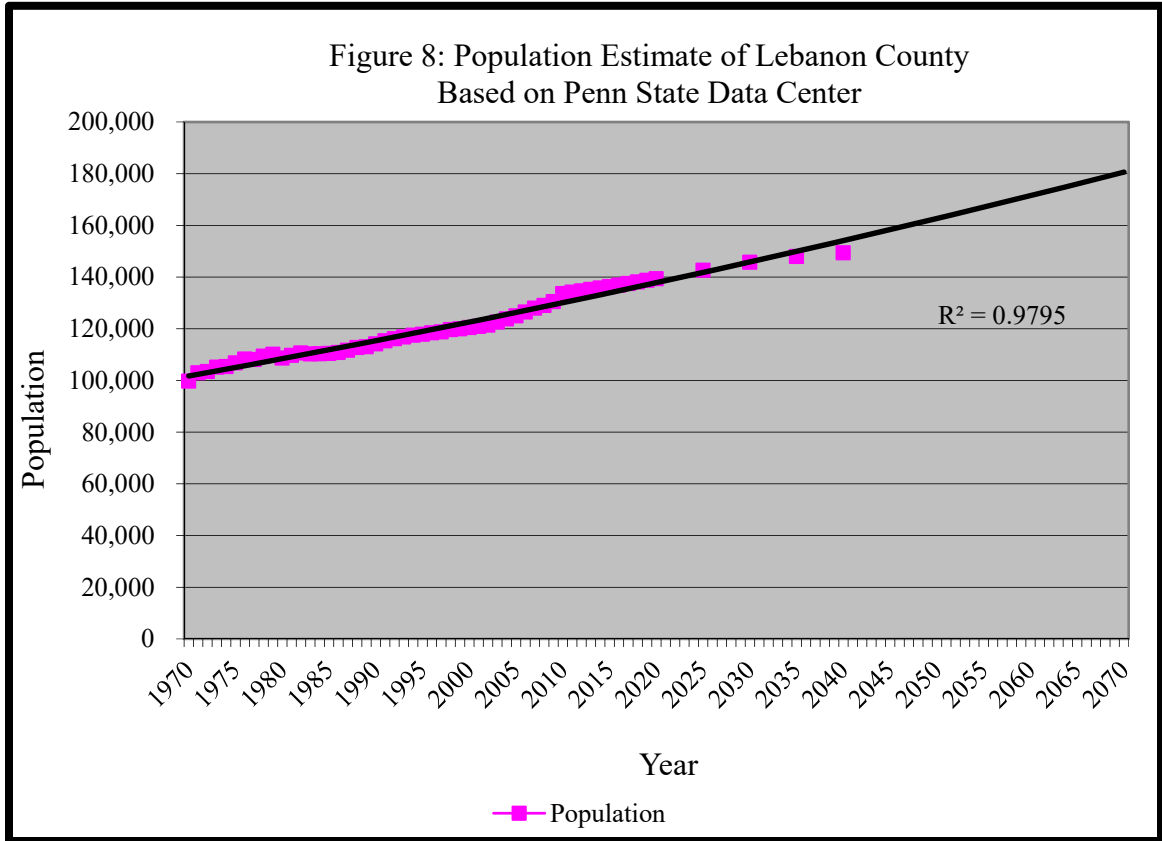
**Figure 7: Average MSW Receipts by Month (Adjusted)**



It should be noted that while it appears that waste receipts fall dramatically in February, that month is also shorter as evidenced by the plot of the Average Daily Volume (ADV) on a daily basis. Figure 8<sup>6</sup> illustrates the change in Lebanon County population and future population projections.

<sup>5</sup> Source: WMP-001 (2020) Figure 1

<sup>6</sup> Source: WMP-016 (2020) Figure 2



**Figure 8:** Population of Lebanon County Based on Penn State Data Center

Waste recycling programs in effect in 1998 diverted approximately 40% of the municipal waste generated. Waste recycling programs grew and in 2009 diverted 42% of the Counties waste. Over the past several years the growth in recycling has continued, currently reaching 48% recycled despite the loss of recycling markets in 2018. The total quantity of MSW disposed by landfilling in Lebanon County was obtained from the GLRA scale house data reported from 2007 to 2019. This data is summarized in Figure 9 and Figure 10<sup>7</sup> (below).

<sup>7</sup> Source: WMP-016 (2020) Figure 5

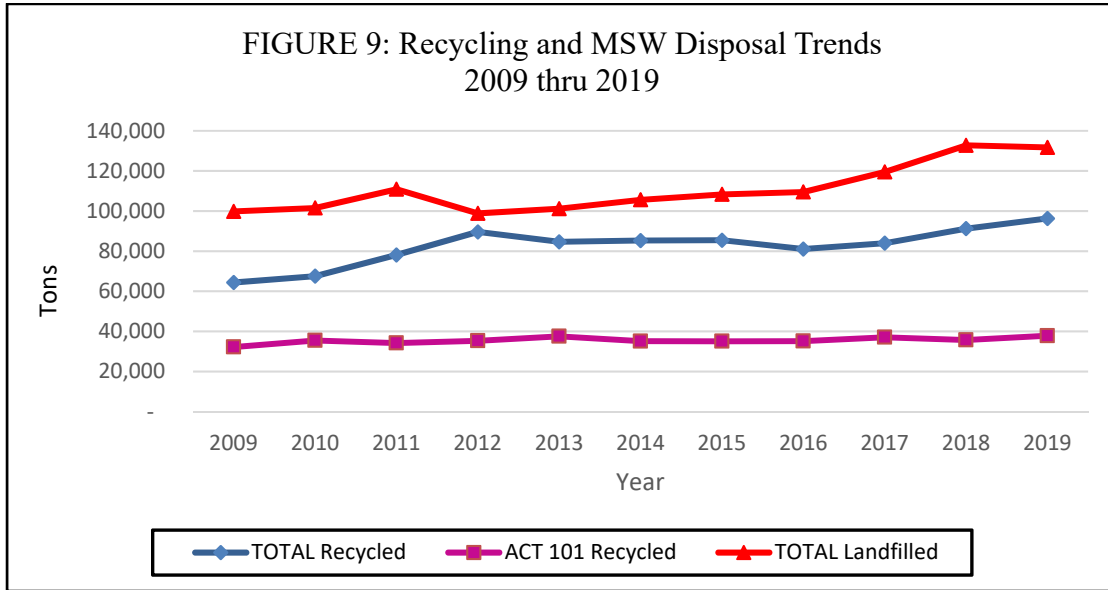


Figure 9: Recycling and MSW Disposal Trends, 2009 thru 2019

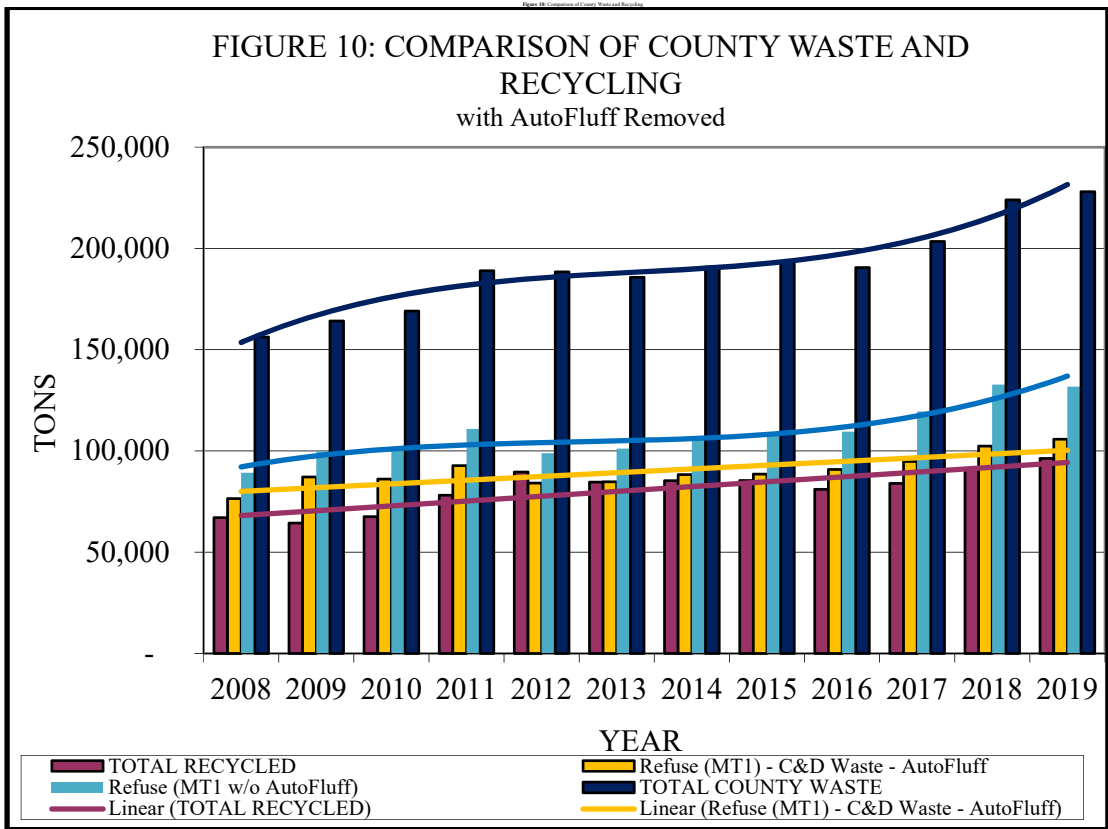


Figure 10: Comparison of County Waste and Recycling

For the evaluations in WMP 2000, waste was characterized into 34 categories (see Table 3) based on the sampling protocol developed as part of the onsite sampling program. The

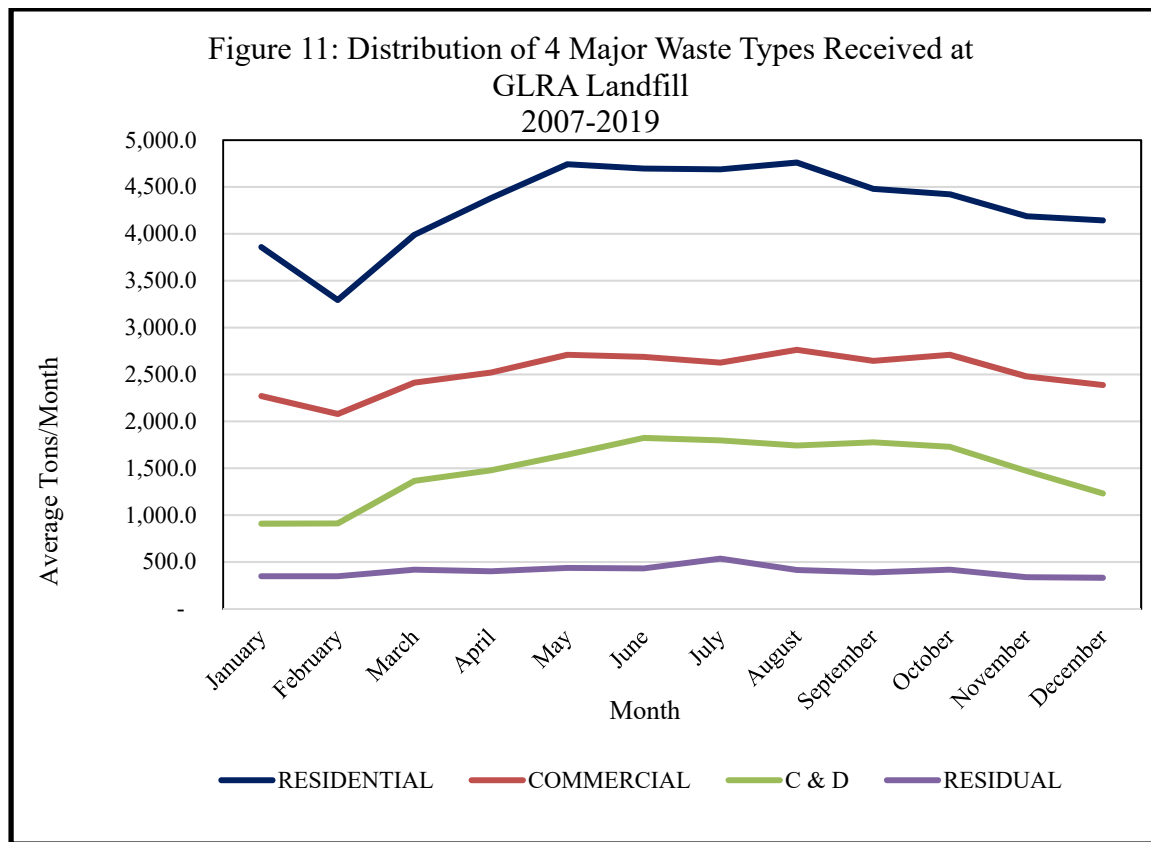
percentages of each type of waste in each of the categories was then determined by an onsite sampling program conducted by SCS Engineers during July 1995.

TABLE 4 SAMPLING PLAN CATEGORIES	
PAPER	ORGANICS
Corrugated Cardboard	Textiles
Newspaper	Wood
Office/Computer Paper	Foodwaste
Magazines	Yard Waste
Folding Cartons	Miscellaneous Organic
Mixed Paper	FERROUS METAL
Other Paper	Food Containers/Bimet
PLASTICS	Other: Wht Good/Scrap
PET, HDPE, LHDPE (Rigid)	Miscellaneous Ferrous
PVC (#3) Rigid	NON FERROUS METAL
LDPE, LLDPE Rigid	Aluminum Cans
White Goods, Furniture	Other Aluminum
Plastic Bags	Misc. nonferrous
Other Plastic	GLASS
ORGANICS	Clear Containers
Rubber/Leather	Brown Containers
Carpets, rugs, misc.	Green Containers
Rubber Tires	Other Glass
Clothing, Footwear	INORGANICS
	HAZARDOUS

Table 4. Sampling Plan Categories

This sampling program confirmed that Lebanon County essentially mirrored the Federal waste composition studies, and concluded that further action was not required until such point that it became financially beneficial to pursue alternative waste disposal options. The table is included in this edition of the WMP to provide background for future studies. The most recent analysis of the possibilities for a Material Recycling Facility (MRF) concluded that a MRF was not indicated currently. Should further study indicate that this would be an option, detailed analysis of the Lebanon County waste stream should be conducted at that time.

The quantity of recycled materials reported were summarized and averaged for the years 2008 through 2019 and the results are illustrated in Figure 10. The sum of the reported recycle quantities and the quantities of MSW received at the scale house results in the total quantity of MSW generated in Lebanon County (some waste may be generated in the County which is not accounted for in this manner). In order to remove the bias of AutoFluff on the results, all data presented excludes the receipt of that material.



**Figure 11: Distribution of 4 Major Waste Types Received at the GLRA Landfill**

Figure 11<sup>8</sup> presents the monthly average of the waste disposed at the GLRA landfill categorized according to the source of waste generation. This figure illustrates the fraction of waste received from the four major sources of waste over the course of the year

<sup>8</sup> Source: WMP-001 (2020) Figure 2

Figure 8 presents the Lebanon County population history (Penn State Data Center). Combining the scalehouse data, the Act 101 recycle data, and the Lebanon County population history resulted in the determination of MSW generation projections for the years 1970 through 2070. These projections for the planning period to 2030 are presented in Table 5<sup>9</sup> as annual quantities. Tables 6 and 7 contain an identification of the GLRA waste acceptance criteria, and can be used to define the waste acceptable for disposal at the existing GLRA waste disposal site. Table 8 presents the percentage of the Lebanon County wastes contributed by each municipality (based on scalehouse records). Together these tables present the quantity, type, and origin of waste generated in Lebanon County for the period of time covered by this WMP.

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<sup>9</sup> Source: WMP-016 (2020) Table 10

**Table 5:** Record and Projected Generation, Recycle, and Disposal Quantities of MSW

<b>TABLE 5</b>											
<b>Record and Projected Estimates of Generation, Recycle, and Disposal Quantities of MSW</b>											
<b>YEAR</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Population	120,421	120,845	121,352	122,510	123,728	124,948	126,441	127,889	128,934	130,424	133,568
Gross Discards (Tons/yr) <sup>1</sup>	119,078	117,112	125,103	132,077	140,041	142,269	155,247	133,945	143,530	151,481	153,665
Diversion (Recycle-Tons/yr)	47,319	45,239	49,897	50,050	54,253	58,154	70,912	57,930	67,091	64,359	67,557
Diversion Rate <sup>1</sup>	40%	39%	40%	38%	39%	41%	46%	43%	47%	42%	44%
Net Discards of MSW (Tons/yr) <sup>1</sup>	71,759	71,873	75,206	82,027	85,788	84,115	84,335	76,015	76,439	87,122	86,107
C&D Waste ((Tons/yr)	12,083	13,812	23,304	15,868	17,666	15,120	12,263	10,885	12,755	12,677	15,402
Total Net Discards to Landfill (Tons/yr)	83,842	85,685	98,510	97,895	103,454	99,235	96,598	86,900	89,195	99,798	101,509
Notes:											
1. Does not include C/D waste											

<b>TABLE 5 (continued)</b>										
<b>Record and Projected Estimates of Generation, Recycle, and Disposal Quantities of MSW</b>										
<b>YEAR</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
Population	134,071	134,608	135,147	135,689	136,232	136,840	137,451	138,064	138,680	139,300
Gross Discards (tons/yr) <sup>1</sup>	170,885	173,752	169,381	173,612	174,126	171,887	178,733	193,162	202,070	196,238
Diversion (Recycle-tons/yr)	78,128	89,590	84,595	85,289	85,401	81,053	83,957	90,782	96,286	88,904
Diversion Rate <sup>1</sup>	46%	52%	50%	49%	49%	47%	47%	47%	48%	45%
Net Discards of MSW (tons/yr) <sup>1</sup>	92,757	84,162	84,786	88,323	88,725	90,834	94,776	102,381	105,784	107,334
C/D Waste (tons/yr)	18,095	14,674	16,361	17,282	19,576	18,653	24,673	30,346	25,930	19,746
Total Net Discards to Landfill (tons/year)	110,853	98,836	101,147	105,605	108,301	109,487	119,449	132,727	131,714	127,080
Notes:										
1. Does not include C/D waste or AutoFluff										

**TABLE 5 (continued)**  
**Record and Projected Estimates of Generation, Recycle, and Disposal Quantities of MSW**

<b>YEAR</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>
Population	137,800	138,600	139,400	140,200	142,600	141,800	142,600	143,400	144,200	145,700
Gross Discards (tons/yr) <sup>1</sup>	194,125	195,251	196,379	197,506	200,886	199,760	200,886	202,014	203,141	205,254
Diversion (Recycle-tons/yr)	87,947	88,457	88,968	89,479	91,010	90,500	91,010	91,521	92,032	92,989
Diversion Rate <sup>1</sup>	45%	45%	45%	45%	45%	45%	45%	45%	45%	45%
Net Discards of MSW (tons/yr) <sup>1</sup>	106,178	106,794	107,411	108,027	109,876	109,260	109,876	110,493	111,109	112,265
C/D Waste (tons/yr)	19,534	19,647	19,761	19,874	20,214	20,101	20,214	20,328	20,441	20,654
Total Net Discards to Landfill (tons/year)	125,712	126,441	127,171	127,901	130,091	129,361	130,091	130,820	131,550	132,919

Notes:

1. Does not include C/D waste or AutoFluff

**TABLE 6: Sources of GLRA Solid Wastes Acceptable for GLRA Landfill Disposal**

Category	Source	Typical Generators of Waste	Types of Solid Wastes
A. Municipal	1. Residential	Single family homes, duplexes, town houses, apartments, etc.	Food wastes, paper, cardboard, plastics, textiles, leather, yard wastes, wood, glass, tin cans, aluminum, other metals, ashes, street leaves, special wastes (including bulky items, consumer electronics, white goods, yard wastes collected separately), household hazardous wastes (Refer to Table 6 for a more detailed listing.)
	2. Commercial	Stores, restaurants, markets, office buildings, hotels, motels, print shops, service stations, repair shops, etc.	Paper, cardboard, plastics, wood, food waste, glass, metals, special wastes, hazardous wastes
	3. Industrial	Construction, fabrication, light and heavy manufacturing, refineries, chemical plants, power plants, etc.	Industrial process wastes, scrap materials, etc. Non-industrial wastes including food wastes, rubbish ashes, demolition, and construction wastes, special wastes.
	4. Equivalent	Residential, commercial, and industrial sources	Non-recyclable content from Material Recovery and Transfer Stations.
	5. Construction/Demolition	New construction sites, road repair/renovation sites, razing of buildings, broken pavement	Wood, plaster, drywall and wallboard, metals, asphaltic substances, bricks, block and unsegregated concrete. This also includes dredging waste, grubbing waste, street sweepings, and non-friable asbestos waste.
	6. Shingles	Repair/renovation sites, razing of buildings	Shingles, nails, wood
	7. Other Waste	Municipal waste sources	<u>Putrescible Waste</u> consisting of organic waste materials which due to biological decomposition are, or have a tendency to be, rotten, foul, or odorous, including dead animals and spoiled foods but not including sludge; <u>Special Handling Waste</u> consisting of materials which due to their unique characteristics require special handling; <u>Bulky Waste</u> which consists of large items which require additional compaction for effective utilization of landfill space; <u>Processed Infectious/Pathological Waste</u> which has been sterilized in an EPA/DEP Certified facility and which is classified as Special Handling waste
	8. Stumps & Trees	New construction sites, clearing sites	Stumps and trees, branches over 4" diameter
	9. Green Waste	Yard waste	grass clippings, leaves, tree branches less than 4" diameter, etc.
	10. Sewage Sludge	Water, wastewater, and industrial treatment processes, etc.	Municipal treatment plant wastes, principally composed of residual sludge (Quantity limited to less than 25% of total daily tonnage)
B. Source-separated Recyclable Materials		Recycled residential, commercial, industrial wastes	Tires, white goods, clear glass, colored glass, steel and bimetallic cans, aluminum cans, wood, lead acid batteries, aluminum scrap, ferrous scrap, newsprint, office paper, corrugated cardboard, plastic
C. Residual Waste	1. Form U; Residual Waste	Industrial and Manufacturing Facilities Industrial waste	Garbage, refuse, other discarded material or other waste, including solid, liquid, semisolid, or contained gaseous materials resulting from industrial, mining, and agricultural operations. Also, sludge from an industrial, mining or agricultural water supply treatment facility, waste water treatment facility or air pollution control facility (non-hazardous). A Form U "Request to Process or Dispose of Residual Waste" is required to allow the acceptance of waste streams in accordance with the GLRA Waste Characterization Plan.
D. Hazardous	1. Household Quantities	Residential	Anti-freeze; batteries (non-lead acid and from individual or household use); chlorinated hydrocarbons; gasoline and kerosene; grease and rust solvents; oven, toilet and drain cleaners; paints, rust preventatives, stains and wood preservatives; pesticides, fungicides, herbicides, insecticides, rodenticides, roach and ant killers; photographic and pool chemicals; thinners, solvents and furniture strippers; transmission and brake fluids; used oil or other hydrocarbon based lubricants; wood, metal, rug and upholstery cleaners and polishes.

Table 6: Sources of GLRA Solid Wastes Acceptable for GLRA Landfill Disposal

**TABLE 7: Sources of GLRA Solid Wastes Unacceptable for GLRA Landfill Disposal**

Category	Source	Typical Generators of Waste	Types of Solid Wastes
A. Un-Acceptable	1. Chemotherapeutic	Hospitals	Waste resulting from the production or use of antineoplastic agents used for the purpose of stopping or reversing the growth of malignant cells.
	2. Chemical	Municipal waste sources	Drums, barrels, buckets, and paint cans that contain unsolidified residue;
	3. Explosives	Governmental centers, industrial	Explosives and ordinance materials; compressed gas cylinders (pressurized)
	4. Hazardous waste	Municipal, commercial, industrial, institutional, mining, or agricultural operations	Garbage, refuse or sludge from an industrial or other industrial waste water treatment plant; sludge from a water supply treatment plant or air pollution control facility; other discarded material including solid, liquid, semisolid or contained gaseous material;
	5. Infectious/ Pathological Waste (un-treated)	Schools, hospitals, prisons, governmental centers	Wastes generated by hospitalized patients who are isolated, or on blood or body fluid precautions, in order to protect others from communicable disease; Cultures and stocks of etiologic agents; Animal waste blood and animal blood products which are known or are suspected to contain contagious zoonotic pathogens, and human waste blood and blood products; Tissues, organs, body parts, blood and body fluids that are removed during surgery and autopsy; Wastes generated by surgery or autopsy of septic cases or patients with infectious diseases; Wastes that were in contact with pathogens in any type of laboratory work, including collection containers, culture dishes, slides, plates and assemblies for diagnostic tests and devices used to transfer, inoculate and mix cultures; Sharps such as needles, syringes and contaminated broken vials; Wastes that were in contact with the blood of patients undergoing hemodialysis at hospitals; Carcasses and body parts of animals exposed to contagious zoonotic pathogens; Animal bedding and other Wastes that were in contact with animals suffering from contagious zoonotic diseases due to natural infection or laboratory research, and their excretions, secretions, carcasses or body parts; Waste biologicals - for example, vaccines produced by pharmaceutical companies for human or veterinary use; Food and other products that are discarded because of contamination with etiologic agents; Equipment and equipment parts contaminated with etiologic agents.
	6. Liquid Waste	Municipal sources	Waste that contains free liquids as determined by Method 9095 (paint filter liquids test), as described in the EPA's "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (EPA Publication No. SW-846)
	7. Radioactive Materials	Industrial/Medical	Any radioactive materials other than naturally occurring or residues from medical treatment at acceptable levels.
	8. Solid Waste	Non-Lebanon County	Any waste generated outside of Lebanon County
	9. Tires	Municipal sources	Any type of tire
	10. White Goods	Municipal sources	Large appliances (weighing more than fifty pounds) such as: air conditioners, clothes washing and drying machines, dishwashers, furnaces and electrical heaters, hot water heaters, refrigerators and freezers, stoves and ovens.

<b>Table 8</b>				
<b>Average Municipality/Township Waste Disposal Percentages</b>				
<b>Area</b>	<b>Designation</b>	<b>(1990-1999) Percent</b>	<b>(2000-2009) Percent</b>	<b>(2010-2019) Percent</b>
1	Annville Township	3.01%	3.19%	3.36%
2	Bethel Township	2.40%	4.35%	4.03%
3	Cleona Borough	2.27%	1.87%	2.05%
4	Coldspring Township	0.01%	0.01%	0.00%
5	Cornwall Borough	2.07%	1.48%	1.45%
6	East Hanover Township	1.77%	3.15%	2.37%
7	Heidelberg Township	2.41%	1.49%	1.70%
8	Jackson Township	2.40%	3.39%	5.37%
9	Jonestown Borough	2.13%	1.88%	1.20%
10	Lebanon City	34.22%	31.99%	25.96%
11	Millcreek Township	1.29%	1.14%	2.56%
12	Mount Gretna Borough	0.96%	0.56%	0.29%
13	Myerstown Borough	5.24%	4.08%	5.75%
14	North Annville Township	0.76%	1.03%	1.21%
15	North Cornwall Township	2.27%	3.06%	2.75%
16	N. Lebanon Township	4.51%	5.84%	6.97%
17	N. Londonderry Township	3.86%	4.92%	4.35%
18	Palmyra Borough	7.29%	6.96%	5.99%
19	Richland Borough	1.43%	0.77%	0.81%
20	South Annville Township	1.37%	1.05%	0.49%
21	S. Lebanon Township	6.12%	6.86%	6.61%
22	S. Londonderry Township	2.40%	4.06%	6.57%
23	Swatara Township	1.22%	1.63%	2.17%
24	Union Township	4.65%	3.03%	4.14%
25	West Cornwall Township	1.93%	0.98%	1.20%
26	West Lebanon Township	1.99%	1.23%	0.66%
<b>TOTAL</b>		<b>100%</b>	<b>100%</b>	<b>100%</b>

## **SECTION 3**

### **3.0 Lebanon County Waste Diversion Program**

An evaluation (refer to Attachment 5 of Part II) was performed by Dr. David Giefer as part of WMP 2000 to determine the most economical method of processing and disposing of Lebanon County waste. The study evaluated various technologies that divert waste from landfill disposal including recycling, composting, incineration, and different combinations of these methods. The study was reviewed by Dr. Giefer during the revision of WMP 2010. SCS Engineers, in preparation for this revision (WMP 2020) conducted a similar review in their Pro-Forma Economic Analysis of solid waste management planning alternatives.

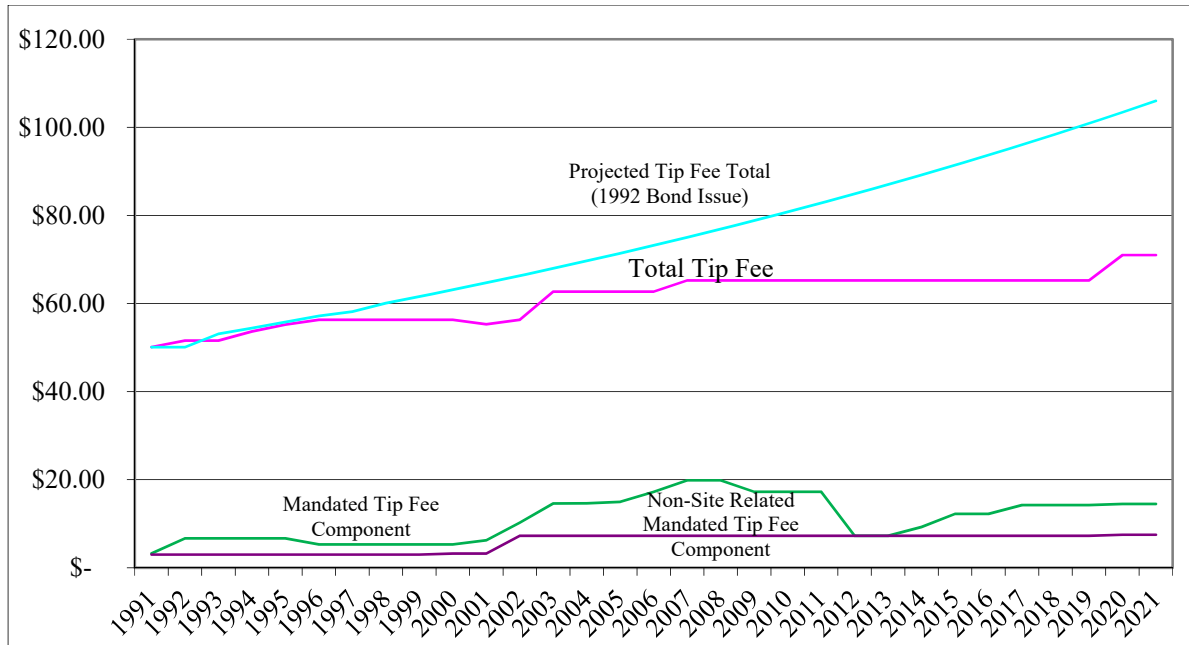
The history and projections of population, waste generation, and recycling quantities appear consistent with the conclusions of those studies, confirming that the current methods of waste disposal and diversion are functioning adequately throughout the county. The results of the initial study also indicated that implementation of recycling technologies could improve the waste management economics for Lebanon County; this continues to be the case. Enhanced source recycling through incentive programs, modification of methods for waste management fee collection, and implementation of a County MRF were shown to be economically feasible in such a way that resulting increases in revenues would allow waste collection fees, paid by the residents, to decrease. The 2018 Pro-Forma Economic Analysis, with the benefit of hindsight and a view of the current recycling environment, concluded that a large scale MRF was not the most viable option for Lebanon County.

Currently there does not appear to be any significant change in the underlying assumptions to the study. The implementation of the Waste Management program progression outlined in WMP 2000 was stalled by challenges to flow control, an issue finally resolved shortly before WMP 2010 was concluded. While one of the initial suggestions to consider in WMP 2000 was the use of incentive based recycling programs opposition to this concept was so strong and vocal that it was removed from the final edition. It is anticipated that opposition to this type of suggestion continues although the County is aggressively pursuing recycling opportunities on a voluntary basis in addition to the actions of the mandated communities.

Implementation of recycling in the County is limited to programs that supplement the current methods used, both public and private. With these existing programs, the economic benefits of increased recycling are minimal except for the diversion of waste from landfill disposal. Historically, the economics of recycling varies depending on the changes in market conditions for recycled products. As markets shift the economic benefit

of recycling changes from a positive (income) to one where getting a product into the recycling market stream costs money, leading to an overall decrease in revenues. In the case of recycling efforts supported by the GLRA, the revenue source is the tip fee charged to waste entering the landfill. It is noted that individual residents have no economic incentive to increase recycling; none the less recycling volume is increasing within Lebanon County. In spite of the potentially negative economics, recycling in Lebanon County was determined to be an environmentally responsible approach by WMP 2000. Lebanon County is, therefore, continuing to proceed with the promotion of recycling (without incentives) through recycling at the source of waste generation as the best method for processing recycled materials prior to re-use.

An analysis of the current population of Lebanon County, recycling quantities, and waste flow was conducted as part of the update to the Waste Management Plan (See Calculation WMP-016 (2020)). The conclusion of this analysis is that population increases and recycling rate increases will result in a steady flow of waste to the GLRA facility. While overall costs of operating the GLRA facility were not within the scope of this report, it is noted that the 1992 Bond issue predicted a growth in tip fee far in excess of that experienced. (See Figure 12). While the bulk of the increase in tip fee, and ultimately the collection fee charged to residents of Lebanon County has been State mandated fees there is a responsibility at the county and municipal level to understand and control the fees paid by the residents. To this end an analysis of tip fees was conducted following the SCS Pro Forma Economic Analysis and provided to the Board of the GLRA and the Advisory Committee. As a result of that study the GLRA did raise their tip fees effective January 1, 2020 (See WMP-012-RPT), and will evaluate rates annually based on projected operational and capital costs to operate, expand, close, and provide post-closure care for the facility.



**Figure 12: Historical and Projected Tip Fee Components**

If the implementation of recycling programs results in increased source recycling, the composition of the waste received at the GLRA landfill is expected to change. Correspondingly, the economic feasibility of building a facility to separate out recyclables from the incoming MSW (a MRF) could change as well. The high capital cost of a MRF and the nature of recycling markets dictate a detailed characterization of the waste stream and analysis of then current markets should that course of action appear viable.

The following sub-sections discusses the programs directed at waste diversion through the promotion of source recycling, recycling cost awareness programs, building a MRF, and other methods recommended by the WMP for a diversion of Lebanon County waste from landfill disposal.

### **3.1 County Recycling Promotion Program**

#### **3.1.1 General Description**

The primary purpose for a recycling program is environmental responsibility and the diversion of waste from landfill disposal. Targeted materials for recycling may include just a few items or a large number of items. The decision of which materials to include in a particular program rests on considerations of expected waste stream impact, cost, convenience to participants, and markets and is influenced by state and local mandates. As with other recycling planning alternatives, the choice will depend largely on expected waste reduction and expected cost, in many cases with a trade-off between the two

objectives. To that has been added in recent years a struggle with markets that has on occasion eclipsed efforts to recycle responsibly. This section reviews the health, viability, and future direction of recycling in Lebanon County.

Various studies were performed by the GLRA in preparation for WMP 2000 to determine the characteristics of the MSW received at the GLRA landfill. These studies identified that recycling of glass was low in the County and could be increased. Approximately 50% of paper, metals, and yard wastes generated in Lebanon County were then being recycled. Less than a fourth of the plastics generated were being recycled. WMP 2000 noted that recycling could be improved in Lebanon County by increased recycling of the components currently being recycled (that is, glass, paper, plastics, metals and yard waste).

Markets, and materials in the recycling stream have changed over the years. Newsprint, once on the order of 5% of our recycling in comparison to waste receipts, has all but disappeared from the recycling stream. Glass bottle use is decreasing with glass recycling remaining at about the same rate as it was in 2001. Plastic recycling in 2001 weighed in at about 0.2% in comparison to the waste receipt tonnage, rose to 2.5% in 2015, and is now at 1% by weight following the 2018 market change. On a volume basis this remains a significant increase.

The greatest increase is seen in the green waste/yard waste category. In 2001 the total amount recycled was approximately 4.5%. In 2019 this amount reached 37% relative to the waste receipt tonnage. The combination of regulation by DEP prohibiting the landfilling of green waste, the passage of ordinances within the townships, the creation of several township composting facilities, and marketing the compost back to county individuals and businesses serves as a model of the critical benchmarks of a successful recycling program.

Beginning in 1992 with the permitting of the GLRA Compost facility, source separated green waste and yard waste were received for processing at the GLRA site at a reduced tipping fee. In addition, some green waste is received commingled with the MSW received for disposal at the landfill and is separated as the MSW is dumped for disposal. Recycling of this waste is by composting. Green waste is collected at a specified location at the GLRA landfill site, chopped in a tub grinder, and added to a compost pile. A five-year average (1995 to 1999) of materials received at the GLRA landfill for composting was 900 tons/yr. This average dropped to approximately 700 tons/year in the period of 2004 to 2009 due to the development of municipal composting operations opening in four of the

six Act 101 Mandated municipalities. Since that time the average amount of green waste received and processed by the GLRA has steadily increased to about 1,100 tons annually. While the initial characterization study indicated that as much as 5,000 tons/year of green waste remained in the waste stream as of 1999, the advent of multiple green waste outlets diverted over 30,000 tons in 2019. The GLRA compost product derived from that waste stream continues to market successfully, with supplies generally running out before the end of the mulching season.

Section 1501 of Act 101 requires certain municipalities to establish recycling programs. All municipalities with a population of more than 5,000 people, or with a population density of more than 300 people per square mile, are required to implement a curbside collection recycling program. Municipalities which met these population criteria for the first time after the 1990 Censuses are required to establish curbside recycling programs. In Lebanon County, the five municipalities meeting those criteria in 1990 were: the City of Lebanon, North Lebanon Township, South Lebanon Township, North Londonderry Township, and Palmyra Borough. In 2000 North Cornwall was added to this list and in 2010 the decennial census caused the addition of Jackson Township to this list. The current status of Recycling Programs in Lebanon County is illustrated by Table 9<sup>10</sup> (below). With the recent voluntary addition of Richland to those municipalities implementing recycling, the number of municipalities with no recycling has been reduced to six.

In 1999, there were a total of 13 municipality/townships participating in curbside recycling in Lebanon County and 11 recycling drop-off centers. Currently there are 18 curbside programs and 11 drop off centers located in the county. The municipal drop off locations currently are in, Lebanon City, Annville Township, N. Lebanon Township, Union Township, North Cornwall, South Lebanon, North Londonderry Township, Heidelberg Township and the GLRA.

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<sup>10</sup> Source: WMP-016 (2020) Table 5

**TABLE 9  
STATUS OF RECYCLING PROGRAMS IN LEBANON COUNTY  
MUNICIPALITIES; SPRING 2017**

Bethel Cold Spring E. Hanover Millcreek N. Annville Swatara	NO RECYCLING PROGRAM
Heidelberg	VOLUNTARY RECYCLING DROP OFF
Annville Cleona Cornwall Jonestown Mount Gretna Myerstown Richland S. Annville W. Cornwall W. Lebanon Union	LOCALLY MANDATED RECYCLING PROGRAM
S. Londonderry	CURRENTLY LOCALLY MANDATED; ACT 101 MANDATED 2020 CENSUS
Jackson Lebanon City N. Cornwall N. Lebanon N. Londonderry Palmyra S. Lebanon	ACT 101 MANDATED RECYCLING PROGRAM

A five-year average (1994 to 1998) of recycled materials reported from the municipalities/townships averaged 7,100 tons/yr. The total quantity of materials recycled in Lebanon County averaged 43,600 tons/yr for the same five-year period. In 2009 this value had risen to over 64,000 tons/yr, while MSW landfilled remained under 100,000

tons/yr.

As noted in Section 2.5 waste recycling programs in effect in 1998 diverted approximately 40% of the municipal waste generated. Waste recycling programs grew and in 2009 diverted 42% of the county's waste. Over the past several years the growth in recycling has continued, currently reaching 48% recycled despite the loss of recycling markets in 2018.

All curbside collection recycling programs in the County have a scheduled day at least bi-weekly during which separated materials are to be placed at the curbside or similar location for collection. Municipalities, or private haulers, may perform the collection, transportation, processing or marketing of recyclables. Each municipality required (by Section 1501 of Act 101) to implement the curbside program should have an ordinance or regulation to require the following.

1. All homes, apartments and other residential establishments must separate at least three materials deemed appropriate by the municipality from other waste generated in their dwellings. The three materials will be chosen from the following: Clear glass, colored glass, aluminum, steel and bimetallic cans, high grade office paper, newsprint, corrugated paper and plastics.
2. All homes, apartments and other residential establishments must separate leaf waste from other waste generated, unless those persons have otherwise provided for the composting of leaf waste. Leaf waste includes leaves, garden residues, shrubbery and tree trimmings, but not grass clippings.
3. Commercial, municipal and institutional establishments will separate high grade office papers, cardboard, aluminum, leaf waste and other material deemed appropriate by the municipality from the other waste generated there. Commercial or institutional establishments can be exempted if they already arrange for recycling of materials that they are required to recycle.

Based on historical recycling data for Lebanon County, Table 5 identifies the record and projected recycled quantities for the County from 2000 through 2030. As indicated in the table, the record rate of recycling met the Act 101 goal of 35% by the target year 2003, achieving a 40% diversion rate in 2000. The County has continued to pursue recycling efforts, achieving a diversion rate of 48% in 2019. While the future diversion rate utilized

is lowered to a conservative 45%, it is the recommendation of this WMP to continue to grow the diversion rate as the environmentally responsible plan of action.

### **3.1.2 Municipality Recycling Program**

Setting a goal of 35% waste diversion through recycling by 2003, Act 101 supports the use of recycling as a waste management tool with a number of different provisions. The Act sets up grant programs for municipal recycling program development and implementation, for partial reimbursement of County Recycling Coordinator costs, and for performance-based reimbursement for municipal recycling programs. Also, the Act requires landfills and resource recovery facilities to establish at least one recycling drop-off center; requires resource recovery facilities to develop a program for the removal, to the greatest extent possible, of recyclable materials; and prohibits landfills and resource recovery facilities from accepting for disposal truckloads composed primarily of leaf waste.

The development and continuation of methods to promote recycling in each of the municipalities continues to be recommended by this waste management plan in an effort to grow the diversion rate in each of the municipalities in the County. In addition to overall environmental benefits, increased diversion will impact the daily quantity of waste received at the GLRA facility, increasing the lifespan of this resource for the County.

Incentive programs were overwhelming discouraged by the general population in 1999, and were not included in that Waste Management Plan. Individual municipalities have over time developed programs that fit their resident populations and worked to achieve the goal of increased diversion. Since 1999 the number of curbside programs increased from 13 to 18, the number of municipalities with no program has decreased from 6 to 5, and the County's overall diversion rate has increased. Each municipality has been encouraged to utilize the resources of the County Recycling Coordinator and craft a program that functioned for their citizens.

It is the recommendation of WMP 2020 that each municipality should continue to make those individual choices, evaluating the success of their programs and adjusting as necessary. As a general rule, a well-designed program for collection of recyclables from the residents' homes in the County will:

- provide public education,

- provide weekly collection,
- distribute a household storage container,
- pick up recyclables on the same day as waste collection, and
- vigorously promote the recycling program

The extent of resident participation is dependent upon many factors other than the complexity level of effort required in a source separation program. Public education is an important factor, as are the demographic characteristics of the community including income, education, and location (suburban, urban, or rural).

Participating in a separation program requires that households learn new behaviors, and unlearn others. Learning new behavior involves the expenditure of time, mental and physical effort, and sometimes money. In general, as a program proceeds and recycling becomes more of a habit, the “perceived effort” to accomplish recycling diminishes. Over time, less mental effort is needed to separate the domestic waste and households become more supportive of the costs and benefits of recycling.

The County is achieving success with their current programs and current diversion rates. Municipalities are utilizing the County Recycling Coordinator to craft their programs, educate their public, and increase their environmental awareness. While the optimal program may someday be a countywide effort, the waste collection and recycling approach in each municipality should continue to be reviewed on a case-by-case basis to determine the optimal approach to be implemented to increase recycling and whether a standardized program is either necessary or desired.

### **3.1.3 Ordinance Evaluation & Modification**

A waste management agreement between the County and the GLRA is required for the execution of this Waste Management Plan. Currently an agreement is in effect and has been renewed. This agreement establishes the GLRA as the entity responsible for waste management in Lebanon County. From this agreement, all programs, identified in this plan, can be implemented by the GLRA.

Under the Municipal Waste Management Agreement between Lebanon County and the GLRA (see Attachment #2), the County agrees to delegate to the Authority its powers and duties under Act 101 and the Authority agrees to assume those powers and duties and to

implement the approved County Plan and any subsequent revisions.

As part of the agreement, a County Ordinance was implemented to provide a legal basis for the Waste Management Agreement. Since Lebanon County has entered into an agreement with the GLRA for waste management, the County agreement supersedes any municipal agreement regarding waste management. Currently individual waste management ordinances are in effect in eleven municipalities in Lebanon County. These waste ordinances are written to ensure that the residents within a municipality have mandatory waste collection and that all municipal solid waste be directed to a designated facility in the DEP approved County Solid Waste Management Plan.

While not all municipalities in Lebanon County actively promote recycling, efforts undertaken since the original Waste Management Plan have succeeded in growing the recycling community within the county. Currently 86% of the County's population is served by a recycling program of some type. The County Recycling Coordinator has been routinely utilized as a resource by municipalities seeking to modify their ordinances and will continue to function as that resource for ordinance review and modification as necessary.

The GLRA has noted that large events routinely occur in the County where a large quantity of waste is generated and the potential for waste diversion is evident and required by Act 101. (ie. County fairs, sporting events, etc.) They continue in an effort to evaluate those situations as necessary to aid in and promote recycling throughout the County in support of Act 101 requirements for such recycling in both mandated and non-mandated communities.

#### **3.1.4 Program Implementation**

The GLRA staff (refer to Figure 4) has been and is responsible for helping the municipalities/townships with implementing recycling programs. They will continue in their efforts maintain current recycling efforts, to provide a resource for diversion programs and grant applications, and to be ready to assist the non-mandated municipalities in their efforts when prudent.

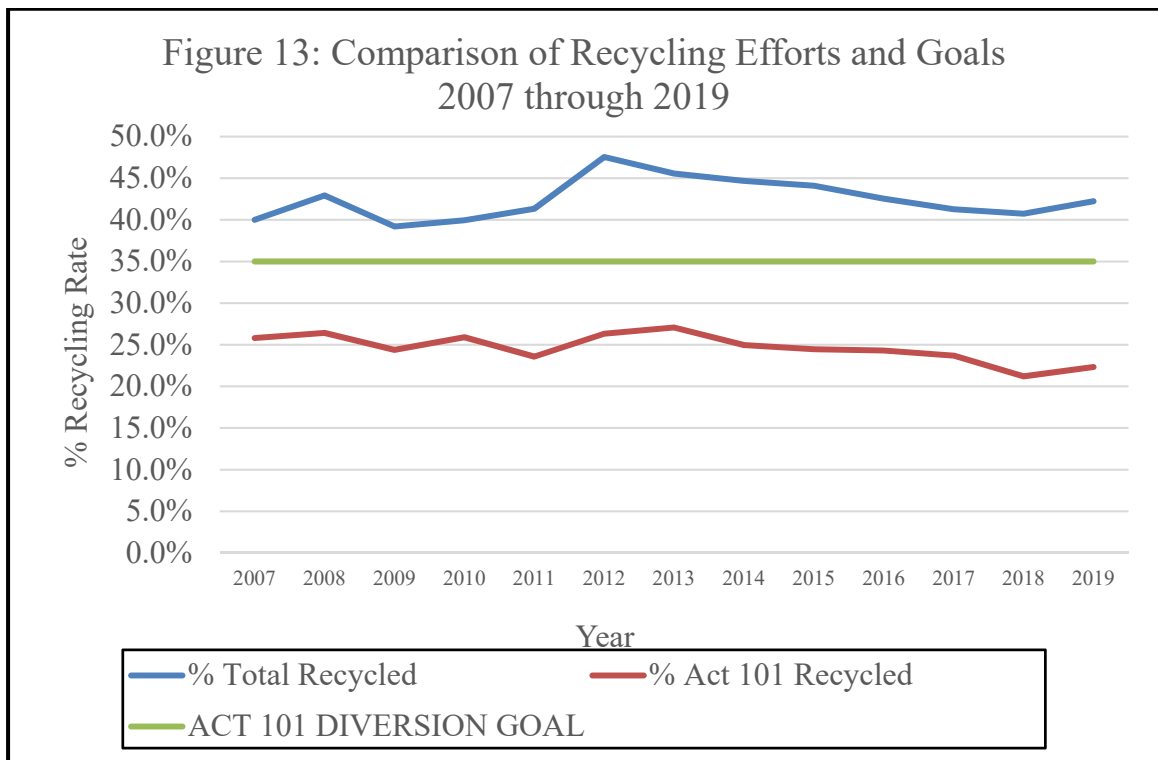
The GLRA and individual municipalities will review the plans as necessary and implement them as needed. The GLRA will also review overall County waste management and recycling approaches to assure that recycling in the County has adequate support and every

provision is given to each municipality to assure consistency.

## 3.2 Recycling Cost Awareness Program

### 3.2.1 General Description

For the years 1994 through 1998, the rate of recycling in Lebanon County averaged approximately 35%. This was predominantly achieved through the recycling of glass (clear, brown and green), aluminum (cans and scrap), paper (newspaper, office paper, mixed paper, magazines and corrugated), steel cans, plastics (PET, HDPE and PVC), car batteries, tires, metals (ferrous, non-ferrous and mixed), white goods, and leaves. In the years from 2010 through 2019 the rate of recycling in Lebanon County averaged 47% achieved through a different mix of materials as markets, population, and businesses changed. (See Figure 13)



Residential recycling in the County is done by means of curbside collection or drop-off centers and accounts for approximately 40% of the diversion rate, with commercial recycling accounting for approximately 60%. The quantity of materials Source Separated in Lebanon County was presented in Table 5 for the years 2000 through 2019, and projected through 2030. This projection was based on the information collected as part of the Act

101 requirements for reporting annual quantities of materials recycled within each County in Pennsylvania from both curbside recycling programs and drop-off centers located throughout the County. The County is currently exceeding Department of Environmental Protection goals for waste diversion, and is expected to continue to do so.

Support by County residents for the recycling efforts is important to help divert MSW from landfill disposal. Residents also need to be informed and understand the costs associated with the recycling program since often the costs are larger than the realized revenues collected upon delivering the materials at a recycle processing center. This section identifies the programs that will help to make the residents of Lebanon County aware of the efforts and associated costs required to collect and deliver recycled materials to a recycling center for processing. The efforts, and associated costs, for the recycling of yardwaste are also discussed.

### **3.2.1.1 Recycling Maintenance Costs**

Costs for recycling are distributed between the residents and the County (with the GLRA acting as an agent for the County). The fees the residents pay for waste collection cover the costs associated with hauling and disposition of recycled material including the tip fee paid for disposal of non-recycled material. The County pays, in part, for recycling through surcharges on the tip fee paid to the GLRA for disposal of items that are not recycled and by DEP grants that are paid directly to the County. Ultimately the revenues that pay for recycling do not come from the disposition (or marketing) of the recycled product, but rather from hauler fees and the disposal of non-recycled materials. This economic reality is a key factor in the economic analysis of a MRF as an alternative consideration for Lebanon County, since the revenues from marketing recycled materials could be captured if the County, or its agent, owns the facility.

Since recycling costs are covered from revenues received for the disposal of non-recycled materials, the residents should be aware of the costs associated with the recycling program. Program costs are covered by the County residents and businesses through the fees paid for waste collection. The GLRA, as an agent for the County, is responsible for seeing that an appropriate portion of these fees are distributed for the maintenance of the recycling activities in the County.

### 3.2.1.2 Recycled Material Collection/Processing Costs

Collection costs for recycled material result from curbside collection program costs and from drop-off center operation and collection costs. Except for yard waste processing, recycled material processing costs are not currently a part of the Lebanon County recycling programs. The following discusses cost considerations for the recycling approaches currently a part of Lebanon County's recycling program.

- Curbside Collection Program Costs. The costs for curbside pickup include collection and transportation costs, as well as costs that may be incurred upon delivery of the materials at a processing center. A separate truck or trailer is required for collection of recycled materials. The collected recycled product is taken to a recycling center where there is often a charge (usually per ton of materials) for receiving the materials. Sometimes there is revenue or the materials are received with no charges depending upon the market for the recycled materials at the time. In addition there is a transportation cost associated with taking the materials to a recycling center. Typical costs to collect recyclables (whether they are set out or not) range from \$2.00 to \$3.00 per residence every time recycling is done. These costs are covered by the residents through the waste collection fees paid to each of the haulers.

Thirteen municipal curbside collection programs existed in Lebanon County in 1999 serving approximately 64% of the population in the County. Currently, there are eighteen municipal curbside programs servicing approximately 86% of the population in the County.

- Drop-Off Center Program Costs. A drop-off program requires residents to separate recyclable materials at the source and bring them to a specified drop-off or collection center. Because residents are responsible for not only separating their recyclable materials, but also taking them to a drop-off center, low participation can be a problem in achieving the diversion rates desired from these programs. Drop-off centers also require residents to store the materials until sufficient quantities are collected to warrant a trip to the drop-off center.

Prior to 2000, to encourage participation especially in the more rural areas, Lebanon County made drop-off centers as convenient to use as possible. In 2010 most drop-off programs have become supplemental to many curbside recycling programs,

expanding the collection of additional materials not traditionally collected curbside beyond the typical commingle or single stream. Currently eleven drop-off centers are setup and located throughout Lebanon County. Nine out of the eleven drop-off centers accept Act 101 recyclable materials, while the other two accept the more non-traditional items such as appliances, scrap metal, or batteries. One of the nine (the GLRA) accepts non-traditional items in addition to Act 101 materials.

There are costs associated with the setup and maintenance of drop-off centers. Often the costs for drop-off center setup are partially covered through DEP grants. Setup costs include the costs for construction of the site, purchase of containers and the purchase of other materials to make the drop-off center effective and efficient. Maintenance costs for the drop-off center include frequent pickup of the containers filled with recycled material and transportation of these containers to a recycle material processing center. The processing centers may charge to receive the recycled material or there may be some revenues paid to the collector for the materials depending upon the market for recycled materials at the time.

Eight of the drop-off centers within Lebanon County are municipally owned and operated; the municipality is financially responsible for all costs associated with the collection, processing and transportation to market of the recyclable materials. The County drop-off center is owned and operated by the GLRA with responsibility for all expenses relative to the collection, transportation and marketing of the materials. The two remaining drop-off centers are each commercially owned and operated by a private business.

- Yardwaste Recycling. Since February 1992 GLRA has operated a DEP permitted compost facility on a 5-acre portion of its site. GLRA established this composting facility on its property to handle green waste arriving at the site in segregated loads. GLRA defines green waste as: leaves, tree trimmings, grass clippings, garden residue, shrubbery, branches, limbs, pruning's, and clean wood (untreated and unpainted). There is currently no restriction for the disposal of green waste in the GLRA landfill; however, separation for composting and diversion from landfill disposal is encouraged. Lower tipping fees are charged for green waste and clean wood which can be composted rather than landfilled since it does not take up space in the landfill.

The compost operation consists of placing segregated loads of green waste delivered

to the site in a storage area. The composting operation at the GLRA site is by means of a static aerobic compost pile. Leaves, grass clippings, and brush clippings are the most commonly composted yard wastes. Clean wood can also be used for the compost operation (since the compost mix requires a high content of carbon material). Stumps are also composted, but only after they have been chipped to produce a smaller, more uniform size.

This waste is shredded and placed in windrows for composting. A “tub grinder” is used to prepare the green waste for composting by reducing the size and therefore increasing the surface area exposed to the biological degradation process. Tub grinders consist of a large tub having a revolving upper section, and a stationary lower section containing a hammer mill. Output from the tub grinder goes to the first stage windrow. A windrow is constructed by stacking the prepared feedstock (yardwaste) in the form of an elongated pile (long piles up to about 9 to 14 feet high). The procedure involved in stacking the material is influenced by the volume and nature of the material to be composted, the design and capacity of the available materials handling equipment, and the physical layout of the windrow area. The windrows are turned as necessary to allow mixing with oxygen in the air to facilitate aerobic decomposition of the organic material.

Costs associated from this operation involve labor to receive and process the green waste to prepare it for composting. Labor is also required to turn the windrow periodically. Various equipment costs are associated with the required front-end loader, tub grinder, screener, and other support equipment needed for the operations.

The final cured product is offered for sale to anyone needing the material. The GLRA compost facility produces average quality mulch and a high quality compost. It is offered to anyone for purchase at a minimal fee.

Since its beginning in 1992, the GLRA Compost Facility has been joined by compost facilities hosted by Jonestown, Lebanon City, North Londonderry, West Lebanon, North Cornwall, and South Lebanon. Nine additional municipalities operate leaf/yard waste collection services within their boundaries.

### **3.2.1.3 Administrative Costs for Waste Management**

As identified in Section 1, the GLRA has been delegated the authority to provide for the

management of the wastes generated in Lebanon County. In addition to managing a centralized landfill site in Lebanon County, the GLRA has been given the responsibility to provide waste management planning to support Act 101 requirements and to see that the programs identified in the plan are carried out or modified to suit the needs of the County and its municipalities.

The GLRA was initially established to manage and operate the landfill for the municipalities in the County. The additional requirement to manage wastes and recycling programs for the County has resulted in additional costs primarily attributed to added personnel and additional services provided. These costs are currently covered by the tipping fee revenues, but should be understood and considered separately from the costs associated with landfill operations.

### **3.2.2 Program Implementation**

The GLRA staff has been responsible for implementing recycling cost awareness program in the County.

Actual costs associated with different parts of the program were identified over a period of time and monitored. The data collected and maintained includes costs related to: household hazardous waste/electronics collection costs, drop-off center costs, yardwaste composting costs, and program administrative costs.

The GLRA implemented a cost awareness program within the county and modified the billing invoice to reflect the costs of the various programs as suggested by WMP 2000. While this did provide an educational tool it also created great confusion and was difficult to maintain in a manner that would be educational. Although this practice was discontinued, the information gathered has been utilized where appropriate to provide public education. The GLRA continues to monitor costs of various programs for educational use as well as prudent business practice.

## **3.3 MSW Processing Program**

### **3.3.1 Program Description**

The methods used to recover source-separated materials include curbside collection and homeowner delivery of separated materials to drop-off and buyback centers. The further

separation and processing of wastes that have been source separated usually occurs at MRF. A MRF is typically designed to provide further separation to allow the recyclable materials to be marketed. In addition, a MRF can be designed to process MSW that has not been source separated such as commingled MSW or single stream MSW.

An economic evaluation of the recovery of the recyclable content of the waste currently received at GLRA in preparation for WMP 2000 appeared to indicate that a MRF to separate recyclable materials from the incoming MSW would be economically feasible. The results of this evaluation are included in Attachment 5 of Part II (WMP 2000). Recyclable materials removed by the MRF would include metals, paper, some plastic, and glass. The recommendation to implement a MRF in Lebanon County was conditioned on the results of a detailed Waste Characterization Study to be conducted during the design and planning stage to validate the conclusions of the economic evaluation model. A separate review of that conclusion was conducted during the 2018 Pro Forma Economic Analysis in preparation for WMP 2020 and concluded that a full size MRF would not be as economically feasible as the current landfill disposal option.

The conditional recommendation for implementing a MRF was based on the fact that waste composition will vary over time. A future re-evaluation could show that a “dirty” MRF, as contemplated in WMP 2000, to separate recyclable materials from MSW is not feasible, but a MRF to further process the recyclable materials from municipal curbside and drop-off recycling programs may be an economic benefit to the residents of Lebanon County.

If a dirty MRF is shown to be cost beneficial and is implemented for separation of the incoming MSW to the GLRA landfill, the removal of organics may be readily performed as part of the overall separation process. The removed organic materials (primarily foodwaste and yardwaste) and plastics could be processed by incineration and/or composting (biodegradable fraction) as a means of diversion of the materials from landfill disposal.

Further studies and characterization will establish siting requirements and design details for a MRF should it become prudent to re-consider.

### **3.3.2 Program Implementation**

The GLRA staff has the responsibility to provide feasibility evaluations for implementation of a MRF in Lebanon County. Should the staff believe that a MRF is potentially beneficial

and feasible the first effort to initiate the program will be to perform a detailed waste characterization study on the MSW received for disposal at the GLRA landfill. For a MRF to be successful in Lebanon County, the project must: be economically feasible; be supported by markets for the recycled materials; have adequate revenues from marketing the recycled materials separated from the incoming waste; and result in a positive projected cash flow. A detailed waste characterization study should be a sampling program similar to the one conducted in 1995, and would be a prerequisite to design.

Once the characterization study is completed, an economic evaluation that would consider the existing market price of the recycled materials would be conducted. If the results of the economic evaluation are favorable, then a recommendation to go ahead with implementation of a MRF would be made to the GLRA for approval.

## SECTION 4

### 4.0 Lebanon County Waste Disposal Program

#### 4.1 GLRA Landfill Disposal Program

##### 4.1.1 General Description

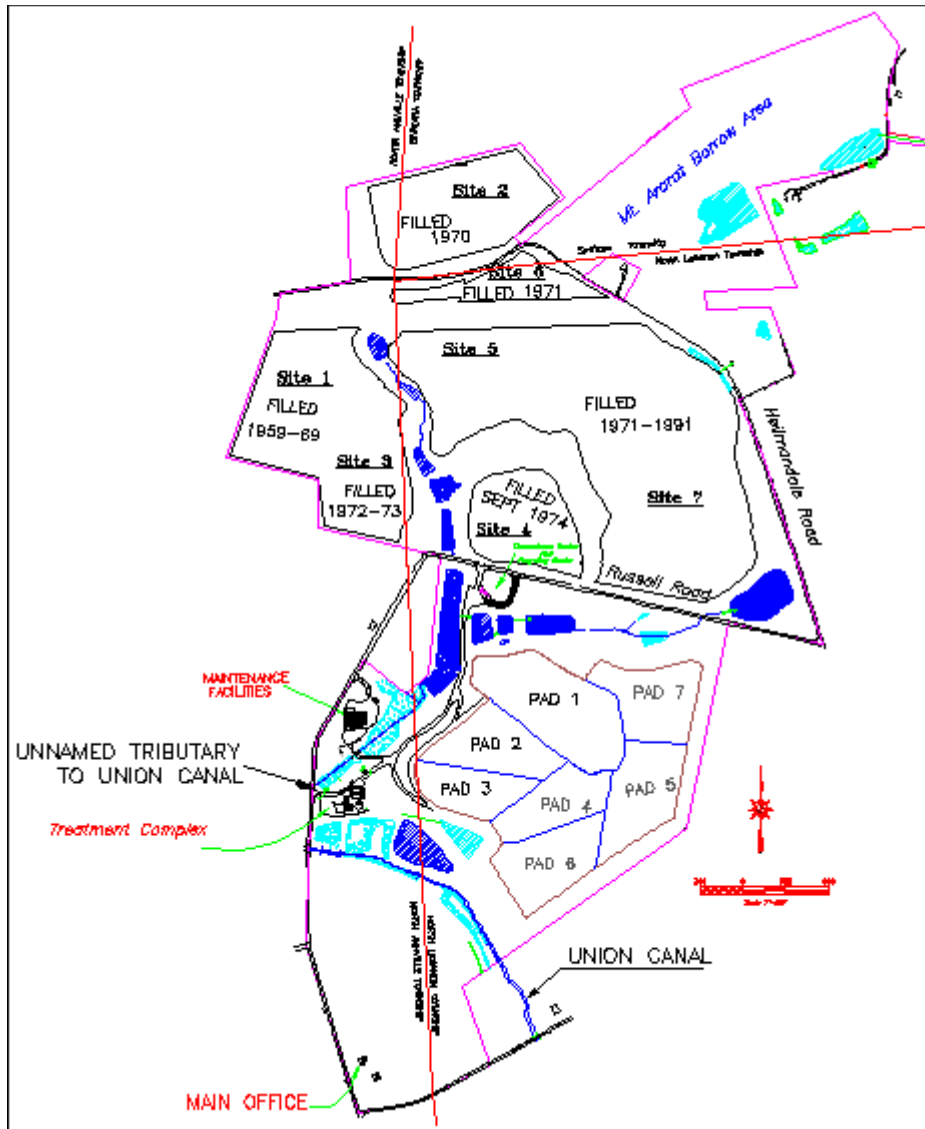
The GLRA owns and operates a municipal solid waste landfill in Lebanon County located approximately three and one half miles northwest of the City of Lebanon. The GLRA owns land and is responsible for contiguous landfill masses located in North Annville, Swatara, and North Lebanon Townships, with active landfilling taking place in North Lebanon Township. As identified in Tables 6 and 7, the GLRA landfill facility accepts only MSW and select Residual Waste<sup>11</sup> streams and is permitted to accept an average of 750 tons per day<sup>12</sup>, with a maximum of 1,100 tons of MSW in any one day. The GLRA owns additional contiguous properties in North Lebanon, North Annville, and Swatara Townships to support these landfilling operations.

Figure 14 A shows the general layout of past and present operations on the GLRA properties. Landfilling operations at the GLRA site began in 1957 under private ownership in the northern part of the properties. The GLRA was formed in 1959 and purchased the existing operation. The area north of Russell Road is the previously permitted portion of the landfill operated under DEP permit 100825. This area, identified as “Site 7” was used for landfilling MSW until the summer of 1991. Final closure operations are complete, including placement of an impermeable cover to minimize future infiltration of rain water to reduce the generation of leachate. The GLRA leases a building in the Treatment Complex area to Energy Power Partners (EPP), and sells to them the Landfill Gas (LFG) generated from Site 7 and the active landfill operations. EPP generates electricity from the combustion of the LFG in internal combustion engines driving a generator. In this arrangement the GLRA is responsible for the operating and capital costs for the gas recovery system, and receives payment for the gas collected and delivered.

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<sup>11</sup> In accordance with a Waste Characterization Plan approved by the Department. The items approved for disposal correspond to out of date regulations that recognized “Municipal Like Residual Waste” (Type “S”) for disposal at MSW facilities.

<sup>12</sup> Raised to 750 tons per day in accordance with Permit Condition, Major Permit Modification, Mar 15, 2006 in July, 2018



**Figure 14 A: GLRA FACILITIES: 1959 to Current**

A series of leachate storage/treatment ponds, located in the west-central part of the site, are used to treat the leachate from the historical unlined landfill areas north of Russell Road. Pump stations, located at the lined sites, collect and transfer leachate from the lined sites through a separate processing system. A force main to the municipal wastewater treatment facility in Lebanon is provided so that the collected leachate from the lined landfills can be pumped directly to the public sewer collection system for treatment at the Lebanon Authority POTW (Publicly Owned Treatment Works). The on-site leachate pre-treatment facility, initially constructed as mandated by the Department of Environmental Protection (DEP), was decommissioned in 2008 and the equipment sold and removed from the site in 2009.

The new lined area of the GLRA landfill is located south of Russell Road and is shown in Figure 14 A. The first GLRA lined landfill (identified as Pad 1) received its DEP construction permit (Permit No. 101544) in October 1990. Pad 1, consisting of approximately 13 acres, went into operation in August of 1991. A permit expansion was issued in November 1994 for Pads 2 through 6, to be constructed adjacent to Pad 1 to allow for a continuous filling operation. Issues with Pad 7 precluded its approval during initial permitting. During Permit Renewal (Aug 21, 2000) Pad 7 design was approved. Construction of all currently permitted Pads was completed in 2008. As of 1 Jan 2020 all cells had been utilized for disposal purposes, with a partial final cap project underway to cap portions of Pad 1, 2, 3, 4, and 6. The design life of the various cells is illustrated in Table 9. It is noted that the life of individual pad is influenced by the overall footprint of the lined area and that there remains airspace on all pads. The latest Annual Report predicts approximately 3.7 years of remaining life as of 1 Jan 2020.

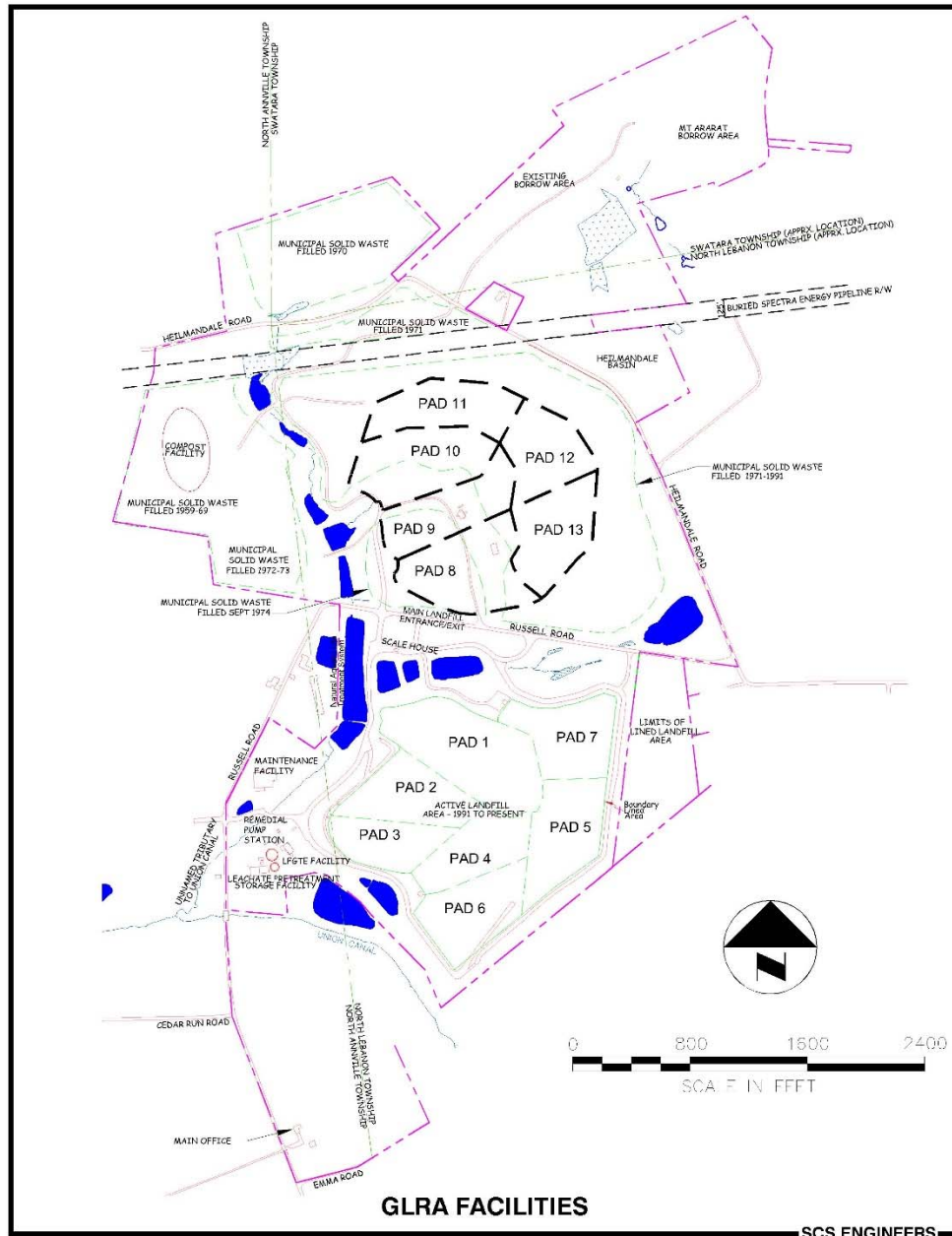
Table 10 presents the size and expected life of each of the planned landfill pads for the previous Waste Management Planning periods. As predicted, the GLRA landfill site had adequate capacity for the previous 10 year planning period through 2020. Within this planning period the Department of Environmental Protection allowed the submission of a Minor Permit Modification containing a “Settlement Accommodation Plan” that predicted the settlement of waste over time and allowing the overfilling of waste beyond the permitted topography. The SAP added approximately 2 years to the life of the facility at our current annual waste acceptance rate.

The Department of Environmental Protection does not allow the submission of an expansion permit until there is less than 5 years of capacity remaining on the site. Efforts to evaluate waste management options were undertaken as early as 2010, with a landfill expansion permit submitted in the summer of 2018. This Waste Management Plan is written with the assumption that the permit expansion will be approved and constructed in 2023, with revisions to Table 10 as noted.

Table 10: Planned GLRA Landfill Life

Table 10 Planned GLRA Landfill Life						
Pad Number	Area (Acres)	Pad Design Volume (CY)	Weight MSW (Tons)	Life Expectancy (Years)	Operating Years	
					From	To
1	12.7	650,000	323,825	4.2	1991	1995
2	6.9	735,000	382,185	4.5	1995	2000
3	5.1	487,000	250,898	3	2000	2003
4	5.9	828,900	447,458	5.1	2003	2008
5	7.6	659,800	356,265	3.7	2008	2012
6	7.1	822,000	443,880	4.4	2012	2016
7	7.2	922,000	485,123	4.5	2016	2021
SAP	-	330,443	223,049	1.7	2021	2023
8	9.57	697,543	418,526	2	2023	2024
9	7.3	867,586	520,552	2.4	2025	2027
10	8.91	1,284,957	770,974	3.6	2027	2031
11	7.02	851,988	511,193	2.4	2031	2033
12	6.54	947,928	568,757	2.7	2033	2036
13	7.35	1,403,750	842,250	3.9	2036	2040

The planned location of Cell 8 through 13 is depicted in Figure 14 B (below)



**Figure 14 B: GLRA FUTURE FACILITIES**

**4.1.2 Waste Acceptance Criteria**

Tables 6 and 7 define the wastes that are acceptable and the wastes that are not acceptable for disposal at the GLRA landfill facilities.

### **4.1.3 Program Implementation**

The WMP implementation schedule is presented in Figure 17. As planned the GLRA reviewed the potential for reclamation of previous, unlined, landfill sites. This investigation concluded that this activity would be cost prohibitive and potentially detrimental to the neighborhood for the life of that project. To test the economics of building a MRF, this option was included in the 2018 Pro Forma Economic Analysis that included not only an analysis of a MRF, but the possibility of disposing of Lebanon County Waste through transportation and incineration. All of these options were less cost effective than permitting a “piggy-back” expansion over existing unlined sites. Accordingly, the GLRA focused on submitting a permit expansion as soon as they reached the permitting window to provide the necessary capacity for the next 10-year plan period. With all permitted landfill space currently constructed, the current focus of the GLRA is to plan, design, and permit the next generation of landfill space. The planning, design, and permit submission stages were completed as scheduled; the Permit Review process by the Department of Environmental Protection is expected to take two years. Adequate capacity currently exists through mid-year 2023.

## **4.2 Hauler Licensing Program**

### **4.2.1 General Description**

The issue of hauler licensing is currently addressed in Act 90 and the GLRA Regulations for Lebanon County. Licensing is structured such that no vehicle is charged for both State and Lebanon County Licenses. Vehicles required to be licensed by DEP receive an Act 90 License and pay all applicable fees to DEP. GLRA provides a license to operate in Lebanon County at no charge to these vehicles upon presentation of Act 90 documentation to GLRA. Vehicles which are not required to be licensed by DEP under Act 90 do require a license to collect waste within Lebanon County and dispose of waste at the GLRA site. These licenses are issued and the license fees are collected by GLRA. Waste Vehicle Licenses are the means by which the County imposes minimum standards on waste collection and transportation and by which the County exercises waste management and flow control. Currently all haulers of municipal and residual waste are required to have a permit to operate in Lebanon County. This is a requirement that is enforced by the GLRA and is intended to be maintained for the duration of this WMP and evaluated as necessary.

## **4.2.2 Program Implementation**

The GLRA staff is responsible for implementing and maintaining the hauler licensing program. The goal of the program is to provide assurance to municipal officials that a commercial vehicle with a GLRA license is licensed in accordance with GLRA regulations to collect MSW within the county and transport it. This license is provided at no cost to the commercial sector to avoid a conflict with PA Act 90, a state licensing program.

## **4.3 Flow Control**

### **4.3.1 General Description**

Act 101 requires that Lebanon County assure the availability of adequate permitted processing and disposal capacity for the municipal waste generated in Lebanon County for the duration of the planning period.

The Act mandates that Lebanon County demonstrate that it has secured ten (10) years of estimated future processing or disposal capacity for all municipal waste generated in Lebanon County. That capacity comes at a cost which, in Lebanon County, is then recovered through tipping fees. Waste flow control, as presently implemented by County ordinance, has worked well in Lebanon County since 1990 to achieve this objective. That ordinance mandates that all municipal waste generated in Lebanon County must be delivered to a solid waste management facility designated by the County. Waste flow control assures the revenue stream for planning and implementation of public facilities which will, in turn, assure the required ten (10) years allocated capacity. Waste flow control also aids in assuring the proper disposal of municipal waste, the mitigation of future environmental liability, and compliance with State and Federal laws, including recycling mandates and implementation of all aspects of the Lebanon County Municipal Waste Management Plan.

Waste Flow Control additionally assures the revenues required to pay for certain public services enjoyed by the residents of Lebanon County. These services include recycling support, enforcement of waste management regulations, administration of the County Waste Management Plan, and monitoring/care of inactive landfills that exist in the County. The revenues to support those services are currently included as part of the tip fee that is collected to cover the cost of waste disposal.

As a joint municipal authority formed by every incorporated municipality in Lebanon County, the GLRA has operated as Lebanon County's only permitted solid waste management provider for the past six (6) decades, and has been the County's sole legally designated solid waste management facility, under Act 101 guidelines, since 1990. The GLRA has fulfilled all of the County's responsibilities under the Act for municipal waste planning and implementation of the existing County waste management plan in an exemplary fashion.

The ability of the GLRA to provide the assurance of ten (10) more years of adequate permitted capacity is conditioned upon an assured revenue stream from tip fees with which to pay for that capacity. Recently in United Haulers Assn. v. Oneida-Herkimer Solid Waste Management Authority, 127 S.Ct. 1786 (2007) the United States Supreme Court affirmed the right of public solid waste disposal facilities to institute and manage flow control of municipal solid waste. The GLRA, as a separate municipal government, benefits from that legal decision.

Lebanon County plans to continue to utilize traditional waste flow control as presently implemented and practiced. It is imperative that Lebanon County approve of all locations in which County generated municipal waste is disposed. It is equally important for Lebanon County to be assured that municipal waste originating from the County is disposed of in a lawful manner and in a site that has been approved by the County. With the exception of emergency situations, Lebanon County intends to restrict disposal of Lebanon County generated municipal waste to the GLRA landfill or other GLRA/County approved facility.

The primary method of managing the collection and movement of MSW generated within the County will be through licensing of haulers collecting MSW in the County. The functional goal of this effort is to treat all private entities equally in accordance with the regulations of the GLRA, the ordinances of the Municipalities and the County, and the laws of the State.

The GLRA has provided Lebanon County assurances for waste disposal capacity based on estimates of the quantity of waste expected to be generated within the County through the year 2023, and is preparing to provide waste disposal capacity for the future.

### **4.3.2 Program Implementation**

Currently, Lebanon County has implemented flow control through County Ordinance, requiring MSW<sup>13</sup> generated within the County to be deposited in the GLRA landfill or other GLRA/County approved facility. Implementation of flow control should continue similarly for the years covered by this WMP to assure that the GLRA will be able to maintain adequate revenues.

The County has executed a new agreement with the GLRA delegating the duties and responsibilities of waste management plan administration, recycling under Act 101, and capacity disposal assurance for the ten year term of this minor plan amendment.

## **4.4 GLRA Landfill Gas Recovery and Disposal Program**

Landfill gas (LFG) management is necessary to meet permit conditions from Pennsylvania Department of Environmental Protection Bureau of Waste Management, Bureau of Air Quality, and requirements of the United States Environmental Protection Agency. These requirements impact the management of gas from the current operational lined landfill (Pads 1 through 7) and that of the older inactive unlined landfill closed in 1991. The primary and preferred means of landfill gas control is through collection and sale of the landfill gas to EPP for use as a fuel for power production. The second means for control of LFG from the entire GLRA facility is through collection of the LFG followed by destruction through an enclosed flare. The flare is only planned to be used in the event the gas cannot be used for electrical power production due to either planned or unplanned shutdown of the plant. The following discusses both approaches followed for control of LFG at the GLRA landfill facility.

### **4.4.1 General Description of Gas to Energy Processing Operations**

The landfill gas collection system on the entire site is owned and operated by GLRA. A system of horizontal and vertical collectors (wells) are installed in the waste mass as soon as there is sufficient depth of waste to make construction feasible. Collection and movement of the LFG is accomplished by a blower system providing suction to the LFG collection system in the landfills. Both the enclosed flare and the generation facility are

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<sup>13</sup> C&D Waste is included, as it is regulated as MSW

capable of moving the maximum expected flow of LFG, as it is produced, to either the generators for power production or to the enclosed flare for destruction. Currently the existing variable speed blowers deliver between 500 CFM to 1200 CFM of LFG to the power generation engines. A system of two blowers, in parallel, provides backup should one blower require maintenance or be off line.

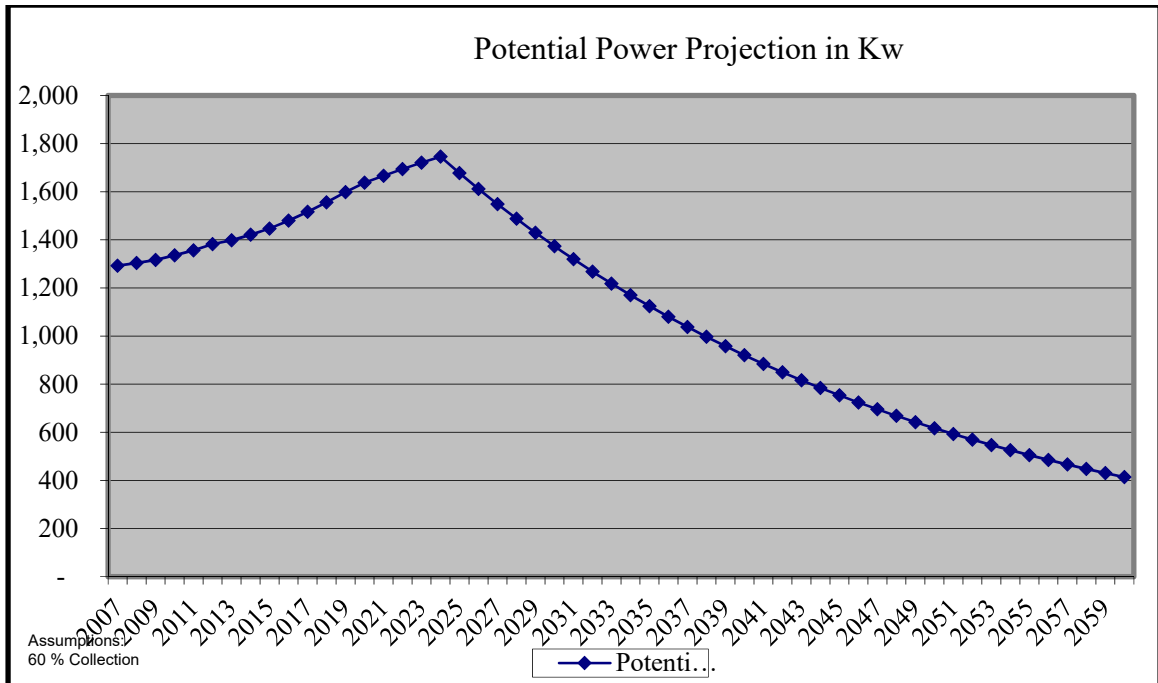
LFG collected in this manner contains water vapors. Primary removal of these vapors is achieved through condensation within the transmission lines and drainage from the line into a barometric drain. The barometric drain in turn discharges the condensed liquid into the landfill mass while preventing air from being drawn into the system by the line vacuum. Secondary removal of water vapor is performed near the intake of the blower systems in a “knockout” vessel. The liquid from the knockout vessel drains to the facility leachate collection system for treatment.

The collected LFG is sent to EPP to fuel two V-20 Caterpillar Internal Combustion Engines. Each of the existing engines is rated at approximately 850 cubic feet/minute of LFG consumption when burning average quality LFG. The inlet LFG to the engines passes through a set of filters that clean the gas before it goes into the engines. A gas quality meter is provided to determine the air mixture required to achieve good combustion.

The power generated by the engines varies over time since the amount of combustible LFG produced varies with the decomposition of the MSW and operating parameters of the collection system. The potential power projections for the current configuration of GLRA landfill sites is illustrated in Figure 15<sup>14</sup>. This potential power projection will change with the permitting of the proposed expansion permit.

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<sup>14</sup> Source: WMP-026 (2020)



**Figure 15: Potential Power Production**

#### 4.4.2 General Description of the Flare Gas Disposal Operation

To control the odors from LFG production and to meet increasing LFG control requirements from both the State and Federal Government the GLRA implemented an aggressive LFG collection and disposal program in the late 1990's. The primary aspect of the program was the addition of horizontal collection pipes concurrent with the disposal of trash. An enclosed flare and blower skid was brought on-line in 2001 as backup to the power generation system then operated by Lebanon Methane Recovery. This system continues to function as a backup to the current LFG to Energy system owned and operated by EPP. The functional goal of the system from the gas migration perspective is to keep the entire landfill under a negative pressure relative to atmospheric, while maintaining the flexibility to increase or decrease vacuum to individual areas to meet gas management objectives.

#### 4.4.3 Program Implementation

The GLRA staff is responsible for disposing of LFG in a cost effective and environmentally sound manner. The gas collection system will continue to be installed as MSW is placed in the lined landfill pads. The generators in place, owned and operated by EPP, are

adequate to provide for consumption of all gas generated in the current landfill. Space has been provided in the power generation facility for a third unit to beneficially use gas from future landfill sites on the GLRA facility. This will provide adequate destruction of LFG for approximately 40 years based upon the volume of waste generated in Lebanon County and the projected growth for the 40 year period. The enclosed flare has also been sized to combust all the gas generated by the landfills on the GLRA facility for a 40 year period.

## **4.5 GLRA Leachate Treatment Program**

### **4.5.1 General Description**

In operation since 1957, the GLRA landfill facility has both lined and unlined landfill disposal sites. Rainwater once in contact with trash is defined as “leachate”. The facility is serviced by two separate and distinct leachate treatment systems. Leachate treatment for the unlined sites (Sites 1 through 7 - see Figure 14 A) is by a “Natural Aquatic Life Treatment System” (NALTS). This system receives groundwater inflow and leachate from seven separate unlined landfill sites in its headwater regions and delivers the collected water to aquatic ponds where biological treatment takes place. The purpose of the NALTS is to provide treatment for leachate that has been released from existing unlined landfill sites.

Leachate from the current lined site is required to be captured and treated prior to release. While the GLRA at DEP’s insistence initially constructed a primary treatment plant for the leachate, the discharge from that plant required tertiary treatment. The most economical solution to this requirement was the direct piping of the plant discharge to the Lebanon Authority POTW (Formally the City of Lebanon POTW). Based on a cost analysis, the GLRA Treatment Plant was bypassed and the leachate is now completely treated by the Lebanon Authority POTW. In 2008, the GLRA Treatment Plant was formally decommissioned and removed from the permit, and in 2009 the equipment was sold.

Current landfill operations take place on a Resource Conservation and Recovery Act (RCRA) Subtitle "D" double lined landfill site, permitted by the Department of Environmental Protection as Permit #101544 utilizing an High Density Polyethylene (HDPE) liner system on top of a geocomposite liner. This system separates rainwater percolating through the trash (leachate) from the environment, and allows the collection, transportation, and treatment of the leachate. The leachate is collected from liner runoff in a collection tank.

Storm water which can be diverted from contact with the trash is directed off the lined landfill area to a storm water management system. At the point of discharge from the system the storm water is monitored under an NPDES Permit. Storm water management on the site is guided by comprehensive Storm water Management Plans submitted to the Bureau of Waste Management as part of the permitting process for the lined landfill pads. Storm water discharge from the vicinity of the landfilled areas is monitored in accordance with an NPDES permit issued by the DEP Bureau of Water Quality. Storm water run-off undergoes no treatment prior to exiting from the site. Storm water and leachate from the older, unlined and uncapped disposal site areas of the facility are collected and treated in the NALTS prior to discharge through an NPDES discharge point.

#### **4.5.2 Program Implementation**

The current leachate treatment system is adequate for all existing GLRA sites and planned disposal sites for the duration of the planning period (to the year 2030). Therefore, no other programs are to be implemented.

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## SECTION 5

### 5.0 Lebanon County Land Resource Consumption Evaluation Program

Efforts have been made to reduce expansion of the GLRA site and the need for consumption of landfill space at the GLRA site. Some of the alternatives considered included landfill recovery and MSW diversion with out-of-county incinerators. This section reviews those alternative programs.

#### 5.1 Lebanon County Landfill Recovery Program

##### 5.1.1 General Description

As shown in Figure 10, the GLRA site consists of numerous unlined, inactive landfill sites in addition to the lined cells (Pad 1 thru 7). These sites produce leachate that requires treatment and periodic monitoring. In addition, the sites occupy an area that will need to be monitored long into the future. These sites can be identified according to the following list (see Figure 14 A).

Site 1: 1959 to 1969 fill period

Site 2: 1970 to 1971 fill period

Site 3: 1972 to 1973 fill period

Site 4: 1974 fill period

Site 5: 1975 fill period

Site 6: 1976 to 1977 fill period

Site 7: 1978 to 1991 fill period

Site recovery evaluations (refer to Attachment 5) were made as part of the preparation of WMP 2000 to determine if recovery of inactive landfill sites would result in an economic benefit for the residents of Lebanon County. This evaluation considered excavating each of the sites to remove the materials, recover items that can be recycled (or effectively volume reduced), and re-dispose all non-recyclable materials in a lined site. The excavation, or mining, of a landfill uses conventional soil excavating and processing techniques. Using excavators, the process produces soil-like material that is screened by a

trommel or finger screen to remove large items such as wood, appliances, tires, metals, plastics and fabric. Recovered materials can be sold (if recyclable), volume reduced, or placed in a lined landfill site for final disposal. The recovered soil can be used for daily cover on a lined site, or potentially, left on the site being recovered for use at a later date.

The first phase of site recovery, site excavation, involves digging up the site and placing the removed materials in a dump truck to haul to a centralized processing station located close to the landfill site being recovered. The second phase involves separating out the soil fraction from the excavated materials with a trommel screen. The soil fraction is placed in a storage location on-site where it can be analyzed and treated (if needed) before being used for other purposes. The MSW removed from the landfill site can be moved through a magnetic separation process to extract the ferrous metals for recycling. A manual sort can then be done on the remaining MSW to remove hazardous materials, combustible (or compostable) materials, and aluminum (for recycling).

A second detailed evaluation of landfill recovery was conducted in 2016 by SCS Engineers as an option to consider for the Next Generation Facility Analysis. Added to the Calculation Log as WMP-010-RPT the conclusion of this report was that landfill recovery was more expensive than a “piggy-back” design by a factor of three. Additionally there was concern that the GLRA site, with neighbors in close proximity to the excavation process, would have difficulty controlling odors for the life of the project.

The initial economic analysis covering the planning period of WMP 2010 similarly concluded that site recovery would be costly and would require that Lebanon County acquire debt or have significant tipping fee increases to finance the recovery operations

### **5.1.2 Program Implementation**

Due to economic and practical considerations, site recovery has been removed from consideration for waste management planning. Although some site recovery will be involved in the piggy-back expansion currently in the permitting process, wholesale site recovery was determined to not be practical.

## **5.2 MSW Processing with Incineration Facilities**

### **5.2.1 Program Description**

An economic evaluation concluded that implementation of an incineration facility in Lebanon County was not feasible. None-the-less, use of incineration is an excellent method to process waste for waste diversion from landfill disposal. Although an in-County incinerator is not economically feasible, the recent Pro Forma Economic Analysis considered the use of available incineration facilities located outside Lebanon County. Neighboring counties are the most attractive locations to transfer the waste for incineration if such an approach is determined to be an economic benefit to the residents of Lebanon County. This would include the incineration facilities in Lancaster County, York County, and Dauphin County. The mechanism for diversion of Lebanon County generated MSW evaluated was by transferring the MSW after receipt at a new GLRA transfer facility. The analysis concluded that this would not be an economical alternative to the current landfill disposal practice.

While this alternative is not currently viable when measured against the current landfill expansion piggy-back, it should be re-evaluated in a future planning period.

### **5.2.2 Program Implementation**

The GLRA staff is responsible for evaluating the use of a neighboring County incinerator to process Lebanon County MSW. The implementation schedule for these evaluations is shown in Figure 17 in Section 8. If a recommendation for using an incinerator is made, GLRA approval is required. An RFP can then be prepared and sent to the incineration facilities considered by the evaluation to be appropriate to process Lebanon County MSW. After approving the incinerator selection process and all required approvals and permits have been obtained, the diversion program can be initiated.

The GLRA staff will also evaluate the use of incineration to process materials that could be separated with a MRF. As shown in the implementation schedule of Figure 17, this effort is initiated following the characterization study for determining MRF feasibility. If use of an incinerator is shown to be feasible, GLRA approval is required to proceed. An

RFP can be prepared and sent to the incineration facilities considered by the evaluation to be appropriate to process Lebanon County MSW. After completing the incinerator selection process, GLRA may secure required approvals and permits prior to initiating the diversion program.

## **5.3 Next Generation Landfill Evaluation**

### **5.3.1 Program Description**

The GLRA in 2006 conducted a “Future Capacity Evaluation” to determine the course of action for the future land disposal of waste from Lebanon County. The conclusion of that study was the it would be most economical to site the Next Generation Facility over the top of the existing permitted site north of Russell Road (Permitted previously under permit No. 108225). Without any waste diversion the projected life of that facility was approximately 25 years.

This evaluation was re-evaluated by SCS Engineers and a report prepared simultaneously with the report on mining landfill cells. This report, added to the calculation log as WMP-011-RPT, concluded that a Piggy-Back Expansion was the most viable alternative for Lebanon County waste; this project moved into the design and permitting stage. The Department of Environmental Protection does not allow the submission of an expansion permit until there is less than 5 years of capacity remaining on the site. Efforts to evaluate waste management options were undertaken as early as 2010, with a landfill expansion permit submitted in the summer of 2018. Currently this expansion permit is in the technical review stage.

## **5.4 Third Generation Planning**

### **5.4.1 Program Description**

Currently the Next Generation Facility discussed in Section 5.3, above, appears to exhaust all environmentally conscious and practical choices for the existing property. To provide for the management of MSW for the future of Lebanon County decisions and direction will have to be considered far enough in advance to allow for a 10 year permitting/design process and a 5 year planning and acquisition process.

## **SECTION 6**

### **6.0 Waste Reduction and Recycling Education Program**

#### **6.1 Recycling Education Program**

##### **6.1.1 General Description**

A resident in Lebanon County currently prepares waste for collection in a manner consistent with established practices. Changes to the existing methods of waste collection and disposal are expected to be confusing for the typical residential waste generator unless an education program is undertaken before any program changes are made. A properly implemented education program should facilitate implementation of those programs where the residents of the County are directly involved.

Eliciting participation in promoting source recycling as recommended by this WMP consists of lowering the barriers to participation for each resident of Lebanon County. One of the barriers to recycling is the perception that it isn't worth the effort. This barrier can be reduced by implementing a public education program that conveys the importance and ease of recycling and by designing the program to make source recycling more convenient.

An education program can be used to enhance social pressure, a force which can be very persuasive to residents within the County. The fact that recycling has strong community support helps to motivate some people to recycle. The appearance of special containers on recycling collection day makes recycling a very visible activity and can create peer pressure for nonparticipants.

Education reduces another barrier to participation -- lack of descriptive information that identifies how to participate. Measures must be taken to educate that segment of the population who have a favorable attitude toward recycling, but aren't sure exactly what to do. Education should also be directed to the segment of the population that does not see the benefits to recycling and therefore will oppose any efforts to support the recycling efforts.

An effort should be made to keep recycling requirements simple and uniform. Distributing

home storage containers (or bags) with an instructional brochure enclosed, and publicizing the recycling program procedures through direct mail and the local media are several ways to overcome the informational barrier to participation. In addition, education is needed to ensure that all participants follow the correct procedures.

Education in elementary schools can be an effective means of addressing some of the above barriers. An education program in the schools can be directed at teaching children the importance of recycling and some basics of how to recycle at home. Additionally, the children can be given instructional materials to take home. Besides the direct value of the education to the children, they can be expected to pass on these lessons to their parents, while exercising a unique form of "social pressure" for recycling at home.

### **6.1.2 Program Implementation**

The GLRA recycling coordinator is responsible for implementing the education programs to promote recycling. Each of the ongoing recycling efforts in Lebanon County should have a continuous program of advertising and education for the public. Prior to implementing any recycling program, an extensive education program should be undertaken that will provide understanding for the general aspects of the program. This should minimize confusion during implementation of the program. Another aspect of the education programs should be to assure availability of information as modifications to the implemented recycling program changes. This will help the residents of the County to understand their duties related to recycling efforts. A successful education program will provide the likelihood of a more successful recycling effort through the implementation of the programs recommended by this WMP.

The responsibility for public education is and will continue to be shared by the County, the GLRA, and the municipalities/townships. The County can develop educational materials that are relevant throughout the County, while municipalities can tailor the materials to their specific programs. Community-specific promotional materials have the advantage of harnessing community pride to generate interest and boost participation. Even for program-specific public education efforts, the County can provide assistance.

## **6.2 Enforcement Education Program**

### **6.2.1 General Description**

Enforcement of the waste management ordinances is the responsibility of the municipalities in the County. As an agent for the County, the GLRA issues permits to allow certain waste management activities to occur within the County and is involved in enforcement following the municipalities lead. The GLRA first mission in this regard is in education of the regulations promulgated under the Waste Management Plan, followed by levying of fines should that prove unsuccessful. The primary responsibility of education and enforcement lies with each municipality. A continuing education program is required to provide the municipal officials with a clear understanding of the permitted waste management activities in the County, and the resources with which to support them. Education program topics should include as a minimum:

- Municipality Responsibilities
- Authority Member Responsibilities
- GLRA Staff Responsibilities
- Permitted Programs
- Methods of Enforcement
- Fines and Penalties
- Municipal Enforcement vs. GLRA Enforcement

A general, publicity oriented, educational program for County residents is one of the current tenants of the GLRA through print, radio, and public involvement. This program should be continued and expanded at every opportunity. The more individuals that are aware of the acceptable waste management practices in the County, the better are the chances of implementing successful waste management programs.

### **6.2.2 Program Implementation**

The municipalities, with the help of the GLRA staff, are responsible for implementing ordinance enforcement education programs. With the increasing presence of internet media for communication, monthly meetings of the GLRA Board Members appointed by their municipalities, and direct email notices to municipalities changes in waste

management programs are routinely communicated. The responsibility for public enforcement education is shared by the County, the GLRA, and the municipalities/townships. The GLRA, acting for the County, develops educational materials that are relevant throughout the County, while municipalities can tailor the materials to their specific programs. These practices will continue and should be expanded at every opportunity.

## **SECTION 7**

### **7.0 Emergency Disposal Plan**

There are three types of emergency situations to be addressed by a GLRA emergency disposal plan: Natural Disaster within Lebanon County, Abnormal Event causing the GLRA disposal site to close down, and Recycling Processing Center closure within the County. A large amount of waste materials would be generated from any of these events. Disposal of this material could exceed the permitted disposal limits for the GLRA landfill site. This section addresses the programs to establish emergency plans for any (or all) of the types of emergency situations identified.

#### **7.1 Natural Disaster Emergency Plan Program**

##### **7.1.1 General Description**

A program to provide for disposal of Lebanon County waste resulting from some form of natural disaster occurring within the County has not been established. The primary waste component that would result would probably be organic in nature (such as trees, brush, and construction type debris). Emergency plans should consider processing this waste to minimize the volume requiring disposal. Items in the waste that cannot be processed, and process residues, would be disposed of at the GLRA landfill site. The majority of this waste could probably be classified as Construction/Demolition waste.

The emergency plan for disposal of this waste should consider the least expensive means for disposal. The method selected should minimize the quantity of waste that is disposed in a double-lined landfill site, since that is the most expensive method of disposal.

##### **7.1.2 Program Implementation**

The GLRA staff is responsible for preparing the program for the Natural Disaster Emergency Plan. The facilities identified in Figure 16 have been contacted to determine the feasibility of using facilities from neighboring counties to process, or dispose of, the waste in the event of a natural disaster in Lebanon County impacting the ability of the

GLRA to deal with waste. Currently there is in place a plan for emergency waste disposal. Missing from the planning process is the progression of effort from the occurrence of an emergency event to the final disposition of waste. The GLRA as a part of waste management planning should develop an emergency action plan based on their staff acting to identify those locations as required by an event during the event. It is suggested that this plan identify the staff and resources of the GLRA available to County EMA in the event of an emergency to facilitate efficient waste coordination, collection, and disposal.

## **7.2 Facility Emergency Plan Program**

### **7.2.1 General Description**

The GLRA, acting as the Waste Management Agency for the County, is responsible for the assurance of adequate space for the County's MSW. This includes responsibility for negotiating backup capacity with other facilities to assure the availability of capacity in the event that the GLRA's Waste Management System is unable to accept waste for any reason. Those agreements will not be executed unless and until that need arises.

Neighboring area landfills and waste processing facilities are identified in Figure 16 for informational purposes. It is the responsibility of the GLRA to negotiate agreements and enact them as required to meet the needs of the County in accordance with their mission.

Similarly, the GLRA is responsible for the disposal of leachate on an emergency basis should the City of Lebanon Authority's POTW not be able to accept leachate temporarily. Currently there is a verbal, reciprocal, agreement in place for leachate to go to Derry Township Municipal Authority and for Derry Township sludge to be accepted by GLRA in an emergency situation.

### **7.2.2 Program Implementation**

The GLRA staff remains responsible as the lead agency reporting to an incident commander (EMA) for implementing emergency disposal and collection plans. To this end the GLRA should amend their current facility emergency plans with a plan for coordination, collection, and disposal of waste from Natural Disasters. This plan, once

approved by the GLRA Board of the Authority, would be provided to the County EMA for approval and use as required. The pre-approval of this plan by the Board of the GLRA would result in time saving should the need arise to commit GLRA resources. The approval of this plan by the County EMA would result in early identification and use of a resource that might not otherwise be thought of.

## **7.3 Recycled Material Emergency Processing Plan**

### **7.3.1 General Description**

Lebanon County has increased the amount of material recycled substantially in the past 10 years. Currently this material is collected, placed in at least one intermediate facility, and then forwarded to an intermediate processor and/or a material recovery facility. Increasingly recycling has become a part of the service offered by the hauling community, or required of them in fulfillment of contracts. The failure of any part of that chain of recycling would have consequences for the residents of the county, the hauling community, and the county as a whole.

Residential recycling drop-off programs as well as the commercial sector recycling programs are geared toward the collection of source separated recyclable materials. These source separated materials are taken to a material recovery facility where the processing of the materials simply entails the baling and consolidating of the source separated recyclables until they are shipped to the desired market.

Currently Lebanon County is serviced by:

- A recycling consolidation facility operated by Reazer's Recycling, Inc located in North Lebanon Township that accepts single stream, commingled, and source separated material for forwarding to a MRF for processing.
- A source separated material recovery facility operated by Consolidated Scrap Resources-Brandywine (CSR-Brandywine) in the City of Lebanon. CSR-Brandywine accepts all metals and source separated fiber and plastics from the commercial and industrial sectors.

- A single stream, commingled, and source separated material recovery facility operated by Coughle's Recycling, Inc. (CRI) in Hamburg, PA. CRI processes single stream, commingled, and source separated recyclable materials.
- A single stream, commingled and source separated MRF operated by Penn Waste, Inc in York, PA. Penn Waste processes single stream and source separated recyclable materials.

All current recycling programs in Lebanon County are dependent upon the ability to have a location available to deliver the recycled materials for processing (a MRF). If a processing center is not available, then the materials may need to be disposed of as MSW in a landfill. It is therefore important for Lebanon County to have a recycled material emergency processing plan in the event something unforeseen impacts the existing processing centers abilities to receive and process the recycled materials collected weekly in Lebanon County.

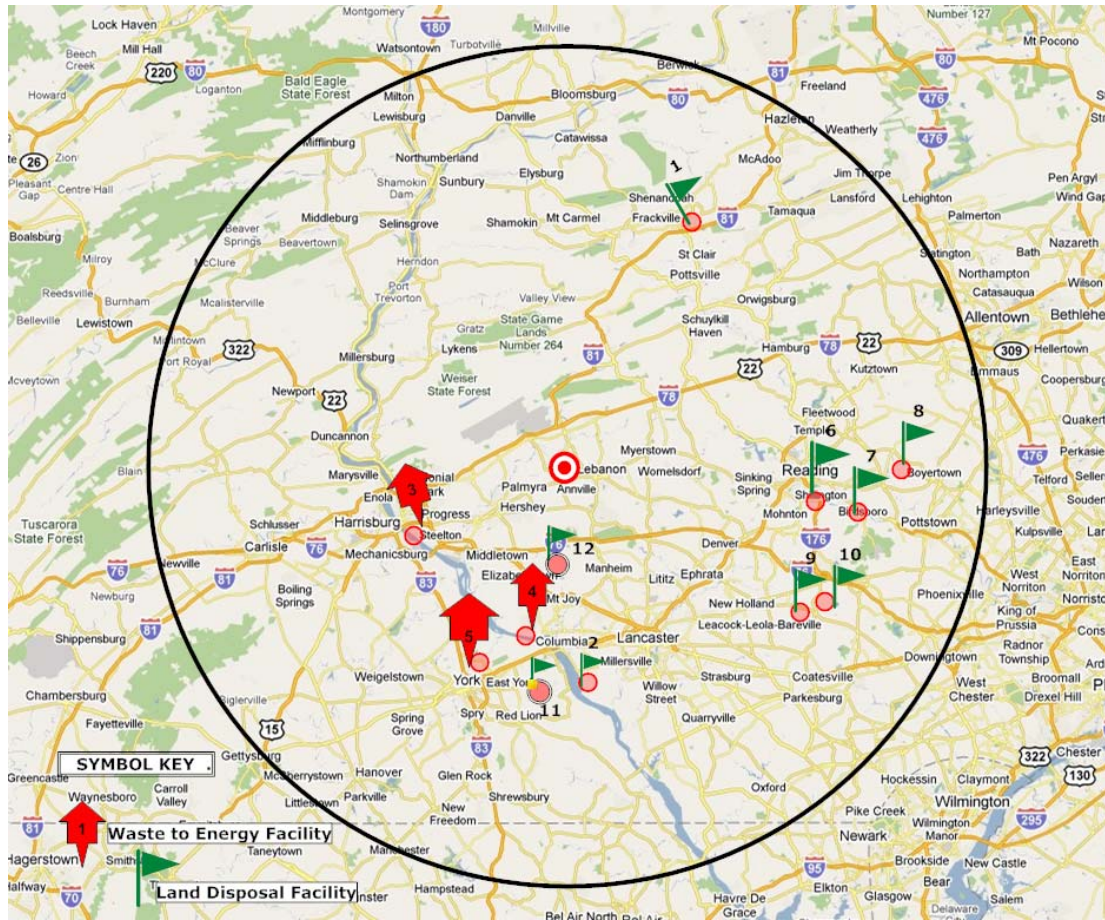
Efforts to involve municipalities in emergency planning over the past ten years have achieved little in the way of results. Emergency planning can take place without that input provided the hauling community supports the concepts. The primary focus of emergency planning should be to provide a temporary forwarding/consolidation facility for recycled materials. The GLRA Convenience Center could be easily converted to a Recycling Consolidation Facility utilizing open top containers. This would displace the convenience center customers and potentially the green waste drop off area. The hauling community could provide a compactor to handle the non-commercial traffic<sup>15</sup> on a temporary basis.

### **7.3.2 Program Implementation**

The GLRA staff is responsible for preparing the recycled material emergency processing plan. The implementation schedule for the preparation of the plan is shown in Figure 17. This plan should address the emergency operation of a facility to bridge the loss of bulk recycling capability within Lebanon County until the private sector can recover and take over.

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<sup>15</sup> Discussion from Advisory Committee meeting of 21 Jul 10



**Figure 16: Facilities within 50 miles**

Map Tag #	Facility Name	Facility Type
	Greater Lebanon Refuse Authority Landfill	MSW
1	Commonwealth Environmental Systems	MSW
2	LCSWMA Frey Farm Landfill	MSW
3	Harrisburg WTE	WTE
4	LCSWMA Resource Recovery Facility	WTE
5	York County Resource Recovery Center	WTE
6	Western Berks Landfill	MSW
7	Pioneer Crossing	MSW
8	Rolling Hills Landfill	MSW
9	Lanchester Landfill	MSW
10	Conestoga Landfill	MSW
11	Modern Landfill	MSW
12	Lancaster Landfill (Advanced Disposal)	C&D

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## **SECTION 8**

### **8.0 WMP Implementation Schedule**

The implementation schedule of the Lebanon County WMP is presented in Figure 17. The format for the schedule is a Gantt chart. Each item is identified on the schedule by section number of the WMP. Some completed activities remain on the schedule for their historical value. Some activities are shown as “ongoing” tasks with no specified completion date during the duration of the period of time represented by the WMP (2020 to 2030).

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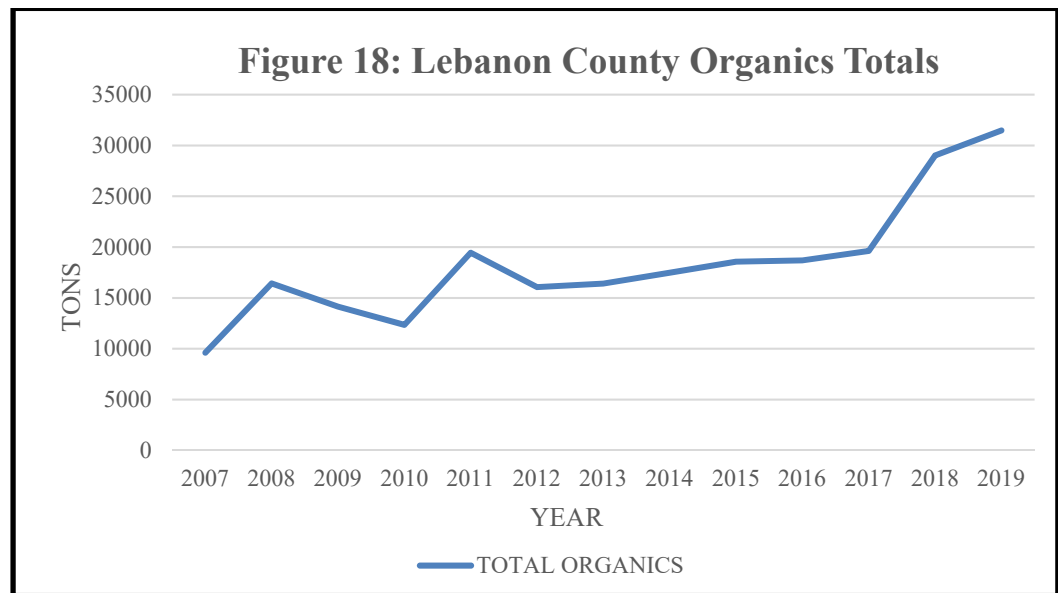


## SECTION 9

### 9.0 Programs Considered and Not Recommended

The following programs were either considered during the preparation of this waste management plan and are not recommended to be implemented as part of this WMP, or were suggested for consideration but were unable to be evaluated. These programs should be re-considered during the preparation of the next WMP that covers the period of time past the year 2030.

- Green Waste Collection Program. The collection of green and yard waste is currently not a part of waste collection and hauling in Lebanon County, although multiple municipalities currently provide for this collection either through collection or drop-off. The trend for collection of this material has been steadily increasing; no program at the County level seems to be necessary.



- Centralized Waste Collection. In certain high density housing situations a centralized waste collection system would have obvious benefits. Waste collection efficiency would be increased, noise and traffic in a residential area would be decreased, and costs could conceivably be lowered. With this approach, County residents would take waste to a convenient collection location -- rather than the

curb in front of their residence. This type of system is suggested to remain a goal for evaluation in the next planning period.

- PAYT Program. “Pay As You Throw” programs (PAYT) are incentive based and establish a differential between the cost of collection of MSW disposed in the landfill versus the cost of collection of recyclable materials. Under a PAYT system, waste collection uses pre-paid containers to allow a County resident to segregate the MSW generated into a recyclable container costing less for collection and a non-recyclable waste container costing more for collection. Thus, the more a County resident recycles, the less the resident’s MSW collection fee. While a PAYT program is a viable alternative to the waste collection services currently employed in the County, social conditions within the County do not currently lend themselves to this program. In fact despite the absence of an incentive program such as PAYT, 86% of the county’s population is served by some type of recycling program with a steady recycling rate despite recent interruptions in recycling markets (2015). Consideration will continue to be given the implementation of some type of incentive program should conditions warrant.
- Contract Hauling. The current means of waste collection in Lebanon County is for each County resident to establish an individual contract with a waste collection provider to collect residential waste. Contract hauling, on the other hand, requires that each municipality establishes a single contract with a hauling company for residential waste collection in the municipality.

Contract hauling historically promotes competitive pricing for waste hauling, aids in facilitating better service, ensures that all residents of the County are provided with MSW collection, increases hauling efficiency by minimizing traffic resulting from multiple haulers, increases safety through that reduced traffic, and allows possible waste disposal cost savings to be passed directly to County residents.

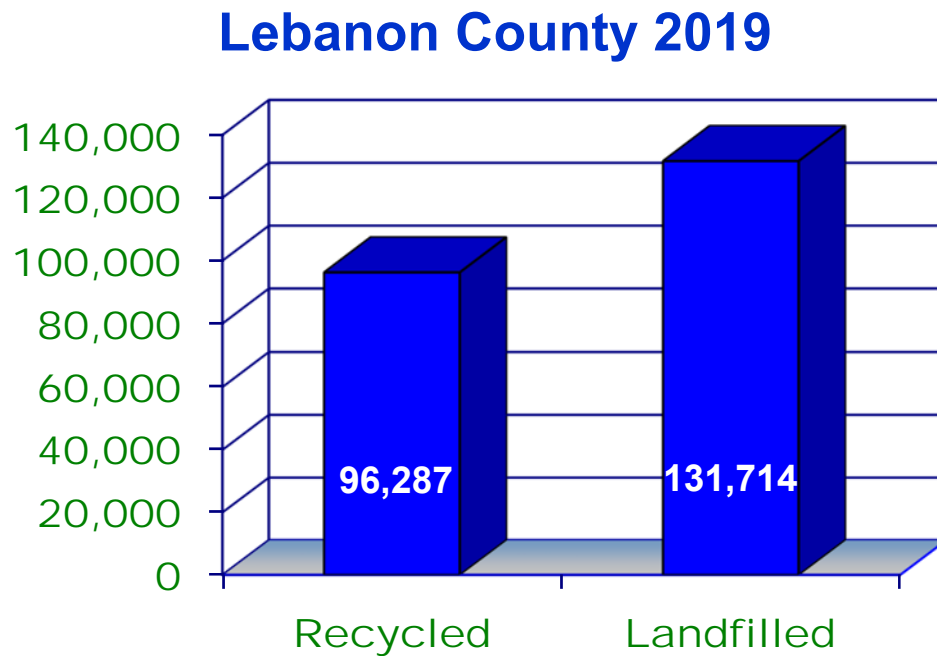
Currently Lebanon County experiences competition from several local haulers servicing the County. The local hauling community system, competing for the same customer base, not only controls costs through competition, but inspires loyalty. The Waste Management Plan affirms that the selected waste collection approach is one that individual municipalities must decide for themselves. Should technical support be necessary the GLRA would be expected to assist in this process.

## SECTION 10

### 10.0 Sustainability of Recycling

As outlined by Act 175 of 2002, Pennsylvania communities are to make their recycling programs more financially self-sufficient. Since 2002, the Department has reported the progress of recycling in Pennsylvania through an analysis of economic and environmental benefits rather than simple tonnage and percentage rate.

Avoided disposal costs are important to the County's disposal facility. The more that is recycled and kept out of the landfill, the more air space is preserved, the longer the life of the landfill. As you can see from the following diagram from 2019 data, there is a substantial savings on avoided costs for the County's Municipal Solid Waste Management Facility through recycling. If the 96,287 tons was not recycled, it would have ended up in the landfill almost doubling the amount of trash that comes in each year. The disposal fees for MSW in Lebanon County for 2019 were 131,714 tons of trash at \$65.25 per ton or \$8,594,338. The avoided costs on the 96,287 tons recycled in Lebanon County in 2019 diverted from the landfill at \$65.25 per ton were \$6,282,726. That is almost equivalent to 3/4 of an entire year of Lebanon County's trash not coming to the landfill.



**Figure 19:** Diverted Tonnage vs. Landfilled Tonnage; GLRA 2019

Since GLRA is Lebanon County's solid waste management facility, recycling is a management tool which will foster longevity of the County's disposal facility. The more that is diverted from the landfill, the longer the life of the facility. Recycling is an important part of the overall integrated solid waste management system in Lebanon County. Lebanon County has a vested interest in supporting recycling programs, education and diversion of materials which in turn extends the life of its landfill.

Beyond the normal Act 101 recyclables, Lebanon County also provides additional sustainable programs to its residents as part of its comprehensive integrated solid waste management system encompassing: household hazardous waste, propane cylinders, electronics, tires, and compost operations. These are additional environmental benefits from other waste diversion and recycling programs that are offered and funded through the GLRA Tipping Fee.

HHW Collection

Since May 2001, GLRA has sponsored a year-round countywide Door-to-Door Household Hazardous Waste (HHW) Collection Program. In May 2002, Lebanon County added the collection of electronics to its HHW Program up until August of 2012 when it opened its own electronics recycling facility.

**SUMMARY OF DOOR-TO-DOOR HHW/ELECTRONICS COLLECTIONS IN LEBANON COUNTY**

2001	332 residents participated	35,311 pounds of HHW/E-Waste	17.66 tons of HHW/E-Waste
2002	199 residents participated	25,307 pounds of HHW/E-Waste	12.70 tons of HHW/E-Waste
2003	292 residents participated	35,306 pounds of HHW/E-Waste	17.65 tons of HHW/E-Waste
2004	488 residents participated	63,154 pounds of HHW/E-Waste	31.58 tons of HHW/E-Waste
2005	696 residents participated	75,749 pounds of HHW/E-Waste	37.88 tons of HHW/E-Waste
2006	755 residents participated	63,799 pounds of HHW/E-Waste	31.90 tons of HHW/E-Waste
2007	855 residents participated	65,992 pounds of HHW/E-Waste	33.00 tons of HHW/E-Waste
2008	963 residents participated	72,940 pounds of HHW/E-Waste	36.47 tons of HHW/E-Waste
2009	946 residents participated	81,962 pounds of HHW/E-Waste	40.98 tons of HHW/E-Waste
2010	1042 residents participated	81,711 pounds of HHW/E-Waste	40.86 tons of HHW/E-Waste
2011	639 residents participated	87,784 pounds of HHW/E-Waste	43.90 tons of HHW/E-Waste
2012	390 residents participated	44,978 pounds of HHW/E-Waste	22.49 tons of HHW/E-Waste
2013	353 residents participated	26,290 pounds of HHW	13.15 tons of HHW
2014	384 residents participated	25,814 pounds of HHW	12.91 tons of HHW
2015	536 residents participated	32,959 pounds of HHW	16.48 tons of HHW
2016	352 residents participated	24,037 pounds of HHW	12.02 tons of HHW
2017	369 residents participated	25,003 pounds of HHW	12.50 tons of HHW
2018	471 residents participated	22,454 pounds of HHW	11.23 tons of HHW
2019	410 residents participated	19,478 pounds of HHW	9.74 tons of HHW

Propane Cylinders

Since 2002, GLRA has provided a free drop-off for empty propane cylinders from 1 lb. up

to 100 lb. in size. From 2002 through 2019, GLRA has collected and recycled 66.27 tons of propane cylinders.

Electronics Collection

When the Covered Device Recycling Act (CDRA), was passed, GLRA opened an electronics recycling facility for Lebanon County Residents in response to the landfill ban of covered electronic devices. The facility officially opened in January 2012. Below are total tons by year that the facility has successfully collected and recycled since its inception.

<b>2012 Grand Total</b>	<b>750,085 Pounds</b>	<b>375.04 Tons</b>
<b>2013 Grand Total</b>	<b>803,821 Pounds</b>	<b>401.91 Tons</b>
<b>2014 Grand Total</b>	<b>926,559 Pounds</b>	<b>463.28 Tons</b>
<b>2015 Grand Total</b>	<b>982,742 Pounds</b>	<b>491.37 Tons</b>
<b>2016 Grand Total</b>	<b>735,215 Pounds</b>	<b>367.61 Tons</b>
<b>2017 Grand Total</b>	<b>622,482 Pounds</b>	<b>311.25 Tons</b>
<b>2018 Grand Total</b>	<b>660,000 Pounds</b>	<b>330.00 Tons</b>
<b>2019 Grand Total</b>	<b>560,000 Pounds</b>	<b>280.00 Tons</b>

Tire Collection

Lebanon County also provides for the recycling of tires at GLRA’s facility year-round as well as Lebanon County’s annual tire collection event held in late April or early May each year at the Lebanon Fairgrounds.

**SUMMARY DATA OF TIRES COLLECTED IN LEBANON COUNTY 2003-2019:**

<b>2003</b>	<b>80.10 tons</b>
<b>2004</b>	<b>84.50 tons</b>
<b>2005</b>	<b>80.20 tons</b>
<b>2006</b>	<b>67.50 tons</b>
<b>2007</b>	<b>77.32 tons</b>
<b>2008</b>	<b>74.16 tons</b>
<b>2009</b>	<b>61.10 tons</b>
<b>2010</b>	<b>92.36 tons</b>
<b>2011</b>	<b>89.45 tons</b>
<b>2012</b>	<b>97.98 tons</b>
<b>2013</b>	<b>86.39 tons</b>
<b>2014</b>	<b>70.07 tons</b>
<b>2015</b>	<b>70.83 tons</b>
<b>2016</b>	<b>114.29 tons</b>
<b>2017</b>	<b>14.48 tons (No County Collection in 2017 at the Lebanon Fairgrounds)</b>
<b>2018</b>	<b>369.44 tons (Spring &amp; Fall Tire Collections at the Lebanon Fairgrounds)</b>
<b>2019</b>	<b>527.51 tons<sup>16</sup></b>

<sup>16</sup> Increase due to reporting of Mahantango & A&R Tire in Lebanon County Recycling Report for 2019

### Compost Operations

GLRA has operated a year-round a permitted compost facility since 1992. The sale of the processed compost products helps to offset the costs of operation, as well as divert these organic materials from the landfill. The revenue contributes to the overall sustainability of Lebanon County's integrated solid waste management system. Below are the sales comparisons for the past 20 years.

#### **PLANT BEDDING/WOOD MULCH SALES COMPARISONS 00-19**

<b>YEAR</b>	<b>CUBIC YARDS</b>	<b>PRICE PER CY</b>	<b>REVENUE</b>
2000	866	\$12.00	\$10,392.00
2001	860	\$12.00	\$10,320.00
2002	1038	\$12.00	\$12,456.00
2003	818	\$12.00	\$9,816.00
2004	423	\$12.00	\$5,076.00
2005	434	\$12.00	\$5,208.00
2006	399	\$12.00	\$4,788.00
2007	406	\$12.00	\$4,872.00
2008	657	\$12.00	\$7,884.00
2009	713	\$12.00	\$8,556.00
2010	660	\$12.00	\$7,920.00
2011	450	\$12.00	\$5,400.00
2012	954	\$12.00	\$11,448.00
2013	955	\$12.00	\$11,460.00
2014	617	\$12.00	\$7,404.00
2015	995	\$12.00	\$11,940.00
2016 (Only Wood Mulch)	610	\$12.00	\$7,320.00
2017 (Only Wood Mulch)	835	\$12.00	\$10,020.00
2018	828	\$12.00	\$9,936.00
2019 (All Sold Out in Oct)	730	\$12.00	\$8,760.00

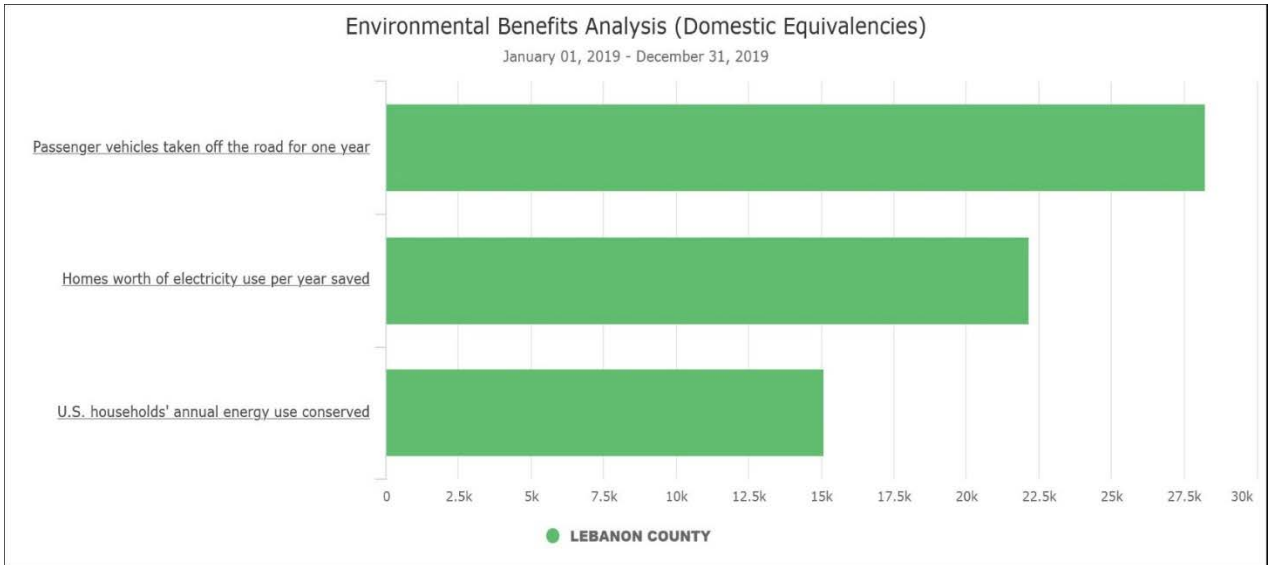
### Sustainability and Environmental Benefits Analyses

Lebanon County has calculated the most recent environmental benefits of the most recent calendar year of recycling using the U.S. EPA Waste Reduction Model (WARM) to help track and voluntarily report greenhouse gas (GHG) emissions reductions, energy savings and economic impacts from several different waste management practices.

The Environmental Benefits Analyses is intended to be used as a tool for educating the public, legislators, and state and municipal employees about the impact and benefits of sustainable waste management strategies. Calculations and factors in the reports generated by the WARM Model are based on the May 2019 version of the U.S. EPA WARM and the December 2019 version of the U.S. EPA GHG Equivalencies Calculator, with the exception of environmental equivalencies which are multiplied by a factor of -1 to show benefits as positive values.

Using Lebanon County's 2019 recycling and waste data, the WARM Model is able to generate the environmental benefits analyses for Domestic Equivalencies, Fuel Equivalencies, and Natural Resources Equivalencies. See the following charts and data tables for each of these equivalencies:

## Domestic Equivalencies



Metric tons of carbon equivalent (MTCE) is a unit of measurement that expresses the heat-trapping effects of various greenhouse gas emissions. Another unit of measure sometimes used is metric tons of carbon dioxide equivalent (MTCO<sub>2</sub>). Source: U.S. EPA (May 2019) User's Guide WARM version 15 Excel – provides an overview for users of the Excel-based tool for WARM version 15. Available at: <https://www.epa.gov/warm/documentation-chapters-greenhouse-gas-emission-energy-and-economic-factors-used-waste-reduction>.

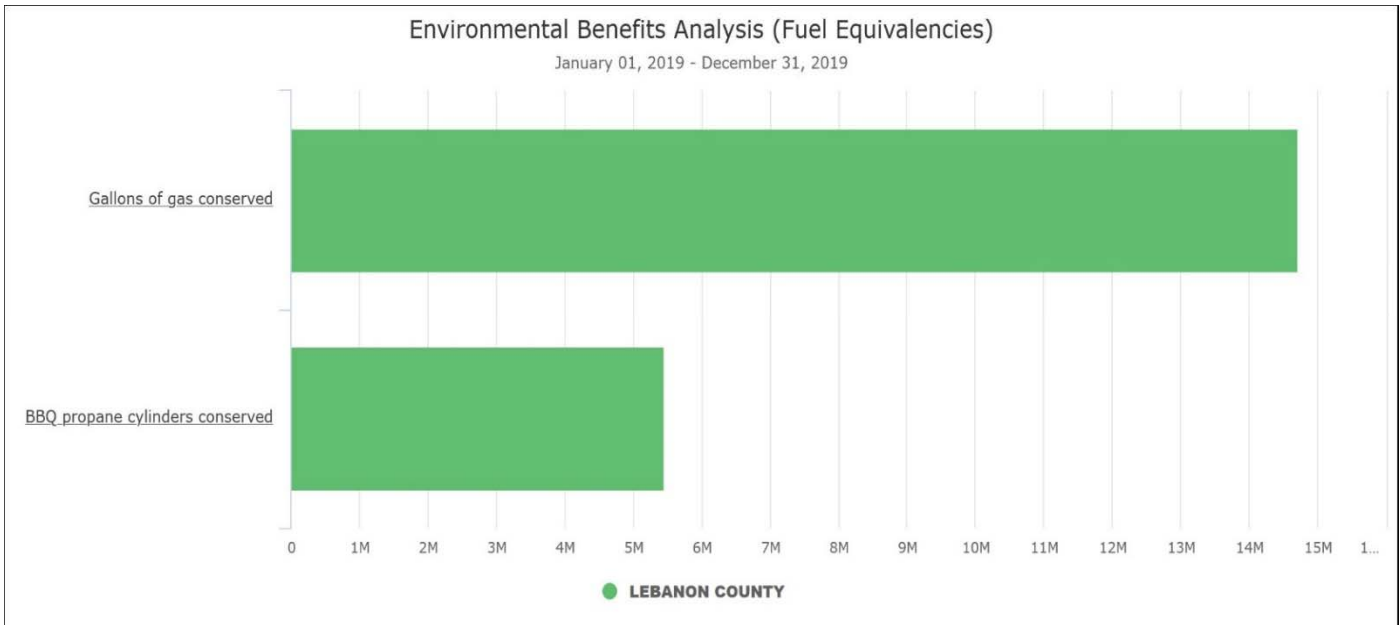
### Environmental Benefits Analysis (Domestic Equivalencies)

January 01, 2019 - December 31, 2019

Materials	MTCO2E	Passenger vehicles taken off the road for one year	Homes worth of electricity use per year saved	U.S. households' annual energy use conserved
<b>LEBANON COUNTY 2019</b>				
[AA1] Aluminum Cans	1811.15	391.18	306.68	208.9
[AA2] Aluminum Scrap	8216.83	1774.69	1391.27	947.73
[C01] Corrugated = corrugated	69863.59	15089.33	11829.26	8058.08
[CR1] E-Waste = includes televisions	455.94	95.45	77.18	52.58
[F02] Steel & Bimetallic (Tin) Cans	210.05	45.37	35.57	24.23
[GL1] Clear Glass = bottles and jars	7.19	1.55	1.22	0.83
[GL2] Mixed Glass = bottles and jars	20.36	4.4	3.45	2.35
[GL3] Green Glass = bottles and jars	0.94	0.19	0.14	0.1
[GL4] Brown Glass = bottles and jars	4.01	0.87	0.68	0.46
[M01] Rubber Tires	689.36	148.24	116.21	79.16
[M03] Clothing/Textiles	1371.46	296.21	232.21	158.18
[MM1] Mixed Metals = includes Drum Steel	1996.97	431.31	336.13	230.33
[NO2] Copper	998.59	215.69	169.08	115.18
[PA1] Magazines & Catalogs	1942.91	419.63	328.97	224.1
[PA2] Newsprint / Newspaper	2503.04	540.61	423.81	289.7
[PA3] Mixed / Other Paper Grades = junk mail, paper board, computer paper, chipboard	1688.31	407.94	319.73	217.8
[PA4] Office Paper = all high grades	6231.15	1345.82	1055.05	718.7
[PA6] Phone Books	138.54	29.92	23.46	15.98
[PL1] #1 Plastic (PET) = Polyethylene Terephthalate	156.03	33.7	26.42	18
[PL2] #2 Plastic (HDPE) = High Density Polyethylene	111.02	23.98	18.8	12.81
[PL3] #3 Plastic (PVC) = Unplasticized & Plasticized Polyvinyl Chloride	0	0	0	0
[PL4] #4 Plastic (LDPE) = Low Density Polyethylene	0	0	0	0
[PL5] #5 Plastic (PP) = Polypropylene	0	0	0	0
[PL6] #6 Plastic (PS) = Polystyrene & Expanded Polystyrene	0	0	0	0
[PL7] Mixed / Other Plastic	595.55	128.63	100.84	68.89
[SS1] SINGLE STREAM = All recyclables, including fiber, collected together	23854.74	5152.21	4039.07	2751.41
[SSF] Source Separated Foods	230.39	49.76	39.01	26.57
[WW1] Wood Waste	819.92	176.87	136.68	94.45
[XX] COMMINGLED = 2 or more recyclables collected together, fiber separate	2925.94	631.95	495.42	337.48
[Y01] Yard & Leaf Waste	3595.34	778.53	608.78	414.69
<b>Total:</b>	<b>130635.1</b>	<b>28214.92</b>	<b>22119.05</b>	<b>15067.49</b>

Calculations and factors in this report are based on the May 2019 version of the U.S. EPA Waste Reduction Model (WARM) and the December 2019 version of the U.S. EPA Greenhouse Gas Equivalencies Calculator, with the exception of environmental equivalencies which are multiplied by a factor of -1 to show benefits as positive values. Users wishing to rely on this report should review the WARM model and consult directly with the report owner. Emergis Knowledge is not responsible for the accuracy, reliability, or currency of the report results.

# Fuel Equivalencies



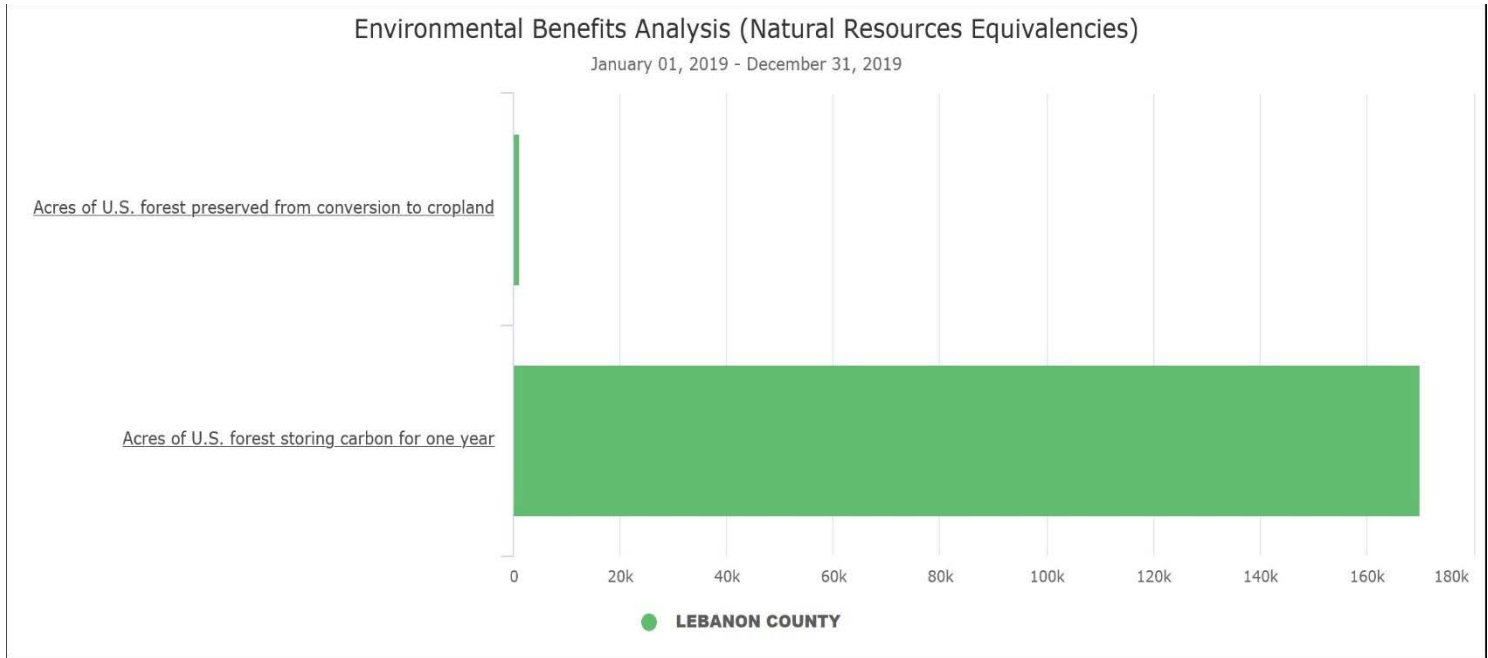
## Environmental Benefits Analysis (Fuel Equivalencies)

January 01, 2019 - December 31, 2019

Materials	MTC02E	Gallons of gas conserved	BBQ propane cylinders conserved
<b>LEBANON COUNTY 2019</b>			
[AA1] Aluminum Cans	1811.15	203797.23	75464.42
[AA2] Aluminum Scrap	8216.83	924590.14	342368.02
[C01] Cardboard = corrugated	69863.59	7861324.38	2910982.91
[CR1] E-Waste = includes televisions	455.84	51293.09	18993.41
[F02] Steel & Bimetallic (Tin) Cans	210.05	23635.42	8752
[GL1] Clear Glass = bottles and jars	7.19	809.29	299.67
[GL2] Mixed Glass = bottles and jars	20.36	2290.86	848.29
[GL3] Green Glass = bottles and jars	0.84	95.06	35.2
[GL4] Brown Glass = bottles and jars	4.01	451.71	167.26
[M01] Rubber Tires	686.36	77231.9	28598.33
[M03] Clothing/Textiles	1371.46	154322.23	57144.23
[MM1] Mixed Metals = includes Drum Steel	1996.97	224706.63	83206.99
[N02] Copper	998.59	112364.7	41607.71
[PA1] Magazines & Catalogs	1942.91	218623.29	80954.38
[PA2] Newsprint / Newspaper	2503.04	281651.55	104293.22
[PA3] Mixed / Other Paper Grades = junk mail, paper board, computer paper, chipboard	1888.31	212479.86	78679.52
[PA4] Office Paper = all high grades	6231.15	701153.11	259631.15
[PA6] Phone Books	138.54	15588.51	5772.29
[PL1] #1 Plastic (PET) = Polyethylene Terephthalate	156.03	17556.61	6501.07
[PL2] #2 Plastic (HDPE) = High Density Polyethylene	111.02	12492.76	4625.96
[PL3] #3 Plastic (PVC) = Unplasticised & Plasticised Polyvinyl Chloride	0	0	0
[PL4] #4 Plastic (LDPE) = Low Density Polyethylene	0	0	0
[PL5] #5 Plastic (PP) = Polypropylene	0	0	0
[PL6] #6 Plastic (PS) = Polystyrene & Expanded Polystyrene	0	0	0
[PL7] Mixed / Other Plastic	595.55	67013.35	24814.49
[SS1] SINGLE STREAM = All recyclables, including fiber, collected together	23854.74	2684228.37	993947.4
[SSF] Source Separated Foods	230.39	25924.79	9599.73
[WWW1] Wood Waste	818.92	92147.81	34121.56
[XXX] COMINGLED = 2 or more recyclables collected together, fiber separate	2925.94	329238.07	121914.11
[Y01] Yard & Leaf Waste	3595.34	404561.56	149805.77
<b>Total:</b>	<b>130635.1</b>	<b>14699572.27</b>	<b>5443129.12</b>

Calculations and factors in this report are based on the May 2019 version of the U.S. EPA Waste Reduction Model (WARM) and the December 2019 version of the U.S. EPA Greenhouse Gas Equivalencies Calculator, with the exception of environmental equivalencies which are multiplied by a factor of -1 to show benefits as positive values. Users wishing to rely on this report should review the WARM model and consult directly with the report owner. Emerge Knowledge is not responsible for the accuracy, reliability, or currency of the report results.

# Natural Resources Equivalencies



## Environmental Benefits Analysis (Natural Resources Equivalencies)

January 01, 2019 - December 31, 2019

Materials	MTC02E	Acres of U.S. forest preserved from conversion to cropland	Acres of U.S. forest storing carbon for one year
<b>Lebanon County 2019</b>			
[AA1] Aluminum Cans	1811.15	12.25	2352.14
[AA2] Aluminum Scrap	8216.83	55.58	10671.21
[C01] Cardboard = corrugated	69863.59	472.59	90731.93
[CR1] E-Waste = includes televisions	455.84	3.08	592
[F02] Steel & Bimetallic (Tin) Cans	210.05	1.42	272.79
[GL1] Clear Glass = bottles and jars	7.19	0.05	9.34
[GL2] Mixed Glass = bottles and jars	20.36	0.14	26.44
[GL3] Green Glass = bottles and jars	0.84	0.01	1.1
[GL4] Brown Glass = bottles and jars	4.01	0.03	5.21
[M01] Rubber Tires	686.36	4.64	891.38
[M03] Clothing/Textiles	1371.46	9.28	1781.12
[MM1] Mixed Metals = includes Drum Steel	1996.97	13.51	2593.46
[N02] Copper	998.59	6.75	1296.86
[PA1] Magazines & Catalogs	1942.91	13.14	2523.25
[PA2] Newsprint / Newspaper	2503.04	16.93	3250.7
[PA3] Mixed / Other Paper Grades = junk mail, paper board, computer paper, chipboard	1888.31	12.77	2452.35
[PA4] Office Paper = all high grades	6231.15	42.15	8092.4
[PA6] Phone Books	138.54	0.94	179.92
[PL1] #1 Plastic (PET) = Polyethylene Terephthalate	156.03	1.06	202.63
[PL2] #2 Plastic (HDPE) = High Density Polyethylene	111.02	0.75	144.19
[PL3] #3 Plastic (PVC) = Unplasticised & Plasticised Polyvinyl Chloride	0	0	0
[PL4] #4 Plastic (LDPE) = Low Density Polyethylene	0	0	0
[PL5] #5 Plastic (PP) = Polypropylene	0	0	0
[PL6] #6 Plastic (PS) = Polystyrene & Expanded Polystyrene	0	0	0
[PL7] Mixed / Other Plastic	595.55	4.03	773.44
[SS1] SINGLE STREAM = All recyclables, including fiber, collected together	23854.74	161.37	30980.18
[SSF] Source Separated Foods	230.39	1.56	299.21
[WW1] Wood Waste	818.92	5.54	1063.53
[XXX] COMMINGLED = 2 or more recyclables collected together, fiber separate	2925.94	19.79	3799.92
[Y01] Yard & Leaf Waste	3595.34	24.32	4669.27
<b>Total:</b>	<b>130635.1</b>	<b>883.68</b>	<b>169655.97</b>

Calculations and factors in this report are based on the May 2019 version of the U.S. EPA Waste Reduction Model (WARM) and the December 2019 version of the U.S. EPA Greenhouse Gas Equivalencies Calculator, with the exception of environmental equivalencies which are multiplied by a factor of -1 to show benefits as positive values. Users wishing to rely on this report should review the WARM model and consult directly with the report owner. Emergent Knowledge is not responsible for the accuracy, reliability, or currency of the report results.

## Sustainability and Waste Reduction

Most people are aware that source reduction, reuse, and recycling decreases reliance on landfills, incinerators and waste-to-energy facilities. These waste reduction strategies are also critical for protecting the global environment. By reducing the need for "virgin"

resources extracted from forests, oil reserves, and mines, we use less energy, reduce greenhouse gases, water pollution, and conserve natural resources.

Reducing energy use decreases greenhouse gas emissions because the majority of consumed energy in the United States relies on fossil fuels (i.e., gasoline, diesel, natural gas and coal). Fossil fuels are the most significant source of carbon and other greenhouse gas emissions. Energy conservation also minimizes the need for energy development and production, which are also responsible for significant environmental impacts.

Source reduction, reuse, and recycling also keep materials out of landfills, incinerators and waste-to-energy facilities, where water and air contamination can result from leachate, air emissions, and ash residue.

By contrast, the steps required to supply recycled materials to industry (i.e., collection, processing and transportation) use less energy than the steps in supplying virgin materials (i.e., extraction, refining, processing, and transportation). The majority of the energy savings associated with the use of recycled content materials in manufacturing is the result of avoided processing, because recycled materials have already been processed at least once.

Although the most visible benefit of waste diversion is the decrease in disposal, the evidence generated by the WARM modeling provides a window into the tremendous overall environmental benefit for use in educating our municipal officials, our legislators, and the public. The GLRA will continue to encourage recycling for the environmental benefit and continue in their role as educators and stewards.

## **SECTION 11**

### **11.0 Open Burning**

This section has been added to the WMP to evaluate forward planning to accommodate national, state, and local efforts to accomplish tasks which may impact the continuation of open burning practices within the County. The consequence of a complete ban on burning without prior planning would lead to increased quantities of waste requiring disposal that might otherwise be recycled. Waste Management Planning over the next ten years should include efforts to identify material, markets, and systems to accommodate that material and to educate the public on the issues and solutions associated with open burning.

Currently each municipality is tasked with the responsibility to regulate burning of material. Many municipal regulations have been adjusted in recent years to accommodate and encourage recycling efforts, control “nuisance smoke” in residential areas, and to safeguard the health of residents. The State DEP has advanced the concept of banning items from landfills (on hold currently) that traditionally have been consumed by open burning. Nationally several states including rural states have banned open burning. There are multiple reasons why this step has been taken: a history of wildfires as a result of poor supervision of burning, overall air quality and increasing health issues related to air quality, and contamination of the food and water supply from dioxin equivalents.

Currently the County is fragmented by inconsistent open burning regulations between municipalities and by different standards between the residential and agricultural communities. While it is understandable that the quality of agriculture is important to the fabric of Lebanon County, health issues from air quality and from contamination of the food supply impact not only the residents of the county, but the perception of the health of the agricultural products from the county. It was with this in mind that the GLRA instituted a pilot study of the quantity and composition of waste normally burned on farms within Lebanon County. This study concluded with a memorandum report in November 2011.

Open burning regulations vary between municipalities, with four municipalities having no residential regulations, seven municipalities having no agricultural regulations or weak agricultural regulations, and two municipalities allowing no burning<sup>17</sup>. Since 1995 the number of municipalities with no ordinance addressing burning at all has dropped from eight to four. While this direction is positive, there are continued concerns with

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<sup>17</sup> Provisions for special exceptions are available

uncontrolled combustion of waste within the county.

The most critical issues are health related, as evidenced by Lebanon County's place in a designated EPA Air Basin noted for non-attainment of air quality. Documentation exists indicating that that breathing issues among children are increasing, and that low temperature combustion as found in open burning is a major source of that condition. Even more alarming is the evidence that Lebanon County is one of 107 counties that account for 25% of the dioxin contamination of the country's meat and poultry supply<sup>18</sup>, again with open burning as a major source of that contamination.

It is the recommendation of this Summary that Tasks related to open burning continue to be on the timeline for the next ten year period as follows:

### **11.1 Education**

Short term and long term consequences of Open Burning impact the recycling stream, the waste stream, and the overall health of the County. As a part of Recycling Education and proper waste management this topic lends itself well to existing material. In fact the GLRA Recycling Coordinator has already included several articles discussing the consequences of open burning utilizing various public service publications of the GLRA. This effort should be continued and expanded where possible.

### **11.2 Agricultural Characterization**

The GLRA, as part of Waste Management Planning, instituted a pilot program to identify materials being burned on local farms within the County and what the impact of landfill disposal would be in terms of landfill space and cost. This program produced a memorandum summarizing the results in November of 2011. The study noted an estimate of costs to small, medium, and large farms of between \$1,000 per year to \$4,500 per year. The data collected noted a significant quantity of items inappropriate for open burning by regulation.

### **11.3 Agricultural Alternatives**

Agricultural waste and open burning is not a new topic and has been studied extensively in

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<sup>18</sup> Out of 3077 counties nationwide

other states. A Memorandum in May of 2017 titled “Open Burning in Lebanon County” noted the specific “Agricultural Exemption” carved out by specific legislative action in Pennsylvania;

*Section 4.1. Agricultural Regulations Prohibited. —The ENVIRONMENTAL QUALITY BOARD shall not have the power nor the authority to adopt rules and regulations relating to air contaminants and air pollution arising from the production of agricultural commodities in their unmanufactured state but shall not include the use of materials produced or manufactured off the premises of the farm operation.*

In reviewing the data collected in 2011 a significant portion of the waste was comprised of materials that did not grow on the agricultural property, and were thus prohibited from open burning. Waste Management for the next ten year period should work to identify cost effective alternatives to burning farm waste as well as alternatives to land disposal.

**FIGURE 20 NOTES AND DEFINITIONS:**

**Standard Exceptions**

Cooking Fire  
Campfire  
Written Bonfire Permit

**Domestic Refuse**

Paper  
Cardboard  
Wood  
Similar Cellulose Materials

**Agricultural, Limited**

ITEMS GROWN ON THE PROPERTY  
Typical Clearing & Grubbing

**Act 101 Recyclables**

Glass, clear or colored	Plastics
Steel bimetallic cans	Aluminum
High Grade Office Paper	Newsprint
Corrugated Paper	

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MUNICIPALITY		No Burning	No Burning, Standard Exceptions	Domestic Refuse plus Standard Exceptions	Act 101 Recycled Materials not allowed	NOT ADDRESSED BY ORDINANCE	Container/Fireplace			Notes	Agricultural, limited	Property Line Distance (ft)	Dwelling Distance (ft)	Building Distance (ft)	Visible Emissions Limit	Notes
							Property Line Distance (ft)	Dwelling Distance (ft)	Building Distance (ft)							
<b>PENNSYLVANIA</b>				<b>State Minimum</b>						Agricultural: Un-manufactured products only						
Annville Township							50/100		50/100	No Permit Required/Permit Required	Permit Required					
Bethel Township							10	50	25	Container Restrictions		150	300	150	x	Tires noted as allowed (Not legal)
Cleona Borough												150	150			
<b>Cold Spring Township</b>										<b>No Ordinance</b>						
Cornwall Borough							15	15	15	Yard Waste allowed						
<b>E. Hanover Township</b>										<b>No Ordinance</b>						
Heidelberg Township											Not discussed					
Jackson Township	Mandated Community							25	25			25	25			
Jonestown Borough				Paper, Cardboard, untreated wood only			20		25/100	Permit may be requested for exceptions						
Lebanon City	Mandated Community															
Millcreek Township										Applies only to specific Zones, container, other zones as regulated by DEP						
Mount Gretna Borough																
Myerstown Borough			Very few exceptions							Permit required						
<b>N. Annville Township</b>										<b>No Ordinance</b>						
N. Cornwall Township	Mandated Community										Permit Required					>25 acres, Permit Required
N. Lebanon Township	Mandated Community		Zone R1, R2				10	30	30	Non-Combustible Container Required						
N. Londonderry Township	Mandated Community			Zone R1												
Palmyra Borough	Mandated Community						35	35	35			100	100	100		>10 Acres
Richland Borough																
<b>S. Annville Township</b>										<b>No Ordinance</b>						
S. Lebanon Township	Mandated Community						15	15	15			20	100	100		Permit
S. Londonderry Township							30/15	30/15	30/15	Open fire/Container						
Swatara Township			< 1 Acre	>1 Acre			20	30	30	Minimum 1 Acre Lot		20	30	30		Not specifically mentioned
Union Township								50	50							
<b>W. Cornwall Township</b>																
W. Lebanon Township																

**Figure 20: Status of Open Burning Regulations in Lebanon County: September 2017**

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**SECTION 12**  
**12.0 Township Motion/Resolution Records**  
**(Example)**

Annville Township

Date: \_\_\_\_\_

At the regularly scheduled meeting of Annville Township held on the date above a motion was passed to approve the LEBANON COUNTY MUNICIPAL WASTE MANAGEMENT PLAN, NON-SUBSTANTIAL REVISION, 2020 to 2020.

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Signature

Secretary  
Annville Township

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# WMP 2000 DOCUMENT INDEX

## PART II: SUPPORTING ATTACHMENTS

### Response Matrix for DEP Guidelines

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Attachment 2:	Task 2:	Description of Facilities
Attachment 3:	Task 3:	Estimated Future Capacity
Attachment 4:	Task 4:	Description of Recycling Program
Attachment 5:	Task 5:	Financial Factors: Selection and Justification of Municipal Waste Management
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Attachment 7:	Task 7:	Implementing Entity Identification
Attachment 8:	Task 8:	Public Function
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# **ATTACHMENT 1: ORDINANCE 61**

ORDINANCE NO. 61  
LEBANON COUNTY MUNICIPAL WASTE MANAGEMENT ORDINANCE

WHEREAS, the Municipal Waste Planning, Recycling and Waste Reduction Act of July 28, 1988, P.L. 528, No. 101 was approved on July 26 1988; and

WHEREAS, Act 101 gave the County of Lebanon, Commonwealth of Pennsylvania (the "County") primary responsibility for planning for municipal waste processing and disposal within its boundaries and the primary authority to control the flow of municipal waste generated within its boundaries; and

WHEREAS, Act 101 authorizes a County with an approved municipal waste management plan that was submitted under the Act to require that all municipal wastes generated within its boundaries shall be processed or disposed at a designated processing or disposal facility;

WHEREAS, Act 101 authorizes a County, in carrying out its duties under Section 303, to adopt ordinances, resolutions, regulations and standards for the processing and disposal of municipal waste; and

WHEREAS, Section 303 (d) of Act 101 authorizes Counties to enter into a written agreement with another person, including a municipal authority, pursuant to which that person undertakes to fulfill some or all of the County's responsibility under Act 101 for municipal waste planning and implementation of the approved County plan; and

WHEREAS, In the case United Haulers Assn. v. Oneida-Herkimer Solid Waste Management Authority, 127 S.Ct. 1786 (2007) the United States Supreme Court affirmed the right of public solid waste disposal facilities to institute and manage flow control of municipal solid waste; and

WHEREAS, the purpose and requirements of Act 101 will be best carried forth by (a) adopting this Ordinance and (b) entering into an Agreement with Authority ("Municipal Waste Management Agreement") which will empower and require Authority (i) to implement and carry forth the 2020 Plan and (ii) to fulfill certain duties of the County under Act 101.

NOW, THEREFORE, it is hereby enacted and ordained by the County of Lebanon, Commonwealth of Pennsylvania, as follows:

Section 1. Definitions

The following capitalized terms, when used in this Ordinance, shall have the meaning set forth below.

"Act 97". The Solid Waste Management Act, Act of July 7, 1980, P.S. 380, No. 97 as now or hereafter amended.

"Act 101". The Municipal Waste Planning, Recycling and Waste Reduction Act, Act of July 28, 1988, P.L. 528, No. 101, as now or hereafter amended.

"Authority". Greater Lebanon Refuse Authority, a municipality authority organized and existing under the Municipality Authorities Act, as amended.

"Authority Rules and Regulations". The rules and regulations adopted and revised from time to time by the Authority.

"Capacity Assurance". The promise by the Authority for the capacity agreed to between the County and the Authority for the period between the date of the promise and the end of the Planning Period.

"County". The County of Lebanon, Commonwealth of Pennsylvania

"Municipal Waste Management Agreement". The agreement between the County and the Authority defining and delegating certain of the County's municipal waste management powers and responsibilities to the Authority, as authorized by Act 101.

"Designated Facility". Any Municipal Waste storage, collection, transfer, processing or disposal facility or site constructed, owned or operated by or on behalf of the Authority.

"Municipal Waste". Municipal Waste as defined in Section 103 of Act 101.

"Person". Any individual, firm, partnership, corporation, association, institution, cooperative enterprise, municipality, municipal authority, governmental entity or agency, or any other legal entity whatsoever which is recognized by law as the subject or rights and duties. In connection with any provisions of the Ordinance prescribing a fine, penalty, imprisonment, denial or grant of any license, or any combination of the forgoing, the term "Person" shall include the officers and directors of any corporation or other legal entity having officers and directors.

"Plan". The Lebanon County Municipal Waste Management Plan of 2020, as now or hereafter amended.

"Planning Period". The ten year period for which the plan is written.

"Recycling". The collection, separation, recovery and sale or reuse of metals, glass, paper, leaf waste, plastics and other materials which would otherwise be disposed or processed as municipal waste or the mechanized separation and treatment of municipal waste (other than through combustion) and creation and recovery of reusable materials other than a fuel for the creation of energy.

"Regulated Municipal Waste". Any solid waste generated or collected within the County which is garbage, refuse, industrial lunchroom or office waste and other material, including solid, liquid, semisolid or contained gaseous material, resulting from operation of residential, municipal, commercial or institutional establishments and from community activities and any sludge not meeting the definition of residual or hazardous waste under Act 97 from a municipal, commercial or institutional water supply treatment plant, wastewater treatment plant or air pollution control facility. The term does not include Source Separated Recyclable Materials.

"Source Separated Recyclable Materials". Materials generated or collected within the County that are separated from Municipal Waste at the point of origin for the purpose of recycling. The term is limited to clear glass, colored glass, aluminum, steel and bimetallic cans, high-grade office paper, newsprint, corrugated paper, plastics and other marketable grades of paper.

"System". The overall municipal waste management system, and every aspect thereof, owned or operated

or utilized by or on behalf of the County or the Authority in implementation of the Plan, including without limitation, equipment, vehicles, offices, staff, transfer stations, landfills and the like.

Section 2. Operation by Licensed Collectors; Compliance; Fees.

(a) Licensing. Any Person engaged in the business of collecting, hauling or disposing of Municipal Waste generated in this County shall, prior to engaging in such business or activity, obtain a license for the specific purpose of conducting such business or activities, which license shall be issued and administered by the Authority. No person who is required to be licensed by the Authority to collect Municipal Waste within the System for processing or disposal may collect, transport or dispose of Municipal Waste generated within the County, without a license. Any vehicle licensed by the State of Pennsylvania under "Act 90" shall receive an Authority license upon proper documentation of that license, at no charge.

(b) Compliance with Rules, Regulation and Ordinances. In carrying out activities relating to Municipal Waste collection, transportation or disposal with this County, all Municipal Waste collectors and transporters shall comply with all regulations, rules, and standards pertaining to the collection; transportation, and disposal of Municipal Waste as promulgated by the State, all ordinances, resolutions, rules, regulations and standards pertaining to the collection, transportation and disposal of Municipal Waste as may hereinafter be enacted by this County and all resolutions, rules, regulation and standards adopted by the Authority pursuant to this Ordinance and the Municipal Waste Management Agreement

(c) Fees. The Authority shall have the power to establish and collect a license fee to be paid by any Person applying for such license in accordance with the requirement of this Section 2.

Section 3. Waste Flow Control

(a) Delivery to Designated Facility. Except as provided in (b) and (c) below, all Regulated Municipal Waste shall be delivered to a Designated Facility.

(b) Delivery to Other Sites. Delivery of Regulated Municipal Waste to other sites pursuant to the Plan may occur only as permitted by rule, regulation, ordinance, or order duly issued by the Authority.

(c) Recycling. Nothing herein shall be deemed to prohibit Source Separation or Recycling or to affect any sites at which Source Separation or Recycling may take place.

Section 4. Disposal Capacity

Provision shall be made in the Municipal Waste Management Agreement between the County and the Authority for the Authority to provide Capacity Assurance for the Planning Period.

Section 5. System Administration

(a) Pursuant to the Municipal Waste Management Agreement between the County and the Authority, the Authority shall have the power and its duty shall be to implement the Plan, or as hereafter amended, and this Ordinance and, in order to carry forth such power and duty, to adopt and enforce Authority Rules and Regulations.

(b) Authority Rules and Regulations shall, at a minimum:

(i) identify those categories of materials from Regulated Municipal Waste which shall be subject to site designation;

(ii) identify the Designated Facility for each selected category of Regulated Municipal Waste;

(iii) specify such pre-disposal processing or separation or other requirements as are deemed necessary or convenient for the efficient, effective, reliable and safe operation of a Designated Facility and the System;

(iv) govern the issuance, administration and revocation of licenses, including without limitation, application procedures, fees, standards and conditions for licenses, record and reporting requirements, equipment and vehicle requirements, and any other matters deemed necessary or convenient by the Authority for the efficient, effective, reliable and safe operation of a Designated Facility and the System, including without limitation:

(A) withholding, suspending or revoking licenses; and

(B) establishing fees for use of the System; and

(C) establishing fees and penalties for violations of Authority Rules and Regulations (which fees and penalties may be established as determined by the Authority in an amount designed to protect the System and to compensate the Authority for the costs, damages and lost revenues related to any such violation).

(c) Authority Rules and Regulations shall ensure the efficient, effective, reliable and safe operation of the System. Authority Rules and Regulations shall be consistent with, and shall carry forth, the Plan. All fees shall be reasonable and uniform, provided, however, that different fees may be charged for:

(i) different categories of Regulated Municipal Waste as established by the Authority.

(ii) different points of entry into the System.

Section 6. Facilities.

No Person shall use or permit to be used any property owned or occupied by that Person within the County as a Municipal Waste processing or disposal facility for Municipal Waste generated within the

County unless such use is authorized pursuant to the provisions of Act 101, and is consistent with, and is reflected in, the Plan.

Section 7. Unlawful Activities; Public Nuisance.

It shall be unlawful for any Person to violate, cause or assist in the violation of any provision of this Ordinance, or violate, cause or assist in the violation of any rule, regulation, resolution or standard promulgated by the Authority pursuant to this Ordinance and the Municipal Waste Management Agreement, or any rules, regulation, resolution or standard promulgated by the County consistent with this Ordinance and the provisions of Act 101 and the Plan. All unlawful conduct shall also constitute a public nuisance.

Section 8. Enforcement and Penalties.

(a) The Authority shall have the power, and its duty shall be, to bring any and all enforcement proceedings authorized by Act 101 or this Ordinance.

(b) Any Person who engages in unlawful conduct as defined in this Ordinance shall, upon conviction thereof, in a summary proceeding before a district justice, be sentenced to pay a fine of Two Thousand Dollars (\$2,000) per occurrence, to be paid to the use of the Authority, with costs of prosecution.

(c) Any Person who engages in unlawful conduct as defined in this Ordinance, shall, in accordance with applicable provisions of the laws of the Commonwealth, be subject to the provisions of Act 101, Chapter 17, as such provisions with respect to enforcement and remedies may apply to any such unlawful conduct.

Section 9. Revocation of License.

Upon finding that any Person has engaged in unlawful conduct as defined in Section 6 of this Ordinance, the Authority may, (a) revoke any license issued by the Authority to the Person and (b) deny any subsequent application by that Person or any Person who or which was, or who or which is, affiliated with, related to, or controlled by, any Person who was, at the time of commitment of such unlawful conduct, or any time thereafter, an officer, director, shareholder, partner, or joint venture of, under contract with, employed by, or related or affiliated in any manner with such Person, for issuance of this license required by Section 2 hereof.

Section 10. Injunctions; Concurrent Remedies.

(a) Restraining Violation. In addition to any other remedy provided in this Ordinance, the County or the Authority may institute a suit in equity where unlawful conduct or a public nuisance exists as defined in this Ordinance for an injunction to restrain a violation of this ordinance or of any rules, regulations, resolutions, or standards promulgated or issued by the County pursuant to this Ordinance and the Municipal Waste Management Agreement.

(b) Concurrent Remedies. The penalties and remedies prescribed by this Ordinance shall be deemed concurrent. The existence or exercise of any remedy shall not prevent the County or the Authority from exercising any other remedy provided by this Ordinance or otherwise provided at law or equity.

Section 11. Construction.

The terms and provisions of this Ordinance are to be liberally construed, so as best to achieve and to effectuate the goals and purpose hereof. This Ordinance shall be construed in pari materia with Act 97 and Act 101.

Section 12. Municipal Ordinances.

Pursuant to Section 304(d) of Act 101, the provisions of this Ordinance shall supersede the provisions of any municipal ordinance to the extent that the provisions of any such municipal ordinance are inconsistent with, or conflict with, the provisions of this Ordinance, except as otherwise provided by Section 502(0) of Act 101.

Section 13. Severability.

If any sentence, clause, section or part of this Ordinance is for any reason found to be unconstitutional, illegal or invalid, such unconstitutionality, illegality or invalidity shall not affect or impair any remaining provisions, sentences, clauses or parts of this Ordinance. It is hereby declared as the intent of the Lebanon County Board of Commissioners that this Ordinance would have been adopted had such unconstitutional, illegal or invalid sentence, clause, section or part thereof had not been included herein.

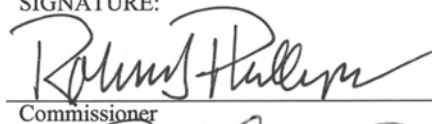
Enacted this 3rd day of October, 2019 and included in the minutes of a regular meeting of the BOARD OF COUNTY COMMISSIONERS.

ATTEST:



County Administrator

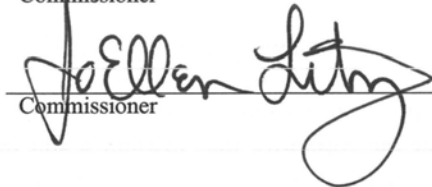
SIGNATURE:



Commissioner



Commissioner



Commissioner

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**ATTACHMENT 2:  
MUNICIPAL SOLID WASTE MANAGEMENT  
AGREEMENT BETWEEN LEBANON COUNTY AND  
GREATER LEBANON REFUSE AUTHORITY**

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**Municipal Waste Management Agreement between  
Lebanon County  
and  
Greater Lebanon Refuse Authority**

This agreement, made this 3rd day of October, 2019, between the County of Lebanon, a fifth class county of the Commonwealth of Pennsylvania and the Greater Lebanon Refuse Authority, a municipality authority in Lebanon County duly constituted under the Municipality Authorities Act, 53 Pa.C.S.A. §5601-5622 (hereinafter "Authority"), witnesseth;

WHEREAS, The Municipal Waste Planning, Recycling and Waste Reduction Act, Act of July 28, 1988, P.L. 528, No. 101 ("Act 101") was approved on July 29, 1988; and

WHEREAS, Act 101 gave the County (a) primary responsibility for planning for municipal waste management within its boundaries and (b) the primary power to plan for the disposal of municipal waste generated within its boundaries; and

WHEREAS, Section 303(d) of Act 101 authorizes counties to enter into an agreement with another person, including a municipal authority, pursuant to which that person undertakes to fulfill some or all of the county's responsibilities under Act 101 for municipal waste planning and implementation of the approved county plan; and

WHEREAS, Authority was established by all of the municipalities located within the County of Lebanon for the purposes of acquiring, holding, constructing, improving, maintaining and operating, owning and leasing, either in the capacity of lessor or lessee, facilities and equipment for the collection, removal or disposal of ashes, garbage, rubbish and other refuse materials by incineration, landfill or other method;

WHEREAS, the 2020 Plan will provide that the Authority will assume and fulfill all of the County's rights, duties and obligations under Act 101 for Municipal Waste planning and for implementation of the 2020 Plan; and

WHEREAS, the 2020 Plan will be implemented and carried forth by (a) adopting the Lebanon County Municipal Waste Management Ordinance ("County Municipal Waste Management Ordinance") and (b) entering into this Municipal Waste Management Agreement ("Agreement") with the Authority; and

WHEREAS, the county intends to adopt a Minor Plan Modification and approve (a) the 2020 Plan and (b) the County Municipal Waste Management Ordinance;

NOW, THEREFORE, the County and the Authority, intending this to be a sealed instrument which is legally binding upon themselves and their respective successors and assigns, agree as follows:

Section 1. Definitions

(a) "Act 97" - The Solid Waste Management Act, Act of July 7, 1980, P.S. 380, No. 97, as now or hereafter amended.

(b) "Act 101" - The Municipal Waste Planning, Recycling and Waste Reduction Act, Act of July 28, 1988, P.L. 528, No. 101, as now or hereafter amended.

(c) "Authority" - Greater Lebanon Refuse Authority, a municipal authority in the County organized and existing under the Municipality Authorities Act of 1945, as amended.

(d) "Authority Rules and Regulations" - The rules and regulations adopted and revised from time to time by the Authority.

(e) "County" - The County of Lebanon, Pennsylvania.

(f) "Lebanon County Municipal Waste Management Ordinance" - The ordinance to be enacted by the County substantially in the form attached as Exhibit 1 to this Agreement.

(g) "Municipality" - A municipality within the County.

(h) "Plan" - The Lebanon County Municipal Waste Management Plan of 2000, as now revised, and herein referred to as the 2010 Plan, or hereafter amended.

(i) "Recycling" - The collection, separation, recovery and sale or reuse of metals, glass, paper, leaf waste, plastics and other materials which would otherwise be disposed or processed as municipal waste or the mechanized separation and treatment of municipal waste (other than through combustion) and creation and recovery of reusable materials other than a fuel for the creation of energy.

(j) "Regulated Municipal Waste" - Any solid waste generated or collected within the County which is garbage, refuse, industrial lunchroom or office waste and other material, including solid, liquid, semisolid or contained gaseous material, resulting from operation of residential, municipal, commercial or institutional establishments and from community activities and any sludge not meeting the definition of residual or hazardous waste under Act 97 from a municipal, commercial or institutional water supply treatment plant, wastewater treatment plant or air pollution control facility. The term does not include Source Separated Recyclable Materials.

(k) "Source Separated Recyclable Materials" - Materials that are separated from Municipal Waste at the point of origin for the purpose of recycling.

(l) "System" - The overall solid waste management system, and every aspect thereof, owned or operated by or on behalf of the Authority in implementation of the 2010 Plan, including without limitation, equipment, transfer stations, resource recovery facilities, landfills and the like.

Section 2. County Agreement Regarding the Plan.

(a) The County will not amend, revise, repeal, change or otherwise alter the 2020 Plan during the term of this Agreement without prior consultation with the Authority.

Section 3. County Agreement to Enact Ordinance.

(a) The County will adopt and enact a new Lebanon County Municipal Waste Management Ordinance which will reenact the provisions of the 2000 Plan and newly enact the minor plan revisions of the 2020 Plan"; and

(b) The County shall not amend, revise, repeal, change or otherwise alter the Lebanon County Municipal Waste Management Ordinance during the term of this Agreement without consultation with the Authority.

Section 4. Delegation of Powers and Duties and Assumption of Responsibility by the Authority.

(a) The County hereby delegates to the Authority all rights, duties and obligations of the County under Act 101 for Municipal Waste planning and for implementation of the 2020 Plan. Notwithstanding such delegations, the County may enforce the Lebanon County Municipal Waste Management Ordinance. If the Authority shall be unable or unwilling to carry forth its obligations under the Ordinance, the County shall assume the responsibility for said administration and enforcement.

(b) The Authority hereby assumes and agrees to fulfill and carry forth all of the County's rights and obligations under Act 101 for Municipal Waste planning and for implementation of the Plan; and in connection with the Authority's obligations under this Agreement:

(i) The Authority shall take all such actions and shall exercise all such powers as are necessary, or appropriate to design, develop, finance, construct, own, operate and manage a comprehensive solid waste management system as necessary, contemplated and required under the Lebanon County Municipal Waste Management Ordinance and the Plan.

(ii) The Authority shall adopt, administer and enforce on behalf of the County and on its own behalf the Lebanon County Municipal Waste Management Ordinance and the Authority Rules and Regulations.

(iii) The Authority Rules and Regulations shall be consistent with, and shall carry forth, the Lebanon County Municipal Waste Management Ordinance and the Plan.

(iv) The Authority shall establish and charge such fees and impose such penalties as shall be reasonable and adequate to ensure the safe, reliable, efficient, and effective design, development, financing, construction, operation and management of the System.

(v) The Authority shall have the power, and its duty shall be, to bring any and all enforcement proceeding authorized by Act 101 or this Ordinance. This power shall be in addition to any and all powers granted to the Authority by applicable state law and Authority rules and regulations.

Section 5. Additional Covenants.

(a) The County and the Authority shall in good faith during the term of this Agreement take all such actions as may be necessary or appropriate to carry out the purposes of this Agreement.

(b) If and to the extent that the Authority is determined by a court of competent jurisdiction not to be authorized to carry out any function or duty required by this Agreement, the responsibility to perform such function or duty shall devolve upon the County.

Section 6. Representation and Warranties.

The County and the Authority represent and warrant that:

(a) Each has all requisite power and authority to enter into this Agreement, to engage in the transactions contemplated by this Agreement and to perform their respective obligations under this Agreement in accordance with the terms of this Agreement.

(b) The execution, delivery and performance of this Agreement have been duly authorized by all necessary action, and the undersigned officers of the County and the Authority have been empowered by all necessary action to execute and deliver this Agreement.

(c) This Agreement constitutes a valid obligation, legally binding upon the County and the Authority and enforceable against them in accordance with the terms of this Agreement and in the manner in which valid contractual obligations are enforced generally.

Section 7. Term.

This Agreement shall be for a term beginning on the date of approval of the Minor Plan Revision to the 2000 plan and ending on December 31, 2030. Section

8. Assignability.

The Authority or the County may assign or pledge this Agreement in relation to the financing of the System but no other assignment of this Agreement shall be authorized or permitted without the prior written consent of the non-assigning party.

Section 9. Waiver Not to Be Construed.

No waiver by either party of any term or condition of this Agreement shall be deemed

or construed to constitute a waiver of any other term or condition of the Agreement. Failure of either party to insist in any one or more instances upon strict performance of any of the terms, covenants, agreements or conditions of this Agreement shall not be considered a waiver or relinquishment of any such term, covenant, agreement or condition, but the same shall continue in full force and effect.

Section 10. Amendments.

This Agreement shall not be modified or amended except by written instrument duly executed on behalf of the County and the Authority.

Section 11. Severability.

If any provision of this Agreement shall for any reason be held to be invalid or unenforceable, the invalidity or unenforceability shall not affect the remainder of this Agreement; and this Agreement shall be construed and enforced consistent with its express purposes as if such invalid or unenforceable provision had not been contained in this Agreement.

Section 12. Duplicate Originals.

This Agreement may be executed in counterparts, each of which shall be regarded for all purposes as a duplicate original.

Section 13. Indemnification.

The County shall protect, indemnify and hold the Authority harmless from and against all liabilities, actions, damages, claim, demands, judgments, losses, expenses, suits, or attorneys fees and shall defend the Authority in any suit, including appeals, arising out of events or activities occurring in connection with this Agreement and which are caused by acts or omissions of the County. The Authority shall protect, indemnify and hold the county harmless from and against liabilities, actions, damages, claims, demands, judgments, losses, expenses, suits or attorney fees and shall defend the County in any suit arising out of events or activities occurring in connection with this Agreement and which are caused by acts or omission of the Authority. These indemnification provisions are for the protection of the parties only and shall not establish any rights or liabilities in any other persons.

Section 14. Notices.

All notices required under this Agreement shall be in writing and sent by certified or registered mail return receipt requested addressed as follows:

If to the County, to:

County of Lebanon  
Room 207, Municipal Building

400 S. 8th St. Lebanon PA 17042

If to the Authority, to:

Greater Lebanon Refuse Authority  
1610 Russell Rd.  
Lebanon PA 17046

IN WITNESS WHEREOF, the County and the Authority hereto have duly executed and delivered this Agreement.

ATTEST:

  
\_\_\_\_\_  
County Administrator

For the County:

  
\_\_\_\_\_  
Commissioner

  
\_\_\_\_\_  
Commissioner

  
\_\_\_\_\_  
Commissioner

ATTEST:

  
\_\_\_\_\_  
County Administrator  
Executive Director

For the Authority:

  
\_\_\_\_\_  
Chairwoman

  
\_\_\_\_\_  
Secretary