Maryland
Department of
the Environment

Wes Moore, Governor
Aruna Miller, Lt. Governor

Serena McIlwain, Secretary
Suzanne E. Dorsey, Deputy Secretary
Adam Ortiz, Deputy Secretary

March 28, 2025

Mr. Joseph J. Siemek, P.E., Director
Harford County Department of Public Works
212 S. Bond Street
Bel Air, Maryland 21014

Dear Mr. Siemek:

The Maryland Department of the Environment ("MDE") has completed its review of Harford County's (the "County") Bill No. 24-040, for adopting the County's 2025-2034 Solid Waste Management Plan (the "Plan"). The County Council adopted the Plan on January 22, 2025, and the Department of Public Works forwarded the Plan to MDE for its review and approval. MDE received the adopted resolution and the Plan on January 24, 2025.

After review, MDE determined that the adopted resolution satisfies the requirements of Sections 9-503, 9- 505, and 9-1703 of the Environment Article, Annotated Code of Maryland, and Code of Maryland Regulations 26.03.03. In accordance with Section 9-507(a) of the Environment Article, Annotated Code of Maryland, the Plan is approved.

Section 9-506(b)(2) of the Environment Article, Annotated Code of Maryland, requires the County to submit a progress report to MDE at least every two years including any revisions or amendments to the County Plan that have been adopted. Since the County's Plan was adopted on January 22, 2025, the County must submit to MDE its progress report on or before **January 22, 2027**.

Thank you for your continuing interest and cooperation in providing sound and long-term solid waste management planning for the County. If you have questions or need additional clarification these matters, please contact me at 410-537-3381 or by email at rick.kessler@maryland.gov or have a member of your staff contact Mr. Bradley Baker, Manager, Resource Management Program, at 410- 537- 3314 or by email at Bradley.baker1@maryland.gov.

Sincerely,

Rick Kessler
Director
Land and Materials Administration

cc: Patrick S. Vincenti, President, Harford County Council
Steven A Walsh, Deputy Director, Harford County Department of Public Works
Jeffrey T. Schoenberger, Administrator, Harford County Department of Public Works
Bradley Baker

ROBERT G. CASSILLY
Harford County Executive

ROBERT S. McCORD
Director of Administration

JOSEPH J. SIEMEK, P.E.
Director of Public Works

DEPARTMENT OF PUBLIC WORKS

January 24, 2025

Tariq Masood, MS(Engr), PMP
Project Manager
Waste Diversion Division, Resource Management Program
Land and Materials Administration
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore I Maryland 21230

Re: Harford County Solid Waste Management Plan

Dear Mr. Masood:

Please find attached the Solid Waste Management Plan, 2015-2034 for Harford County, Maryland. A draft of the plan was submitted to you for review and comment in May 2024. The draft plan was subsequently revised to address your comments. The plan was introduced to the Harford County Council under Bill 24-040 on December 10, 2024. A public hearing was held on January 14, 2025. The County Council voted to adopt the plan, as submitted, on January 21, 2025.

The following is submitted for your review and approval:

1. Copy of Harford County Bill 24-040, signed by the County Council and County Executive
2. Solid Waste Management Plan, dated November 25, 2024

Sincerely,

Jeffrey T. Schoenberger, P.E.
Administrator

cc: Joseph J. Siemek, P.E., Director | Steven A. Walsh, P.E., Deputy Director | file

HARFORD COUNTY BILL NO. 24-040

Brief Title (Solid Waste Management Plan)
is herewith submitted to the County Council of Harford County for enrollment as being the text as finally passed.

CERTIFIED TRUE AND CORRECT

Council Administrator

Date 1/21/25

ENROLLED

Council President

Date 1/21/25

BY THE COUNCIL

Read the third time.

Passed: LSD 25-003

Failed of Passage: _____

By Order

Council Administrator

Sealed with the County Seal and presented to the County Executive for approval this 22nd Day of January 2025, at 3:00 p.m.

Council Administrator

BY THE EXECUTIVE

COUNTY EXECUTIVE

APPROVED: Date 1/22/25

BY THE COUNCIL

This Bill No. 24-040 having been approved by the Executive and returned to the Council, becomes law on January 22, 2025.

EFFECTIVE: March 24, 2025

COUNTY COUNCIL

OF

HARFORD COUNTY, MARYLAND

BILL NO. 24-040

Introduced by Council President Vincenti at the request of the County Executive

Legislative Day No. 24-032 Date December 10, 2024

AN ACT to repeal and reenact, with amendments, Section 109-8, Solid waste management plan, of Article I, General Provisions, of Chapter 109, Environmental Control, of the Harford County Code, as amended; to provide for the adoption of a revised September 2024 Solid Waste Management Plan governing all aspects of solid waste for Harford County; to provide that the County may change the Plan by resolution adopted by the County Council if the Maryland Department of the Environment disapproves of or requires changes to any part of the Plan; and generally relating to the Solid Waste Management Plan.

By the Council, December 10, 2024

Introduced, read first time, ordered posted and public hearing scheduled

on: January 14, 2025

at: 7:15 PM

By Order: Mylia A. Dixon, Council Administrator

PUBLIC HEARING

Having been posted and notice of time and place of hearing and title of Bill having been published according to the Charter, a public hearing was held on January 14, 2025, and concluded on January 14, 2025.

Mylia A. Dixon, Council Administrator

EXPLANATION: CAPITALS INDICATE MATTER ADDED TO EXISTING LAW. [Brackets] indicate matter deleted from existing law. Underlining indicates language added to Bill by amendment. Language lined through indicates matter stricken out of Bill by amendment.

Section 1. Be It Enacted By The County Council of Harford County, Maryland that Section 109-8, Solid waste management plan, of Article I, General Provisions, of Chapter 109, Environmental Control, of the Harford County Code, as amended, be, and it is hereby, repealed and reenacted, with amendments, all to read as follows:

Chapter 109. Environmental Control

Article I. General Provisions

§ 109-8, Solid waste management plan.

The Solid Waste Management Plan, dated [January 2015] SEPTEMBER 2024, as adopted by Bill No. [15-004,] 24-040, as subsequently amended from time to time, is incorporated by reference as part of this chapter as though fully stated herein, and is hereby declared to be the County's Official Solid Waste Management Plan.

Section 2. And Be It Further Enacted that if the Maryland Department of the Environment disapproves of or requires changes to any part of the Solid Waste Management Plan approved by this Act, the County may make any necessary changes to the Plan by resolution adopted by the County Council.

Section 3. And Be It Further Enacted that this Act shall take effect 60 calendar days from the date it becomes law.

EFFECTIVE: March 24, 2025

The Council Administrator does hereby certify that Seven (7) copies of this Bill are immediately available for distribution to the public and the press.

Mylia A. Dixon

Council Administrator

Harford County, Maryland

Solid Waste Management Plan
2025 - 2034

November
25
2024

Prepared for:

Harford County
Department of Public Works
Bureau of Solid Waste Services
212 S Bond Street
Bel Air, MD 21014

Prepared by:

SCS ENGINEERS
1881 Campus Commons Drive
Suite 450
Reston, VA 20191
p. 703.471.6150

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EXECUTIVE SUMMARY

The Harford County Solid Waste Management Plan (2025-2034) is a planning document for the County to guide solid waste management activities for the next 10 years. Amendments may be necessary to meet changing state solid waste management requirements or to meet the needs of the Harford County community. As required by the Code of Maryland Regulation (COMAR) 26.03.03, this plan will be reviewed and updated at least once every three (3) years, if needed. The County plans on operating all solid waste services in compliance with federal, state, and local laws and regulations.

This plan provides an overview of the County's current and projected population, employment, and land use practices. Population and employment growth over the 10-year planning period needs to be considered when addressing future solid waste management activities. Zoning and land use policies can impact solid waste planning by determining the types of properties that are allowed to host solid waste management facilities. This plan uses HarfordNEXT, an important planning document established in 2016, as a resource.

This plan contains relevant information about the County's existing solid waste management system in both the private and public sector. The plan addresses the life cycle of waste including waste generation, collection methods, and the import and export of waste. The County also addresses changes to their solid waste program since the development of the 2014 plan. Key changes to the County's program in the last ten years include the closure of the Harford waste-to-energy facility, the approval of Bill No. 20-017 that provides for recycling at office buildings, and the agreement with Baltimore County to direct all waste in Harford County to the Eastern Sanitary Landfill. The analysis of the existing system is the basis for the County's needs assessment and subsequent action plan.

This plan evaluates the existing solid waste management system to determine if it can adequately provide for the solid waste management needs of the County over the ten-year planning period. The plan addresses alternatives for the collection of waste, recycling, and yard trim. Physical siting constraints for potential new solid waste acceptance facilities are reviewed. These constraints include topography, geologic conditions, existing water structures, land use, and planned long-term growth.

The plan of action for the County's integrated solid waste management system for the ten-year planning period is presented in this document. This action plan aligns with the County's needs while maintaining technical and economic feasibility. Flexibility is incorporated into the plan to account for changes in material markets, technology, and regional cooperation opportunities. The plan evaluates waste reduction, recycling, and other diversion programs to meet the state's minimum recycling goal of 35 percent. Public education and outreach are emphasized as an important step in meeting the state's recycling goal. A summary of the action items over the ten-year planning period is summarized below. The anticipated timeframe for which each activity may be completed is also listed according to the following schedule: short-term – 2025-2028; medium-term – 2029-2031; and long-term – 2032-2034.

Action Step	Timeframe
Action Step 1 – Promote and Encourage Source Reduction and Reuse	
Conduct a source reduction education/outreach campaign	Short
Subsidize compost bin sales to encourage backyard composting	Short
Maintain directory of County-based organizations/entities that accept materials for reuse	Short
Expand bulky recycling participation	Medium
Action Step 2 – Increase Recycling Participation	
Education to encourage increasing participation in existing County recycling programs	Short
Action Step 3 – Evaluate Opportunities for the Diversion of Food Waste	
Inventory existing programs in the County diverting food waste; identify large quantity generators in the County of food waste	Short
Evaluate program collection options for diversion of food waste	Short
Explore food waste collection in public schools	Short
Facilitate food donation programs	Short
Conduct organics composting education and outreach campaign	Short
Study feasibility of implementing a facility to compost/process food waste	Medium
If determined feasible, issue RFP for partner to recover food waste	Long
Action Step 4 – Monitor Recycling Technologies and Packaging Options	
Expand mix of recyclable materials accepted at the HWDC/HODO if processing and marketing capabilities exist	Short/Medium/Long
Action Step 5 – Support/Enforce State Recycling Requirements	
Enforce Apartment and Condo recycling law	Short
Support recycling in office buildings in response to state requirements	Short
Action Step 6 – Plan for Future Disposal Capacity	
Identify and evaluate options for waste disposal capacity beyond 2036	Short/Medium/Long
Action Step 7 – Evaluate Need for Future Yard Trim and Recycling Capacity	
Identify site and develop a citizen's yard trim convenience center to benefit residents in the southern portion of the County	Short/Medium
Develop new HODO area to reduce congestion and improve safety and efficiency at the HWDC	Medium/Long
Implement most feasible option for safe and effective residential recycling services	Medium/Long
Action Step 8 – Regional Coordination	
Coordinate potential regional disposal and/or diversion opportunities to serve County residents through the Authority and /or directly with other jurisdictions	Short/Medium/Long

1. RULES GOVERNING SOLID WASTE MANAGEMENT

1.1 INTRODUCTION

Harford County, Maryland (the "County"), is a body politic and corporate and a political subdivision of the State of Maryland. The Harford County Comprehensive Solid Waste Management Plan for the planning years 2025 – 2034 (the "Plan"), sets forth the policies, goals, and plans for the comprehensive management of solid waste in the County. The Plan was prepared by the Department of Public Works, Bureau of Solid Waste Services in accordance with Title 9, Subtitle 5 of the Environment Article, Annotated Code of Maryland. State law requires that the Plan be adopted by the Harford County Council through the public hearing process and submitted to the Maryland Department of the Environment (MDE) for approval.

1.2 AUTHORITY AND PURPOSE

State law requires the County to develop a "Solid Waste Management Plan" for the entire County, including municipal corporations. The Plan must cover a ten-year planning period and describe the solid waste disposal systems, solid waste acceptance facilities, and the systematic collection and disposal of solid waste by public or private entities. In accordance with §9-503 of the Environment Article of the Annotated Code, the County must review its Plan every three years and based on this review, amend the Plan as necessary if the County considers a revision to be necessary, or if MDE requires a revision. If an amendment is necessary, the County must conduct a public hearing prior to adopting, amending, or revising the Plan. The ten-year plan must be organized and contain the information required in accordance with COMAR 26.03.03, "Development of County Comprehensive Solid Waste Management Plans."

The purpose of this Plan is to describe the existing and planned County programs and establish the framework that will provide for the comprehensive management of solid waste generated by the County's residential, commercial, industrial, institutional, and public sectors during the ten-year planning period from 2025 through 2034. This Plan reflects the established integrated solid waste management system adopted and implemented by the County. It sets the manner in which solid waste generated within the County will be managed during the next ten years. **Appendix A** includes a list of acronyms used in this Plan.

1.3 GOALS, OBJECTIVES, AND POLICIES FOR SOLID WASTE MANAGEMENT

The Harford County Department of Public Works, Bureau of Solid Waste Services is responsible for the management of solid waste and recycling in the County. The County is committed to provide a safe, environmentally sustainable, economically sound, and integrated solid waste program that will:

- Explore opportunities to increase the efficiency and cost-effectiveness of the County's solid waste program.
- Promote waste prevention and undertake source reduction measures to the extent feasible.
- Implement waste recycling measures that are practical with available and locally proven technologies and markets. Technologies, markets, and cost-effectiveness should be reviewed periodically to evaluate changes to the recycling program with the diversion of additional waste materials as new cost-effective opportunities arise, particularly if they result in lower costs than traditional disposal methods.
- Increase the amount of waste that is diverted from disposal at the Harford Waste Disposal Center (HWDC) when practical and economically feasible.
- Improve accessibility, function, and efficiency of HWDC homeowner drop-off by improving infrastructure and expanding diversion and reuse opportunities.
- Explore opportunities to increase organics recycling and promote backyard and community composting.
- Prioritize public education and outreach activities to maximize the amount of solid waste that is recycled. Educate the public on the sound and sustainable solid waste management practices implemented by the County.
- Assess opportunities for encouraging proper recycling to reduce contaminants in the recyclable material stream.
- Plan for disposal and recycling capacity beyond the ten-year planning period.

1.4 SOLID WASTE MANAGEMENT HIERARCHY

The County subscribes to the U. S. Environmental Protection Agency hierarchy for solid waste management. The hierarchy prioritizes strategies for managing waste from most to least environmentally preferred. The hierarchy emphasizes waste reduction, reuse, recycling, and composting as more desirable than incineration and landfilling of waste as key to sustainable materials management. These strategies encourage circularity in the economy by keeping materials, products, and services in circulation for as long as possible to reduce greenhouse gas emissions that contribute to climate change. **Figure 1** is a summary of the key elements of the U.S. Environmental Protection Agency (EPA) Waste Management Hierarchy starting with the most preferred to the least preferred.

Figure 1. U.S. EPA Non-Hazardous Materials and Waste Management Hierarchy

Source: U.S. Environmental Protection Agency, accessed from https://www.epa.gov/smm/sustainable-materials-management-non-hazardous-materials-and-waste-management-hierarchy

- **Source Reduction and Reuse:** Source reduction refers to the prevention of waste at the source. It is the most preferred strategy because when less waste is generated, less waste needs to be managed. Reuse extends the life of materials that would otherwise be considered waste by keeping them in circulation for further use in either its existing or modified form.

- **Recycling and Composting:** Recycling is the separation, collection, and processing of unwanted waste items into new products. Composting is the controlled management of organic materials (i.e. yard trim, food waste, etc.) to produce compost, soil amendments, mulch, and other enriching products.

- **Energy Recovery:** Energy recovery is converting non-recyclable waste into usable electricity, heat, and fuels. This energy is considered renewable and offsets the need for energy from fossil fuels, thereby generating fewer climate pollutants and greenhouse gas emissions. Examples of energy recovery include landfill gas collection, waste-to-energy, and anaerobic digestion.

- **Treatment and Disposal:** The least preferred waste management option is treatment and disposal. Treatment of waste can reduce the volume or toxicity of waste prior to disposal. Landfilling of waste is the most common type of disposal in the United States. Currently, the waste that is not reduced, reused, or recycled in the County is landfilled.

The Maryland Recycling Act (MRA) requires Harford County to recycle 35 percent of the waste generated in the County. In addition, Maryland established a voluntary waste diversion goal of 60 percent, and a voluntary recycling rate of 55 percent by 2020. The waste diversion goal is comprised of the recycling rate plus source reduction credits (maximum 5 percent). Counties earn source reduction credits through activities designed to reduce the amount of waste generated.

1.5 CONFORMANCE WITH LAND USE PLANS

The solid waste management goals and objectives established by the County are consistent with the land uses stated in HarfordNEXT, the County's comprehensive master plan. The current solid waste facilities are in conformance with all applicable land uses. Future solid waste management facilities will be developed in accordance with the County's zoning and land use regulations and will be consistent with the goals and objectives of the State, regional, and local planning and zoning agencies. **Appendix B** contains the confirmation from the County's Director of Planning and Zoning that the amendments to the solid waste plan are consistent with the County's Master Plan.

1.6 COUNTY GOVERNMENT STRUCTURE

Harford County is a charter county of Maryland with an elected County Executive and an elected seven-member County Council. The following describes each entity's role in setting County policy:

- **County Council** – This body enacts all County laws and the annual operating and capital budgets. The County Council also carries out all legislative functions and serves as the County Board of Health.

- **County Executive** – The County Executive establishes all executive branch policies, prepares and submits to the County Council an annual budget, appoints department heads, boards, and commissions, serves as the County's Chief Executive, and manages the operation of the executive branch of County Government.

Several County agencies have important solid waste management functions, including the Department of Public Works, Bureau of Solid Waste Services and the Department of Planning and Zoning. Specific functions of each include the following:

- **Department of Public Works, Bureau of Solid Waste Services** – This agency is responsible for implementing the County's solid waste management and recycling programs. Their responsibilities include the following:

    - Design, construction, inspection, operation, maintenance, and monitoring of all County-owned solid waste management facilities and equipment;

    - Coordination, development, and implementation of the Harford County Solid Waste Management Plan;

    - Confirm County compliance with State of Maryland waste reduction and recycling goals;

  - Implement and coordinate the work specified within the Harford County Debris Management Plan in response to a declared natural or manmade disaster; and
  - Enforce applicable sections of §109 Environmental Control of the Harford County Code in addition to Section §157-28 Solid Waste Fees.

- **Department of Planning and Zoning** – This department is responsible for the following:
  - Coordinate with the Department of Public Works on the development and implementation of the Solid Waste Management Plan, and land use criteria related to solid waste facilities;
  - Determine the compatibility of land uses for proposed solid waste facilities;
  - Provide information concerning the Chesapeake Bay Critical Area requirements, the Harford County Natural Resource District, and drinking water/groundwater resources and how they all govern the siting of solid waste management facilities.

Appendix C provides the detailed organizational chart for the Harford County Government and specifically the organizational chart for the Department of Public Works, Bureau of Solid Waste Services.

1.7 FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS

Laws and regulations impacting solid waste management exist at the Federal, State, and County levels. Overall requirements and minimum standards for protecting human health and the environment are established at the Federal level. States adopt requirements that meet or exceed those mandated by Federal regulations. State regulations specify minimum design criteria and the permitting, construction, operation, maintenance, and monitoring requirements for many types of solid waste management facilities. Requirements established by the County must be compatible with Federal and State laws and regulations but may require more stringent compliance than what Federal and State laws and regulations provide. Specific issues relating to land use, zoning, procurement, and financing solid waste management facilities are regulated specifically by the County.

This section provides information on the applicable Federal, State, and County laws and regulations impacting solid waste management and identifies the responsible agencies.

1.7.1 Federal

1.7.1.1 Statutes Affecting Solid Waste Management

There are a number of federal laws that impact the management of solid waste. Key federal requirements are summarized in this section.

- **Resource Conservation and Recovery Act (RCRA) (42 U.S.C. 6901 et seq.)**: In 1965, the Solid Waste Disposal Act was passed to improve solid waste disposal methods.

It was amended in 1970 by the Resource Recovery Act and again in 1976 by RCRA. Most recently, it was amended in 1984 by the Hazardous and Solid Waste Amendments (HSWA). The Act is divided into nine subtitles, A through I. Subtitles C, D, and F provide specific guidance and requirements impacting municipal and hazardous waste.

- Subtitle C established a system for the management of hazardous waste. This includes identifying and listing hazardous waste and promulgating standards for generators, transporters, and managers of hazardous waste. This subtitle also sets requirements for owners and operators of hazardous waste treatment, storage, and disposal facilities.

- Subtitle D regulates municipal solid waste through technical standards for solid waste management facilities and through requirements under which states may develop and implement solid waste management programs. This subtitle sets the minimum criteria for Municipal Solid Waste (MSW) landfills, including location restrictions, operating requirements, design elements, and closure and post-closure care requirements, among other things.

- Subtitle F of RCRA requires the federal government to participate actively in procurement programs to foster the use of recycled materials. Government purchases that are subject to the Subtitle F requirements are designated in material-specific "procurement guidelines" that are promulgated by the EPA. Section F also requires federal facilities to comply with all federal, state, interstate, and local requirements concerning the disposal and management of solid waste.

- **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)** (42 U.S.C. 103 et seq.): This Act (also known as Superfund) establishes a program for the identification and remediation of waste disposal sites containing hazardous substances, establishes standards for clean-up efforts and disposal of wastes, and provides a mechanism for assigning liability for environmental contamination.

- **Clean Water Act (CWA)** (33 U.S.C. 1251 et seq.): Section 402 of this Act establishes the National Pollutant Discharge Elimination System (NPDES) program which regulates effluent limitations for the discharge of wastewater and runoff from solid waste management facilities into bodies of water. The construction of facilities that may impact rivers, lakes, marshes, swamps, or wetlands is regulated by Section 404 which is administered by the U.S. Army Corps of Engineers. Section 405 addresses the disposal of wastewater treatment sludges. The CWA also declares there should be no discharges of oil or hazardous substances into or upon the navigable waters of the United States.

- **Clean Air Act** (42 U.S.C. 7401 et seq.): Regulates emissions from landfill gas management systems and resource recovery facilities. Landfill operators must comply with the requirements of the State implementation plan established under Section 110.

- **Safe Drinking Water Act** (42 U.S.C. 300f et seq.): Establishes maximum contaminant levels for parameters included in groundwater monitoring programs. These requirements are often referenced as standards for groundwater monitoring programs for landfill facilities.

- **Federal Emergency Management Act** (6 U.S.C 313 et seq)**:** Prohibits siting of solid waste facilities within the 100-year floodplain.

- **Endangered Species Act (**16 U.S.C. 35 et seq)**:** Prohibits construction or operation of solid waste facilities that will result in the "taking" of an endangered or threatened species, or in the destruction of their critical habitat.

- **Save Our Seas 2.0 Act** (Public Law 116-224): This Act became law in 2020 and establishes requirements and incentives to reduce, prevent, and recycle marine debris in the United States. The Act includes a title that prioritizes combating marine debris through the creation of the Marine Debris Foundation to support the marine debris activities of the National Oceanic and Atmospheric Administration. Additionally, the Act aims to improve domestic infrastructure to prevent marine debris and requires the Department of State to implement U.S. policy to cooperate with foreign governments and the private sector to combat marine debris.

- **Infrastructure Investment and Jobs Act** (Public Law 117-58): This Act, also known as the Bipartisan Infrastructure Law, provides $275 million in grants for infrastructure to support the U.S. recycling industry. For each fiscal year from 2022 to 2026, $55 million in grant money will remain available until expended. The Solid Waste Infrastructure for Recycling grant program is authorized by the Save Our Seas 2.0 Act. This program provides grants to facilitate recycling strategies to improve and modernize material management infrastructure, support improvements to local materials management and recycling programs, and assist local solid waste authorizes in making improvements to local waste management systems.

- **Recycling Enhancements to Collection and Yield through Consumer Learning and Education (RECYCLE) Act:** This Act is part of the Infrastructure Investment and Jobs Act. It provides U.S. EPA with resources to increase recycling education. It authorizes up to $15 million annually over five (5) years for grants to states, local governments, tribes, nonprofits, and public partnerships to expand education efforts for commercial and residential recycling. EPA is also required to develop a toolkit that facilitates increasing recycling participation and decreasing material contamination in recycling streams.

- **Inflation Reduction Act of 2022** (Public Law 117-169): The Inflation Reduction Act of 2022 focuses on reducing greenhouse gas emissions, curbing energy prices, increasing investments in domestic manufacturing capacity, encouraging procurement of commodities from domestic or free-trade partners, and researching and developing commercially viable green technologies. This law supports technologies, such as anaerobic digestion, through tax credits, provides $5 billion in grant programs for pollution reduction, and establishes green banks to provide low-cost funding for clean energy projects.

- **Winning on Reducing Food Waste:** This initiative is an interagency partnership between the U.S. Department of Agriculture (USDA), the U.S. Environmental Protection Agency (EPA), and the U.S. Food and Drug Administration (FDA) to reduce the amount of food waste in the United States. The initiative includes six (6) priority areas that include the following: 1) Enhance interagency cooperation, 2) Increase consumer education and outreach efforts, 3) Improve coordination and guidance on food loss and waste measurement, 4) Clarify and communicate information on food safety, food date labels, and food donations, 5) Collaborate with private industry to reduce food loss across the supply chain, and 6) Encourage food waste reduction by federal agencies in their respective facilities.

- **Per-and-Polyfluoroalkyl Substances (PFAS):** U.S. EPA has taken a number of steps to address PFAS impact on the environment. Key activities on PFAS impacting waste management activities include:

    - Issuing an advance notice of proposed rulemaking to inform potential future CERCLA regulation.

    - Issuing guidance for states and municipalities to use the most current sampling and analysis methods in the Clean Water Act National Pollutant Discharge Elimination System permitting program reduce PFAS in the environment, which includes waste management sites.

  A comprehensive list of U.S. EPA's actions to combat PFAS pollution is available at www.epa.gov/pfas.

- **Public Utilities Regulatory Policies Act** (16 U.S.C 46 et seq. or Public Law 95-617): PURPA was developed to require local power utilities to purchase power from qualifying facilities to promote competition. Qualifying facilities include small generators that source renewable energy, including waste and biomass. State public service commissions set the rates for which this power is purchased by a local power utility.

1.7.1.2 Regulations Affecting Solid Waste Management

The Code of Federal Regulations (CFR) contains the rules established in the Federal Register by the executive departments of the Federal Government. Federal regulations establish overall regulatory direction and minimum nationwide standards for protecting human health and the environment. The CFR is divided into fifty (50) titles which are further divided into chapters and subparts thereof. Title 40 of the CFR is titled Protection of the Environment, which includes Subchapter I Solid Wastes (40 CFR Parts 239 through 282).

Solid waste management on the Federal level is the responsibility of the U.S. Environmental Protection Agency (EPA). Direct implementation of solid waste programs is delegated to State and local governments. A summary of Federal regulations important to solid waste management contained in 40 CFR, Chapter I, Subchapter I - Solid Wastes is summarized in **Table 1**.

Table 1. Code of Federal Regulations

Part #	Title
Part 239	Requirements for State Permit Program Determination of Adequacy
Part 240	Guidelines for the Thermal Processing of Solid Wastes
Part 241	Solid Wastes Used as Fuels or Ingredients in Combustion Units
Part 243	Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste
Part 246	Source Separation for Materials Recovery Guidelines
Part 247	Comprehensive Procurement Guideline for Products Containing Recovered
Part 254	Prior Notice of Citizen Suits
Part 255	Identification of Regions and Agencies for Solid Waste Management
Part 256	Guidelines for Development and Implementation of Solid Waste Management
Part 257	Criteria for Classification of Solid Waste Disposal Facilities and Practices
Part 258	Criteria for Municipal Solid Waste Landfills
Part 260	Hazardous Waste Management System: General
Part 261	Identification and Listing of Hazardous Waste
Part 262	Standards Applicable to Generators of Hazardous Waste
Part 263	Standards Applicable to Transporters of Hazardous Waste
Part 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities.
Part 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
Part 266	Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
Part 267	Standards for Owners and Operators of Hazardous Waste Facilities Operating under a Standardized Permit
Part 268	Land Disposal Restrictions
Part 270	EPA Administered Permit Programs: The Hazardous Waste Permit Program
Part 271	Requirements for Authorization of State Hazardous Waste Programs
Part 272	Approved State Hazardous Waste Management Programs
Part 273	Standards for Universal Waste Management
Part 278	Criteria for the Management of Granular Mine Tailings (Chat) in Asphalt Concrete and Portland Cement Concrete in Transportation Construction Projects Funded in Whole or in Part by Federal Funds
Part 279	Standards for the Management of Used Oil
Part 280	Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST)
Part 281	Approval of State Underground Storage Tank Programs
Part 282	Approved Underground Storage Tank Programs

1.7.2 State of Maryland

1.7.2.1 Laws Affecting Solid Waste Management

The primary State agency overseeing solid waste management is the Maryland Department of Environment. MDE's Land Management Administration is responsible for regulating solid waste management and recycling efforts. Article 9 – Environment Article, Annotated Code of Maryland contains MDE's authority for the regulation of solid waste. Key Maryland state laws impacting solid waste management include the following:

- **Maryland Environmental Service Act (1970):** Creates the Maryland Environmental Service to manage service regions that were created to deal with issues affecting the state's water supply, wastewater purification, and solid waste management.
- **Northeast Maryland Waste Disposal Authority (1980):** Creates and establishes the powers of the Northeast Maryland Waste Disposal Authority.
- **Water and Sewage Plan Act (1983):** Requires the preparation and submission of solid waste management plans by counties and establishes the minimum requirements of such plans.
- **Chesapeake Bay Critical Area Protection Program (1984):** Controls human intervention in the Bay area.
- **Maryland Wastewater Treatment Law (1987):** Requires permits prior to installing, altering, or extending a water supply system or refuse disposal system (including a landfill, waste transfer station, incinerator, or other waste processing facility).
- **Maryland Recycling Act (1988):** Requires that by 1994 each jurisdiction with a population greater than 150,000 reduce its solid waste stream by at least 20% through recycling (15% for jurisdictions with lesser populations). The recycling rate calculation includes both residential and commercial waste and recycling tonnages.
- **Medical Waste Legislation (1988):** Regulates identification, record keeping, treatment, transport, and disposal of special medical wastes. Prohibits infectious wastes in solid waste and in solid waste landfills in the state.
- **Maryland Air Quality Control Act (1989):** Allows adoption of rules for air pollution control, sets emission standards and air quality control areas, and requires training for municipal solid waste incinerator operators.
- **Nontidal Wetland Regulations (1990):** Prevents net loss of nontidal wetlands by establishing a stringent permitting process.
- **Land-Clearing Debris Landfills – Amount of Security (1990):** Addresses the value of bonds required as security for each acre of land-clearing debris landfills.
- **Maryland Nonpoint Source Pollution Control Laws (1990-1994):** Allows for the adoption of criteria and procedures by counties and soil conservation districts to

implement soil erosion control programs and for counties and municipalities to implement stormwater management programs.

- **Natural Wood Waste Recycling Act (1991):** Establishes the requirements for wood waste recycling in Maryland, authorizes the Department of the Environment to adopt additional regulations governing recycling facilities, and requires a permit for operation of wood waste facilities created after July 1, 1992.

- **Plastic Material Code (1991):** Regulates that rigid plastic containers or bottles may not be distributed for sale in the state unless appropriately labeled indicating the plastic resin used to produce them.

- **Scrap Tire Law (1992):** Prohibits the disposal of scrap tires in landfills after January 1, 1994, and creates a licensing system for the management of scrap tires. Establishes requirements for implementing a scrap tire recycling system, licensing haulers and collection facilities. Establishes Tire Clean-Up and Recycling Fund.

- **Mercury Oxide Battery Act (1992):** Makes mercury oxide battery manufacturers responsible for collection, transportation, and recycling or disposal of batteries sold or offered for promotional purposes in the state.

- **Composting Act (1992):** Includes composting in the definition of recycling. Requires that county recycling plans address composting issues and bans loads of yard materials collected separately from trash from being landfilled effective in 1994.

- **Sludge Application (1993):** Regulates land application procedures for sludges to maintain public health.

- **Maryland Landfill Siting Law (1994):** Describes the requirements for public hearings regarding landfill siting, and addresses permitting requirements and security requirements. Explains the requirements for submission of plans and documents necessary to conduct a technical review and to approve proposed facilities.

- **Nickel Cadmium (NICD) Battery Act (1995):** Regulates the storage, transportation, and destination of nickel-cadmium batteries.

- **Maryland Landfill Financial Assurance Law (1997):** Sets forth financial assurance requirements for landfills in conformance with the requirements of federal regulations.

- **Maryland Used Oil Recycling Act (1997):** Requires MDE to develop programs to educate the public on oil recycling and to designate used oil collection facilities. It also prohibits the disposal of used oil into sewers, drainage systems, or natural waters.

- **Electronics Recycling (eCycling) Program (2007):** Mandates that manufacturers of certain electronic devices (computers, televisions, etc.) contribute payments toward a fund for local government electronics recycling programs or that such

manufacturers establish their own electronics recycling collection programs. Authorizes counties to address the subject of electronics recycling in their recycling plans.

- **Public School Recycling Plans (2010):** An Act requiring a county recycling plan to address the strategy for the collection, processing, marketing, and disposition of recyclable materials from county public schools.

- **Fluorescent and Compact Fluorescent Light Recycling (2010):** An Act requiring a county recycling plan to address the strategy for the collection and recycling of fluorescent and compact fluorescent lights that contain mercury.

- **Maryland Recycling Rate and Diversion Goal (2012):** This law amends the 1988 Maryland Recycling Act by requiring solid waste management plans to include a Recycling Plan that achieves an increase in the countywide recycling rate to 20 percent (counties with populations below 150,000) or 35 percent (counties with populations above 150,000) of the county's solid waste stream by July 1, 2014, with full implementation of the Recycling Plan by December 31, 2015. The law also establishes a voluntary state-wide waste diversion goal of 60 percent and the method for calculating county diversion rates. It requires that certain information be reported by each county to the MDE to be used in determining source reduction credits.

- **Apartment Building and Condominium Recycling (2012):** An Act requiring a county recycling plan to address the collection and recycling of recyclable materials from residents of apartment buildings and condominiums that contain 10 or more dwelling units by property owners or managers of apartment buildings and councils of units owners of condominiums. Also, if applicable, a method for implementing a reporting requirement for recyclable materials generated at apartment buildings and condominiums that contain 10 or more dwelling units.

- **Special Event Recycling (2014):** An Act requiring a county recycling plan to address the collection and recycling of recyclable materials from special events by October 1, 2015.

- **Income Tax Credit – Oyster Shell Recycling – Credit Amount (2015):** Senate Bill 694 (SB694) altered the amount of a certain credit against the State income tax for each bushel of oyster shells recycled during the taxable year; providing for the application of this Act; and generally relating to a state income tax credit for oyster shell recycling.

- **Office Building Recycling (2019):** An Act requiring a county recycling plan to address the collection and recycling of recyclable materials from buildings that have 150,000 square feet or greater of office space.

- **Organic Waste, Organics Recycling, Collection, and Acceptance for Final Disposal (2019)**: Prohibits the owner or operator of a refuse disposal system from accepting loads of separately collected organic waste for final disposal unless the owner or operator provides organics recycling.

- **Expanded Polystyrene Food Service Products Ban (2020):** Bans the sale and use of food service products composed of expanded polystyrene.

- **Food Scraps Management (2021):** House Bill 264 (HB264) requires large food waste generators to divert food waste from disposal if those generators are located within 30 miles of an organics recycling facility with the capacity and willingness to enter into a contract.

- **Maryland Recycling Act, Recyclable Materials and Resource Recovery Facilities, Alterations (2021):** House Bill 280 (HB280) altered the definition of "recyclable materials" under the MRA to exclude incinerator ash and repealed the authority of a county to use a resource recovery facility to meet 5% of the waste reduction required to be achieved through recycling in the county's recycling plan.

- **Recycling Market Law (2021):** House Bill 164 (HB164) requires the Office of Recycling in the Department of the Environment to promote the development of markets for recycled materials and products in the State. Also requires the Office to evaluate the availability of certain markets and identify businesses in the State that use recycled materials. Finally, this Act also requires the annual Maryland solid waste management and diversion report to be submitted to the General Assembly by September 1, 2022, and each year thereafter.

- **Statewide Recycling Needs Assessment and Producer Responsibility for Packaging Materials (2023):** Senate Bill 222 (SB222) alters the definition of "organics recycling" to include the processing of certain compostable packaging materials in a certain manner; requiring the Department of the Environment to approve a certain producer responsibility organization for certain purposes on or before a certain date; establishing a producer responsibility advisory council to provide advice and make recommendations regarding establishing and implementing a producer responsibility program in the State for packaging materials and to report to certain committees of the General Assembly on or before a certain date; requiring the Office of Recycling in the Department to hire an independent contractor to conduct a certain statewide recycling needs assessment in a certain manner and to submit a certain report to the Governor and the General Assembly on or before a certain date; and generally relating to a statewide recycling needs assessment and producer responsibility for packaging materials.

- **Maryland Paint Stewardship (2024):** House Bill 1 (HB1) requires producers of architectural paint, or a representative organization, to submit a plan for a paint stewardship program to the Department of the Environment by July 1, 2025 and prohibits the sale of architectural paint beginning January 1, 2026, unless an approved Paint Stewardship Program has been implemented.

- **Maryland State Implementation Plan (Ongoing):** Limits emissions from specific pollutant sources to prevent air quality from falling below National Ambient Air Quality Standards (NAAQS) for six (6) criteria air pollutants: ground-level ozone, particulate matter, lead, carbon monoxide, nitrogen dioxide, and sulfur dioxide.

1.7.2.2 Regulations Affecting Solid Waste Management

The principal State of Maryland regulations pertaining to solid waste management are found in COMAR. Pertinent regulations include Title 26 Department of the Environment; Subtitle 04 Regulation of Water Supply, Sewage Disposal, and Solid Waste (COMAR 26.04.07).

A summary of key Maryland regulations impacting solid waste management include the following:

- **Compost** (COMAR 15.18.04): These regulations regulate the testing and distribution of compost, including branding and labeling of the product in addition to requirements for the facility operator.

- **Comprehensive Solid Waste Management Plans** (COMAR 26.03.03): This regulation requires each county to maintain a current, comprehensive solid waste plan covering the subsequent ten-year period. It specifies plan content requirements by chapter and approval procedures.

- **Sewage Sludge Management** (COMAR 26.04.06): These regulations regulate the collection, handling, burning, storage, treatment, land application, disposal, and transportation of sewage sludge and septage waste. They establish a permitting system for sludge transporters, processors, disposal facilities, and land application sites.

- **Solid Waste Management** (COMAR 26.04.07): This regulation establishes permitting requirements, design standards, operating procedures, closure specifications, and post-closure monitoring requirements for sanitary, rubble, land-clearing debris, and industrial landfills. The regulations also include requirements for solid waste processing facilities, transfer stations, and incinerators.

- **Scrap Tire Storage, Collection, Transferring, Hauling, Recycling, and Processing** (COMAR 26.04.08): These regulations regulate the management of scrap tires with a focus on recycling. MDE authorizes scrap tire facilities and haulers by issuing licenses and approvals. The regulations provide technical and operational standards for scrap tire facilities. Scrap tire storage facility storage procedures, closure procedures, financial assurance requirements, license renewal, and financial assistance are addressed.

- **Natural Wood Waste Recycling Facilities** (COMAR 26.04.09): These regulate natural wood waste recycling, including the recycling of trees and other vegetative refuse. They establish permitting procedures and operating standards for these facilities and require that only natural wood waste is accepted. Facility discharges to air or water are limited to those allowable under permits governing solid waste disposal. Wood waste may not be burned at the facility, except as permitted by MDE.

- **Composting Facilities** (COMAR 26.04.11): These regulations establish the conditions that a compost facility operator shall meet when constructing a

composting facility. It includes basic design criteria, siting criteria, groundwater distance specifications, pad requirements, and stormwater and contact water design requirements,

- **Food Residuals – Organics Recycling and Waste Diversion Authority** (COMAR 26.04.13): These regulations establish certain requirements pertaining to the diversion of food residuals from final disposal in a refuse disposal system.

- **Water Pollution Control** (COMAR 26.08): These regulations require a permit for discharges of wastes or wastewaters into the waters of the state. They specify permit application, issuance, and hearing procedures and establish surface water and groundwater quality criteria.

- **Oil Pollution and Tank Management** (COMAR 26.10): These regulations prohibit oil pollution, require report of any oil spill or discharge, specify a procedure for removal of any oil discharge, and require an Oil Operations Permit from the MDE.

- **Air Pollution Control** (COMAR 26.11.02, 26.11.03, 26.11.08, and 26.11.19): Sets forth air pollution control requirements for solid waste incinerators and landfill gas flares and for the issuance of permits. Specifies Part 70 Permit issuance, content, and hearing requirements. Operator training and emissions standards are set forth in Section 26.11.08. Section 26.11.19 sets volatile organic compounds control requirements (emission standards and guidelines) for municipal solid waste landfills meeting specified size and age requirements.

- **Hazardous Waste Management** (COMAR 26.13): This regulation establishes rules concerning the Disposal of Controlled Hazardous Substances (CHS) and special medical waste (SMW). It provides waste listing, criteria defining hazardous wastes, definitions of hazardous and medical wastes, record-keeping requirements (manifest), permitting requirements, and regulations governing waste storage, transport, and disposal.

- **Erosion and Sediment Control** (COMAR 26.17.01): These regulations identify activities for which controls are required and specify plan approval procedures. They specify control measure design standards and inspection/enforcement requirements. They also describe the content requirements of local sediment and erosion control ordinances.

- **Stormwater Management** (COMAR 26.17.02): These regulations specify the minimum content of county and municipal ordinances and responsibilities for the review of stormwater management programs. They establish minimum control requirements and design criteria for stormwater management facilities and inspection and maintenance requirements.

- **Construction on Nontidal Waters and Floodplains** (COMAR 26.17.04): This regulation provides evaluation criteria, permitting procedures, and other requirements governing the construction, alteration, or repair of structures or other obstructions located in the 100-year floodplain.

- **Water Appropriation and Use** (COMAR 26.17.06 and 26.17.07): These regulations specify permitting requirements and approval criteria applicable to the appropriation and use of waters of the state, including groundwater.

1.7.3 Local

1.7.3.1 County Laws Affecting Solid Waste Management

Portions of the Harford County Code that affect solid waste management activities include, but are not limited to:

Chapter 109:	Environmental Control
Chapter 157:	Licenses and Permits
Chapter 169:	Master Plan
Chapter 214:	Sediment Control and Stormwater Management
Chapter 267:	Zoning Code

1.7.3.2 County Regulations Affecting Solid Waste Management

Harford County regulations that affect solid waste management activities include, but are not limited to:

- Harford County Solid Waste Management Rules and Regulations
- Harford County Road Code

2. POPULATION, EMPLOYMENT, AND LAND USE

2.1 INTRODUCTION

This chapter provides a description of Harford County including residents, work force and major employment sectors, and land use practices. These conditions provide important insight into current and future solid waste management activities over the next 10-year planning period. Land use practices and conditions can also impact solid waste planning in that land use patterns may constrain the location of future solid waste management facilities.

2.2 OVERVIEW

Harford County is located in the northeastern region of the State of Maryland. The County is bordered on the north by the Commonwealth of Pennsylvania; on the east by the Susquehanna River and Cecil County, Maryland; on the south by the upper reaches of the Chesapeake Bay, and on the west by Little Gunpowder Falls and Baltimore County, Maryland. The total area of the County is 527 square miles, of which 437 square miles are land and 90 square miles are water[1].

The County is traversed by thirteen major highways: Interstate 95, U.S. Route 1, U.S. Route 40, and Maryland Routes 7, 22, 23, 24, 152, 136, 155, 165, 543, and 924. It is located between the urban centers of Philadelphia, Pennsylvania and Wilmington, Delaware to the north and Baltimore, Maryland and Washington, D.C., to the south. **Figure 2** is a map of Harford County, Maryland.

Development of the County initially occurred along Old Philadelphia Road (Maryland Route 7). A major Federal installation, the Aberdeen Proving Ground with facilities at both Aberdeen and Edgewood, spurred development in the southern portion of the County. Since 1977, the County has directed new development to occur within a designated growth area, otherwise known as the Development Envelope, which is generally defined as the areas south of Interstate 95 and along the Maryland Route 24/924 corridor north to Maryland Route 23. The Development Envelope aims to concentrate development in a specific region of the County that is appropriately zoned and has adequate public facilities and resources to sustain a growing population. **Figure 3** presents the current Harford County Land Use Map.

[1] U.S. Census Bureau, https://www.census.gov/quickfacts/fact/table/harfordcountymaryland/PST045222

Figure 2. Harford County Map

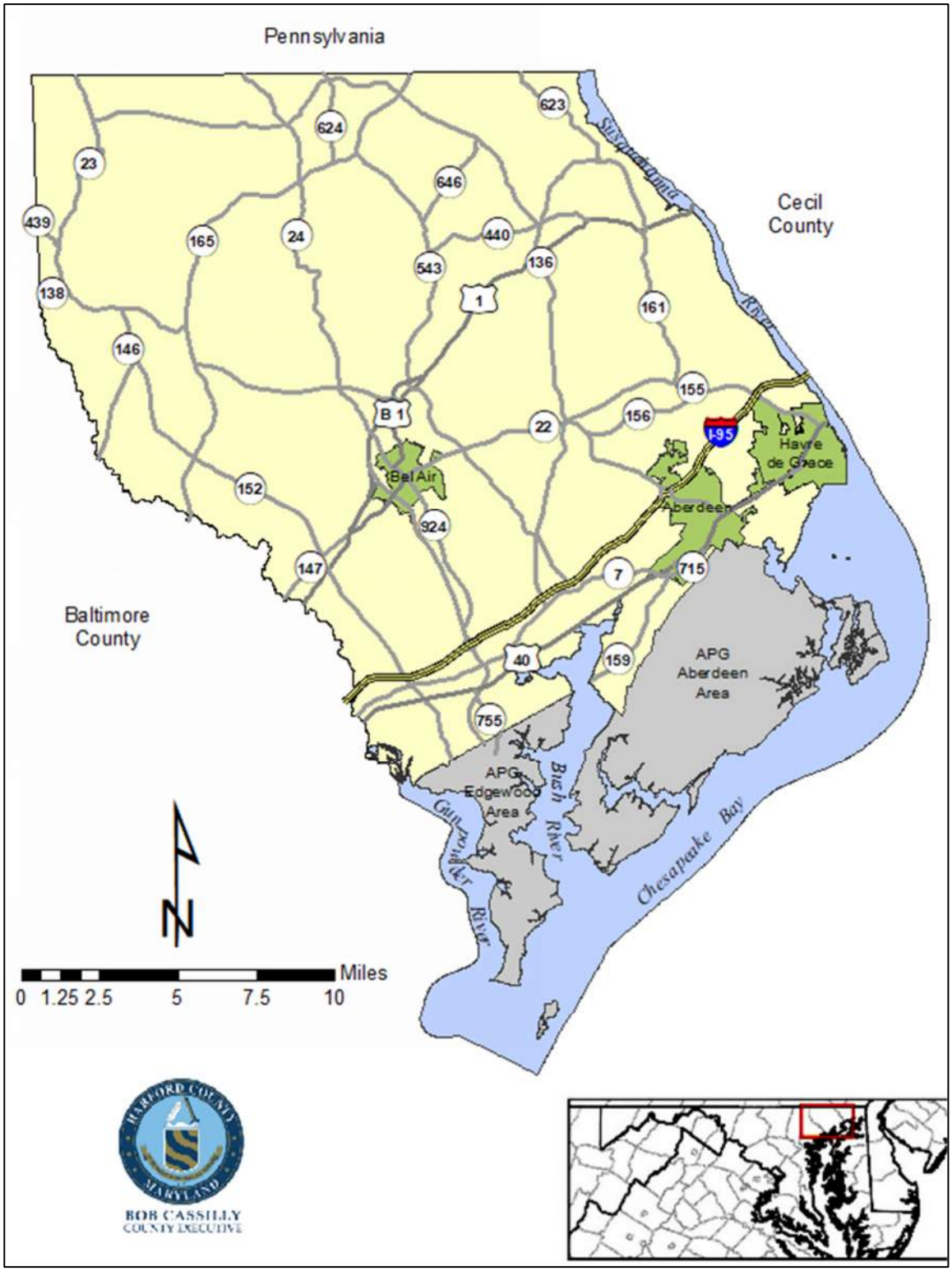
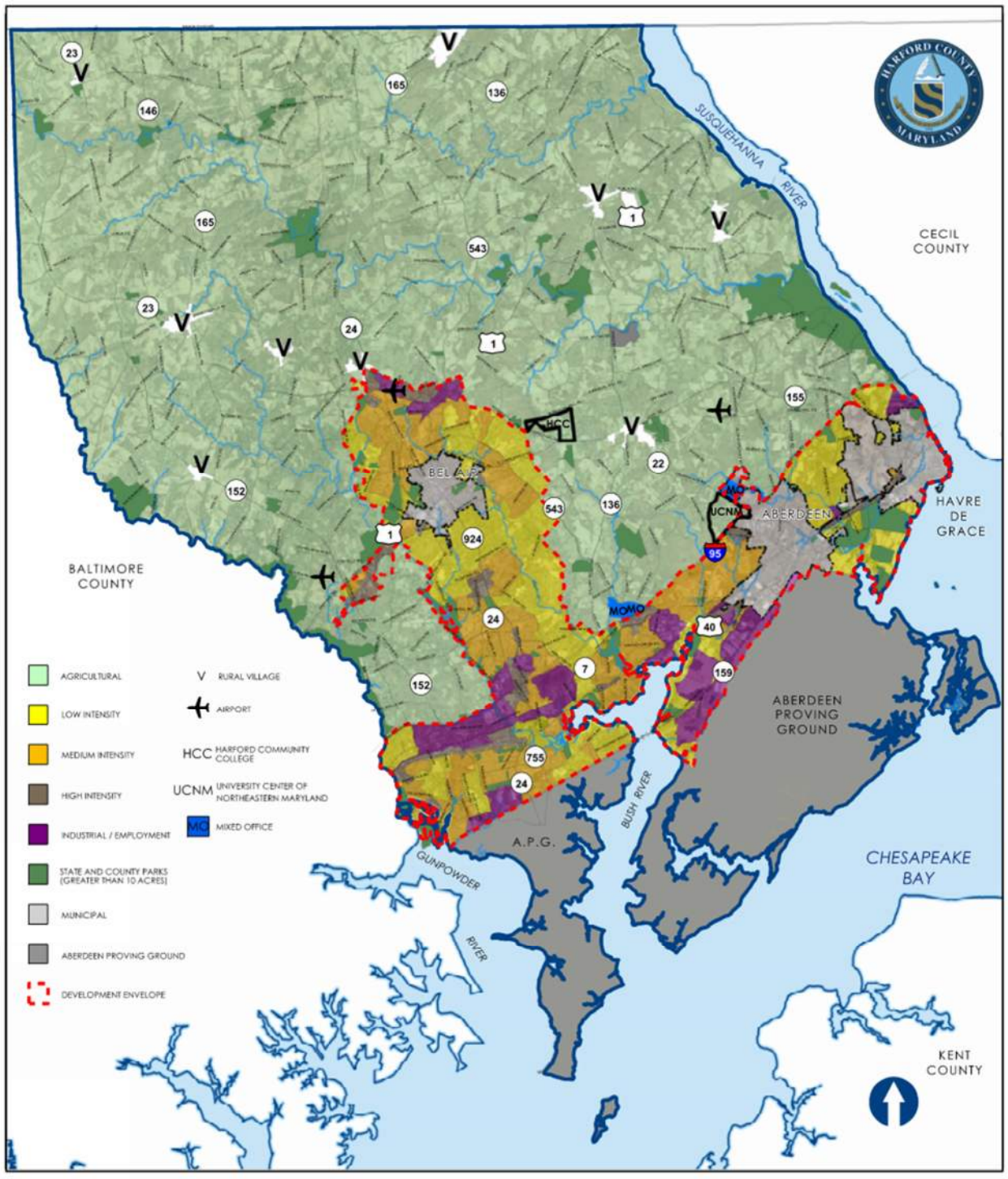


Figure 3. Harford County Land Use Map



2.3 POPULATION

The 2020 U.S. Census reported the County's population to be 260,924. This population figure includes the incorporated municipalities of Bel Air, Havre de Grace, and Aberdeen. This population marks a 6.6 percent increase over the County's population as reported by the 2010 U.S. Census. The County's Department of Planning and Zoning estimates the County's population will increase by about 5.3 percent over the planning period from 2025 to 2034 and about five (5) percent for the period 2035 through 2045. **Figure 4** provides the historic population data over the preceding 10-year planning period while **Figure 5** provides the projected population over the next 20 years through 2045.

Figure 4. Historical Harford County Population

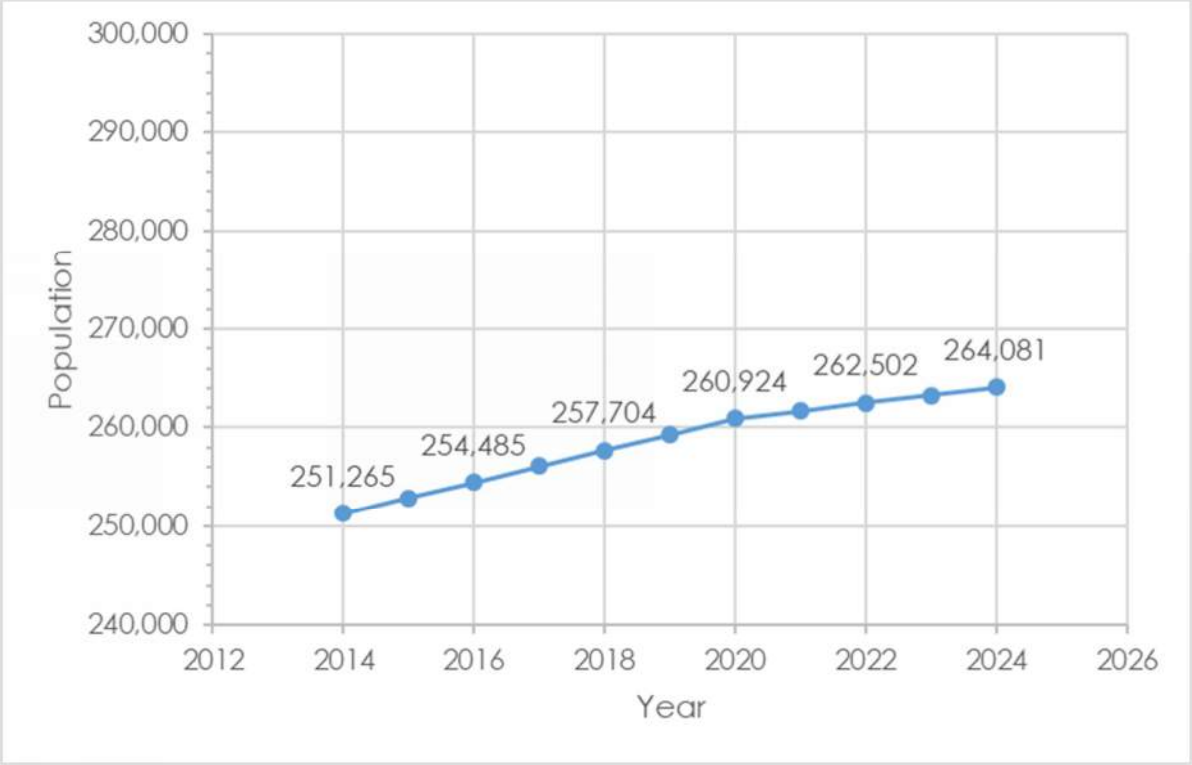
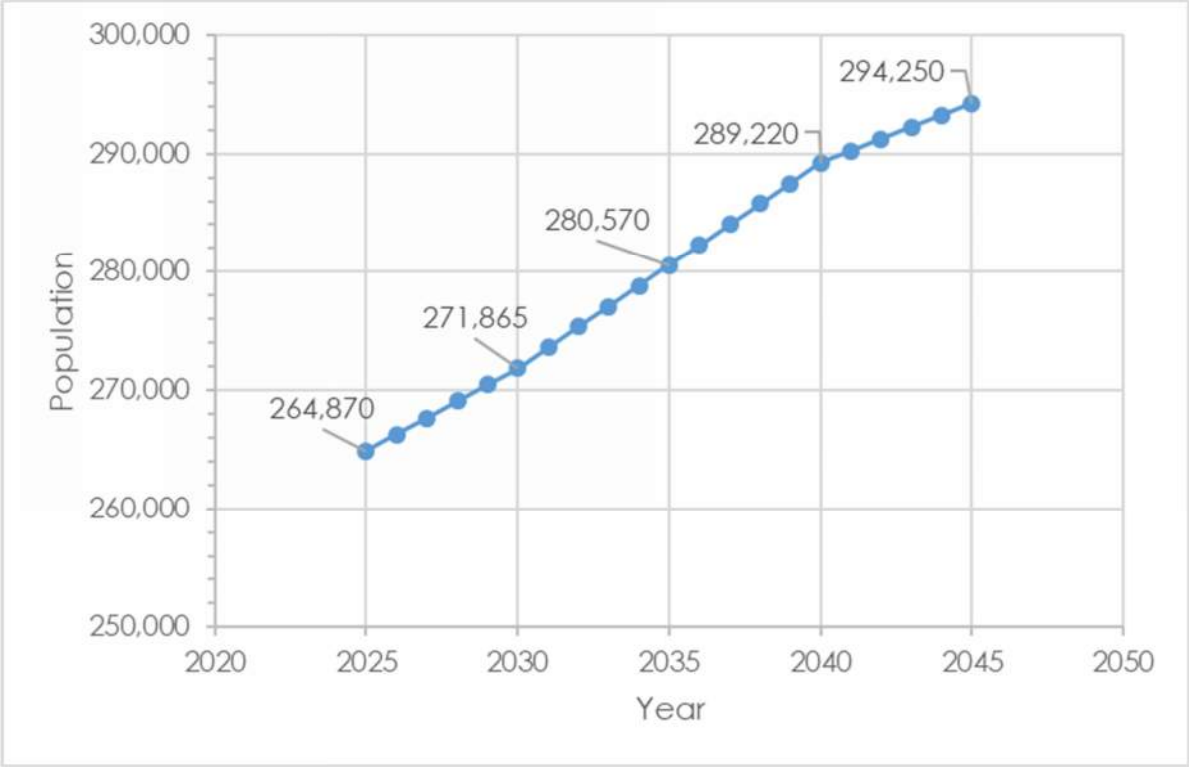


Figure 5. Projected Harford County Population



There are three incorporated municipalities within Harford County, the Town of Bel Air, the City of Aberdeen, and the City of Havre de Grace. Additionally, the County is home to the U.S. Army Garrison, Aberdeen Proving Ground. These three incorporated communities and the Aberdeen Proving Ground have a combined population of about 43,500 people, which comprises 16.6 percent of the County's total population. **Table 2** provides the population of each of these communities in 2020.

Table 2. County Population by Community

Community	Population	Percent of County Population
Aberdeen	16,254	6.2%
Bel Air	10.661	4.1%
Havre de Grace	14,807	5.7%
Aberdeen Proving Ground	1,668	0.6%
Unincorporated County	217,534	83.4%
TOTAL	**260,924**	**100%**

2.4 EMPLOYMENT

The Maryland Department of Planning, through the Maryland State Data Center (MSDC), maintains historical figures and develops employment forecasts for each county in Maryland. The MSDC estimates there were 128,188 jobs in Harford County in 2020. This marks a nearly 11 percent increase, equivalent to about 12,500 jobs, from the MSDC's data reported in 2010. The MSDC estimates that the number of jobs available in Harford County will continue to increase to 154,100 over the 10-year planning period through 2035. The detailed historical and projected employment data is presented in **Figure 6** (historical) and **Figure 7** (projected). **Appendix D** includes detailed employment data by industry.

Figure 6. Historical Jobs Count for Harford County

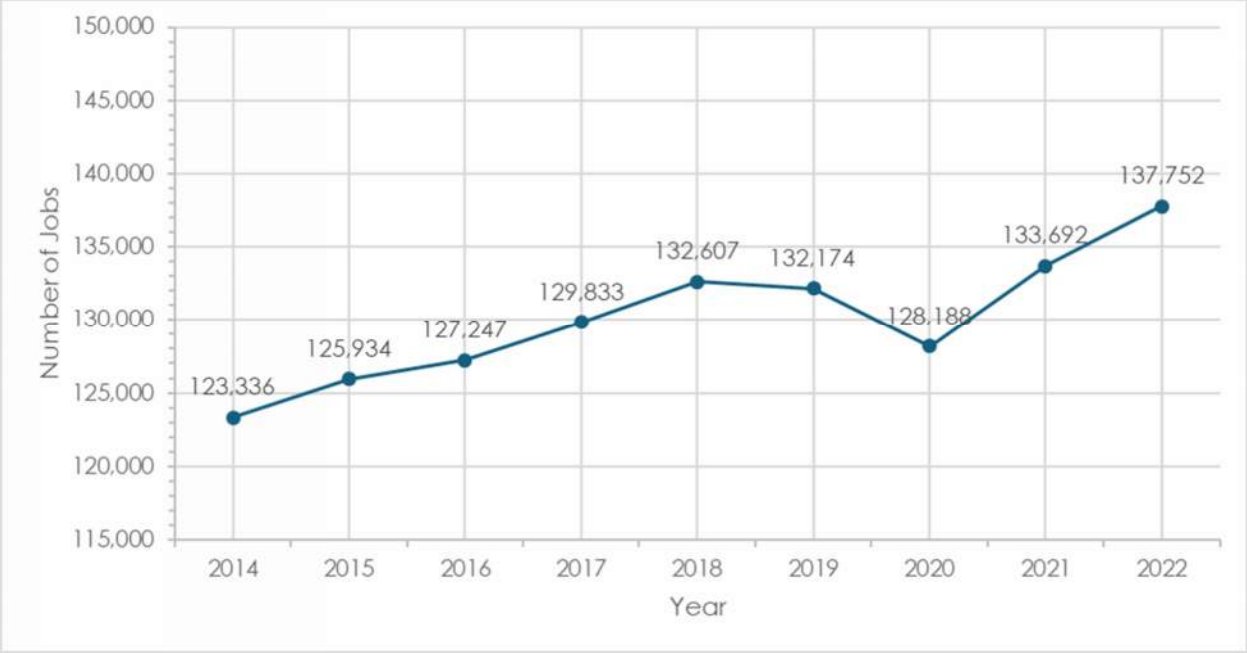
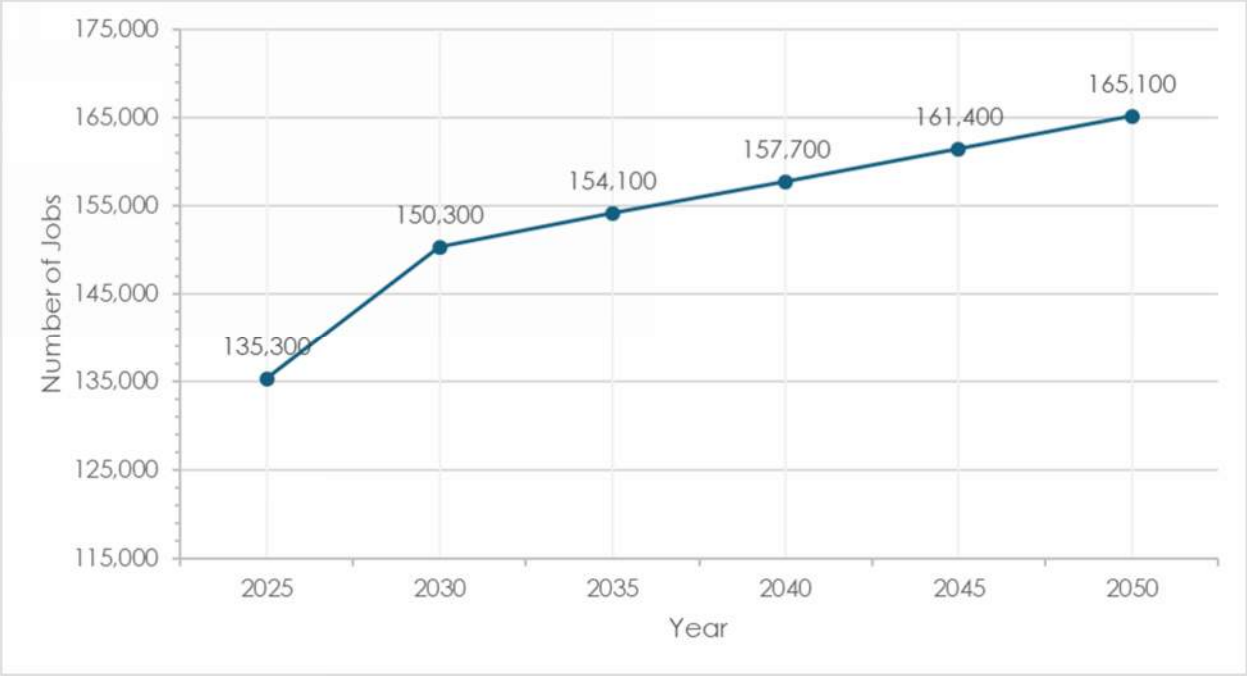


Figure 7. Projected Jobs Count for Harford County



As discussed above, Harford County is home to a major Federal facility, the Aberdeen Proving Ground (APG), which is owned and maintained by the Department of the Army. The 72,516-acre facility is located in the southeastern part of the County along the Chesapeake Bay. APG is physically divided into two areas by the Bush River; these areas are known as the Aberdeen Area (aka APG North) and the Edgewood Area (aka APG South). The APG is the largest military and civilian employer in Harford County with over 13,000 civilians and military personnel working on post. Other significant employment sectors within the County include retail trade (11 percent), health care (11 percent), professional and technical services (9 percent), state and local government (7 percent), and construction (7 percent).

2.5 ZONING AND LAND USE

Land use policies in the County are implemented through planning and zoning decisions. Land use policies directly impact solid waste management by influencing the quantity and type of waste generated and where solid waste management facilities may be sited. While this Plan contains basic zoning and land use information, its purpose does not extend to creating or enforcing local land use and zoning requirements.

As noted in Chapter 1, the County's solid waste management goals and objectives conform to State and County land use plans pertaining to solid waste management. The County prioritizes waste reduction and recycling activities as part of its solid waste management program to minimize the County's need for additional solid waste disposal capacity. The County's solid waste management program also prioritizes the use of out-of-county disposal facilities to further support the County's land use goals.

The Harford County comprehensive plan, HarfordNEXT, was established in 2016 and is the core document guiding key planning activities in the County. HarfordNEXT unites the County's sector-specific planning documents into one streamlined document and introduces a thematic approach to organize policies and implementation strategies. Central to the plan are policies aimed at fostering safe, harmonious, and livable communities. The comprehensive plan provides direction for addressing future growth, continuing revitalization, providing adequate public facilities, promoting economic development, and preserving and protecting natural resources, agricultural lands and historic resources.

2.6 SOLID WASTE MANAGEMENT FACILITY ZONING REQUIREMENT

Locating solid waste management facilities in Harford County is regulated by Section §267, Zoning, of the Harford County Code. Specifically, Sections § 267-89 through §267-92 refer to solid waste management facilities and contain the zoning district requirements and other conditions on developing new solid waste management facilities. These sections of the Harford County Code are provided in **Appendix E**.

2.7 SUBSIDIARY PLANS

Section 26.03.03.02B of COMAR requires that each county's solid waste management plan include all or part of the subsidiary development plans of the towns, municipal corporations, sanitary districts, privately owned facilities and local, State, and Federal agencies to the extent these inclusions promote public health, safety and welfare. The County requested solid waste planning documents from the incorporated communities in Harford County and the Aberdeen Proving Ground. **Appendix F** includes the planning documents and information provided by these communities. Documents and information were provided by The City of Aberdeen, City of Havre de Grace, and the Aberdeen Proving Ground. No plan or information was provided by the Town of Bel Air.

3. EXISTING SOLID WASTE MANAGEMENT SYSTEM

3.1 OVERVIEW

This chapter contains information on the County's existing solid waste management system, including County, private and municipal programs and services, waste generation, material streams, and the import and export of waste. This chapter also includes information on collection methods and solid waste acceptance facilities within the County. The analysis presented in this chapter of the County's existing solid waste management system is the basis for the needs assessment and action plan presented in subsequent chapters of this plan.

The County has made a number of changes to their solid waste program since the development of the 2014 plan. This section summarizes the key changes or updates to the County's solid waste management system in the last ten years.

- **Closure of the Harford Waste-to-Energy Facility –** The County's waste-to-energy facility closed in March 2016. This facility served as the primary disposal facility for waste materials not recycled or diverted for many years. The closure of this facility required the County to establish a new long-term disposal solution.

- **Preserve Capacity at HWDC Landfill –** Upon closure of the Harford Waste-to-Energy facility, the County made the decision to preserve remaining capacity at the County owned HWDC Landfill. The quantity of waste disposed at the HWDC Landfill was reduced with the waste being routed to an out-of-county facility instead (discussed below).

- **Agreement with Baltimore County –** In 2013, Harford County entered into an agreement with Baltimore County to direct all waste collected in Harford County to the Eastern Sanitary Landfill (ESL) in Baltimore County. The agreement provides for the disposal capacity of waste generated in Harford County for 20 years and processing of single stream recyclables, through 2036. The agreement includes two 10-year extensions should the County decide to exercise them.

- **Increase in MRA Rate –** The County prioritizes the diversion of waste to reduce environmental and public health impacts of the existing solid waste system. Over the previous planning period (2014-2024), the County's MRA rate increased from 44.3 percent to 48.3 percent. MDE allows counties to receive additional points on their recycling rate to account for source reduction and waste reduction programs and services. Harford County regularly receives these additional points that push the County's diversion rate to over 50 percent.

- **Office Building Recycling –** Bill No. 20-017 was approved by the County Council and County Executive. It amended the County's 2014 Solid Waste Management Plan to provide for recycling at office buildings according to Environment Article 9-1714(b)(1) of the Maryland Code.

3.2 PROGRAMS AND SERVICES

The majority of the County's solid waste management programs and services are located at the Harford Waste Disposal Center, which is located near the rural unincorporated community of Street. This facility includes a permitted Municipal Solid Waste landfill, a homeowner drop-off area, and a mulch and compost facility. The County utilizes disposal capacity at facilities outside the County. In order to preserve landfill space for future needs, the HWDC only accepts waste from residential self-hauling customers.

The homeowner drop-off area provides convenient access for residents to dispose and divert materials generated from their households. Residents must show identification or otherwise prove they are a resident of Harford County to use the facility. Residents may drop-off household trash, single-stream recyclables, and items such as tires, scrap metal and appliances, electronics, construction/demolition debris, and other special wastes. The mulch and compost facility provides residents with drop-off services for organic materials such as yard trim, including grass clippings, branches, leaves, and brush. These materials are processed onsite to produce compost and mulch products that are available for free to residents in small quantities and offered for sale in larger quantities. A more detailed description of the HWDC is provided later in this chapter.

The County regularly provides information and education on the solid waste programs and services available to residents and the business community. A key activity of the County's education program is providing solid waste and recycling education in the Harford County Public School System. The County also oversees regulatory and enforcement programs pertaining to County laws and requirements for waste management and recycling. This includes requirements for recycling at apartment buildings. As described in further detail later in this chapter, the County maintains a waste hauler-licensing program to manage private haulers that provide solid waste and single-stream recycling collection services in Harford County.

3.3 WASTE GENERATION

An important goal of the County's Solid Waste Management Plan is to estimate how much solid waste will be generated over the planning period. **Table 3** provides the data

on the total amount of MRA waste disposed and recycled in the County from 2014 through 2022.

Table 3. Historical MRA Waste Generation

Year	Waste Disposed (tons)	Waste Diverted (tons)	Total Waste Generation (tons)
2014	136,869	108,895	245,764
2015	141,610	96,267	237,877
2016	123,124	93,311	216,435
2017	142,360	99,346	241,706
2018	147,118	112,831	259,949
2019	156,581	127,467	284,048
2020	168,770	118,330	287,100
2021	173,095	140,888	313,983
2022	179,095	169,148	348,243

The December 2022 waste generation quantities for Harford County as provided by MDE were used to estimate per capita and total waste generation amounts over the planning period 2025-2034. This data is aggregated from all solid waste facilities, both public and private, that reported receiving solid waste generated in Harford County. It includes both MRA and non-MRA waste.

A per capita waste generation rate is the amount of solid waste generated by each person in the County over a particular period, in this case one year. The rate takes into consideration current waste generation quantities and the population of the County. Per capita waste generation can be tracked over time and is a good indicator for understanding if people are generating more waste on an individual level or if the projected increase in waste generation is due to an increase in population. Using the MDE waste generation data and a County population of 262,502 people, it is estimated each person living in the County generated 2.3 tons of waste in 2022[2]. **Table 4** provides a detailed breakdown of both MRA and non-MRA waste generation quantities for 2022 as reported by MDE along with the calculated annual per capita waste generation quantity.

[2] Population of 262,502 based on linear growth from 2020 to 2025 from Harford County Department of Planning and Zoning population estimates.

Table 4. Harford County SWMP Action Item Summary

Waste Category		2022 Tons	Per Capita Waste Generation, 2022 (tons/year)
MRA Waste Disposed	Residential Wastes	89,339	0.3403
	Commercial Wastes	91,163	0.3473
	Mixed MSW	275	0.0010
	Industrial[1]	--	--
	Institutional[1]	--	--
	TOTAL MRA DISPOSED	**180,777**	**0.6887**
Non-MRA Waste Disposed	Land Clearing/Demolition Debris	42,612	0.1623
	Controlled Hazardous Substances	--	--
	Asbestos	607	0.0023
	Special Medical Waste/Dead Animals	300	0.0011
	Household Hazardous Waste	20	0.0001
	Wood Waste	95	0.0004
	Bulky or Special Wastes	--	--
	Vehicle Tires	114	0.0004
	Wastewater Treatment Plant Sludges	--	--
	Septage	--	--
	TOTAL NON-MRA DISPOSED	**43,634**	**0.1662**
TOTAL OVERALL WASTE DISPOSED		**224,411**	**0.8549**
Waste Diverted	MRA Waste Recycled	169,109	0.6442
	Non-MRA Waste Recycled	198,604	0.7566
	TOTAL DIVERTED	**367,713**	**1.4008**
TOTAL WASTE GENERATION		**592,124**	**2.2557**

[1] Included with commercial waste tonnage data.

The per capita waste generation figures in **Table 4** were used to estimate waste generation quantities for each material stream over the planning period 2025-2034. To make these estimates, each material generation rate was multiplied by the projected population in the County for each year as reported in **Figure 5** (Chapter 2). Using these projections, the County expects solid waste generation to increase from 593,905 tons in 2023 to 632,880 in 2034, an increase of about 6 percent. **Table 5** provides the breakdown of projected waste generation over the planning period.

Table 5 Projected Waste Generation Quantities

	Waste Category	Waste Generation (tons)											
		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
MRA Waste Disposed	Residential Wastes	89,608	89,876	90,145	90,621	91,097	91,573	92,049	92,526	93,118	93,711	94,303	95,488
	Commercial Wastes	91,437	91,711	91,985	92,471	92,957	93,443	93,929	94,415	95,019	95,624	96,229	97,438
	Mixed MSW	276	277	277	279	280	282	283	285	287	288	290	294
	Industrial[1]	--	--	--	--	--	--	--	--	--	--	--	--
	Institutional[1]	--	--	--	--	--	--	--	--	--	--	--	--
	TOTAL MRA DISPOSED	**181,321**	**181,864**	**182,408**	**183,371**	**184,335**	**185,298**	**186,262**	**187,225**	**188,424**	**189,623**	**190,822**	**193,220**
Non-MRA Waste Disposed	Land Clearing/Demolition Debris	42,741	42,869	42,997	43,224	43,451	43,678	43,905	44,132	44,415	44,698	44,980	45,545
	Controlled Hazardous Substances	--	--	--	--	--	--	--	--	--	--	--	--
	Asbestos	609	611	612	616	619	622	625	629	633	637	641	649
	Special Medical Waste/Dead Animals	301	302	303	304	306	308	309	311	313	315	317	321
	Household Hazardous Waste	20	20	20	20	20	21	21	21	21	21	21	21
	Wood Waste	95	96	96	96	97	97	98	98	99	100	100	102
	Bulky or Special Wastes	--	--	--	--	--	--	--	--	--	--	--	--
	Vehicle Tires	114	115	115	116	116	117	117	118	119	120	120	122
	Wastewater Treatment Plant Sludges	--	--	--	--	--	--	--	--	--	--	--	--
	Septage	--	--	--	--	--	--	--	--	--	--	--	--
	TOTAL NON-MRA DISPOSED	**43,765**	**43,896**	**44,028**	**44,260**	**44,493**	**44,725**	**44,958**	**45,190**	**45,480**	**45,769**	**46,059**	**46,637**
	TOTAL OVERALL WASTE DISPOSED	**225,086**	**225,761**	**226,435**	**227,631**	**228,827**	**230,023**	**231,219**	**232,415**	**233,904**	**235,392**	**236,880**	**239,857**
Waste Diverted	MRA Waste Recycled	169,618	170,126	170,635	171,536	172,437	173,338	174,240	175,141	176,262	177,384	178,506	180,749
	Non-MRA Waste Recycled	199,201	199,798	200,396	201,454	202,512	203,571	204,629	205,688	207,005	208,322	209,639	212,274
	TOTAL DIVERTED	**368,819**	**369,925**	**371,030**	**372,990**	**374,950**	**376,909**	**378,869**	**380,829**	**383,267**	**385,706**	**388,145**	**393,023**
	TOTAL WASTE GENERATION	**593,905**	**595,685**	**597,465**	**600,621**	**603,777**	**606,933**	**610,088**	**613,244**	**617,171**	**621,098**	**625,026**	**632,880**

[1] Included with commercial waste tonnage data.

The Maryland Recycling Act, Section 9-1705 of the Environment Article, Annotated Code of Maryland, requires each County to document its recycling rate and submit the results to MDE. Over the previous planning period, the County MRA recycling rate increased from 44.3 percent to 48.3 percent. MDE allows counties to receive additional points on their recycling rate to account for source reduction and waste reduction programs and services. Harford County regularly receives these additional points that push the County's recycling rate over 50 percent.

3.4 MATERIAL STREAMS

Section 26.03.03.03 (D) of COMAR identifies the types of waste materials discussed in this plan, including the existing and ten-year projected annual quantities generated within the County. **Table 6** lists the waste materials discussed in this chapter.

Table 6. Waste Materials Addressed in this Chapter

Residential Wastes	Commercial Wastes
Industrial Solids, Liquids, And Sludges	Institutional Waste
Land-Clearing and Construction/Demolition Debris	Controlled Hazardous Substances
Dead Animals	Bulky Waste or Special Wastes
Vehicle Tires	Septage And Sewage Sludge
Other Significant Waste Streams	

3.4.1 Residential Waste

Residential waste includes municipal solid waste generated by the nearly 99,000 households in Harford County. Residential waste does not include dead animals, bulky wastes, and vehicle tires, which are described separately in subsequent sections. Licensed refuse haulers in Harford County collect and deliver residential waste to the Eastern Sanitary Landfill located in Baltimore County, Maryland. Most rear- and side-loading collection vehicles in the County collect "household waste" curbside from single family homes.

Residents of Harford County may also self-haul their refuse to the HWDC, which includes a homeowner drop-off area (HODO). Residents place their waste into one of five (5) 50 cubic yard roll-off containers. These containers are hauled from the HODO, by facility personnel, to either ESL or the HWDC landfill for disposal.

3.4.2 Commercial Waste

Commercial waste includes waste generated by private businesses and institutions, including government facilities, schools/colleges, and nonhazardous waste generated by industry. Licensed refuse haulers in Harford County collect and deliver commercial waste to ESL. Front-load collection vehicles are typically used to collect commercial waste from businesses, institutions, apartments, and some townhome communities that have dumpsters where waste is placed and collected. Waste generated by the APG is also considered commercial waste.

3.4.3 Land Clearing and Construction and Demolition Debris

Land clearing and construction and demolition (C&D) debris (also known as rubble) include stumps, woody vegetation, rock, soil, masonry, asphalt, brick, glass, plastics, mortar, treated and untreated wood, gypsum board, and scrap metal. Land clearing and C&D debris generated in Harford County are disposed of in privately owned and operated rubble landfills outside of the County. Harford County policy does not permit land clearing and C&D debris to be accepted at ESL or HWDC, except for small quantities of C&D that is self-hauled by individual residents from projects at their primary residence. As of January 2024, there are no private facilities within the County licensed to accept land clearing and C&D debris for disposal.

3.4.4 Controlled Hazardous Substances

Under Maryland regulations, the term Controlled Hazardous Substance (CHS) is used synonymously with the term hazardous waste. Section 26.13.02.03 of COMAR provides the specific definition of hazardous waste as a substance that conveys toxic, lethal or other injurious effects, causes sub-lethal alterations to plants, animal or aquatic life, or may injure humans.

Special Medical Waste (SMW) is also classified as a CHS by MDE and is defined in Section 26.13.11.02.B(11) of COMAR as a solid waste that is composed of anatomical material, blood, blood-soiled articles, contaminated material, microbiological laboratory wastes, or sharps (i.e., syringes, needles, surgical instruments, etc.) not otherwise excluded under Section 26.13.11.03 of COMAR. SMW is typically generated by hospitals and clinics, nursing facilities, doctor and dentist offices, and veterinary clinics. SMW does not include residential or commercial wastes, ash from authorized medical waste incinerators, or wastes from animals not suspected of carrying diseases infectious to humans.

CHS wastes are not permitted to be disposed of in a municipal solid waste landfill; instead, CHS must be handled, stored, collected, transported, processed, and disposed of in specific ways according to State and Federal regulations and guidelines. CHS waste is collected separately by private haulers and taken out of the County to treatment facilities or hazardous waste disposal sites. Manifests are required to accompany waste shipments, which must be signed and verified by the generator, transporter, and disposal or treatment facility. The management of CHS and SMW is not under the jurisdiction of Harford County and therefore this information will not be addressed in this Plan. MDE tracks the generation of CHS and maintains a database that includes CHS generators and the types and volumes of CHS generated.

For purposes of this plan, CHS does not include household hazardous waste (HHW). HHW is hazardous waste generated by residential users in small quantities, whereas CHS wastes are produced in larger quantities by businesses, industry, and institutions. Examples of HHW materials include oil-based paint, solvents, fuel, caustic cleansers, acid, mercury containing items such as thermometers and thermostats, pool chemicals, herbicides, pesticides, and other materials which may cause harm if not safely handled or managed. It is permissible, under current State and Federal regulations, for residents to dispose of some HHW in a municipal solid waste landfill. Harford County encourages the separate collection and management of HHW, and typically holds quarterly HHW collection days

to provide County residents with a convenient and safe disposal option for these materials.

3.4.5 Dead Animals

Dead animals include animals that have been hit and killed by a vehicle, often left by the side of the road. Dead animals are collected by the State Highway Administration and Harford County Highways and disposed of at the HWDC landfill.

3.4.6 Bulky Wastes

Bulky wastes are materials that are large and typically collected separate from residential and commercial wastes. Bulky waste includes furniture, large household appliances (white goods), and scrap metal items. County residents and businesses may recycle white goods, swing sets, metal furniture, bicycles, lawn mowers and tractors, air conditioners, and other metal scrap at the HWDC. White goods delivered to HWDC by residents and private haulers are separated from other materials for refrigerant removal. White goods are then compacted and stored for pick-up by a contractor. The contractor transports these items to a metal processor.

3.4.7 Vehicle Tires

Scrap tires are defined in COMAR 26.04.08.02 (17) as "any tire or part of it that no longer is suitable for its original intended purpose by virtue of wear, damage, or defect, excluding scrap tire parts…" Residents may dispose of scrap tires at the HWDC. Commercial establishments may dispose of scrap tires with privately-owned licensed scrap tire haulers or acceptance facilities.

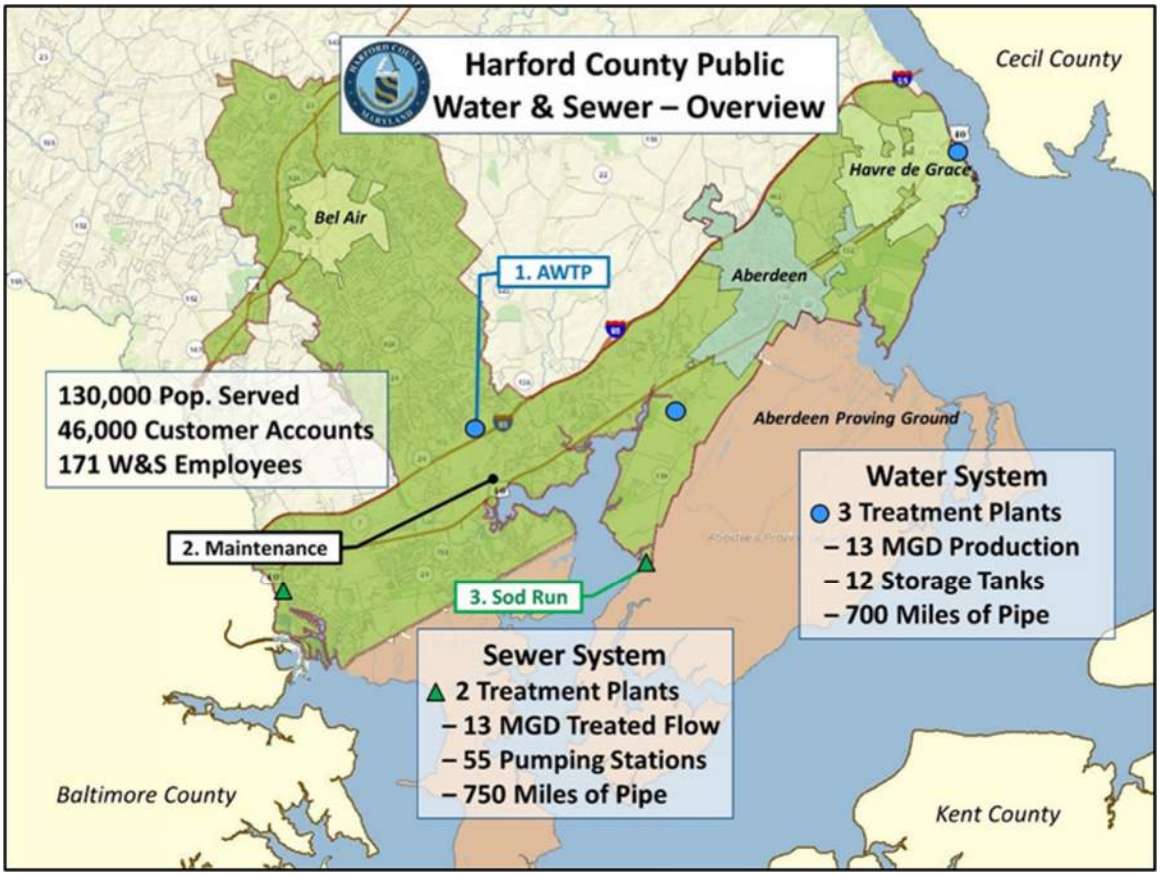
3.4.8 Septage and Sewage Sludge

Septage is the liquid and solid material pumped or removed from chemical toilets, septic tanks, seepage pits, and privies, cesspools, holding tanks or other facilities that receive sewage. Both MDE and Harford County require that septage be collected and treated as raw sewage at a permitted wastewater treatment plant (WWTP). This material generated in the County is processed and treated at the Sod Run Wastewater Treatment Plant (Sod Run) located southwest of Perryman in Harford County.

In 2023, nearly 23,000,000 gallons of septage was received at Sod Run. This includes material collected from septage tanks, holding tanks, and grease traps. Sewage sludge is a by-product of the wastewater treatment process and is regulated by MDE. This material is further treated at Sod Run to meet EPA pollutant and pathogen requirements. Treatment of the sewage sludge consists of thickening, thermophilic anaerobic digestion (stabilization), dewatering, and air drying, which generates Class B biosolids. The Class B biosolids generated are applied to land in Maryland (sewage sludge utilization permit 2019-STF-5853) and Pennsylvania (PAG 08 – 9909) by a private company. If the biosolids do not meet the requirements for land application, the County is authorized to dispose of them at the Modern Landfill in York County, Pennsylvania. In 2023, nearly 16,000 wet tons of biosolids were generated by Harford County. Additionally, sewage sludge from the Joppatowne Wastewater Treatment Plant is conveyed through the sanitary sewer system to Sod Run for processing. Sludge from the County's Spring Meadows Wastewater

Treatment Plant is also transported via a County-owned tanker truck to Sod Run for processing.

Figure 8. Overview of Water and Wastewater Management System in Harford County



3.4.9 Other Waste

- **Water Treatment Plant (WTP) Residuals** – Water treatment systems that use surface water as their source (i.e., streams, rivers, reservoirs, etc.) produce residuals or sludge as a waste by-product of the treatment process due to the removal of suspended solids in the surface waters. Three (3) surface water treatment systems are currently operated in Harford County. Select information about these facilities is provided in **Table 7**.

Table 7. Management of Residuals from County Water Treatment Plants

Facility Name	Surface Water Source	Residuals Treatment
Abingdon WTP	Loch Raven Reservoir Susquehanna River	Conveyed via sanitary sewer system to Sod Run for treatment; land applied by private company
Havre de Grace WTP	Susquehanna River	Transported to Sod Run and mixed in sludge lagoon; land applied by private company
Perryman WTP	Groundwater wells	Managed by activated carbon and removed by contractor

Other WTP's in Harford County, including APGN Building 250, and the City of Havre de Grace manage their own residuals and do not use the County wastewater treatment system for processing of the material.

- **Used Oil and Antifreeze –** Used motor oil and antifreeze are generated primarily from the operation of motor vehicles by individuals, businesses, and institutions. Waste oil and antifreeze are collected for recycling by Maryland Environmental Service (MES) under an Intergovernmental Agreement with Harford County. Under this agreement, MES maintains nine (9) drop-off sites that residents can use to dispose of oil and antifreeze. Additionally, the County accepts used oil and antifreeze at the HWDC. MES picks up the used materials at each site, including the HWDC, for recycling. The used oil is sold for industrial boiler fuel, used in hot mix asphalt, or used in cutter stock for oil fuel burners. Certain industries such as pulp and paper mills and electric utilities use the recycled fuel oil. Used oil may also be refined for use again as motor or other lubricating oil. Used antifreeze is recycled to eliminate contaminants, and additives are used to restore its antifreeze qualities for reuse. Under the Harford County used oil and antifreeze collection program, about 535 tons of used oil and antifreeze were collected for recycling in 2022. Used oil and antifreeze is also collected by commercial and institutional vehicle maintenance and repair facilities, though the volume of used oil and antifreeze collected by these facilities is unknown.

- **Agricultural Wastes –** Wastes generated by agricultural practices include slash from timber operations, organic residues from crop production, livestock manure, and containers from agricultural chemicals. Most of these wastes are reused and recycled onsite at the farm or agricultural facility where they were generated and are not collected for disposal. Agricultural waste generation is not a significant solid waste management issue in Harford County and is not specifically addressed in this plan.

- **Fluorescent Lights –** Historically, fluorescent and compact fluorescent lamps have provided efficient and cost-effective lighting solutions for businesses and residents.

However, these lighting products can be hazardous as they contain mercury. Harford County has implemented a permanent program whereby fluorescent and compact fluorescent lights are collected and recycled to facilitate the protection of public health and the environment. This program provides recycling solutions to residents, commercial entities, County facilities, and any other entities that produce these lighting products. Residents are encouraged to transport fluorescent lamp tubes and compact fluorescent lights (CFLs) to the HWDC or to one of the County's Household Hazardous Waste (HHW) collection events for recycling. All fluorescent light tubes and CFLs are packed into large-capacity boxes especially designed for the lights. The full boxes are picked up by the County vendor and taken to a processing facility. Additionally, some local retail stores may provide fluorescent light and CFL recycling services.

- **Latex Paint –** Latex paint is a common type of paint that is used at residential and commercial properties. Latex paint is not considered hazardous, but typically requires special handling in liquid form. When possible, the County encourages residents to let unwanted latex paint dry out to become a solid using kitty litter, wood chips, or sawdust. Once dry, residents are encouraged to dispose of latex paint with their regular household garbage. Residents may also drop-off latex paint at the HWDC for disposal. Latex paint received at the HWDC is placed in a lined container prior to disposal.

3.5 SPECIAL PROGRAMS

3.5.1 Multi-Family Residential

3.5.1.1 Program Specifics

The Annotated Code of Maryland, Environment Article §9-1711(b)(1) requires that each owner of a multi-family residential property shall provide for the collection of recyclable materials from residents and removal of the collected material for further recycling.

The County has identified 65 apartment buildings and 55 condominiums that fall within the scope of this recycling plan. The County provided notice of recycling requirements to the Responsible Parties prior to law implementation. Each Responsible Party was informed that it must develop and maintain a recycling program which meets the following minimum requirements:

- Provide for the collection and recycling of acceptable items, as identified under the County's single-stream recycling program.

- Provide all containers, labor, and equipment necessary to collect the recyclables throughout each building; an appropriate quantity of suitably sized containers must be provided to accommodate the quantity of recyclable materials generated by residents based upon the frequency of collection.

- Collect recyclable materials a minimum of once per week and transport them to secondary recycling markets.

- Submit an annual report detailing the quantity of recyclables collected and where materials were transported upon request from the County's Office of Recycling.

3.5.1.2 Program Monitoring and Enforcement

The Harford County Department of Public Works, Bureau of Solid Waste Services monitors apartment and condominium building recycling programs for compliance with the Harford County Code §109-7.2 Collection of recycling at apartments and condominiums.

The County has the right to inspect any apartment or condominium building subject to the multi-family recycling requirement and may issue a citation for non-compliance. Each Responsible Party is required to perform the tasks necessary to achieve compliance with its recycling program with state and county law.

Any Responsible Party who violates this requirement may be subject to the issuance of a citation by the County and a civil penalty not to exceed $50 per day for each day that a violation continues.

3.5.2 Office Buildings

The Annotated Code of Maryland, Environmental Article §9-1714(a)(1) defines an office building as a building that has 150,000 square feet or greater of office space. Further guidance provided by MDE states that "when there are two buildings under the control of one person/entity that together equal 150,000 sq. ft. or more of office space the law applies, even if each building is less than 150,000 sq. ft.; and "because (1) the bill addresses requirements for "buildings that have 150,000 sq. ft. or greater of office space" and (2) an "office building" means a building that has 150,000 sq. ft. or greater of office space" an owner would be required to provide for recycling for the entire building. The bill does not mention limiting the recyclable requirements only to the office space portion, rather the bill's requirements apply when any building contains 150,000 sq. ft. or greater of office space;" and "any building with less than 150,000 sq. ft. of office space is not subject to the requirements."

The Harford County Department of Public Works, Bureau of Solid Waste Services, through its solid waste management operations contractor, maintains a list of all office buildings within Harford County of 150,000 square feet or greater. The list of impacted office buildings is updated annually.

Monitoring of recycling receptacles is carried out by the office building owners and/or tenants. Each year, the Harford County Office of Recycling contacts affected office building owners or their management companies to identify the service provider and verify that single-stream recycling services are provided.

3.5.3 Roadside Litter

The Harford County Bureau of Solid Waste Services is responsible for the Harford County roadside litter control program. Staff supporting this program are responsible for picking up litter at the HWDC and litter and illegal dumping along County roadways. Staff is assisted by County citizens sentenced to community service hours by a judge following conviction for a petty crime, misdemeanors, or as part of the Absent Parent Program.

Additionally, Harford County has a successful Adopt-A-Road program, whereby residents, groups, and companies adopt a portion of a County road in their community and agree to collect roadside litter at a specified frequency. The County provides supplies and materials for these residents to safely collect litter.

In 2022, the Adopt-A-Road program included over 100 different organizations or individuals cleaning up 175 miles of County roads. These clean-up efforts resulted in nearly 8,400 pounds of solid waste and 2,900 pounds of recyclable materials collected. The Maryland State Highway Administration is responsible for the collection of roadside litter along all State roads and has a similar adopt-a-road program to the County.

3.5.4 Educational Institutions

The responsibility for planning and implementing public school recycling within Harford County is a cooperative effort between the Harford County Government, Bureau of Solid Waste Services, Harford County Public Schools (HCPS) and the Harford Community College (HCC). Both HCPS and HCC have established comprehensive recycling plans and programs in their respective school systems.

3.5.4.1 Harford County Public Schools

HCPS is comprised of 53 elementary, middle, and high schools, administrative offices, and grounds maintenance facilities. HCPS has incorporated recycling activities at all levels of their operation. Key recycling priority items include the following:

- Establish recycling requirements as part of HCPS's disposal contract.
- Leverage partnerships with private entities for alternative funding sources for recycling activities.
- Implement conservation procedures that include guidelines for waste reduction and recycling.

The central aspect of HCPS's strategic plan is its single-stream recycling program, which was implemented at all school facilities at the start of the 2009/10 school year. As part of this program, recycling containers are strategically placed throughout each school and support building. The recycling program is "single-stream," whereby all acceptable recyclable materials may be placed in the same container for recycling. This type of program facilitates use of the program and can encourage the recycling of more materials. HCPS's Environmental Leadership Program is responsible for the oversight of all HCPS waste diversion and recycling programs.

The HCPS single-stream recycling program is only one part of the school system's comprehensive recycling strategic plan. HCPS has implemented recycling programs for other materials, including computers and electronics, displays and monitors, audio-visual equipment, printers, scanners, and copiers. Additionally, motor oil, antifreeze, batteries, scrap metal, fluorescent lamps, and cooking oil are recycled. The recycling of these materials is done through contracted vendors who collect and manage the materials.

HCPS's single-stream recycling program includes standard recycling containers that have been placed in each classroom and work area throughout the school system. Additionally, the HCPS's recycling program includes recycling opportunities in school common areas such as cafeterias, theaters, cluster or pod areas, and school lobbies. Large, wheeled recycling collection containers were purchased for the custodial staff to collect and consolidate recyclable materials from all locations throughout each school or facility for placement in dumpsters outside the schools for collection by a private hauler. HCPS purchases and maintains all recycling containers.

Although not required under the 2009 amended Annotated Code of Maryland, Environmental Article 9-1703, HCPS partnered with the Harford County Department of Parks and Recreation to implement recycling collection at all school sports fields and stadiums throughout the county.

The recycling program is a component of the HCPS Energy and Resource Conservation policy which is mandatory for all schools. Each school has a designated Resource Conservation Administrator (RCA) who is responsible for overseeing policy compliance at the building level. The Resource Conservation Manager for the school system is responsible for working with all RCAs to facilitate system-wide compliance.

The Resource Conservation Manager conducts inspections, reviews service levels, investigates reported or unreported pick-up and disposal complaints, meets with HCPS staff and contractors to educate or review practices, and review contractor compliance with the school recycling contract at least once each year. Any issues which arise that are deemed deficiencies on the part of the contractor are detailed in writing and reported to the contractor. The contractor must initiate actions to correct all deficiencies found within 30 days of notification. If deficiencies are not being satisfactorily corrected, HCPS may take over service and pursue its completion, by contract or otherwise, and the contractor shall be liable to HCPS for all cost incurred.

The Harford County Office of Recycling (HCOR) Education Program worked with HCPS staff to expand the recycling education program throughout the school system. Before the expansion, recycling education only occurred in fourth grade. With the expansion, all students in pre-kindergarten to twelfth grade receive some level of recycling education. HCOR works in conjunction with the Maryland Association of Environmental and Outdoor Education curriculum to assist schools in attaining Green School Certification. As of 2024, 37 HCPS schools participate in the certification program. The County also supports the Harford County Envirothon that helps high school students learn about the environment and natural world through hands-on research and study.

3.5.4.2 Harford Community College

Harford Community College (HCC) is located in Bel Air and includes a facility at Aberdeen Proving Grounds and property utilized by Towson University. The overall recycling strategic plan in place at HCC focuses on a variety of recyclables that are included in HCC's recycling program to significantly reduce the amount of trash that would otherwise require disposal. This program applies to all existing and future HCC facilities.

HCC is a public, comprehensive, community-engaged institution of higher education. In cooperation with and with the support of Harford County Government, HCC has promoted the sustainability of recycling and solid waste management systems that includes maximum efficiency, economic vitality, and reduced environmental and human health impacts.

The college strives to reduce per capita waste generation and increase the recovery of recyclable materials. Recyclables in HCC's program must include, but are not limited to, mixed paper and cardboard. Other materials collected for recycling may include plastics (including plastic bottles and jugs such as water bottles and soft drink bottles, wide-mouth plastic containers and most other plastic items with the recycling symbol #1 through #7), glass food and beverage containers, and metal food and beverage containers. HCC has established a single-stream recycling collection program.

In addition to HCC's single-stream recycling program the college recycles computers, computer hardware, electronics, displays, monitors, audio-visual equipment, printers, scanners, copiers, motor oil, antifreeze, batteries, bulk scrap metal, fluorescent lamps, and cooking oil. These materials are collected and recycled by vendors under contract to HCC or delivered by HCC to the HWDC.

HCC has approximately 100 indoor and outdoor single-stream recycling containers. HCC is responsible for the purchase and maintenance of all recycling containers. The recyclable material collected at HCC is deposited into front loading or compaction containers located at the Maintenance Building by HCC's contracted custodial service. Currently the recyclables from HCC are processed and marketed under multi-year contracts with a private vendor. Additionally, HCC began participating in the Abitibi Paper Retriever fundraising program in May 2010.

HCC fully supports efforts to increase recycling awareness, participation, and environmental stewardship among students, employees, and visitors at all HCC facilities. Effective education programs and commitment strategies support the development of new daily habits and practices that will lead to an increase in recycling activities. HCC will continue to evaluate the overall solid waste and recycling programs on campus to facilitate continued and increased diversion of materials.

3.5.5 Special Events

The County supports recycling at special events including the Farm Fair, Italian Festival, and other smaller community events throughout the year. Recycling at special events poses challenges that include event sponsor support, container labeling and placement, attendee participation, and vector concerns. Special event recycling in Harford County typically includes separate "recycling" containers for attendees at events to place beverage containers. Additionally, special event recycling includes containers for vendors/suppliers to place corrugated cardboard for recycling. Each event host or sponsor arranges with a private hauler to service containers and deliver recyclable materials for processing.

3.6 WASTE IMPORT AND EXPORT

As discussed in Chapter 1, the majority of solid waste and source-separated recyclable materials are exported out-of-county for disposal and processing. Transporting waste to out-of-county disposal facilities is a decision made by Harford County Government to preserve landfill disposal space in the County. Waste transported out-of-county is directed to the Eastern Sanitary Landfill in Baltimore County. In 2022, 167,281 tons of waste was delivered to the ESL by Harford County haulers. Additionally, 19,264 tons of single-stream recyclables were transported to the ESL.

Harford County reports no imported waste entering the County as the County does not allow out-of-county waste to be disposed of at Harford County solid waste disposal facilities.

3.7 SOLID WASTE COLLECTION

Private hauling companies provide solid waste and single-stream recyclable materials collection services to residents, homeowners associations (HOAs), and business owners/operators in the County. Residents, HOAs, and business owners contract directly with a hauling company to provide regular curbside and onsite collection of materials. The County requires that all haulers operating in the County be licensed to collect solid waste. The licensing process requires the submittal of information to the County for review and the issuance of a license. Haulers must provide residential solid waste collection and single-stream recyclable materials collection services at a minimum of at least once a week to operate in the County. A list of private haulers licensed in the County to collect solid waste in 2023/2024 is provided in **Appendix G.**

Within Harford County there are four (4) incorporated municipalities that directly provide solid waste, recycling, and yard trim collection services to their residents. The following includes information about each of these community's collection programs:

- **Aberdeen Proving Ground** – The APG contracts with a private hauler for collection of solid waste and recyclable material from Garrison housing, office buildings, and research labs on their grounds. APG has established an Integrated Solid Waste Management Plan to guide solid waste management activities on their property.

- **City of Aberdeen** – The City of Aberdeen collects materials from approximately 4,600 households with municipal equipment and staff. In 2023, the City collected about 3,600 tons of trash and 1,200 tons of recyclable materials. The City anticipates continued growth over the planning period with the addition of over 500 new single-family and townhome residential units being developed.

- **City of Havre de Grace** – The City of Havre de Grace contracts with a private hauler for the curbside collection of trash and recyclable materials. Approximately 7,100 tons of solid waste were collected in 2023, the majority of which was disposed in a landfill. The City anticipates growth over the planning period with up to 1,500 single- and multi-family units being developed.

- **Town of Bel Air** – The Town of Bel Air uses their own equipment and staff to collect trash, recyclable materials, bulky waste, and yard trim from single-family households. The Town has 10 people dedicated to solid waste services that use the following equipment to collect waste: four rear-loader trash trucks, one stake body truck, and one forestry body truck with chipper machine.

3.8 ACCEPTANCE FACILITIES

The section describes facilities located in Harford County that accept solid waste for processing and disposal. This section also provides information on the Eastern Sanitary Landfill (ESL), located in Baltimore County, Maryland, which is the primary facility where solid waste generated in Harford County is accepted. Waste accepted at ESL is either landfilled at ESL or transferred for disposal at another facility, mainly out-of-state landfills. Single-stream recyclables accepted at ESL are transferred to the Baltimore County material recovery facility in Cockeysville, Maryland.

3.8.1 Harford Waste Disposal Center

The HWDC is located in the unincorporated community of Street, Maryland a rural area of northern Harford County. The 398-acre facility is County-owned and bounded on the north by Dublin Road (MD Route 440), on the west by Scarboro Road, and on the south by Sandy Hook Road. The HWDC's Maryland grid coordinates are N 719,100/E 1,510,500. The facility operates under Maryland permit No. 2022-WMF-0570. A layout and land use plan for HWDC can be found in **Appendix H**.

A number of services are provided at the HWDC including the following:

- MSW Landfill
- Homeowner Drop-off Area
- Mulch and Compost Facility

In addition to these core facilities and services, the HWDC site includes a scale and scale house, administrative offices, maintenance buildings, equipment storage areas, parking areas, leachate holding tanks, a stormwater management system, water and septic systems, groundwater monitoring wells, and borrow and stockpile areas for landfill daily cover material. Since August 2016, operations at the HWDC have been performed by the Maryland Environmental Service under an interagency agreement with the County.

While the HWDC is located in a primarily rural area, residential homes border the site along Scarboro Road and Dublin Road. The County has maintained a buffer between its landfilling and maintenance operations and the nearby residential community. The remainder of this section describes each facility on the HWDC property.

3.8.1.1 MSW Landfill

Solid waste management activities have occurred at the HWDC property since the 1950's. An unlined landfill referred to as the Scarboro Landfill was operated from 1956 to 1986. The County operated the landfill using a combination of open burning and trench

disposal methods. In late 1986, the Scarboro Landfill was closed in accordance with an MDE approved closure plan. The site is partially capped by the lined cells A and B of the newer HWDC landfill.

A permit for the first lined landfill cells at the HWDC Landfill was issued in 1985. These cells, designated A through J, are situated on approximately 39 acres of the HWDC property. The cells were constructed in several phases to meet demand for disposal capacity. Waste was actively disposed in these cells from 1987 to 2013. A closure plan for cells A through J was approved by MDE in 2014. Construction of the landfill cap was completed in 2016. The cap extends over most of the entirety of the old Scarboro Landfill. The total utilized capacity of Cells A-J is approximately 2.9 million cubic yards, nearly all of which was utilized at the time the landfill was closed.

Additional landfill cell capacity was approved by MDE by issuance of a new refuse disposal permit in October 2007. The expanded area includes additional landfill cells situated to the north, west, and south of cells A-J. Cell N1 was completed and began accepting waste in September 2011. Cell N2 was completed and began accepting waste in September 2015. Operation of these cells is under current Refuse Disposal Permit No. 2022-WMF-0570, which expires on November 1, 2027. The combined capacity of cells N1 and N2 is approximately 1,068,390 tons. Approximately 415,241 tons of waste have been disposed in cells N1 and N2 as of December 2022. In the past, the HWDC Landfill had received residential and commercial wastes generated in Harford County, along with ash residue from the waste-to-energy facility before it closed in 2016. Pursuant to the solid waste disposal agreement with Baltimore County, the majority of solid waste generated in Harford County has been delivered to the Eastern Sanitary Landfill in Baltimore County since 2016. Accordingly, waste disposal at the HWDC Landfill is minimized.

Topographic mapping of the HWDC landfill is performed annually using aerial photography. The mapping is completed at the end of each calendar year, allowing comparison to the survey from previous year in order to estimate the utilized and available capacity of the landfill cells. The rate of landfill utilization is reduced to less than 20,000 cubic yards per year. At current low fill rates, there will be available landfill capacity, in Cells N1 and N2, until at least 2038; however, any increase in filling will shorten the projected landfill life.

Additional landfill cell areas are included in the current refuse disposal permit. An additional cell, designated N3, is located adjacent to and to the west of cells N1 and N2. A separate group of landfill cells, S1, S2, S3, and S4 are located to the south of cells A-J. The combined capacity of these additional cells exceeds three million cubic yards. Construction of these cells will require relocation of already established facilities including the scalehouse, maintenance shop, homeowner drop-off, leachate storage facility, LFG flare, and the mulch and compost facility. Harford County has elected to utilize out-of-county disposal capacity rather than construct the new cells.

3.8.1.2 Homeowner Drop-Off Area

The HWDC includes a homeowner drop-off area that offers a variety of waste and recycling drop-off programs to residential self-haulers. Although most items may be dropped off without a charge, some items do require a fee for processing and management **Table 8** lists the materials accepted for disposal or recycling at the HWDC homeowner drop-off area.

Table 8. Materials Accepted at the HWDC

Single-stream recycling	Electronics	White goods
Used oil/antifreeze	Gasoline/oil mixtures	Batteries
Tires	Textiles	Propane containers
Asbestos	Fluorescent lights	Latex paint

The County has executed multiple contracts with private entities to provide processing, recycling, and/or disposal services for the management of materials collected at the HWDC. Additionally, the County hosts quarterly Residential Household Hazardous Waste Collection Days at the HWDC. These collection days are typically held in February, May, August, and November. The May and November events usually also include document shredding services. Residents must provide proof of Harford County residency in order to use this service.

3.8.1.3 Mulch and Compost Facility

The County's Mulch and Compost Facility (HMCF) operates under permit number 2021-GCF-002 which expires on March 27, 2026. The HMCF accepts yard trim from both residential and commercial customers. Yard trim material is defined as leaves, grass clippings, and woody debris (branches, garden trimmings, bushes, Christmas trees). Recovery of yard trim by processing into a high-grade compost and mulch is an integral component of Harford County's materials diversion program.

In 1992, Harford County imposed a ban on the landfilling or incineration of yard trim materials from residential and commercial generators. The ban prohibits yard trim from being collected with trash. As a result, separate yard trim collection by private haulers is required. Where collection by a private hauler is not available, drop-off sites have been set up at the HWDC for residents and businesses and the Tollgate Residential Yard Trim Acceptance Facility for use only by county residents.

The HMCF includes an 11-acre paved pad for processing approximately 30,000 tons of material each year. These quantities vary depending upon the amount and severity of storms. **Table 9** provides the annual quantities of yard trim processed at the HMCF for the last seven (7) years.

Table 9. Material Quantities Received and Processed at the Mulch and Compost Facility

Year	Quantity (tons)
2016	31,569
2017	29,202
2018	31,212
2019	33,368
2020	32,828
2021	27,635
2022	27,935

Mulch and compost products from HMCF operations are made available to Harford County residents and businesses. Residents may self-load up to three (3) 30-gallon bags or cans of mulch or compost per trip at the HWDC free of charge whenever it is available. Larger quantities can be purchased by residents and businesses for a fee.

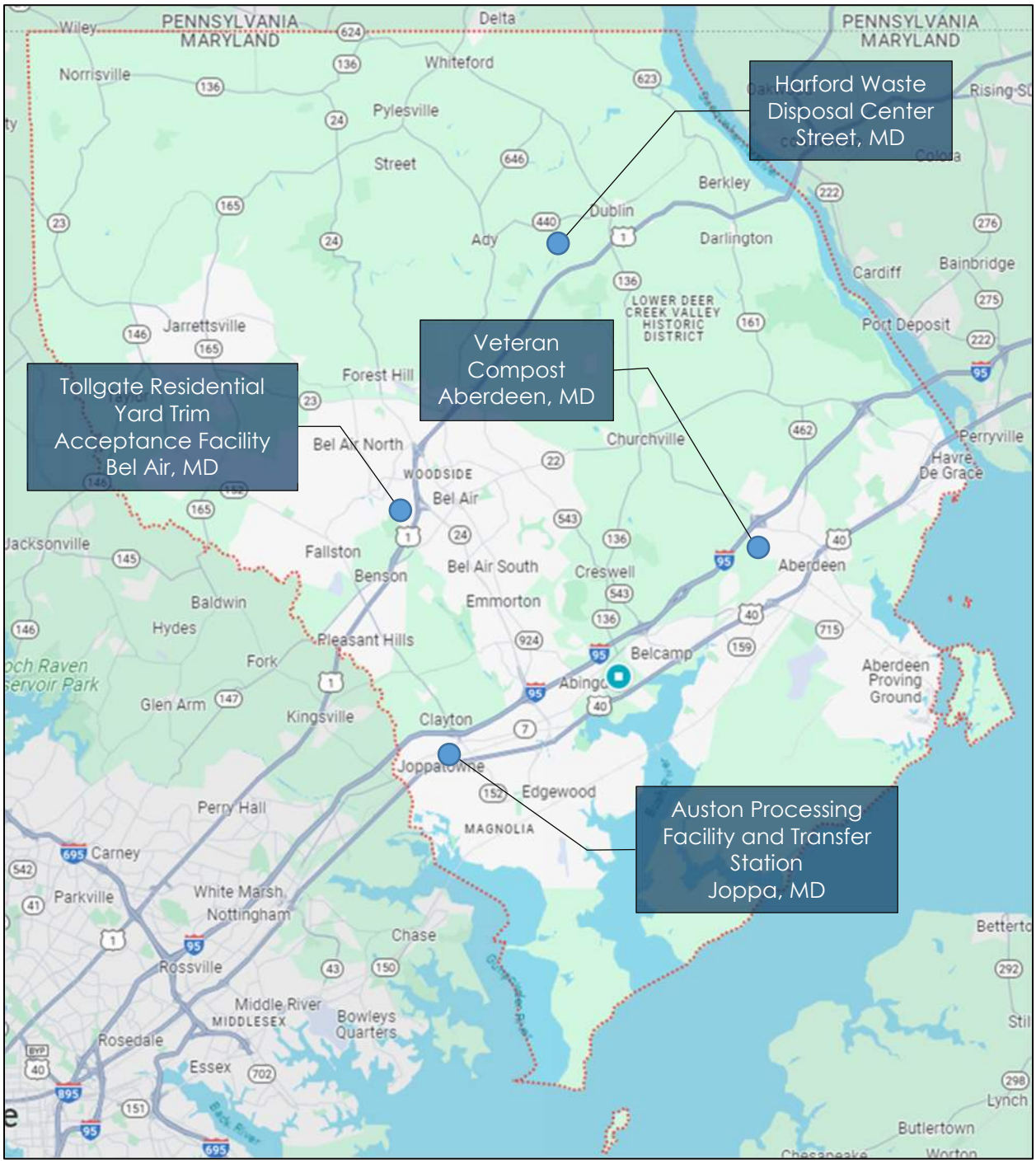
3.8.2 Auston Transfer and Processing, LLC

Auston Transfer & Processing, LLC operates a processing facility and transfer station that is permitted to accept C&D debris, land clearing debris, bulky waste, scrap tires (for transfer), and other recyclable materials. The facility is situated on an approximately 8.2-acre site located at 1202 Pauls Lane (MD Grid Coordinates: N 643,950 / E 1,495,700) in Joppa, Maryland. The permitted maximum amount of solid waste that can be accepted at this facility is 159,600 tons per year. According to their annual report, in 2021 the facility accepted 1,488 tons of C&D and 545 tons of scrap metal. The facility is currently operating under State of Maryland Refuse Disposal Permit No. 2023-WPT-0616 that expires on November 1, 2028.

3.8.3 Veteran Compost

Veteran Compost operates a Tier II compost facility that turns organic wastes such as wood mulch, manures, and food scraps into marketable compost. Garrity Renewables owns and operates a 30-acre site located at 328 Bush Chapel Road (MD Grid Coordinates: N 674,750 / E 1,538,830) in Aberdeen Maryland. According to the owner, the facility is home to the only large-scale worm composting system in the State of Maryland and the second largest food waste composting operation in Maryland. The permitted feedstock capacity is 24,000 tons per year. In 2023 the composting facility accepted 5,068 tons of food scraps and 1,300 tons of wood chips. The facility currently operates under General Composting Facility Permit number 2021-GCF-0011, which expires on March 27, 2026. In 2023, the facility produced approximately 2,250 tons of compost according to the annual report. **Figure 9** is a map of Harford County with each of these solid waste facilities noted.

Figure 9. Harford County Solid Waste Facility Map



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4. ASSESSMENT OF SOLID WASTE MANAGEMENT NEEDS

4.1 OVERVIEW

This chapter includes an evaluation of the existing County solid waste management system. It is important to understand if the existing system can adequately provide for the solid waste management needs of the County over the ten-year planning period, 2025-2034. Feasible alternative technologies, management techniques, and regulatory modifications that could be used to meet identified requirements are discussed. In addition, siting constraints for potential new management facilities are reviewed.

4.2 MANAGEMENT NEEDS – MUNICIPAL SOLID WASTE

As presented in Chapter 3, approximately 592,000 tons of solid waste and recyclables were generated in Harford County in 2022. In 2034, it is projected that Harford County will generate approximately 633,000 tons of solid waste and recyclable materials. Harford County has established an integrated solid waste management system that prioritizes waste avoidance and recovery over disposal. Key components of the County's solid waste management system include:

- Waste reduction;
- Recyclable material and yard waste diversion;
- Transfer to out-of-county disposal facilities; and
- In-County landfill disposal.

All these components are interrelated and integral to the current solid waste management system to protect public health and the environment. Each component of the system provides a valuable contribution to the County's solid waste management program.

4.2.1 Public Outreach and Education

Harford County annually advertises its solid waste and recycling offerings to residents through direct mailings, magazines, and the County's website. This section details the key components of the County's public education and outreach program.

4.2.1.1 Website

The Bureau of Solid Waste Services maintains web pages on the Harford County website to provide information on solid waste and recycling programs. Each page on the Harford County website includes a series of quick links for frequently searched information, including a quick link that directs users to the HWDC web page.

The County also maintains the web domain HarfordRecycles.org, which redirects to the County's recycling web page. This page includes in-depth information on the importance of waste reduction and diversion and provides specific information regarding all the diversion programs available for County residents.

The Bureau of Solid Waste Services web pages are frequently updated to highlight seasonal programs and events (e.g., Christmas tree recycling, grasscycling, etc.) to ensure residents have the most up-to-date information. The Harford County Reuse Guide and a list of frequently asked questions are also maintained on this website.

4.2.1.2 Print Media

The Office of Recycling places advertisements in the quarterly *Harford Magazine* on subjects such as single-stream recycling, business recycling, mulch and compost, and Christmas tree recycling. Print advertisements are also periodically published in The *Aegis* and *Baltimore Sun* to provide information about special events, such as household hazardous waste collection and tire collection events.

4.2.1.3 Social Media

Social media has become a critical tool for outreach and education. The Office of Recycling maintains a Facebook© page which encourages communication and engagement with residents and businesses concerning waste reduction and recycling opportunities. The Facebook© page allows the Office of Recycling to post interactive educational information, address questions, and promote recycling. The County uses contests and giveaways to encourage participation and discussion. The Office of Recycling will continue to maintain an active presence on social media networks.

4.2.1.4 School Outreach

The public school system recognizes the importance of recycling. The Office of Recycling provides teacher training and materials, presentations, and lessons for students at all grade levels, and assistance with special recycling events. School groups are also encouraged to visit the HWDC to see landfilling and recycling in action.

4.2.1.5 Community Outreach

Community outreach is another important aspect of the County's public education program. Community groups are encouraged to contact the Office of Recycling and schedule presentations and tours of the HWDC. In addition, the Office of Recycling participates in local expos, fairs, business events, and other special events to promote recycling.

4.2.1.6 Business Outreach

Businesses are encouraged to recycle through the Partners in Recycling program. This program recognizes businesses who are recycling with a display sticker, a listing on the Office of Recycling's website, and inclusion in media advertising. The Office of Recycling assists interested businesses with waste assessments and provides educational materials, and training sessions in waste reduction and recycling. The Office of Recycling offers onsite visits to discuss business recycling opportunities and the result on their bottom-line. Businesses that report their recycling numbers and are part of the Maryland Green Registry are recognized annually in an advertisement in Harford Magazine.

4.2.1.7 Public Opinion Survey

As part of the solid waste management plan development process, the County implemented a public opinion survey and asked residents for feedback on the existing solid waste management program. The purpose of the survey was three-fold:

- Understand how residents interact with the existing solid waste management program;
- Evaluate residents' satisfaction with the existing system; and
- Solicit feedback on how the current program can be improved.

The County promoted the survey to residents via the County's website, social media, and through other communication tools. The survey was only available via electronic means and was open from mid-December 2023 to mid-January 2024. The County received responses from 704 individuals. Key results of the survey are as follows:

- Nearly two-thirds of respondents said they were very satisfied or satisfied with the County's existing solid waste management system
- About 90 percent of respondents subscribe to the curbside collection of trash and recyclable materials
- 93 percent of respondents recycle at their home
- Of the respondents that do not recycle at home, the most common reasons were not believing recyclable materials are actually recycled and not having space in their home for recyclable materials
- 67 percent of respondents use the HWDC at least once annually
- The most common materials residents drop-off at the HWDC are bulky wastes and electronics

The complete results of the County's public opinion survey are included in **Appendix I.**

4.2.2 Waste Reduction

Waste reduction is the preferred method of solid waste management. Reducing the amount of waste generated lessens the burden on the solid waste management system by decreasing the amount of material entering the system. The County supports waste reduction efforts and encourages residents and businesses to implement waste reduction measures. Examples include using reusable bottles and bags, donating and purchasing second-hand goods, purchasing in bulk, not buying more food than you will eat, and going paperless for bills, magazines, receipts, etc.

4.2.3 Recycling

Appendix J presents the historical amounts of solid waste that has been diverted from the waste stream in Harford County since 2010. During calendar year 2022, over 169,000 tons of MRA recyclables were diverted from the waste stream and recycled. This equates to a waste diversion rate of 50.3 percent for the County. Additionally, over 198,000 tons of non-MRA recyclables were diverted from the waste stream and recycled. These rates are achieved under a voluntary recycling program.

4.2.3.1 Residential Sector

The County provides significant flexibility for residents living in single-family or small multi-family units to decide how waste and recyclable materials are collected and managed. The County does not prescribe what programs or services residents use to manage their solid waste. Two main types of programs exist and are available to residents as follows:

- **Curbside Collection** – The curbside collection of waste and recyclable materials is provided through a free enterprise system. Residents contract for collection services provided by a hauler of their choice from the list of haulers licensed to collect solid waste and recyclable materials in the County. Residents collaborate with their selected hauler to determine the type and frequency of the service. County Code stipulates that all licensed trash collectors collect residential curbside waste and single-stream recyclable materials, separately, at least once per week. Residents pay the hauler directly for the services provided.

- **Self-Haul and Drop-Off** – Residents who do not subscribe to a curbside trash collection service may self-haul trash, single-stream recyclables, and other recyclable materials to the HWDC HODO. Residents using this service pay a fee to drop-off trash and other select materials. Residents may deliver an unlimited amount of recyclable materials to the HODO at no charge.

As discussed in Chapter 3, the State of Maryland requires owners or managers of apartments and condominiums with 10 units or more to provide weekly recycling services to tenants. In response to this requirement, Harford County enacted a parallel requirement for apartment and condominium owners in the County (Bill No. 15-003). Mandated properties are inspected by County staff annually for compliance. The Office of Recycling provides guidance to help bring all properties into compliance.

Although Harford County's existing solid waste program provides for the collection of single-stream recyclables through both curbside and drop-off programs, there are still opportunities to increase the quantity of materials being diverted.

As described in Section 4.2, Harford County promotes the availability of recycling services regularly through public education and outreach programs. Despite education and outreach efforts, some residents choose not to participate. The County identified the following programs or policies for study that may increase public participation in the single-stream recycling program:

- **Mandatory Recycling** – Imposing mandatory recycling would likely increase residential recycling participation and quantities. Mandatory recycling would require additional staff to monitor and enforce and is likely to be unpopular with many residents.

- **Franchised Collection** – Another method that could increase participation is the County-wide contracting of curbside collection so that all residents are provided with curbside recycling services. This would make recycling more convenient for residents but would interfere with the current free-enterprise system.

- **Unit-Based Pricing for Solid Waste Collection** – Unit-based pricing for solid waste services, also known as "pay-as-you-throw," can be effective to encourage recycling when carefully implemented. When trash fees are based on the quantity of materials generated, there is often a reduction in discarded trash and an increase in recycling. Implementation can require residents to purchase special trash bags or stickers. Bag and sticker programs can be controversial because some may perceive it to be a new tax. Additionally, there are concerns that illegal dumping will increase, though there has not been evidence of that in communities that have instituted such programs.

4.2.3.2 Commercial Sector

Harford County does not provide solid waste and recycling collection services to commercial properties in the County. Business owners and/or operators contract directly with the licensed solid waste hauler of their choice to provide for the onsite collection of solid waste and recyclable materials. Businesses and their selected hauler establish container sizes and collection frequencies that are unique to each business.

Businesses are also encouraged to join the Maryland Green Registry, a free, voluntary program administered by MDE. The Maryland Green Registry offers tips and resources to help businesses and other organizations set and meet their own goals on the path to sustainability. Businesses can also access the Recycling Market Directory at mdrecycles.org to find markets for recyclable materials.

Recycling is voluntary at most businesses in Harford County. However, the Annotated Code of Maryland requires that recycling be provided for any office buildings over 150,000 square feet. The Bureau of Solid Waste Services has established a list of properties subject to this requirement and updates it annually. No properties in the County are currently subject to this requirement. If any properties in the County become subject to

this requirement in the future, the Office of Recycling will contact the building owners or their management companies to confirm recycling services exist and to gather details about the program.

Although the County encourages businesses to recycle through their public education and outreach programs, opportunities remain to increase recycling in the commercial sector. Mandatory recycling in the business sector would probably increase recycling rates; however, this would require additional staffing to monitor and enforce. In preparing the annual report required by the MRA for submittal to MDE, many businesses do not respond to inquiries about their recycling efforts. While some businesses may not respond if they don't recycle, other businesses do not want to expend the time and effort to gather this information and some simply choose not to share their recycling information. Mandatory reporting would make it possible to report recycling efforts more accurately in the County and could provide incentive to businesses to recycle.

4.2.3.3 Department of Parks and Recreation

The Harford County Department of Parks and Recreation is responsible for public parks, facilities, trails, and other lands in the County. Additionally, the Department of Parks and Recreation works in partnership with Harford County Public Schools to maintain sports fields and stadiums at all public schools in Harford County. Among other conservation measures, the Department of Parks and Recreation prioritizes recycling as part of their planning activities. Department Goal PR--6 of the strategic plan states "Incorporate sustainable development and conservation practices in all Parks and Recreation parks and facilities." Under this goal, the Department of Parks and Recreation implemented a system-wide single-stream recycling program that includes all sites managed by the Department of Parks and Recreation and stadiums in the public school system[3].

4.2.4 Collection

Alternatives for the curbside collection of waste, recyclables, and yard trim include the free enterprise system, franchised collection, and public operation. Each of these collection options is described below to provide a basis for evaluating the County's existing collection system. It should be noted that the analysis only considers the collection of residential waste. The County's solid waste management system is designed to provide services to residents, not meet the needs of private businesses participating in the local economy. Additionally, each business has unique waste management needs that are best met through a system whereby private entities provide specialized and tailored services to meet these needs.

4.2.4.1 Assessment of Collection Alternatives

4.2.4.1.1 Free Enterprise System

The free enterprise system is the current collection system used in the County. It gives residents the flexibility to select the private waste hauler of their choice based on

[3] Harford County 2022 Land Preservation, Parks and Recreation Plan; https://www.harfordcountymd.gov/DocumentCenter/View/24501/2022-Land-Preservation-Parks--Recreation-Plan

available free market participants. Residents select the desired services provided by the hauler and pays them directly for those services, which are typically provided curbside. Harford County's residential waste and recyclable materials collection system has operated as free enterprise for many decades. Residents who do not contract with a private company can self-haul their solid waste to the HWDC for disposal. Harford County has established a licensing program and flow control that requires haulers to dispose of waste at the ESL. The purpose of flow control is to establish a steady revenue stream that supports the cost to operate the disposal facility as well as the costs for programs such as homeowner convenience centers, recycling services, maintenance facilities, administrative and engineering staff, public outreach, mulch and composting programs, litter control, and post-closure care and maintenance of closed landfills.

i. Advantages

The advantages of a free enterprise system include the following:

- **Control** – Residents and commercial establishments are free to select the waste hauler of their choice. No government entity dictates what hauler must be used.
- **Flexibility to Change Service Providers** – Residents and businesses have the flexibility to change service providers for unsatisfactory service or any other reason, often at any time.
- **Facilitates Competition of Smaller Haulers** – A free enterprise system can provide opportunities for smaller haulers to compete for business. Often smaller haulers do not have the equipment and staff to collect large communities. A free enterprise system gives these haulers the chance to work with customers on an individual basis.
- **Limited Government Resources** – In a free enterprise system, the local government does not need to spend significant resources to support a local waste management collection system. There are no contracts to manage and few complaints to address as residents and haulers work directly together to make the system work.

ii. Disadvantages

The disadvantages in a free enterprise solid waste collection system include:

- **Overlapping Routes** – Neighborhoods/streets will often be serviced by multiple waste haulers each day and possibly multiple days a week.
- **Reduced Efficiency** – In terms of labor, equipment, operation, and maintenance, a free enterprise system is potentially less cost effective and less efficient than a system with assigned routes that do not overlap.
- **Environmental/Quality of Life Impacts** – This type of system results in increased impacts to the environment through the production of more noise, greater

greenhouse gases due to route overlaps, more wear and tear on public roads, and increased traffic congestion.

- **Increased Costs** – Inefficiencies and additional fuel consumption costs experienced by haulers are passed on to the consumer. This potentially increases the cost for services that would otherwise be lower if a community franchised collection system were in place.

- **Revenue Uncertainty** – In a free enterprise system, haulers assume an inherent risk in their revenues due to the uncertainty in the number of customers serviced. The costs associated with this risk and the cost for marketing their services are included in the price paid by the consumer.

The lack of government involvement with the free enterprise system makes it hard to control costs as prices are set by haulers and are not negotiated as part of a jurisdictional contract. Limited competition in an area or region may result in higher costs for these services.

Flow control can be difficult to enforce under a free enterprise system. For jurisdictions that have enacted flow control, service fees are often based on an estimated quantity of waste to be disposed at a designated facility. Service fees, coupled with disposal tipping fees, often provide the revenue needed to support operations and capital investments. If estimated disposal quantities are not received at a facility due to haulers not complying with flow control, revenues may be insufficient.

Free-enterprise programs typically do not have staff focused on monitoring collections, so enforcement of collection rules can be challenging. Whether it is the number of collections per week, collecting waste and single-stream recyclables separately, or delivering materials to the designated facility, there is little recourse to hold haulers accountable.

4.2.4.1.2 Franchised Collection

Under a franchised collection system, a community is geographically divided into multiple areas or districts. The jurisdiction publicly procures collection services from private haulers for each area/district for a specified contract term. Municipal staff would select the hauler that provides the best value for the services requested. The jurisdiction may select a single hauler for all areas/districts or select multiple haulers, each having the responsibility to collect materials in a designated area/district.

The jurisdiction would employ staff to administer the contracts, establish a customer call center, and inspect routes to confirm all residents are serviced on their scheduled collection day. A jurisdiction directly bills each homeowner to cover the cost of the program.

Many counties near Harford County, as well as some communities in the County, use a franchised collection system for waste and recycling collection service. Counties with this type of system include Howard, Anne Arundel, Frederick, Baltimore, Montgomery, and Prince George's counties.

A franchised collection system typically includes all single-family residential housing and multi-family housing up to a certain number of units (typically four (4) or six (6)). Larger multi-family properties are typically managed as part of the commercial collection program, which may also be a franchised collected system. The contracted hauler for each area/district establishes routes and maintains the same collection schedule for the contract period. In some cases, the contractor may be required to provide residential collection containers for trash and/or recycling. The contract includes performance standards for the services provided with associated penalties for missing the standards.

In establishing a franchised collection system, consideration needs to be given to communities with homeowner associations and how those communities would be provided service. HOA requirements may not be compatible with the specifications of a franchised collection contract. Additionally, many of these communities are only accessible by private roads.

i. Advantages

- **Potentially Reduced Costs** – The elimination of overlapping collection routes and the competitive bid process results in efficiencies that should lower the overall cost for communities and residents.

- **Controlled Pricing** – The cost paid to haulers operating in a franchised collection system is established in the contract. While there may be pricing contingencies that allow for consumer price index adjustments and various surcharges as markets change, pricing is tightly controlled.

- **Improved Quality of Life** – More efficient routing for collection vehicles results in less fuel consumption and a corresponding reduction in emissions. Additionally, traffic and noise issues are abated by limiting haulers in a particular area.

- **Guaranteed Customer Base** – Haulers participating in franchised collection systems have a guaranteed number of customers in their service area over the specified contract period. These customers would not have the liberty to hire another company to take the franchised haulers' place.

- **Established Services –** A franchised collection system gives jurisdictions the ability to establish service expectations, such as hours of collection, by inclusion in the contract. Future state regulations may require increased recycling rates and additional waste diversion methods such as separate food waste and yard waste collection. A contracting system is well-suited to implement such programs quickly, efficiently, and uniformly.

- **Mandatory Participation** – Typically, franchised collection systems require all residents living in a community to participate in the system. Mandatory participation in the solid waste system can reduce the occurrence of vagrant dumping, roadside litter, and the import of waste generated outside the jurisdiction. It can also relieve the burden on existing homeowner convenience centers which experience significant traffic congestion on weekends.

- **Facilitates Cooperation Among Public-Private Entities** – Contracted collection systems facilitate cooperation and balance between government involvement and private business, thus creating a public-private system.

ii. Disadvantages

- **Less Control** – Under this system, residents do not have choice in the selection of their waste hauler. All residents must use the service required by the jurisdiction through the franchised collection system.

- **Administrative Costs** – Jurisdictions need to allocate staff resources for contract management to confirm contractor compliance.

- **Impact on Smaller Haulers** – Franchised collection systems have the perception of favoring larger haulers that have more equipment, staff, and resources to service a community. Unless a system is set up to allow smaller haulers to compete, a franchised collection program may limit their participation in the system.

4.2.4.1.3 Public Operation

In a publicly operated solid waste collection system, solid waste services are provided directly by the jurisdiction using their own equipment and personnel. There are many similarities between this system and the franchised collection system regarding billing, customer call numbers, and inspections.

i. Advantages

- **Control** – Public operation of the collection system provides the County with the most control over solid waste management.

- **Cost for Residents** – Program costs of public operation typically do not include a mark-up on expenses as is typically the case when services are provided by the private, for-profit sector. This has the potential to provide residents with service at a lower cost than that of a private hauler.

ii. Disadvantages

- **Cost to County** – Solid waste collection operations have significant capital and operational costs. This includes having multiple trucks and other equipment available to collect the waste. It also includes hiring and retaining staff to provide the collection services. Additional costs for insurance, workers' compensation claims, and administrative support will also increase costs for the County.

- **Recruiting and Training Staff** – Labor markets since the COVID-19 pandemic in 2020 have remained challenging, particularly for solid waste companies providing collection services. Operating solid waste collection equipment requires specialized training and skills that make it difficult to recruit drivers.

4.2.4.2 Evaluation of the Existing Collection System

The County's solid waste collection system currently operates as free enterprise. The Town of Bel Air and the City of Aberdeen have a publicly operated residential solid waste/recycling collection service. The City of Havre De Grace franchises their collection system.

As a result of its close alliance with private businesses and its current philosophy of encouraging a free enterprise system, Harford County Government will continue with a free enterprise system for the collection of trash and recyclables. Consideration of other collection alternatives would occur if changes in the regulatory environment or lack of competition necessitate such changes.

4.2.5 County-Provided Solid Waste Disposal Systems

4.2.5.1 HWDC Landfill

A sanitary landfill contains compacted solid waste within an enclosed lined area to minimize potential adverse environmental impacts. All landfills in Maryland must satisfy requirements established for construction, operation, maintenance, expansion, modification, and closure as stipulated by MDE.

Despite environmental and public concerns associated with landfills, landfilling waste is widely used around the country to manage waste. Even jurisdictions that primarily use waste-to-energy or incineration to manage waste still need access to a landfill for the disposal of ash and other byproducts. Recycling and composting divert significant portions of the waste stream from disposal. Despite increased activities and programs for waste diversion, there are still waste materials that are not or cannot be recycled and require disposal.

Sanitary landfills are sophisticated, well-engineered, and tightly controlled facilities that manage waste to protect public health and the environment. Sanitary landfills typically include the following characteristics and technologies:

- Composite liner systems of clay and geomembrane;
- Leachate collection and removal systems;
- Leachate treatment and disposal systems;
- Closure techniques which reduce the amount of leachate generation;
- Gas collection, control, and monitoring systems;
- Closure and post-closure care and maintenance;
- Ground and surface water monitoring systems;
- Waste screening protocols/procedures; and
- Operational techniques for the control of sediment and erosion, vectors, etc.

The Harford Waste Disposal Center includes the only municipal solid waste landfill currently operating in the County. The County has opted to preserve space at the HWDC landfill by reducing the amount of solid waste disposed at the site. Currently, less than 20,000 cubic yards of waste are disposed in the landfill each year. At this fill rate, there should be available landfill capacity until at least 2038. Although this timeframe is beyond the planning period, planning for waste management beyond 2038 will need to commence during this planning period. An increase in waste disposal at the HWDC Landfill will reduce the projected landfill lifespan.

Additional landfill cells are included in the current refuse disposal permit. Cell N3, is permitted adjacent to Cells N1 and the closed Cells A-J. Additionally, Cells, S1, S2, S3, and S4 are permitted to the south of closed Cells A-J. The combined capacity of these additional cells exceeds three million cubic yards; however, construction of these cells will require relocation of already established facilities including the scalehouse, maintenance shop, homeowner drop-off, leachate storage facility, and the Harford Mulch and Compost Facility (discussed in 1.5.2). Also, changes to zoning requirements greatly reduce the capacity of Cell S4. Additionally, the proximity of the landfill to homes and the associated siting concerns expressed by County residents make it difficult for the County to utilize this site. For these reasons, the HWDC landfill cannot solely provide for the County's long-term solid waste disposal needs. Therefore, Harford County has elected to transport the majority of solid waste to out-of-county disposal facilities rather than construct the new cells.

4.2.5.2 Yard Trim Facilities

The Harford Mulch and Compost Facility and the Tollgate Residential Yard Trim Acceptance Facility have limited space at each respective location for future expansion. The 11-acre pad at the HMCF includes areas for customer unloading, equipment and fuel storage, personnel, incoming material storage, material grinding, windrow processing, and finished product storage. Currently, the HMCF turns over its inventory of up to 45,000 tons annually. This is primarily due to the free pick-up offered to residents and below-market bulk sales rate. The revenues from this program must be supplemented with general fund revenue to cover program expenditures. Due to topographic site constraints, buffer requirements, and environmental constraints, there is no room to expand the HMCF at its current location to accommodate future growth. Additionally, the facility location has been permitted for landfill cells, which will require relocation.

The Tollgate Residential Yard Trim Acceptance Facility also has significant site constraints that limit expansion opportunities. Concerns with this facility include a congested customer unloading area and an inefficient traffic flow pattern. On Saturdays, during the peak seasons, over 1,000 residents visit this facility. This facility is limited to only receiving residential customers in cars, pick-up trucks, and small trailers due to site constraints. Woody vegetation is loaded into roll-off containers and hauled to the HMCF for processing into mulch. Woody material may also be ground-up prior to transport to the HMCF if needed (e.g. after severe storm events). Leaves and grass clippings are loaded separately into roll-off containers and hauled to the HMCF for processing into compost.

There is a need for additional yard trim acceptance and processing capabilities to accommodate future growth.

4.2.5.3 Homeowner Convenience Drop-off Facilities

Residents can self-haul their waste, recyclables, and other special waste items to the HODO at the HWDC. The County's HODO is the primary facility in which many residents in the County interact with the County's solid waste management system. Ninety (90) percent of the 2024 Public Opinion Survey indicated they use the HODO at least once annually. Survey respondents indicated they drop-off a wide variety of materials accepted at the facility with bulky waste, electronics, and yard trim being the most commonly dropped off materials. A discussion of this facility is presented in Chapter 3.

4.2.5.4 Transfer Station

As discussed in Chapter 3, all commercial waste and all single-stream recycling is directed to the ESL. The ESL accepts and manages Harford County waste through the MSW transfer station at the ESL for off-site disposal. Single-stream recyclables are managed through the recyclables transfer station and processed at the material recovery facility in Cockeysville, Maryland.

4.2.6 Food Waste Management

Food waste includes fruit and vegetable matter, meat, paper products including napkins, paper towels, clean pizza boxes, and other biodegradable materials. The most recent data from US EPA (2018) indicated nearly 22 percent of waste generated in the U.S. is food waste. Furthermore, the 2016 Maryland Statewide Waste Characterization Study commissioned by the Northeast Maryland Waste Disposal Authority (the Authority) on behalf of MDE estimates that food waste is approximately 18 percent of the waste disposed in the state. In 2021, the Maryland General Assembly passed House Bill 264/Senate Bill 483 entitled "Solid Waste Management – Organics Recycling and Waste Diversion – Food Residuals." This law requires select food waste generators to separate food waste from other solid waste and provide for the diversion of the material from disposal. The law aligns with U.S. EPA's Wasted Food Scale (**Figure 10**) and Maryland's Food Recovery Hierarchy that prioritizes food waste prevention, food donation to feed people, feeding animals, and composting or anaerobic digestion over landfilling and incineration. This section discusses the activities to collect and process food waste.

Figure 10. US EPA Wasted Food Scale

A recent food waste composting survey conducted by BioCycle identified four (4) entities that compost food waste in Maryland, including Veteran Compost in Aberdeen, which is discussed in Chapter 3. The other three (3) facilities composting food waste in Maryland are:

- Prince George's County Composting Facility in Upper Marlboro
- Key City Compost, Frederick County
- Alpha Ridge Landfill, Howard County

Additionally, MDE has compiled a list of permitted composting facilities in the state some of which may provide food waste composting services[4]

As discussed in Chapter 3, Veteran Compost operates a food waste composting facility on farmland near the City of Aberdeen. Food waste from some regional schools, restaurants, and institutions is collected and brought to their facility for processing into various compost products. Baltimore County has also recently begun a pilot program to compost food waste.

[4] MDE; Composting Facilities – Permitting and Operational Status, September 2023; https://mde.maryland.gov/programs/land/RecyclingandOperationsprogram/Documents/Composting%20Facilities%20with%20Capacities%202023.pdf.

Composting of mixed solid wastes poses significant challenges to producing a compost product that is desirable and marketable due to contamination from inorganic and other materials that make the finished compost unusable. The County supports composting organic materials when it is separated from the overall MSW stream at the source of generation. This is successfully being done in Harford County by Veteran Compost. The County has no knowledge of any local or regional facilities that accept mixed solid waste and process the material as part of a composting program. The County has no plans to develop this type of facility or operation during the planning period. Chapter 5 describes the County's plan to evaluate implementing a food waste recovery program.

In addition to municipal food waste diversion programs, some larger companies established their own food waste composting programs onsite to reduce their waste stream.

Composting food waste typically requires the mixing and blending with yard trim such as leaves, grass clippings, and ground woody vegetation (i.e. mulch). The organics must be processed through a grinder and mixed, according to a pre-determined formula, before being placed in windrows. The existing aerated static pile composting process utilized at the HWDC HMCF requires a prepared hard surface with drainage and a windrow turner. The In-Vessel aerated static piles require blowers and piping throughout the windrows to provide positive or negative air pressure and filters to reduce odors.

i. Advantages

Removal of organics from the waste stream serves to capture valuable nutrients and reduce the volume of material going to other disposal facilities. Food waste diversion would also reduce methane emissions produced by landfills, thus reducing greenhouse gas production and mitigating climate change. With an organics program in place that includes food waste, the County could realize a higher recycling rate.

ii. Disadvantages

Food waste collected from residential customers requires effort on the part of the residents with respect to separation of food waste, storage space for an additional collection container, and the additional cost for a separate weekly pick-up. In addition to these costs, there would be an increase in truck traffic on County roads due to an additional pick-up each week.

The siting of a food waste composting facility could be difficult due to the limited availability of large land parcels within industrially zoned areas. The facility requires tight control and management of food waste materials to minimize and prevent odors. Such a facility would be best isolated from other commercial and residential developments to minimize the impact of potential odors caused by such operations.

4.3 SPECIAL WASTE MANAGEMENT

Special waste management requirements for construction and demolition debris, fluorescent lights, asbestos, special medical waste, and hazardous waste will be discussed in this section.

4.3.1 Construction and Demolition Disposal

Construction and demolition material may include land clearing debris, demolition debris, and construction debris. C&D can be landfilled in a permitted rubble landfill or processed to recover various components for reuse. Options for the disposal and/or processing of Harford County's C&D could include:

- Siting and constructing a County-owned, but privately operated, rubble landfill;
- Siting and constructing a County-owned and operated rubble landfill;
- Using County-owned and operated C&D processing and recycling facility;
- Using privately-owned and operated rubble landfill; and/or
- Using privately-owned and operated C&D processing and recycling facility.

There are no rubble landfills located in Harford County. The closest rubble landfills, available to County residents and businesses, include the Honeygo Run Rubble Landfill and Days Cove Rubble Landfill, both of which are in eastern Baltimore County. The location of these facilities can be inconvenient for County residents, building contractors, and demolition contractors. The market exists for a C&D disposal facility within the jurisdictional boundaries of the County.

Repurpose Aggregates is a private company located off Fort Hoyle Road in Joppa, Maryland that recycles *some* types of C&D debris. Repurpose Aggregates is part of Harford Minerals and began operating in 2022. This facility processes soil, concrete, and asphalt to recover materials that can substitute for the use of virgin aggregates. Repurpose Aggregates does not accept wood or deleterious materials. The Repurpose Aggregates plant can process 250 tons of material per hour; 95 percent of the materials processed are diverted from landfills. These materials are separated, cleaned, and sorted into six (6) different types of aggregates: #3 stone, #57 stone, #8 stone, C-33 coarse sand, fine sand, and clay core that can substitute for virgin aggregate materials.

To be able to process *all* fractions of the C&D stream for recycling requires a system of sorting, screening, grinding, and baling. Hand sorting and picking of the mixed waste stream is the most prevalent method employed. An enclosed warehouse-type building would facilitate sorting and allow efficient, year-round operation. The facility could establish a reduced tipping fee for waste that is source-separated by the contractor and deposited in separate containers or bins at the facility. Materials that could be recovered through such a facility include the following:

- **Wood Wastes** – Wood waste includes pallets, stumps, and brush from land clearing operations, and building demolition debris. Large tub grinders, and waste recyclers (woodchippers), are often used to reduce these wastes to wood chips for marketing. Chips can be marketed as fuel, mulch, and animal bedding. Depending on the market, painted or treated wood, plywood and particle board may be excluded from the chipping operation. In addition, magnetic separation of metal wastes (e.g., nails from pallets) is often employed.

- **Corrugated Cardboard** – This material is baled and readily marketed after separation from the mixed waste stream. Contaminated and plastic-coated cardboard must be excluded.

- **Asphalt Roofing** – This waste material has potentially high resale value due to high percentage of petroleum. However, recycling has not been widespread in the Mid-Atlantic area due to contaminants such as paper backing, stone, and gutter scraps. Materials are used to manufacture road paving products and other asphalt products. Sorted shingles and aggregate are mixed, reduced in volume, and passed over magnets to remove metal impurities.

- **Metal** – This waste is separated by material type (e.g., ferrous, aluminum, copper, etc.) and marketed to scrap metal dealers. The scrap metal is used to manufacture new metal products.

- **Concrete** – Concrete can be crushed then passed over electromagnets to remove wire mesh and rebar, which can be marketed to scrap dealers. Crushed concrete can be used as aggregate for projects such as septic tank drain fields, driveways, pipe bedding and landfill cover.

- **Plastics** – Plastics are typically shredded or crushed, depending on the market, and used to manufacture new plastic products.

- **Other Materials:**

    - **Bricks** – Crushed and used as aggregate or ornamental stone

    - **Carpet** – Recycled into plastic products

    - **Glass** – Ground and used to manufacture fiberglass insulation, sand blasting medium, or asphalt aggregate

    - **Gypsum wallboard** – Crushed and used as agricultural gypsum, wallboard, or cat litter

    - **Porcelain** – Crushed and used as concrete aggregate

4.3.2 Asbestos

Asbestos waste is generated from the rehabilitation and demolition of structures that were typically built from the 1930s through the 70s. The HWDC Refuse Disposal Permit

allows for disposal of non-friable asbestos within the landfill; however, in the 1990's the Harford County Council decided to enact a policy to prohibit the disposal of asbestos in the HWDC Landfill. Harford County accepts items containing non-friable asbestos at the HWDC HODO by appointment only from residential customers. The resident must double bag the material and secure the bag with duct tape. The material is then loaded into a covered and locked roll-off container. Once full, the asbestos is transported to ESL for disposal. Harford County intends to continue this practice in the future.

4.3.3 Special Medical Waste

The County is not permitted to accept special medical waste, including infectious and/or biohazardous medical waste, at the HWDC. The management of special medical waste is not under the jurisdiction of the County. Management of these wastes is strictly regulated by MDE under specific medical waste regulations.

4.3.4 Hazardous Waste

The County does not accept hazardous substances at the HWDC HODO with the exception of small quantities of household hazardous wastes that are generated in the residential waste stream. Currently, hazardous waste generators within the County contract with a licensed hauler of hazardous waste for collection and disposal. The management of hazardous waste is not under the jurisdiction of the County. Hazardous waste storage, transport and disposal is strictly regulated by MDE.

4.3.5 Household Hazardous Waste

Historically, Harford County has held an annual household hazardous waste collection day at the HWDC. All items must be in small containers as purchased in retail stores. Items accepted include oil-based paints and stains, herbicides, pesticides, mercury thermometers, mercury containing thermostats, fluorescent light tubes and CFLs, pool chemicals, caustic cleaners, acids, and other items. Harford County intends to continue to offer this service to residents in the future.

4.3.6 Electronics Recycling (eCycling)

Electronic materials include computers, non-CRT computer monitors, computer peripherals, non-CRT televisions, stereo equipment, VCRs, DVRs, cell phones, holiday lights, and similar electronic products. Harford County has a contract with a private eCycling vendor. In 2022, 95.8 tons of electronic waste was collected for recycling at the HODO. Harford County intends to continue to offer this service to County residents.

4.3.7 Emergency Response for Hazardous Waste Spills

Harford County Emergency Operations Services operates a hazardous material response team (HAZMAT team) based at the Department of Emergency Services facility in Hickory, Maryland. The HAZMAT team is trained and equipped to respond to level one (the highest level) hazardous and/or toxic waste spills and leakages that occur in the County. APG has a hazardous waste unit for responding to spills at the APG facility.

The HAZMAT team procedure is to contain or control spills or leakages of hazardous or toxic materials to minimize the danger to public health and the environment. The

responsible party (hazardous materials generator) is required to contract with a private hazardous waste remediation company for the ultimate clean-up and disposal of the material. If the responsible party cannot be determined, MDE may implement remediation measures.

4.4 CONSTRAINTS ON NEW SOLID WASTE ACCEPTANCE FACILITIES

4.4.1 Physical Constraints on Waste Acceptance Facilities

Several physical characteristics of the land in Harford County influence the siting of new solid waste acceptance facilities. These constraints include topography, soil types, geologic conditions, aquifers, wetlands, surface waters, existing water quality, land uses, planned long-term growth, and critical areas. These constraints, and their potential impact on siting, designing, permitting, and operating solid waste facilities are addressed in this section.

4.4.1.1 General Topography and Physiography

Harford County can be characterized as having two distinct topographical features with a transition zone between the Piedmont Plateau in the northwestern portion of the County and the Coastal Plain in the southeastern portion of the County. The transition between areas is described as the Fall Line or Fall Zone.

Surface elevations vary from more than 700 feet in western portions of the County to approximately sea level along the shoreline of the Chesapeake Bay. The valleys formed by the major drainage ways in the Piedmont are characteristically steep sided. The stream courses are straight and have steep gradients. Hard crystalline bedrock outcrops exist in the stream channels and commonly along the sides of the steeper valleys.

The Piedmont section of the County drains into the Chesapeake Bay via the Gunpowder River, Winters Run, Bynum Run and James Run. It also drains to the Susquehanna River via Deer Creek and Broad Creek.

The topographic setting of the Fall Zone is characterized by gently rolling terrain deeply incised by the drainage ways. Within this region, the streams flowing down from the Piedmont abruptly change gradient, which forms waterfalls as the bedrock of the Piedmont dips easterly beneath the sedimentary deposits of the Coastal Plain.

The Coastal Plain occurs southeast of the Fall Zone and is characterized by broadly rolling hills and plains traversed by tidally influenced streams and rivers. The southeastern boundary of this area in Harford County is the Chesapeake Bay. The margin of the bay varies from low bluffs to tidal marshes.

Sites with suitable topography for solid waste management facilities may be found throughout Harford County, provided that the site selection criteria and development plans are well conceived.

4.4.1.2 Soil Types and Engineering Characteristics

The soils of Harford County can be distinguished based on the physiographic region of the County: Peidmont Plateau, Atlantic Coastal Plain, and Flood Plains and Low Terraces. The *Soil Survey of the Harford County, Maryland Area*, published by the U.S. Department of Agriculture, describes the soil types and is the basis of the following descriptions. Soil types are grouped into associations based upon similarity of physical charateristics as follows:

Piedmont Plateau

- Manor-Glenelg Association
- Chester-Glenelg-Manor Association
- Elioak-Glenelg Association
- Glenelg-Manor Association
- Whiteford Associaiton
- Nashaminy-Aldino-Watchung Association
- Montalto-Nashaminy Association
- Legore-Neshaminy-Aldino Association

Atlantic Coastal Plain

- Neshaminy-Chillum-Sassafras Association
- Beltsville-Loamy and Clayey land-Sassafras Association
- Matapeak-Mattapex Association

Flood Plains and Low Terraces

- Elsinboro-Delanco Association
- Codorus-Hatboro-Alluvial land Association

The properties of the soils on which a landfill is sited should be considered in planning, design, construction, operation, closure, and post-closure of the landfill. Soil characteristics such as soil texture, erodibility, load-bearing capacity, slide resistance, permeability, water table elevation, and quantity should be addressed during the site selection process. Clayey, impermeable soils are desirable soils for the base of the landfill; however, landfill operations require a loamy or silty soil which is easily spread and compacted for cover material.

Soil types preferable for other non-landfill waste management facilities are those which can provide adequate support for buildings, structures, equipment, and/or concrete pads. The location of specific soil types varies based upon site location. The soil types at a site proposed for development in support of this Solid Waste Management Plan will be evaluated on a site-by-site basis.

4.4.1.3 Geologic Conditions & Location

The physiographic provinces and soil types in Harford County are influenced by the underlying geologic conditions. The geologic formations underlying the Piedmont Plateau are predominantly folded and faulted metamorphic rocks of pre-Cambrian and Paleozoic age. Much of the rock is overlain by saprolite and residuals soils, except in stream valleys where younger sediments have accumulated. Historically there have been quarries in the County, which extracted slate, soapstone, serpentinite, and other metamorphic rocks. Two active quarries currently extract gneiss primarily for production of aggregate utilized in construction products.

The geologic formations underlying the Coastal Plain are unconsolidated sedimentary deposits of Cretaceous, Tertiary and Quaternary age. These sedimentary layers, which lie over the pre-Cambrian bedrock, occur as wedges of sands, silts and clays which dip and thicken to the southeast. Deposits of sand, clay, and gravel have been extensively mined in the County in the past.

Solid waste management facilities can be developed in most geologic environments provided that proper engineering and site design practices are implemented. Although landfill facilities can be engineered to be environmentally protective in most geologic settings, it is desirable to have sites in areas in which geologic conditions provide backup attenuation capacity. Optimum geologic conditions for a landfill site include the lack of permeable fault zones underlying the site, and adequate depth to groundwater and bedrock (i.e., according to current regulations). Geologic conditions should be such that an effective groundwater monitoring system can be established.

4.4.1.4 Aquifer Use & Conditions

The Coastal Plain region of Harford County is underlain by three water bearing aquifers: the Patuxent, Patapsco, and Pleistocene Deposits. Although several large well fields in the County draw water from the Patuxent and Patapsco formations, these aquifers are limited in thickness and extent in the County compared with the Pleistocene Deposit. The Pleistocene Formation is the most productive aquifer in terms of water supply, with an average yield of 100-250 gpm per well. The unconsolidated sediments of the Coastal Plain region serve as recharge sites for these aquifers. In the Piedmont, groundwater accumulates in fractures, joints, and faults in the upper zone of the crystalline rock formation underlying the shallow soils. Recharge areas for the above aquifers are located primarily within Harford County.

Aquifer protection is an important consideration in siting solid waste management facilities. Accordingly, solid waste disposal facilities which may have the potential to impact groundwater quality should not be sited in close proximity to well fields or aquifer recharge zones. The process of siting, design, and operation of any solid waste management facility should include consideration of the proximity to well fields, such as the Perryman well field, as well as smaller well fields serving private communities (e.g., Whiteford, Delta/Cardiff, Greenridge, etc.). All solid waste management facilities shall be planned, designed, constructed, and operated to protect groundwater quality.

4.4.1.5 Wetlands

Wetlands are unsuitable areas for siting solid waste management facilities. In no case should facilities be sited in tidal wetlands, as defined in Section 9-101 of the Natural Resources Article of the Annotated Code of Maryland, and the Harford County, Maryland Critical Area Management Program. In some cases, minor unavoidable impacts to non-tidal wetlands may be necessary to provide access for vehicles and utilities. Non-tidal wetlands are defined under COMAR 26.23.01.01(62). Construction activities in wetlands require Federal, State, and local permits and approvals, and mitigation of unavoidable impacts.

4.4.1.6 Surface Water Sources, Flood Plains, and Watersheds

Floodplains are not suitable sites for solid waste management facilities. RCRA Subtitle D Criteria requires that the owners or operators of new and existing municipal solid waste landfills located in the 100-year floodplain must demonstrate that such facilities will not adversely impair the flood-protection functions of the floodplain or endanger human health or the environment.

Several surface water bodies in Harford County are used as sources of raw water for potable water supply systems. These sources include Winter's Run, Deer Creek, and the Susquehanna River. The selection of a site for a solid waste management system within the watershed for these systems must consider possible impacts to water quantity, and if necessary, provide environmental controls. All solid waste management facilities shall be planned, designed, constructed, and operated to protect surface water quality.

4.4.1.7 Existing Water Quality

The more heavily developed portions of Harford County, referred to as the "Development Envelope" and the incorporated municipalities, are primarily served by public or privately-owned water utility systems. These utilities rely upon both groundwater and surface water sources to meet the demands of their customers. The other portions of the County rely primarily on individual wells to supply residential and commercial water needs. Generally surface water and groundwater supplies are of sufficient quality for potable use. In some areas, groundwater has been impacted by release of fuel products and other manmade chemicals. §267-66 of the Harford County Zoning Code – Water Source Protection Districts – prohibit new or expanded sanitary or rubble landfills in areas designated on the Harford County Water Source Protection District map (**Appendix K**). This map includes the Perryman well field, community water systems, and non-transient, non-community water systems as mapped by MDE.

Winters Run, Deer Creek, and the Susquehanna River are used as surface water sources for the Town of Bel Air, Aberdeen Proving Ground, the City of Havre de Grace, Harford County Department of Public Works, and Baltimore City. Siting, construction, and operation of any solid waste management facilities within these watersheds must consider the potential impacts on the water supply.

State and Federal regulations for landfills provide protections for water quality, including site location criteria, design and construction standards, and maintenance and

monitoring requirements. All solid waste management facilities shall be planned, designed, constructed, and operated to protect water quality.

4.4.2 Land Use

The Harford County Zoning Code includes specific restrictions and requirements for siting new solid waste management facilities. These requirements are discussed in detail in Chapter 2. Additionally, new facilities are subject to review for site constraints such as traffic and utilities. Permit conditions typically require preparation and implementation of an operations and maintenance manual that includes controls for odors, noise, dust, and/or adverse traffic impacts. The Harford County Zoning Code, HarfordNEXT, and the Harford County Code provisions for public notification of potential new solid waste management facilities aid the County in reducing the possibility of adjacent incompatible land uses.

4.4.3 Planned Long Term Growth

HarfordNEXT calls for higher residential, commercial, and industrial growth to be focused within specific areas of the Development Envelope. The County's water and wastewater systems are planned to service the Development Envelope and to provide for the densities associated with this designated growth area.

4.4.4 Defined Critical Areas

Harford County is affected by the State's Critical Areas Law. Harford County Code Section 267-63 addresses the Chesapeake Bay Critical Area Overlay District and includes requirements and prohibitions for facilities located in the Critical Area. New or expanded solid waste collection and disposal facilities are prohibited in the Critical Area.

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5. SOLID WASTE MANAGEMENT SYSTEM PLAN OF ACTION

5.1 OVERVIEW

This chapter presents the plan of action for Harford County's integrated solid waste management system for the planning period of 2025-2034. Public and private programs and facilities for source reduction, recycling, processing, and disposal are addressed as part of the County's solid waste management strategy.

The action plan presented in this chapter aligns with the County's needs for managing multiple types and quantities of waste generated. It also provides for system components that are technically and economically feasible for the County to implement. The Harford County Department of Public Works, Bureau of Solid Waste Services manages solid waste and recycling in the County. The County is committed to providing a safe, environmentally sustainable, economically sound, and integrated solid waste program. The County established the following goals to guide the action items presented in this chapter:

- Explore opportunities to increase the efficiency and cost-effectiveness of the County's solid waste program.
- Promote waste prevention and undertake source reduction measures to the extent practical and feasible.
- Implement recycling measures that are practical with available and locally proven technologies and markets. Technologies, markets, and cost-effectiveness should be reviewed periodically to evaluate changes to the recycling program with the diversion of additional waste materials as new cost-effective opportunities arise, particularly if they result in lower costs than traditional disposal methods.
- Increase the amount of waste that is diverted from disposal at the Harford Waste Disposal Center (HWDC) when practical and economically feasible.
- Improve accessibility, function, and efficiency of HWDC homeowner drop-off by improving infrastructure and expanding diversion and reuse opportunities.
- Explore opportunities to increase organics recycling and promote backyard and community composting.

- Prioritize public education and outreach activities to maximize the amount of solid waste that is recycled. Educate the public on the sound and sustainable solid waste management practices implemented by the County.

- Assess opportunities for encouraging proper recycling to reduce contaminants in the recyclable material stream.

- Plan for disposal and recycling capacity beyond the ten-year planning period.

Flexibility is incorporated into the implementation process so the County can respond to developments and changes in materials markets, technology, private sector services, and regional cooperation opportunities. The County is open to considering new approaches to solid waste management in the future.

5.2 COLLECTION SYSTEM

The County will continue with the free enterprise system for collection throughout the planning period. Currently, there is sufficient competition to provide residents with choices for collection. The system will be monitored through the licensing process to determine the adequacy of choice.

During the planning period, the County will continue to accept trash and recycling from residential self-haul customers at the HWDC. The County will evaluate the feasibility of establishing a second drop-off location to serve the more populated areas of the County and reduce pressure at the HWDC. The evaluation will address the need and demand for services and capital and operating costs.

5.3 ACCEPTANCE FACILITIES

5.3.1 Eastern Sanitary Landfill

Under the agreement between Harford and Baltimore Counties, Baltimore County's Eastern Sanitary Landfill (ESL) in White Marsh, Maryland is the primary waste acceptance facility for waste generated in Harford County. All solid waste collection haulers and other commercial customers are directed to deliver waste and single-stream recyclables to the ESL. Harford County also delivers the single-stream recyclables collected at HWDC and much of the waste accepted at the HWDC homeowner drop-off to ESL. Baltimore County maintains contracts for offsite transportation and disposal of waste. Single-stream materials are transferred to Baltimore County's material recovery facility in Cockeysville, Maryland to be sorted and marketed for sale.

The current agreement with Baltimore County expires in 2036. Decisions need to be made to ensure that adequate waste management capacity will exist beyond this planning period.

Three (3) key alternatives exist:

1. **Exercise First 10-Year Option Period** – The County's current agreement with Baltimore County includes the option of two (2) 10-year renewal periods. The

County can opt to exercise the first 10-year option that would provide for the County's disposal needs through 2046. This will require concurrence by Baltimore County and would continue the current practice of direct hauling waste to ESL for transportation and disposal.

2. **Explore Additional Disposal Options** – The County may issue a Request for Expressions of Interest to provide solid waste disposal services. This option would allow the County to identify other disposal options in the region. The County will likely require the construction of its own transfer station for waste and single-stream recyclables under this alternative.

3. **Utilize Space at the HWDC Landfill** – Development of the remaining permitted landfill cells at the HWDC could provide disposal capacity for up to a decade. As discussed in previous chapters, construction of additional cells will require relocation of existing facilities including the scalehouse, maintenance shop, homeowner drop-off, and the mulch and compost facility. Permitting of new cells cannot be accomplished without significant property acquisition to satisfy zoning buffer requirements.

5.3.2 HWDC Landfill

The County has been operating the HWDC landfill since 1987. To preserve capacity of the landfill at HWDC, the majority of solid waste generated in Harford County has been delivered to the ESL in Baltimore County since 2016. Harford County will continue to utilize out-of-county disposal capacity to preserve landfill capacity at HWDC.

5.3.3 HWDC Homeowner Drop-off

The Homeowner Drop-Off (HODO) at the HWDC is the only facility for County residents to drop-off waste and recyclable materials. As identified in the 2024 Public Opinion Survey, the HWDC is not convenient to at least 30 percent of respondents due to its location in the northern part of the County. Additionally, the facility footprint has little space available for traffic queuing. The facility flow pattern requires heavy equipment and truck traffic to mix with passenger vehicles, which increases safety concerns. Unfortunately, the HODO does not have room to be re-configured to address the above concerns.

The HODO at the HWDC will continue to be an important part of the County's solid waste management program throughout the planning period, however, the County intends to relocate the HODO to another location at HWDC to address the numerous shortcomings of the current location. A new location has been identified and the County intends to develop a new HODO during the planning period.

5.3.4 Mulch and Compost Facility

The Harford Mulch and Compost Facility (HMCF) will continue to accept yard trim from both residential and commercial customers. Residential customers will also continue to have the option of self-hauling to either the HMCF or the Tollgate Residential Yard Trim Acceptance Facility in Bel Air.

Approximately 30 percent of residents completing the 2024 public opinion survey indicated that having a yard trim collection facility in the southern portion of the County would be more convenient for them. Therefore, the siting of a residential yard trim convenience center, similar to the Tollgate facility, should be evaluated and implemented during the planning period.

Processing of yard trim into a high-grade compost and mulch is an integral component of Harford County's materials diversion program and will continue during the planning period.

5.4 WASTE DIVERSION

Waste reduction, recycling, and other diversion programs are integral to the County's overall solid waste management strategy. The County's diversion program, which includes a mix of County and private recycling services, is designed to be complimentary and provide residents and businesses in the County flexible options for how they divert materials. This existing program has been successful in exceeding the State's minimum recycling goal of 35 percent. The County continues to prioritize waste diversion dependent upon increased participation by all waste generating sectors. Harford County's waste diversion program includes three (3) major elements:

- Collection of "traditional" recyclable materials and yard trim
- Collection of special wastes/materials such as used motor oil, antifreeze, electronics, propane tanks, textiles, etc.
- Public education and outreach

This section describes the County's waste diversion plan for the upcoming planning period.

5.4.1 Food Waste Diversion

Food waste, including food scraps and food not suitable for donation, comprise a sizable portion of the disposed waste stream. Harford County will explore opportunities for establishing a food waste management program to continue the County's tradition of prioritizing waste diversion. Action items the County may consider include the following:

- Facilitate food donation programs.
- Conduct an organics composting education and outreach program to encourage backyard composting.
- Explore public/private partnerships. Inventory existing food waste diversion programs and large quantity generators of food waste in the County. Study feasibility of implementing a facility to compost/process food waste and, if determined to be feasible, issue RFP for partner to recover food waste.
- Evaluate incorporating food waste composting into the existing yard trim management program.

- Coordinate with neighboring jurisdictions on food waste diversion.

5.4.2 Public Education and Outreach

The education and outreach program operated by the Bureau of Solid Waste Services is available to all waste generators in the County. This program includes a mix of media sources designed to connect and inform the diverse population of Harford County. Key aspects of the program include the following:

- Website
- Social media
- Facility tours
- Videos proper management of waste and recycling materials
- Presentations, exhibits, and community activities
- School curriculum and teacher support
- Directory of local service and market providers
- Business technical assistance

In an effort to reduce waste, the County limits the amount of printed education material available. The County will continue to evaluate the education and outreach program and look for new ways to encourage waste diversion among all generating sectors. Potential public education and outreach initiatives to be considered over the planning period include the following:

- **Conduct a source reduction education/outreach campaign** – Produce education materials that identify and describe the benefits and impact of reducing waste; materials may also include tips and examples of what residents can do to reduce waste.

- **Develop directory of County-based organizations/entities that accept materials for reuse** – Inventory organizations operating in Harford County that accept durable materials for donation that might otherwise be disposed.

- **Education to encourage increasing participation in existing County recycling programs** – Conduct a targeted education program to inform residents of all recycling and waste diversion services available through Harford County to maximize diversion by residents.

5.5 MANAGEMENT OF OTHER WASTE STREAMS

5.5.1 Construction, Demolition, and Land Clearing Debris

The County does not provide collection or disposal of land clearing and C&D debris generated in the County. Private companies and organizations involved in projects that generate this material either self-haul the material or arrange for the collection of this material for disposal in privately owned and operated rubble landfills outside of the County. Harford County policy does not accept land clearing and C&D debris at ESL or HWDC, except for small quantities of self-generated materials that are hauled by residential customers from their in-County primary residence to HWDC. There are no private facilities within the County permitted to accept land clearing and C&D debris for disposal. The County does not anticipate developing a land clearing and C&D debris disposal facility during the planning period.

Since private companies control most C&D debris disposal capacity in Maryland, it is not known what additional disposal capacity will be provided in the long term. Privately operated landfills located in the Mid-Atlantic region outside of Maryland are available to supplement C&D capacity within Maryland, if needed. If adequate private C&D disposal capacity is not available on a long-term basis, the County will work with the Authority, MDE, and other counties to identify and implement opportunities for regional, in-state C&D debris recovery and disposal facilities.

5.5.2 Controlled Hazardous Substances/Special Medical Waste

Commercial and large quantity generators of hazardous substances must engage a licensed contractor for the collection, transportation, processing, and disposal of these materials. The County does not provide services or facilities for these generators.

Harford County encourages residents to reduce the generation of household hazardous waste (HHW) and offers tips to prevent or minimize the use of these materials. The County also holds HHW collection events for residential customers. Residents need to provide proof of residency to participate in the events. The existing program is sufficient to adequately manage the quantities of HHW projected for collection during the planning period.

5.5.3 Dead Animals

Dead animals, animals that have been hit and killed by vehicles and left by the side of the road, are collected by the State Highway Administration and Harford County Bureau of Highways and are disposed of at the HWDC landfill. The existing collection and disposal system is adequate to manage dead animals to protect public health.

5.5.4 Bulky Wastes and White Goods

HWDC will continue to accept furniture and mattresses, from residential self-haul customers, at HWDC for disposal. Haulers and other commercial customers, including landlords and storage unit operators, will continue to be directed to ESL for disposal of furniture, mattress, and other bulky wastes.

HWDC will continue to accept white goods and scrap metal at the HWDC. Commercial customers will continue to be directed to dispose of white goods and scrap metal at the metal processor of their choice.

The existing management system for bulky waste can accommodate the quantities that will be generated over the planning period. Private haulers will continue to provide this service to paying customers. Additionally, bulky waste and white goods delivered to the HWDC can be processed onsite. The containers used to collect the material can be serviced at the frequency necessary to accommodate increased quantities delivered to the facility over the planning period.

5.5.5 Tires

The HWDC accepts tires from residential customers. No commercially generated tires are accepted at the HWDC. The County will maintain a contract with a private licensed vendor for hauling and recycling tires collected at the HWDC. This program has provided a stable management option for tires that will continue throughout the planning period.

5.5.6 Septage and Sewage Sludge

Septage is the liquid and solid material pumped or removed from chemical toilets, septic tanks, seepage pits, privies, cesspools, holding tanks or other facilities that receive sewage. Both MDE and Harford County require that septage be collected and treated as raw sewage at a permitted wastewater treatment plant. The Sod Run WWTP accepts, treats, and processes the septage and sewage sludge generated in Harford County. The current sludge management approach will continue to meet the County's needs during the planning period.

5.5.7 Miscellaneous Wastes

- **Water Treatment Plant Residuals** – Water treatment plant operators will continue to manage the residuals they generate.

- **Used Oil and Antifreeze** – Used oil and antifreeze are accepted from residential customers, for recycling at the HWDC and six (6) satellite sites. Used oil and antifreeze is also accepted at sites in each of the municipalities. Commercial and institutional vehicle maintenance and repair facilities also have used oil and antifreeze collected for proper disposal. The existing used oil and antifreeze collection program is expected to remain sufficient for the planning period.

- **Fluorescent Lights** – Harford County accepts fluorescent lights and compact fluorescent lights from residents that then are taken by the HHW contractor for proper disposal. Commercial and institutional entities manage their own fluorescent light disposal. Additionally, some local retail stores may provide fluorescent light and CFL acceptance services. The County expects these management options will continue throughout the planning period.

- **Latex Paint** – The County encourages residents to let unwanted latex paint to dry out or solidify it using kitty litter, wood chips, sawdust, etc. Once dry, latex paint can be disposed with their regular household trash or dropped off at the HWDC

HODO for disposal. Latex paint received at the HWDC is placed in a lined roll-off container prior to disposal. The existing program is sufficient to manage latex paint for the planning period.

- **Asbestos** – The County does not accept asbestos at the HWDC, except small amounts of non-friable asbestos from residential self-haul customers. Most asbestos generated from demolition or renovation activities is managed by the private sector and is disposed of in out-of-county landfills. Asbestos accepted at HWDC is disposed of at ESL as a special waste.

- **Storm Debris** – The County will continue to provide support for emergency debris cleanup and removal efforts within the Bureau of Solid Waste Services.

5.6 FUNDING

Currently, the County receives revenue to support the Bureau of Solid Waste Services' operating and capital budgets from the following sources:

- Tipping Fees
- Fixed Fees – Residential Customers
- Scrap Metal Sales
- Mulch and Compost Sales
- General Fund

General Fund revenues support most capital costs for new solid waste management facilities and improvements to existing facilities and infrastructure. Other revenue sources are set to recover the costs of the program for which the fee or revenue is collected (i.e. management of special waste at the HWDC, production of compost/mulch products, etc.).

The County anticipates continuing to use a combination of the general fund and user fees to provide solid waste services. The combination of these revenue sources is projected to cover ongoing solid waste management costs. The County may elect to adjust tipping fees, residential usage fees, and mulch/compost fees to cover the costs of these programs.

5.7 ACTIONS TO MEET PLAN GOALS

Harford County will provide sustainable and cost-effective solid waste management by maintaining and expanding programs and services for solid waste diversion. Additionally, the County will continue to evaluate existing and future disposal capacity in the region to confirm County generated solid waste is diverted or managed in a way that protects public health and the environment.

Key actions steps for Harford County for the 2025-2034 planning period include:

- **Promote Source Reduction and Reuse** – The County will incorporate and expand messaging on the importance of source reduction and reuse in existing and new public education and outreach materials, including the County's website. These messages will also be included in curriculum the County uses to support education within the County's public school system.

- **Increase Recycling Participation** – Despite the success of the County's recycling and waste diversion programs, opportunities exist for continued growth. The County will evaluate and consider strategies to increase participation in recycling programs in the County. This includes getting more residents to participate in programs and encouraging existing program participants to more fully utilize the existing system. This will primarily be done through education and outreach using data from County programs to illustrate opportunities for improvement.

- **Evaluate Opportunities for Diversion of Food Waste** – The County has robust programs for the diversion of yard trim from disposal. To complement existing organics management programs, the County will evaluate options for the diversion of food waste from both commercial and residential generating sectors. This will include estimating the quantity of organics in the disposed waste stream, identifying generators of food waste, researching markets for recovered food waste, exploring partnerships for a food waste diversion program, and considering different technologies or managing/processing food waste.

- **Monitor Recycling Technologies and Packaging Options** – The County will remain engaged in monitoring existing and new recycling processes and recovery technologies with consideration for how these technologies could enable recycling program expansion at the HWDC and in other recycling programs in the County. The County will consider cost, material impact, risk, and availability of support when evaluating a new or modified technology for recycling processing.

- **Support/Enforce State Recycling Requirements** – The State of Maryland continues to implement diversion requirements for waste generators in the County. The County will continue to support organizations and entities that request assistance to comply with the state and corresponding county requirements. When appropriate, the County will provide enforcement support. Future state recycling requirements will be implemented and enforced as required.

- **Plan for Future Disposal Capacity** – Currently, the County has opted to preserve space at the HWDC Landfill via a contract with Baltimore County for the disposal of solid waste at the ESL. The existing agreement with Baltimore County runs through 2036, which covers the entirety of this Plan's planning period. However, the County will need to identify and evaluate options for waste disposal capacity before the contract ends. These options may include exercising the first 10-year option period renewal with Baltimore County or utilizing another regional disposal facility. The decision on how the County will manage solid waste for disposal will need to be made before the end of this planning period.

- **Evaluate Need for Additional Yard Trim Acceptance** – The 2024 Public Opinion Survey identified that a southern facility would be a convenient location for nearly one-third of respondents. Since convenience is critical to the success of any recycling program, the County will evaluate the need for establishing a separate yard trim convenience center in the southern portion of the County to better serve residents in that area and facilitate increased participation.

- **Regional Coordination** – As several regional jurisdictions have procured long-term disposal capacity, including Harford County, a new regional waste disposal procurement effort has not been necessary to date. The County anticipates continuing active participation in the Authority to seek regional options for solid waste management, particularly for the period beyond this Plan's timeframe when the County's agreement with Baltimore County is set to expire.

Table 10 provides a summary of the action items along with specific tasks the County will be completing over the 10-year planning period. The anticipated timeframe for which each activity may be completed is also listed according to the following schedule: short-term – 2025-2028; medium-term – 2029-2031; and long-term – 2032-2034.

Table 10. Harford County SWMP Action Item Summary

Action Step	Timeframe
Action Step 1 – Promote and Encourage Source Reduction and Reuse	
Conduct a source reduction education/outreach campaign	Short
Subsidize compost bin sales to encourage backyard composting	Short
Maintain directory of County-based organizations/entities that accept materials for reuse	Short
Expand bulky recycling participation	Medium
Action Step 2 – Increase Recycling Participation	
Education to encourage increasing participation in existing County recycling programs	Short
Action Step 3 – Evaluate Opportunities for the Diversion of Food Waste	
Inventory existing programs in the County diverting food waste; identify large quantity generators in the County of food waste	Short
Evaluate program collection options for diversion of food waste	Short
Explore food waste collection in public schools	Short
Facilitate food donation programs	Short
Conduct organics composting education and outreach campaign	Short
Study feasibility of implementing a facility to compost/process food waste	Medium
If determined feasible, issue RFP for partner to recover food waste	Long

Action Step	Timeframe
Action Step 4 – Monitor Recycling Technologies and Packaging Options	
Expand mix of recyclable materials accepted at the HWDC/HODO if processing and marketing capabilities exist	Short/Medium/Long
Action Step 5 – Support/Enforce State Recycling Requirements	
Enforce Apartment and Condo recycling law	Short
Support recycling in office buildings in response to state requirements	Short
Action Step 6 – Plan for Future Disposal Capacity	
Identify and evaluate options for waste disposal capacity beyond 2036	Short/Medium/Long
Action Step 7 – Evaluate Need for Future Yard Trim and Recycling Capacity	
Identify site and develop a citizen's yard trim convenience center to benefit residents in the southern portion of the County	Short/Medium
Develop new HODO area to reduce congestion and improve safety and efficiency at the HWDC	Medium/Long
Implement most feasible option for safe and effective residential recycling services	Medium/Long
Action Step 8 – Regional Coordination	
Coordinate potential regional disposal and/or diversion opportunities to serve County residents through the Authority and /or directly with other jurisdictions	Short/Medium/Long

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Appendix A

Acronyms

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Solid Waste Management Plan Acronyms

- APG – Aberdeen Proving Ground
- CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act
- CFL – Compact Fluorescent Lamps
- CFR – Code of Federal Regulations
- CHS – Controlled Hazardous Substances
- COMAR – Code of Maryland Regulations
- CWA – Clean Water Act
- C&D – Construction and Demolition
- EPA – Environmental Protection Agency
- ESL – Eastern Sanitary Landfill
- FDA – U.S. Food and Drug Administration
- HAZMAT – Hazardous Material Response Team
- HCC – Harford Community College
- HCOR – Harford County Office of Recycling
- HHW – Household Hazardous Waste
- HMCF – Harford Mulch and Compost Facility
- HOA – Homeowners Association
- HODO – Homeowner Drop-Off Area
- HPCS – Harford County Public Schools
- HSWA – Hazardous and Solid Waste Amendments
- HWDC – Harford Waste Disposal Center
- MES – Maryland Environmental Service
- MDE – Maryland Department of the Environment
- MRA – Maryland Recycling Act
- MSDC – Maryland State Data Center
- MSW – Municipal Solid Waste
- NAAQS – National Ambient Air Quality Standards
- NPDES – National Pollutant Discharge Elimination System
- PFAS – Per-and-Polyfluoroalkyl Substances
- PURPA – Public Utilities Regulatory Policies Act
- RCA – Resource Conservation Policy
- RCRA – Resource Conservation and Recovery Act
- RECYCLE Act – Recycling Enhancements to Collection and Yield through Consumer Learning and Education Act
- SMW – Special Medical Waste
- USDA – U.S. Department of Agriculture
- WTP – Water Treatment Plant
- WWTP – Wastewater Treatment Plant

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Appendix B

Confirmation Letter

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ROBERT G. CASSILLY
Harford County Executive

ROBERT S. MCCORD
Director of Administration

SHANE P. GRIMM, AICP
Director of Planning & Zoning

CERTIFICATION OF THE DEPARTMENT OF PLANNING AND ZONNG

The Department of Planning and Zoning has reviewed the 2025-2034 Solid Waste Management Plan and finds it to be in conformance with HarfordNext, the Harford County Master Plan.

Shane P. Grimm, AICP, Director
Department of Planning and Zoning

9/25/2024
Date

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Appendix C

Harford County Government Organizational Chart

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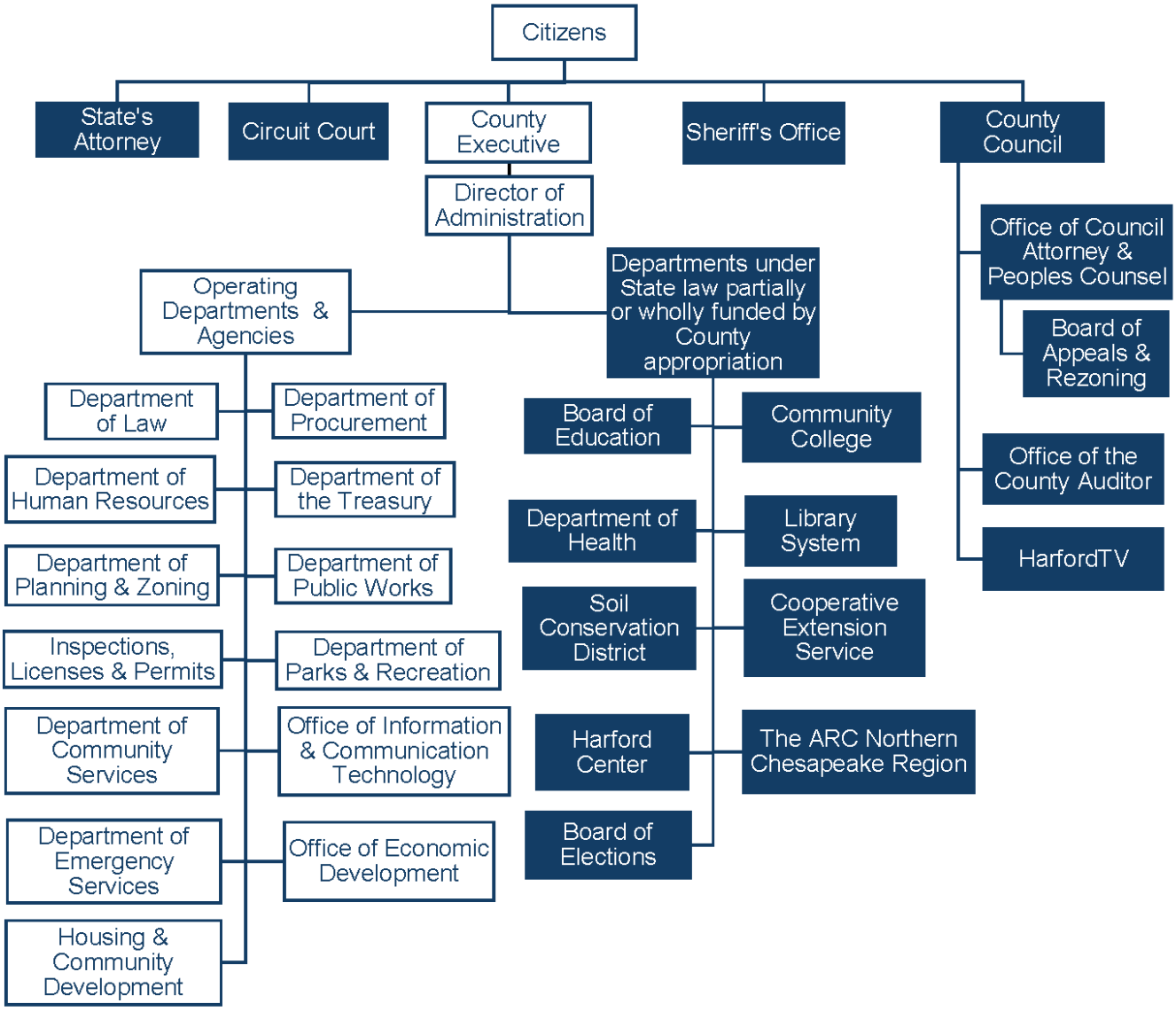
HARFORD COUNTY GOVERNMENT ORGANIZATION CHART



*Departments and agencies highlighted are not under control or supervision of Harford County Government but are partially or wholly funded by County appropriation under State Law.

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Appendix D

Harford County Government Employment Data

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Total Full-Time and Part-Time Jobs (by Industry) - 2014-2045
Harford County, MD

	Historic Data									Projected Data					
NAICS Major Industry	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Total employment (number of jobs)	**123,336**	**125,934**	**127,247**	**129,833**	**132,607**	**132,174**	**128,188**	**133,692**	**137,752**	**135,300**	**150,300**	**154,100**	**157,700**	**161,400**	**165,100**
Farm employment	831	825	897	933	873	832	789	851	823	900	900	900	900	900	900
Nonfarm employment	122,505	125,109	126,350	128,900	131,734	131,342	127,399	132,841	136,929	134,400	149,400	153,200	156,800	160,500	164,200
Private nonfarm employment	98,822	102,091	103,710	106,466	109,356	109,043	105,361	111,005	114,638	110,700	125,600	129,400	133,000	136,800	140,500
Forestry, fishing, and related activities	232	213	211	199	223	(D)	(D)	(D)	256	200	300	300	300	300	300
Mining, quarrying, and oil and gas extraction	151	172	184	174	159	(D)	(D)	(D)	145	200	300	300	300	300	300
Utilities	72	76	87	78	91	144	137	161	187	100	100	100	100	100	100
Construction	8,111	8,167	8,252	8,379	8,665	8,655	8,639	8,813	9,023	8,900	9,900	10,100	10,500	10,700	10,900
Manufacturing	4,647	5,122	5,312	5,253	5,399	5,381	5,228	5,257	5,484	5,100	5,200	5,100	5,000	4,900	4,800
Wholesale trade	3,396	3,705	3,606	3,506	3,695	4,143	4,133	4,276	3,758	4,500	5,300	5,600	5,900	6,200	6,500
Retail trade	15,276	15,313	15,167	15,400	14,995	15,871	14,354	15,516	15,763	14,800	16,400	16,800	17,200	17,600	17,900
Transportation and warehousing	5,784	6,083	6,609	7,094	7,872	6,524	8,092	8,865	9,588	7,900	9,000	9,300	9,500	9,700	9,900
Information	749	769	1,048	1,057	883	741	911	1,039	1,128	900	1,300	1,500	1,700	1,900	2,100
Finance and insurance	4,772	4,984	5,162	5,218	5,548	5,144	5,627	6,264	7,099	5,500	6,100	6,300	6,400	6,600	6,900
Real estate and rental and leasing	5,894	6,052	6,018	6,231	6,291	5,885	6,552	6,985	7,600	6,400	7,100	7,300	7,500	7,700	7,900
Professional, scientific, and technical services	11,197	11,378	11,218	11,552	12,180	12,172	11,921	12,367	12,493	13,000	14,400	14,800	15,100	15,500	15,900
Management of companies and enterprises	348	318	345	321	310	296	279	279	329	300	500	600	600	700	700
Administrative and support and waste management and remediation services	5,294	5,203	5,553	6,110	6,003	6,293	6,158	6,569	6,961	6,800	7,600	7,800	8,000	8,200	8,400
Educational services	1,936	2,011	2,029	2,122	2,182	2,298	1,938	2,041	2,232	2,200	2,900	3,200	3,400	3,500	3,600
Health care and social assistance	12,293	12,896	13,189	13,545	13,947	14,208	13,516	13,522	13,477	14,500	16,100	16,500	17,000	17,400	18,200
Arts, entertainment, and recreation	3,051	3,166	3,294	3,416	3,465	3,473	2,605	2,914	3,153	2,700	4,100	4,200	4,300	4,400	4,500
Accommodation and food services	8,417	9,114	9,195	9,615	9,918	9,993	7,947	8,534	8,607	9,400	10,900	11,400	11,800	12,400	12,700
Other services (except government and government enterprises)	7,202	7,349	7,231	7,196	7,530	7,454	6,964	7,217	7,355	7,300	8,100	8,200	8,400	8,700	8,900
Government and government enterprises	23,683	23,018	22,640	22,434	22,378	22,299	22,038	21,836	22,291	23,700	23,800	23,800	23,800	23,700	23,700
Federal civilian	11,506	11,188	11,042	10,964	11,063	11,252	11,376	11,381	11,407	12,300	12,300	12,300	12,200	12,100	12,000
Military	2,425	2,467	2,127	2,005	1,822	1,684	1,665	1,708	1,668	1,800	1,800	1,700	1,700	1,600	1,600
State and local	9,752	9,363	9,471	9,465	9,493	9,363	8,997	8,747	9,216	9,600	9,700	9,800	9,900	10,000	10,100
State government	580	582	568	561	586	606	598	592	607	600	600	600	600	600	600
Local government	9,172	8,781	8,903	8,904	8,907	8,757	8,399	8,155	8,609	9,000	9,100	9,200	9,300	9,400	9,500

Notes:
1. The estimates for 2011-2016 are based on the 2012 NAICS. The estimates for 2017 forward are based on the 2017 NAICS.
2. (D) Not shown to avoid disclosure of confidential information; estimates are included in higher-level totals.
3. Historic data obtained from the U.S. Bureau of Economic Analysis; last updated November 16, 2023.
4. Projected data obtained from the Maryland Department of Planning.

References:
Harf.pdf (maryland.gov)
BEA Interactive Data Application

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Appendix E

Harford County Solid Waste Code

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§ 109-8.4. Removal from plan. [Added by Bill No. 91-16]

The County Council may remove a site from the Solid Waste Management Plan if the owner or operator:

A. Is in violation of any provision of § 109-8.1, 109-8.2, or 109-8.3 of this Article; or

B. Has not, within 18 months after the date on which the Council placed the site in the plan:

(1) Been issued a permit by the Maryland Department of the Environment; or

(2) Placed the site in operation as a rubble landfill.

§ 109-8.5. Landfill, solid waste transfer station or other solid waste processing facility. [Added by Bill No. 11-62]

A. Prior to submission for inclusion of a landfill, solid waste transfer station or other solid waste processing facility into the Solid Waste Management Plan, a community meeting shall be held.

B. The community meeting shall be held near the site of the proposed facility, preferably in a public or institutional building with adequate parking. The meeting shall be scheduled to start between 6:00 p.m. and 8:00 p.m. on a weekday evening, or scheduled between 9:00 a.m. and 5:00 p.m. on a Saturday, excluding all state and County holidays.

C. At least two weeks prior to the community meeting, the owner/operator of the proposed facility shall ensure that notice of the date, time and location of the community meeting, as well as information required under Subsection J of this section has been provided to the following:

(1) All property owners within one-quarter mile of the proposed facility as identified in the records of the State Department of Assessment and Taxation, by first class mail;

(2) The Department of Public Works, which will post the meeting notice on the County website; and

(3) The County Council.

D. At least two weeks prior to the community meeting, the owner/operator shall ensure that the property that is the subject of the proposed facility is posted with a notice, obtained from the Department of Public Works, stating the date, time and location of the community meeting. The notice shall briefly describe the proposed facility and include the County website address. The notice shall be on a sign measuring at least 22 inches by 28 inches. The notice shall be conspicuously placed on the property, near the right-of-way line of each public road that the property has frontage on, at such location that the notice shall be visible, if possible, from each public road on which the property fronts. Following the posting, the owner/operator shall use reasonable efforts to maintain the notice in a condition visible to the public until the date of the community meeting.

E. At least two weeks prior to the community meeting, the owner/operator shall ensure that notice of the community meeting is published once a week for two consecutive weeks, in at least two newspapers generally circulated in Harford County.

F. The purpose of the community meeting is for the owner/operator to provide information to the community regarding the proposed facility and to allow citizens to ask questions and to make comments and suggestions.

G. At the community meeting, the owner/operator shall present draft plans for the site layout which

includes the information required under Subsection J of this section.

H. The owner/operator shall ensure that a certification of mailed meeting notices and a certification of the newspaper advertisements are included with the submission of the application for inclusion in the Solid Waste Management Plan.

I. Within 45 calendar days of the community meeting, the owner/operator shall submit a summary of the comments made by citizens at the community meeting to the Department.

J. At the community meeting the owner/operator shall provide the following information about the proposed facility:

(1) Information showing that there is a demonstrated need for the facility in the County;

(2) The name, address, and telephone number of the owner/operator;

(3) A map showing the current zoning classification of all land within one mile of the parcel;

(4) Color-coded maps showing:

(a) All residential, institutional, industrial, and agricultural buildings and improvements within one mile of the parcel; and

(b) The approximate location of all proposed residential, institutional, and industrial buildings and improvements that are:

[1] Part of a concept plan, preliminary plan, or site plan currently approved by the Director of Planning and Zoning and located within one mile of the parcel.

(5) A contour map on a scale specified by the Department which shows:

(a) The elevation of all land within one mile of the parcel; and

(b) In a different color, the proposed final elevations of the facility;

(6) Reproductions of the appropriate maps that:

(a) Show all parcels and lots within one mile of the parcel;

(b) Indicate by means of color-coding:

[1] All public water lines;

[2] All parcels that receive public water;

[3] All improved parcels that do not receive public water; and

[4] All unimproved parcels;

(7) A description of any natural screening and buffer on the site and the owner's/operator's proposed screening and buffer plan;

(8) Any information on roads and traffic in the area of the site, including but not limited to functional classification of surrounding roadways and existing average daily traffic (ADT) on roads surrounding the proposed site;

(9) A description of the proposed plan to be used for preventing the escape of dust and solid waste from the site;

(10) A description of the proposed procedures to be used to prevent dirt, soil and solid waste from the site from accumulating on the roads used for ingress to and egress from the site;

(11) A list of the proposed hours of operation and a description of the proposed site design and operating procedures to be used to ensure that traffic to the site does not accumulate off-premises before, during, and after the hours of operation;

(12) A description of the proposed security measures to be used to prevent unauthorized entry into the site after normal operating hours;

(13) A description of the proposed checking and operating procedures to be used to ensure that prohibited material is not deposited at the site;

(14) A list of each state and local permit the owner/operator must obtain before commencing operation of the solid waste facility;

(15) A description of the proposed plan for controlling odors and noise;

(16) An estimate of the daily tons of solid waste to be received and an estimate of the number of trucks to the site on a daily basis; and

(17) A detailed plan showing the dimensions of the facility and any uses to be conducted outside an enclosed facility and their locations on the site.

§ 109-9. Collection and disposal of liquid waste.

A. Compliance with § 109-2. All persons engaged in collection and transportation of liquid waste shall comply with § 109-2 of this Article.

B. Equipment. All vehicles used in the enterprise of liquid waste disposal shall be used only for this purpose. All tanks, hoses and pumps shall be leakproof.

C. Identification of vehicles. Septic tank vehicles shall have the words "Sewage Only," followed by the gallons of tank capacity, on each side of the tank. Lettering shall be as specified in § 109-2.

D. Disposal sites. All septic tank waste shall be disposed of only at those manhole sites as designated by the Director of Public Works with concurrence of the local Health Officer. In no instance will septic tank waste be dumped on open areas, such as farmland and parkland.

E. Sludge disposal. Digested or partially digested sludge will not be disposed of in open areas, such as farmland, sod-growing areas or parkland, without the approval of the Department of Health and the Department of Public Works. Any person contemplating disposal of sludge in the county will submit his proposal to the Department of Health and Department of Public Works for their approval. Such proposal shall include all intended procedures to be used, the amount of sludge to be disposed of and a description of the area and location of the disposal site.

F. Use of county disposal facilities by other jurisdictions. Neighboring or adjacent jurisdictions and municipalities, as well as any person engaged in refuse or liquid waste disposal, shall obtain the consent of the Department of Public Works and the Department of Health before using any disposal facilities or areas within the county.

ARTICLE X
Landfills

§ 267-89. Sanitary landfills.

This use is permitted in the AG, RR, R1, R2, R3, R4, RO, VR, VB, B1, B2, B3, CI, LI and GI Districts, provided that:

A. The site must be included in the most recently adopted Harford County solid waste management plan.

B. The site must be a minimum of 100 acres in size.

C. A site plan shall be developed to consider and address topography of the area, ability to effectively buffer the landfill area and such other factors as the Departments of Planning and Zoning and Public Works and the County Council deem relative in conformity with § 267-9I (Board of Appeals, Limitations, guides and standards).

D. A buffer area, designed to adequately buffer the landfill activities from view of adjoining properties, shall be maintained between the fill area and adjoining property lines. If the existing vegetation within the buffer area does not adequately screen the landfill activities, a landscaped earth berm shall be constructed within the buffer area to provide adequate screening. The distance shall be determined by the County Council after the site plan is developed. For any landfill, or landfill expansion, receiving a permit from the Maryland Department of the Environment after the effective date of this act, a minimum buffer area of 1,000 feet shall be maintained between the fill area and any adjoining residential property line, not including properties owned by the entity operating the landfill. A Type "E" buffer, pursuant to § 267-30 (Buffer yards), shall be provided next to any adjacent residential lot and along any public road. Prior to commencement of landfilling activities, a minimum 20-foot recreational buffer shall be established within the required buffer yard.

E. An undisturbed buffer area of 1,000 feet shall be maintained between the fill area and the banks of the Deer Creek.

F. The Department of Public Works shall cause, prior to submission of the site plan to the County Council, a notice to be published once a week for 2 consecutive weeks in 2 newspapers of general circulation in the County. The notice shall identify the location of the site, the acreage and physical description of the site.

§ 267-90. Rubble landfills.

This use is permitted in the AG, RR, R1, R2, R3, R4, RO, VR, VB, B1, B2, B3, CI, LI and GI Districts, provided that:

A. The site is at least 100 acres in size and must be included in the most recently adopted Harford County solid waste management plan.

B. The Department of Public Works shall cause, prior to submission of the site plan to the County Council, a notice to be published once a week for 2 consecutive weeks in 2 newspapers of general circulation in the County. The notice shall identify the location of the site, the acreage and physical description of the site.

C. An undisturbed buffer area, designed to adequately buffer the landfill activities from view of adjoining properties, shall be maintained between the fill area and adjoining property lines. The distance shall be determined by the County Council after the site plan is developed and shall be a

minimum of 1,000 feet from adjoining property lines. A Type "E" buffer, pursuant to § 267-30 (Buffer yards), shall be provided next to any adjacent residential lot and along any public road. Prior to commencement of landfilling activities, a minimum 20-foot recreational buffer shall be established within the required buffer yard.

D. All areas in which solid waste is deposited are at least 500 feet from the Floodplain District established by Chapter 131 of the Harford County Code, as amended.

E. All areas in which solid waste is deposited are at least 1,000 feet from any lawfully permitted off-site residential or institutional building.

F. The rubble landfill is contoured to substantially conform to the original grade of the site and, in any case, the height of the landfill does not exceed the height of the tallest structure, excluding towers, or natural feature within 2,500 feet of the parcel.

§ 267-91. Solid waste transfer stations. [Amended by Bill No. 11-62]

This use may be granted in the AG, B3, CI and GI Districts, provided that:

A. The site must be included in the most recently adopted Harford County solid waste management plan. The site must be at least 3 acres in the AG District and at least 1 acre in the B3, CI or GI district.

B. A 150 foot buffer shall be provided next to any adjacent residential lot and along any public road. Ancillary uses may be allowed within the buffer including access roads; stormwater management; utilities; wetland mitigation and reforestation; site security measures; and landscaping.

C. Lighting shall be designed and controlled so that any light shall be shaded, shielded or directed so that the light intensity or brightness does not adversely affect the operation of vehicles or reflect into residential lots or buildings.

D. Outside storage of materials or equipment shall be completely buffered from view of adjoining residential properties and public roads.

E. To the extent possible, all buildings on the site shall be located and configured in a manner to maximize the distance between the buildings and adjacent residential lots.

F. Fencing shall be erected and maintained around the facility.

§ 267-92. Other County solid waste processing facilities. [Amended by Bill No. 11-62]

These uses only include County operations associated with the collection of yard waste and recyclable materials. These uses may be granted in the AG, RR, R1, R2, R3, R4, RO, VR, VB, B1, B2, B3, CI, LI and GI Districts, provided that:

A. The facility must be located on County-owned property and operated by the Harford County Department of Public Works.

B. The facility is for the sole purpose of collecting yard waste, as defined by the solid waste management plan, and other recyclable materials.

C. A 150 foot buffer shall be provided next to any adjacent residential lot and along any public road. Ancillary uses may be allowed within the buffer including access roads; stormwater management; utilities; wetland mitigation and reforestation; site security measures; and landscaping.

D. Lighting shall be designed and controlled so that any light shall be shaded, shielded or directed so that the light intensity or brightness does not adversely affect the operation of vehicles or reflect into residential lots or buildings.

E. Outside storage of materials or equipment shall be completely buffered from view of adjoining residential properties and public roads.

Appendix F

Municipal Solid Waste Planning Documents

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Havre de Grace Solid Waste Planning Information

- **Total amount of solid waste generated in the City (please specify residential or commercial or both):** 7,063.01 tons.

- **Amount of solid waste disposed in landfills or other disposal facility:**

Approximately: 3,673 tons.

- **Amount of solid waste diverted from disposal (i.e. recycled, reused, etc.):**

Approximately: 830 tons

- **How has the City's solid waste program changed significantly over the last 10-years?**

Changed contracts from GFL/Waste Industries to Bartenfelder.

- **Does the City anticipate significant changes to the existing solid waste system over the next 10 years (2025-2024)?**

No major changes. Change of contract potentially.

- **Over the next 10 years, does the City anticipate an increase in residential development/housing units that will significantly impact solid waste generation in the City? If so, what kind of housing is expected to be developed (i.e. single-family, multi-family, condos, etc.)**

Development	Type of Unit	Units
Vacant Lots	Single Family	65
Bulle Rock	Multi-family	539
Greenway Farms	Single Family	198
Blenheim Run	Multi-family	60
Bloomsbury Park	Single Family	150
Juniata and Superior	Combination	7
Jonathan Green Farm	Combination	284
Sion Hill	Combination	144
Peter Ianiello (Mt. Felix)	Multi-family	50
Peter Ianiello (Mt. Felix)	Multi-family	9
TOTAL		**1506**

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ABERDEEN, MD - SOLID WASTE (residential)

CITY OF ABERDEEN (RESIDENTIAL)	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Tons of trash (annually)	2197	2839	2557	2313	2485	2340	2391	2439	2469	2624	2827	2991	2963	3058	3172	3177	3040	3012	2961	-	2252	2592	2732	3058	3440	3431	3553	3682	3899	3785	3668	3584
Tons of trash (monthly)	314	237	213	193	207	195	199	203	206	219	236	249	247	255	264	265	253	251	247	-	188	216	228	255	287	286	296	307	325	315	306	299
Pounds of trash (per house per week)	40.1	30.7	27.4	24.7	26.2	24.5	24.6	24.7	24.6	25.7	27.6	28.9	28.1	28.6	29.2	29.0	27.6	27.2	26.8	-	20.4	23.4	24.7	27.6	29.5	29.4	30.1	31.2	33.0	31.7	30.7	30.0
Tons of recyclables (annually)	262	754	868	892	878	817	850	892	905	861	962	1000	923	960	1021	943	902	841	834	-	886	926	911	918	906	918	1037	1095	1275	1230	1206	1196
Tons of recyclables (monthly)	37	63	72	74	73	68	71	74	75	72	80	83	77	80	85	79	75	70	70	-	74	77	76	77	76	77	86	91	106	103	100	100
Pounds of recyclables (per house per week)	4.8	8.1	9.3	9.5	9.3	8.5	8.7	9.0	9.0	8.4	9.4	9.6	8.8	9.0	9.4	8.6	8.2	7.6	7.5	-	8.0	8.4	8.2	8.3	7.8	7.9	8.8	9.3	10.8	10.3	10.1	10.0
Tons of yard waste (annually)	*405	498	549	493	536	438	493	451	408	483	-	-	633	566	737	501	604	581	443	-	-	**669	***433	-	-	-	-	-	-	-	-	-
Tons of yard waste (monthly)	58	42	46	41	45	37	41	38	34	40	-	-	53	47	61	42	50	48	37	-	-	56	36	-	-	-	-	-	-	-	-	-
Pounds of yard waste (per house per week)	7.4	5.4	5.9	5.3	5.6	4.6	5.1	4.6	4.1	4.7	-	-	6.0	5.3	6.8	4.6	5.5	5.3	4.0	-	-	6.0	3.9	-	-	-	-	-	-	-	-	-
Diverted tons (annually)	*667	1252	1417	1385	1414	1255	1343	1343	1313	1344	-	-	1556	1526	1758	1444	1506	1422	1277	-	-	1595	911	-	-	-	-	-	-	-	-	-
Total diversion %	23%	31%	36%	37%	36%	35%	36%	36%	35%	34%	-	-	34%	33%	36%	31%	33%	32%	30%	-	-	38%	25%	-	-	-	-	-	-	-	-	-
Total tons (annually for all items)	*2864	4091	3974	3698	3899	3595	3734	3782	3782	3968	-	-	4519	4584	4930	4621	4546	4434	4238	-	-	4187	3643	-	-	-	-	-	-	-	-	-
Comparison of trash vs. recyclables only	*1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2019	2021	2022	2023
Tons of trash (annually for the city)	*2197	2839	2557	2313	2485	2340	2391	2439	2469	2624	2827	2991	2963	3058	3172	3177	3040	3012	2961	-	2252	2592	2732	3058	3440	3431	3553	3682	3899	3785	3668	3584
Tons of recyclables (annually for the city)	*262	754	868	892	878	817	850	892	905	861	962	1000	923	960	1021	943	902	841	834	-	886	926	911	918	906	918	1037	1095	1275	1230	1206	1196
Diversion for recycling only (vs. trash)	11%	21%	25%	28%	26%	26%	26%	27%	27%	25%	25%	25%	24%	24%	24%	23%	23%	22%	22%	-	28%	26%	25%	23%	21%	21%	23%	23%	25%	25%	25%	25%
Number of Households (Average)	3520	3560	3590	3600	3650	3680	3737	3803	3865	3926	3937	3987	4054	4118	4182	4214	4235	4252	4252	4252	4252	4254	4256	4256	4492	4492	4538	4538	4538	4585	4598	4602

*Represents 7 months total 6/92 thru 12/92. Harford County tip fee began 6/92. Curbside recycling began 6/92. Tonnages info not recorded prior to 6/92.

** Yard Waste estimates based off cubic yardage

Information to supplement the above table:

1) Aberdeen offers curbside collection of trash 1x/week, recyclables 1x/week (same day as trash), yard waste 2x/month (April-Jan.),bulk pick-up by appointment (no extra charge).

2) In the above table, bulk "trash" is included in the trash totals. Bulk "recyclable" is included in the recyclable totals, each represents <10% of these totals.

3) Yard waste is sent to Harford County operated composting facility. HC did not always provide disposal information (tons or cubic yards disposed)

4) Harford County tonnage measurments were not approriately documented in 2002, 2003, 2011, and 2012; therefore, data excluded as indicated

List of Projects

21-01	Edge at Middelton	237 Apartment Units	10.38 acres	Tom Miner - FWA
21-03	The Preserve at Gilbert Meadows	83 Single family homes, 93 Townhouse units	75.12 acres	Amy DiPietro - MRA
22-01	Fieldside Commons	533 Apartment Units	23.39 acres	Dan Spiker - MRA
22-02	St. Joan of Arc Parish Expansion	New Chapel (1445sf) and Gymnasium (4264 sf) Addition	2.98 acres	Travis Moore - FWA
22-05	Aberdeen Overlook	122 single family, 157 townhouse, 65 villas	110.04 acres	Amy DiPietro - MRA/Chris Mears
22-07	Rutter's Store #103	Convenience store with fuel service	20.863 acres	Kevin Phillips - Landmark
22-08	Popeye's - Middleton Holdings Lot 2	Restaurant	1.362 acres	Mitch Ensor - Bay State
23-02	Fields of Aberdeen	94 Rented Stacked Townhouse Apartments	14.94 acres	Dan Spiker - MRA

INTEGRATED SOLID WASTE MANAGEMENT PLAN

U.S. ARMY GARRISON

ABERDEEN PROVING GROUND

September 2023

Prepared for

Directorate of Public Works
Environmental Division

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APPENDICES

ACRONYMS

ACM ..... Asbestos Containing Materials
AMC ..... Army Materiel Command
APG ..... U.S. Army Garrison, Aberdeen Proving Ground
AR ..... Army Regulation
ARL ..... Army Research Lab
ATC ..... Aberdeen Test Center
BRAC ..... Base Realignment and Closure
CFR ..... Code of Federal Regulations
COMAR ..... Code of Maryland Regulations
CWA ..... Clean Water Act
C4ISR ..... Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance
CECOM ..... Communications-Electronics Command
C&D ..... Construction and Demolition
DA ..... Department of Army
DoD ..... Department of Defense
DoDD ..... Department of Defense Directive
DoDI ..... Department of Defense Instruction
DIO ..... Department of Installation Operations
DLA ..... Defense Logistics Agency
DPW ..... Directorate of Public Works
DPW ED ..... DPW, Environmental Division
DPW ED - IOB ..... DPW, ED - Industrial Operation Branch
DPW-HWB ..... DPW, ED – Hazardous Waste Branch
EO ..... Executive Order
EPCRA ..... Environmental Planning and Community Right-to-Know Act
IR ..... Installation Restoration
ISWMP ..... Integrated Solid Waste Management Plan
LCA ..... Life Cycle Analysis
LCC ..... Life Cycle Cost Analysis
MDE ..... Maryland Department of the Environment
MRICD ..... Medical Research Institute of Chemical Defense
NPDES ..... National Pollutant Discharge Elimination System
OSHA ..... Occupational Safety and Health Act
P2 ..... Pollution Prevention
PPA ..... Pollution Prevention Act
QRP ..... Qualified Recycling Program

OB/OD ..... Opening Burning/Open Detonation
RDECOM ..... Research, Development and Engineering Command
RCI ..... Residential Communities Initiative
RCRA ..... Resource Conservation and Recovery Act
SWAR ..... Solid Waste Annual Report
TRI ..... Toxics Release Inventory
TSDF ..... Treatment, Storage and Disposal Facility
UXO ..... Unexploded Ordnance
USAPHC ..... U.S. Army Public Health Command
USDOT ..... U.S. Department of Transportation
WTE ..... Waste-to-Energy

1.0 INTRODUCTION

The U.S. Army Garrison, Aberdeen Proving Ground (APG) Integrated Solid Waste Management Plan (ISWMP) is updated every 5 years or if significant changes affecting solid waste generation or management occur per AR 420-1, Chapter 23-11. Army requirements and previous APG ISWMPs have established diversion goals of 50% for municipal solid waste and 60% for construction and demolition debris. To achieve these goals, an integrated approach to solid waste management is prescribed in which a hierarchy of management approaches is followed. The integrated approach places reducing solid waste generation as the first priority followed by reuse and recycling of solid waste. Disposal via incineration and landfilling is the least favored management option and should be used only after other hierarchical approaches have been determined to be technically or economically infeasible. The previous APG ISWMP included an improvement goal of 2% diversion over the previous year's diversion rate until 2015. Diversion goals of 50% and 60% for municipal waste and construction and demolition waste, respectively, have been established as required by the Department of Defense Strategic Sustainability Performance Plan, 7 September 2016.

APG has undergone major changes via the Base Realignment and Closure (BRAC) process as a net receiver of civilian and contractor personnel, which was completed in 2012. Concurrently with the BRAC process was the Enhanced Use Lease program (EUL) which brought various corporations that provide support to the Garrison to locate within the EUL areas. While the EUL process has brought additional personnel, solid waste management for EUL is not a Garrison responsibility. One additional change to the APG community is the privatization of Garrison housing through the Residential Communities Initiative (RCI) process. The RCI process impacted solid waste management in that the Garrison is not responsible for municipal solid waste management from Garrison housing. Instead it will be managed by the RCI contracting mechanism which requires solid waste to be handled separately from the installation.

The ISWMP for the next five years will emphasize source reduction, reuse and recycling to meet the Army goals. This plan uses 2018 as a baseline and projects forward 10 years through 2028. The 2018 diversion rates at APG exceed the Army's requirements for C&D waste but fell short for municipal waste. During 2018, 44.3% of municipal waste and 95.7% of C&D waste were successfully diverted from incineration and landfilling. Current diversion rates for FY 2023 are 46.3% for municipal waste and 97.7% for C&D waste.

This plan is consistent with U.S. Army Center for Health Promotion and Preventive Medicine Technical Guide No. 197, *Guide for Developing Integrated Solid Waste Management Plans at Army Installations,* as applicable, and has been prepared in accordance with Army Regulations AR 200-1, Environmental Quality; AR 420-1 Army Facilities Management; and the applicable elements of federal and state regulations which set forth direction and general policy for a solid

waste management plan. Code of Maryland Regulation 26.03.03.02B requires each county to include in their Solid Waste Management Plan, all existing, planned or programmed federal facilities to the extent that inclusion shall promote public health, safety and welfare. A copy of this plan will be submitted to Harford County so that the county can meet its Code of Maryland (COMAR) obligations.

Chapter 1 of the plan lays out the goals and objectives that APG has established for its solid waste management program. Chapter 2 presents the responsibilities for individuals, government organizations, and contractors at APG and presents the chain of command for solid waste management decisions. Consistent with Army and COMAR requirements, Chapter 3 provides information relative to the current types and quantities of solid waste as well as five and ten year projections. Also included in Chapter 3 is a discussion of 2018 baseline collection practices and acceptance facilities. Chapter 4 is the plan of action identifying needs followed by action items that will meet the identified needs.

Chapter 3 establishes the hierarchy of which the planning for the next five to ten years is based upon. The hierarchy is consistent with pollution prevention themes that are the preferred environmental management techniques for the federal government. This hierarchy consists of source reduction, reuse, donation, recycling, composting/mulching, incineration with energy recovery, volume reduction without energy recovery, and finally disposal. These terms, defined in chapter three, are the basis for most of the goals and objectives, and comprise the structure of Chapter 4, Integrated Solid Waste Plan of Action. Performance indicators for success measurement are presented in Chapter 5.

1.1 Integrated Solid Waste Management Goals

The goals for the Aberdeen Proving Ground Integrated Solid Waste Management Plan will reflect the requirements of DoD and U.S. Army policy. Expansion of reuse and recycling opportunities will play a prominent role in the management of solid waste for the next 10 years.

The following goals have been established for the APG Integrated Solid Waste Management Plan:

(1) Expand the qualified recycling program (QRP) to include additional commodities to the extent possible.

(2) Identify new diversion opportunities in order to reach the DoD diversion goals of 50% municipal waste and 60% C&D waste.

(3) Improve the collection of solid waste data to aid in meeting the diversion goals.

(4) Ensure all contracts include appropriate language necessary to meet the diversion goals.

(5) Continue to use the Army's online solid waste reporting system entitled Solid Waste Annual Reporting Web system (SWARweb).

(6) Comply with applicable Department of Defense, Department of Army, Federal, state and local regulations and requirements.

(7) Provide cost-effective solid waste management for the Garrison, Aberdeen Proving Ground.

(8) Accomplish solid waste management in a manner that is protective of human health and the environment.

1.2 Integrated Solid Waste Management Objectives

The following objectives have been established so as to allow APG to meet the stated goals of the Integrated Solid Waste Management Plan and to maintain compliance with DoD, DA, federal and state regulations and requirements:

(1) Coordinate with Garrison and tenant contracting groups to ensure all capital projects include a plan demonstrating how the project will divert a minimum of 60% of the C&D waste from landfills and incineration

(2) Update the 2010 analysis of diversion and disposal options during the life of the plan to maximize diversion opportunities and cost effectiveness.

(3) Develop public relations/training program(s) to promote diversion efforts.

(4) Development of a system to improve data collection both in terms of capturing information not currently captured and efficiency in the manner in which data is collected.

(5) Ensure C&D diversion data from all capital projects is captured and reported to the solid waste program.

(6) Maintain post closure monitoring program for Phillips and Westwood Landfills.

(7) Ensure that operations contractors are obligated to participate in the elements of this plan.

1.3 Conformance

The Garrison has prepared this plan to conform to all pertinent Code of Maryland, Army regulations and Executive Orders. It has been prepared to comply with DoD guidance on sustainability, Army guidance for the preparation of integrated solid waste management plans and the general guidance provided in the Code of Maryland Regulations for county solid waste management plans. This Integrated Solid Waste Management Plan will be submitted to Harford County for incorporation into their plan.

1.4 Regulations Governing Solid Waste Management and Pollution Prevention

Solid waste management laws and regulations exist at the federal, state, local, and Army levels. Laws are acts of governing bodies while regulations are developed by the overseeing agencies as a result of laws. Minimum nationwide standards for protecting human health and the environment are established at the federal level. State regulations may meet or be more stringent than those mandated by federal regulations. In general, state regulations specify design criteria and the permitting, construction, operation, maintenance, and monitoring requirements for solid waste management facilities. County regulations, which must be compatible with those at the federal and state level, generally deal with issues concerning land use, procurement, and financing of solid waste management facilities. Army regulations typically reinforce the federal and state requirements and often incorporate requirements unique to the military environment.

1.4.1 Executive Orders

Presidents have issued numerous executive orders (EOs) to promote P2 as the preferred environmental management technique throughout the Federal government. These orders instruct Federal agencies to integrate waste reduction and recycling programs into their environmental initiatives. The most recent EO on the subject is EO 13834 that requires federal agencies and facilities to, "…meet such statutory requirements in a manner that increases efficiency, optimize performance, eliminate unnecessary use of resources, and protects the environment… prioritize actions that reduce waste, cut costs, enhance the resilience of Federal infrastructure and operations, and enable more effective accomplishment of its mission." Executive Order 13834 revokes EO 13693 which revoked the previous EO's 13423 and 13514. Additional information may be found in Table 1-1.

1.4.2 Federal Regulations

Table 1-2 is a brief summary of the federal laws that affect solid waste management and the resulting regulations. The most prominent of these laws is the Resource Conservation and Recovery Act of 1976 (amended in 1980 and 1984). The Resource Conservation and Recovery Act provides federal guidelines and standards for the environmentally sound reuse, handling and disposal of solid waste. In addition, this act requires states to incorporate these guidelines into their solid waste management programs. The Pollution Prevention Act of 1990 established P2 as the Nation's preferred waste management approach for all generators including Federal facilities. The Federal Facilities Compliance Act of 1992 indirectly encourages P2 by waiving sovereign immunity for Federal facilities concerning hazardous waste compliance requirements.

Federal regulations, encoded in the *Code of Federal Regulations*, establish overall regulatory direction and establish minimum nationwide standards for protecting human health and the environment. Title 40 of the Code of Federal Regulations (CFR) is entitled *Protection of the*

Environment. These regulations are set forth by the U.S. Environmental Protection Agency. CFR citations for regulations applicable to the U.S. Army Garrison, Aberdeen Proving Ground's solid waste management program are presented in Table 1-2.

Table 1-1 Summary of Applicable Executive Orders
Integrated Solid Waste Management Plan
Aberdeen Proving Ground, Maryland

Executive Order	Date	Applicable Area	Synopsis
12898	February 11, 1994	Pollution Prevention/ Environmental Justice	Encourages Federal facilities to document potential environmental impacts in environmental justice areas and target such impacts for reduction through pollution prevention.
13834	May 17, 2018	Efficient Federal Operations	Requires in acquisitions use of sustainable environmental practices, including acquisition of bio-based, environmentally preferable, energy-efficient, water-efficient, and recycled-content products; use of paper of at least 30 percent post-consumer fiber content; reduces the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed; increases diversion of solid waste as appropriate, and maintains cost effective waste prevention and recycling programs. Also sets goals for energy reduction, use of alternative fueled vehicles, water consumption reductions. Specifies that non-hazardous waste includes compostable material.

Table 1-2 Summary of Potentially Applicable Federal Regulations
Integrated Solid Waste Management Plan
Aberdeen Proving Ground, Maryland

Statute	Synopsis	Applicable Area	Citation
Resource Conservation and Recovery Act (RCRA) of 1976, Solid Waste Disposal Act Amendments of 1980 and Hazardous and Solid Waste Amendments of 1984 and 2002	This act provides standards and guidelines for the environmentally safe handling and disposal of both hazardous and non-hazardous solid waste. One of the objectives of the act is to encourage waste minimization activities through source reduction and the promotion of recycling and reuse of recoverable materials in solid waste (SW), and/or conversion of Waste-to-Energy.	• Thermal Processing of SW • Land Disposal of SW • Storage and Collection of SW • Beverage Containers • Resource Recovery Facilities • Source Separation Guidelines • Recycled Material Procurement • SW Facility Classification • Municipal SW Landfills • Hazardous Waste Management	40 CFR 240 40 CFR 241 40 CFR 243 40 CFR 244 40 CFR 245 40 CFR 246 40 CFR 247 40 CFR 257 40 CFR 258 40 CFR 260-282
Pollution Prevention Act (PPA) of 1990	This act establishes a national policy to ensure that pollution is prevented or reduced at the source, recycled or treated in an environmentally safe manner, and disposed of or released into the environment only as a last resort.	• Reduction of SARA toxins • Solid Waste Reduction and recycling reporting	42 USC 13101-13109
Clean Air Act and Amendments of 1970, 1977 and 1990	This act was passed to address the problem of controlling sources of air pollution. Although solid waste itself is not governed by this act, many energy recovery and disposal facilities are subject to the requirements of the act. Emissions from resource recovery facilities, landfill gases, and emissions from solid waste incinerators are all subject to at least some of the requirements of the Clean Air Act.	• New Source Performance Standards • National Emission Standards for Hazardous Air Pollutants • Operating Permit Program	40 CFR 60 40 CFR 61 and 63 40 CFR 70 and 71

Table 1-2 (Continued)
Summary of Potentially Applicable Federal Regulations
Integrated Solid Waste Management Plan
Aberdeen Proving Ground, Maryland

Statute	Synopsis	Applicable Area	Citation
Clean Water Act (CWA) Amendments of 1977	The objective of the CWA is to restore and maintain the chemical, physical and biological integrity of the nation's waters. The National Pollutant Discharge Elimination System (NPDES) program was established under this act. This program manages effluent limitations for the discharge of wastewater and runoff from solid waste management facilities into bodies of water. The CWA also addresses the disposal of sewage sludge.	• NPDES Permit Program • Sewage Sludge Regulations	40 CFR 122 40 CFR 503
National Environmental Policy Act of 1970	National Environmental Policy Act requires federal agencies to consider environmental factors just as they would other factors in the decision-making process. One of the key developments of the National Environmental Policy Act is the environmental assessment which must be performed on all major actions which significantly affect the quality of the human and ecological environment. At Aberdeen Proving Ground, Environmental Assessments have been performed on the Westwood and the Phillips Army Airfield Rubble Landfills.	• Environmental Assessment	40 CFR 1502
Federal Facilities Compliance Act (FFA) of 1992	This act amends the Solid Waste Disposal Act to waive federal facilities immunity from violation of substantive or procedural requirements under federal, state, interstate, or local solid or hazardous waste laws.	• Solid Waste Elements	NA
Occupational Safety and Health Act (OSHA) of 1970	This act was established to assure "so far as possible, every working man and woman in the nation safe and healthful working conditions." Various standards promulgated by OSHA such as personal protective equipment and hazardous materials handling, may be potentially applicable for worker protection during solid waste storage, collection, and disposal. Construction related standards included under OSHA Construction Industry Standards are potentially applicable during landfill operations/closure, etc.	• Occupational Safety and Health Standards • Safety and Health Regulations for Construction including asbestos and lead based paint disposal	29 CFR 1910 29 CFR 1926
U.S. Department of Transportation (USDOT) Regulations	Establishes regulations for packaging, communications, emergency response, documentation, and marking during shipping of hazardous materials including asbestos waste	• Hazardous Materials Regulations (asbestos)	49 CFR 107-179

1.4.3 State Regulations

The State of Maryland has adopted a number of laws which have a direct or indirect impact on the management of solid waste. These laws are codified under the Articles of the *Annotated Code of Maryland*. In response to these laws, state agencies develop administrative rules and regulations. These administrative rules and regulations are compiled and published into a document entitled the *Code of Maryland Regulations (COMAR)*. Title 8 of the Code of Maryland Regulations contains regulations of the Maryland Department of Natural Resources, which must be considered when citing and permitting a solid waste management facility. The administrative rules and regulations for the Maryland Department of the Environment are contained in Title 26 of the Code of Maryland Regulations. Within this title are the regulations governing solid waste management. Table 1-3 highlights some of the Maryland Regulations.

1.4.4 Harford County

Harford County regulates solid waste management activities through several mechanisms: the *Harford County Code*, the *Harford County Zoning Code*, and ordinances adopted by the county council and the county executive. Most of the ordinances and regulations pertain to land use and zoning restrictions for solid waste facilities, disposal fees, and/or recycling plans for the county. Although they do not directly address the U.S. Army Garrison, Aberdeen Proving Ground, they impact the Garrison since much of the solid waste generated on-post is recycled or disposed of through Harford County facilities.

Harford County has adopted the Aberdeen Proving Ground's Solid Waste Management Plan into their plan. The *Maryland Annotated Code* and the *Code of Maryland Regulations* allow a county to incorporate subsidiary solid waste plans into its solid waste management plan. It is the intention of Garrison Aberdeen Proving Ground that this updated Integrated Solid Waste Management Plan will also be incorporated into the Harford County Plan.

Of particular note is Bill No. 92-94, which was passed and became law in 1994. Bill 92-94 added general provisions for rubble landfill operations, eliminated any past exceptions extended to the Garrison regarding solid waste, and added zoning standards to the district regulations. Bill 92-94 also imposed additional operating and reporting requirements for the Westwood Rubble Landfill, Phillips Army Airfield Rubble Landfill, and the U.S. Army Medical Research Institute for Chemical Defense (MRICD) incinerator all of which have since been closed. This Bill along with other County regulations is summarized in Table 1-4.

However, as a result of the permanent closure of the Westwood Landfill, Phillips Landfill and the MRICD Incinerator, most of the requirements contained in Bill 92-94 no longer have relevance. Only the requirement to provide Harford County copies of the landfill groundwater monitoring reports and an annual report of C&D waste deposited at rubble fills other than the former Garrison rubble fills, have relevance. Henceforth, the Garrison will only submit copies of the Phillips and

Westwood groundwater monitoring reports to Harford County concurrently with their submittal to the Maryland Department of the Environment (MDE) and will provide an annual report of C&D waste disposal to off post facilities. The Garrison will continue to conduct groundwater monitoring at the Phillips and Westwood landfills until such time that the MDE indicates monitoring is no longer required. The Garrison and MDE have agreed to reduce both the frequency of monitoring and the number of wells to be monitored due to the quality of the groundwater around each landfill. As of 2023, The Garrison is still submitting groundwater monitoring reports to MDE and Harford County.

Table 1-3
Summary of Potentially Applicable Maryland Regulations
Integrated Solid Waste Management Plan
Aberdeen Proving Ground, Maryland

Maryland Code	Synopsis	Applicable Area	Citation
ENVIRONMENT ARTICLE TITLE 26: Water Supply, Sewage Disposal and Solid Waste	Solid waste and sewage sludge management and disposal are addressed under this title. Pollution Prevention and Recycling initiatives are emphasized by Maryland. *Maryland Recycling Act of 1988* requires all Maryland Counties, including Harford County, to reduce county waste streams by 20% via recycling.	• County Solid Waste Management Plans • Sewage Sludge Management • Solid Waste Management • Scrap Tire management • Natural Wood Waste Recycling Facilities • Administration of Federal NPDES program	COMAR 26.03.03 COMAR 26.04.06 COMAR 26.04.07 COMAR 26.04.08 COMAR 26.04.09 COMAR 26.08.04
ENVIRONMENT ARTICLE TITLE 26: Water Management	This title addresses Sediment and Erosion Control, Storm Water Management, Oil Pollution and Underground Storage Tank (UST) management. The Sediment Control Program requires preparation and implementation of a Sediment and Erosion Control Plan for land clearing, grading or other earth disturbances as may be required in landfills. Storm Water Management regulations may impact the operation of solid waste storage, disposal or processing facilities. Oil pollution and tank management includes permit requirements for oil operations, tank management, release reporting and corrective action requirements (disposal of oil contaminated soil). Currently, APG has been implementing corrective actions at several UST release sites.	• Erosion and Sediment Control • Storm Water Management • Oil Pollution and Tank Management	COMAR 26.17.01 COMAR 26.17.02 COMAR 26.10
ENVIRONMENT ARTICLE TITLE 26: Ambient Air Quality Control	This title requires control of air pollution sources through permitting, establishment of Maryland Ambient Air Quality Standards (MAAQS) and emission standards. These requirements are applicable to solid waste management facilities such as municipal solid waste incinerators and resource recovery facilities. Requirements for asbestos containing material disposal and emission control are also addressed.	• Permit to Construct, State Permit to Operate, NSR/PSD approvals • Part 70 (CAA Title V Permits) • MAAQS • General Emission Standards • Control of Incinerators and Operator Training Requirements • Control of Asbestos	COMAR 26.11.02 COMAR 26.11.03 COMAR 26.11.04 COMAR 26.11.06 COMAR 26.11.08 COMAR 26.11.21

Table 1-3 (Continued)
Summary of Potentially Applicable Maryland Regulations
Integrated Solid Waste Management Plan
Aberdeen Proving Ground, Maryland

Maryland Code Environment Article	Synopsis	Applicable Area	Citation
ENVIRONMENT ARTICLE TITLE 26: Hazardous Materials and Hazardous Substances	Maryland hazardous waste regulations are set up similar to the Federal RCRA regulations and address waste identification, standards for generators, transporters, owners/ operators of treatment, storage and disposal facilities, recycling, energy recovery, reclamation, management of special medical wastes, and release response.	• Maryland Hazardous Waste Regulations • Recycling, Waste-to-energy • Special Medical Wastes • Release Response	COMAR 26.13.01-26.13.07 COMAR 26.13.10 COMAR 26.13.11-COMAR 26.13.13 COMAR 26.14.02

Table 1-4
Summary of Applicable Harford County Regulations
Integrated Solid Waste Management Plan
Aberdeen Proving Ground, Maryland

Harford County Law	Synopsis	Applicable Area	Citation
Bill No. 92-94 of 1993	This bill repealed and enacted definitions, added general provisions for rubble landfill operations, eliminated any past exceptions extended to APG regarding solid waste, and added zoning standards to the district regulations. Bill 92-94 amended the Harford County Solid Waste Management Plan to include Westwood Rubble Landfill, Phillips Army Airfield Rubble Landfill, and the U.S. Army Medical Research Institute for Chemical Defense (MRICD) medical waste incinerator into this plan. The bill also established operating conditions and reporting requirements for each of the facilities.	• Submission of groundwater monitoring reports for Westwood and Phillips Rubble Landfills • Submission of an annual rubble waste disposal report for rubble that went to off post landfills	Section1, A-8 and B-8

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1.4.5 DoD, Army and APG Regulations and Guidance

A DoD Directive (DoDD) is a broad policy document containing what is required by legislation, the President, or the Secretary of Defense to initiate, govern, or regulate actions or conduct by DoD components within their specific areas of responsibilities. DoD Directives establish or describe policy, programs, and organizations; define missions; provide authority; and assign responsibilities. A DoD Instruction (DoDI) is a DoD issuance that implements the policy, or prescribes the manner or specific plan or action for carrying out the policy, operating a program or activity and assigns responsibilities. The primary DoD Directive on solid waste management is DoDD 4165.60 was cancelled on 10 September 1998 after serving the purpose for which it was intended and is no longer required. DoD issued an instruction DoDI 4715.23 on implementation of P2. Various DoD Directives/Instruction are summarized in Table 1-5.

The U.S. Army sets forth regulations to ensure that military activities, training centers, and operations are conducted in a manner to conserve natural resources and minimize impact to human health and the environment. Army regulations are at least as stringent as or more stringent than federal and state regulations and often address components unique to the military environment. AR 200-1 is the primary Army regulation for the protection of environmental quality. This regulation established waste reduction and recycling goals for solid waste. AR 420-1 addresses integrated solid waste management and P2 among other things. These along with other Army regulations addressing management of wastes from specific operations such as Real Property Management and Preventive Medicine and are briefly summarized in Table 1-5. This table also contains a summary of APG Regulations 200-50 and 200-60. APGR 200-50 provides APG-specific guidance on solid waste management. In addition to these regulations/policies, other Army guidance is available including Assistant Chief of Staff for Installation Management memo on Army Integrated Solid Waste Management Policy, September 2, 2008 and APG Pamphlet for Special Medical and Related Veterinary, Toxicology and Biotechnology Wastes Management.

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Table 1-5
Summary of Applicable DoD/Army/APG Regulations/Policy
Integrated Solid Waste Management Plan
Aberdeen Proving Ground, Maryland

DoD/Army/APG Regulation	Date	Applicable Area	Synopsis
Department of Defense Strategic Sustainability Performance Plan	September 7, 2016	Sustainability	DoD plan to address sustainability issues including energy, greenhouse gases, solid waste, water resources and climate change. Specifically establishes diversion goals for municipal and C&D waste as well composting of organic materials.
DoDI 4715.23	July 6, 1998	Pollution Prevention Qualified Recycling Program	Requires incorporation of pollution prevention at DoD installations and into all phases of acquisition, operations, maintenance, support and ultimate disposal of weapon systems. The DoD facilities are required to maintain and execute pollution prevention plans, establish qualified recycling programs (QRP), operate a composting program, and comply with toxic release inventory and EPCRA reporting requirements in accordance with the Executive Orders and the Pollution Prevention Act.
AR 200-1	December 13, 2007	Environmental Quality/ Solid and hazardous Waste Management	This regulation prescribes the Army's responsibilities, policies and procedures to preserve, protect and restore the quality of the environment.
AR 40-5	May 25, 2007	Preventive Medicine/ Environmental Quality	This regulation explains the Army's preventive medicine program; identifies the Army's occupational safety and health standards; and establishes organizational structure and procedures for pesticides and pesticide container disposal, and ensuring compliance with regulations for proper management of solid, hazardous and healthcare facility wastes.
AR 40-35	July 21, 2016	Management of Medical Waste	This regulation provides regulatory requirements and guidance for the management of regulated medical waste at all Army Medical Command locations.

Table 1-5 (Continued)
Summary of Applicable DoD/Army/APG Regulations
Integrated Solid Waste Management Plan
Aberdeen Proving Ground, Maryland

AR 40-61	January 28, 2005	Medical Logistics/ Medical Materiel/Waste Management Pollution Prevention	This regulation prescribes Army policies, procedures and responsibilities for managing medical materiel and for logistics support. It addresses: disposal through the DLA of medical materiel (e.g., clinical instruments) that is unserviceable, uneconomically reparable, or otherwise unsuitable for use; precious metals recovery program (e.g., silver from spent x-ray film developing solutions); hazardous materiel/waste (non-regulated medical waste) from the MEDCOM activities; disposal of linens; and medical instrument recycling program. This regulation emphasizes use of pollution prevention approaches to minimize use of disposable items and expand the use of reusable materials.
AR 420-1	February 12, 2008	Army Facilities Management	Describes the management of public works activities, housing, and other facilities operations and management, military construction program development and execution, master planning, utilities services, energy management, and fire and emergency services. Also, it identifies and synopsizes other regulations that provide detailed facilities management policy. Solid waste is covered in Section III, Chapter 23-9. AR 420-1 supersedes AR 11-27, AR 210-50, AR 415-15, AR 420-10, AR 420-18, AR 420-49, AR 420-70, AR 420-72, and AR 420-90.
APGR 200-50	April 01, 2007	Solid Waste Management	This APG Regulation provides APG-specific guidance on solid waste management policies, procedures and responsibilities. It emphasizes pollution waste reduction and recycling.
APGR 200-60	December 1, 2010	Hazardous Waste Management	This APG Regulation prescribes policies, assigns responsibilities and establishes procedures for the management and disposal of various types of hazardous waste at APG.

1.5 Description of the Garrison

This chapter contains specific information regarding the U.S. Army Garrison, Aberdeen Proving Ground including mission, location, organization, population, activities, and land use. This information is presented on the basis of current and projected activities and how they affect generation, collection, and management of solid waste. Projected population data, land use and activities are reviewed and used as the basis for determining solid waste generation data for the next ten years.

1.5.1 U.S. Army Garrison, Aberdeen Proving Ground Mission

The U.S. Army Garrison, Aberdeen Proving Ground, the Army's oldest active proving ground, was established on October 20, 1917, six months after the United States entered World War I, to provide the military a facility where design and testing of ordnance materiel could be carried out in close proximity to the nation's industrial and shipping centers. As a center for Army materiel testing, laboratory research and military training, Aberdeen Proving Ground is home to more than 80 tenants and a host of satellite activities. The Garrison is under the command of the Installation Management Agency.

1.5.2 U.S. Army Garrison, Aberdeen Proving Ground Location/ Transportation

The majority of the U.S. Army Garrison, Aberdeen Proving Ground (The Edgewood and Aberdeen Areas) is located in Harford County, Maryland approximately 30 miles northeast of Baltimore and 75 miles south of Philadelphia. Three sections of the garrison, Carroll Island and Graces Quarters, are located on the west side of the Gunpowder River in Baltimore County and the Churchville Test Track is located approximately 10 miles to the north. The City of Aberdeen and the unincorporated Edgewood lie on the western boundary of the installation, while the Chesapeake Bay borders the southeast boundary. The Garrison is comprised of approximately 72,500 acres of which approximately 36,700 acres are territorial waterways

There is easy access to both the Aberdeen and Edgewood Areas of the U.S. Army Garrison, Aberdeen Proving Ground using U.S. Route 40 and Interstate 95. These major roads are acceptable for solid waste transportation and bypass areas of concentrated activity and residential areas.

1.5.3 Background

The U.S. Army Garrison, Aberdeen Proving Ground provides facilities to perform research, development, testing and evaluation of Army materiel. Facilities include laboratories for research investigations, state-of-the-art ranges, engineering test courses for wheeled and tracked vehicles and a wide variety of research. The installation also supports a wide variety of training, including mechanical maintenance, health promotion and preventive medicine, chemical and biological defense, chemical casualty care, and chemical demilitarization. APG also is host to National Guard and U.S. Army Reserve operations and training. Established in 1917, the site was selected for its location and topographic features. This area is bounded by the Gunpowder River, the Chesapeake Bay, and the Amtrak Railroad, which is adjacent to U.S. Route 40. The Aberdeen and

Edgewood areas of the Garrison are about 12 road miles apart, gate-to-gate. The total land area of Aberdeen Proving Ground is 72,518 acres, of which approximately half is under water. The U.S. Army Garrison, Aberdeen Proving Ground has over 2,000 separate buildings containing approximately 17 million square feet of floor space. The installation contains almost 300 miles of paved roads and 30 miles of railroad.

There are eleven major Army commands represented on-post. The Garrison supports 107 activities, of which 80 are tenant organizations located on the installation. U.S. Army Garrison, Aberdeen Proving Ground and its tenants employ nearly 22,000 military and civilian personnel. Adding the on-post family members gives a total 2018 daytime population of more than 24,000 people.

1.5.4 APG Community

1.5.4.1 Population

Table 1-6 presents a summary of the population data for the U.S. Army Garrison, Aberdeen Proving Ground. This table shows past and current population numbers along with projections for the years 2023 and 2028. This plan is based upon the population projected in Table 1-6. Population data through 2018 was obtained from the APG Master Planner. The projected 2028 population was developed through trend analysis.

Table 1-6 Current & Projected Installation Population

CATEGORY	Past (2014)	Present (2018)	Projected (2023)	Projected (2028)
Total Military and Reserve Personnel	2,606	2,409	2,168	1,689
Total Civilian Personnel*	19,566	18,646	17,282	16,134
Military Family Members	1015	763	514	197
Total	22,578	21,360	20,414	18,020

*** Includes all DoD civilian personnel, private organizations, transient personnel, and non-appropriated fund personnel.**

1.5.4.2 Command Organization

The U.S. Army Garrison, Aberdeen Proving Ground is under the control of the Installation Management Command (IMCOM). The principal mission of the Garrison, Aberdeen Proving Ground is to support testing and evaluation of U.S. Army materiel. In addition, the Garrison is home to multiple tenant organizations that have their own missions and responsibilities. The U.S. Army Garrison, Aberdeen Proving Ground provides a full spectrum of support for its tenants. Two of these support areas comprise an integral portion of the Integrated Solid Waste Management Program. All support is under the direction of the Garrison Commander. The Commander has the

authority to allocate funds and resources for all programs including solid waste management and environmental programs. The responsibility for solid waste management at APG resides with the Directorate of Public Works (DPW).

1.5.4.2.1 Directorate of Public Works - Engineering and Construction Division, (DPW, ECD)

The DPW directs and coordinates the development and implementation of peacetime and emergency master plans; utilization of real estate and real property facilities; provision of utilities (except telephone), construction, alteration, maintenance, repair, operations, and management of facilities; and provision of professional engineering and architectural design for modification and construction of facilities. The DPW, ECD also handles matters inherent to environmental and energy consumption situations attendant to operations; engineering management services of the installation and support activities; and housing operations and management. The DPW, ECD maintains the contracts for solid waste collection and operates the solid waste drop-off centers.

The DPW, ECD is also responsible for the recycling of solid waste that is not handled through the Defense Logistics Agency Aberdeen Field Office. Materials recycled include, but are not limited to, paper, cardboard, glass, aluminum and other metal cans, plastics, and scrap metals. The DPW, ECD is responsible for the majority of the Garrison's municipal and commercial recyclables, including identifying markets for recyclables. Other commercial and industrial recyclables are managed by the Defense Logistics Agency Aberdeen Field Office.

1.5.4.2.2 Directorate of Public Works – Environmental Division (DPW, ED)

The DPW, ED provides a coordinated effort to ensure compliance with all applicable safety and environmental laws and regulations. In doing so, the DPW, ED has developed compliance inspection plans that encompass all tenants and enable the Installation Commander to fulfill his/her responsibility for installation environmental compliance. Additionally, the DPW, ED manages and oversees the installation's natural and cultural resources, utilizing sound stewardship and best management practices while maintaining regulatory compliance.

With respect to solid waste compliance and reporting, the Industrial Operation Branch of the DPW, ED is the lead for the Garrison. The APG Solid Waste Program Manager resides within DPW, ED Industrial Operation Branch as does the Qualified Recycling Plan Coordinator. The Industrial Operation Branch (IOB) is responsible for insuring compliance, including regulatory reporting, with applicable solid waste regulations and directives. The IOB gathers and compiles data to support the Army's Solid Waste Annual Report (SWAR), semi-annual and annual sewage sludge, tire, and landfill groundwater monitoring reporting to the Maryland Department of the Environment. IOB provides the Garrison and support activities with solid waste management guidance, develops the integrated solid waste management plan, APGR 200-50, the Qualified Recycling Plan (QRP) and operates the Pollution Prevention program.

1.5.4.3 Tenant Organizations

The Garrison is comprised of numerous tenant organizations of which eleven are major commands. Each tenant organization has a specific mission and responsibility for its own command. The size and nature of the tenant organizations have been undergoing changes as the overall structure of the armed forces continues to be re-evaluated. Those activities currently having a significant impact on the solid waste management program are identified below.

1.5.4.3.1 U.S. Army Research, Development and Engineering Command (RDECOM)

The U.S. Army Research, Development and Engineering Command (RDECOM) is headquartered at the Edgewood Area of the U.S. Army Garrison, Aberdeen Proving Ground. Along with RDECOM's Edgewood Chemical and Biological Center (ECBC), provides U.S. forces with the capability to survive and sustain mission operations on a twenty-first century digitized battlefield through application of nuclear, biological, and chemical defense, flame, and non-lethal weapons science and technology, engineering, products, and life cycle support services. RDECOM also provides products and services to vital national programs such as treaty verification and environmental remediation in partnership with government, academic, and private organizations.

1.5.4.3.2 Defense Logistics Agency, Disposition Services Field Office at Aberdeen

Formerly the Defense Reutilization and Marketing Office (DRMO), the Defense Logistics Agency, Disposition Services Field Office at Aberdeen serves as the local representative of the Defense Logistics Agency (DLA). The Aberdeen field office performs market research concerning resale value and recycling opportunities for out-of-date items and wastes generated on the installation. The Aberdeen field office is the sales agent for some of APG's scrap metal that are not QRP eligible and a portion of the used motor oil.

1.5.4.3.3 Kirk U.S. Army Health Clinic

The Kirk U.S. Army Health Clinic is the primary facility providing health and medical services to the Garrison community. The clinic provides primary care-level medical services including general medicine, occupational health and preventive medical services to over 70,000 eligible beneficiaries who make up the Garrison community.

1.5.4.3.4 U.S. Army Medical Research Institute of Chemical Defense

The Medical Research Institute of Chemical Defense (MRICD) conducts research, development, testing, and evaluation of medical material and treatments for casualties of chemical agents. This includes fundamental research in pharmacology, physiology, toxicology, pathology, and biochemistry of chemical agents and antidotes for these agents. The MRICD mission is to provide soldiers in the field with effective medical countermeasures against chemical warfare agents.

1.5.4.3.5 U.S .Army Aberdeen Test Center

The U.S. Army Aberdeen Test Center (ATC) plans and conducts development and production tests of weapons, weapon systems, rocket and missile systems, munitions, components, survey and

target acquisition equipment, armor plate, combat, general and special purpose vehicles and ancillary automotive equipment, and other material as required. In addition, the U.S Army ATC provides advice and guidance on test and evaluation matters to material developers and producers, other services, and private industry.

1.5.4.3.6 U.S. Army Research Laboratory

The U.S. Army Research Laboratory (ARL) is a large complex of advanced research facilities with a diversified staff under the RDECOM. The U.S. ARL program consists of more than 2,000 work units funded through mission and Army customer projects, other Department of Defense organizations, the Defense Nuclear Agency, and U.S. agencies and defense related private organizations.

1.5.4.3.7 U.S. Army Communications-Electronics Command

The U.S. Army Communications-Electronics Command (CECOM) is the life-cycle provider for supporting joint warfighting superiority through world-class globally-networked Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) systems among the joint, inter-agency, intergovernmental and multinational communities. A subordinate of the Army Materiel Command (AMC), CECOM and its strategic partners are members of the Materiel Enterprise, providing C4ISR systems and sustainment to Army forces through the Army Force Generation process. At APG this includes the Logistics and Readiness Center (LRC) and the Software Engineering Center (SEC). LRC provides a global logistics support for C4ISR systems and equipment through rapid acquisition, maintenance, production, fielding, new equipment training, operations and sustainment to meet the Army's Reset and Readiness goals in support of Army and coalition forces. The SEC provides software expertise to support C4ISR, as well as logistics, business and enterprise systems in the modern digital environment through life-cycle software solutions that enable warfighting superiority and information dominance.

The CECOM facilities at APG consist of very large, multi-story complexes that relocated to APG as part of the Base Realignment and Closure (BRAC) process. CECOM is the largest organization located at APG in terms of workforce and building square footage. Due to the size of the workforce, CECOM is expected to continue to have a significant impact on solid waste generation and recycling at APG.

1.5.4.3.8 U.S. Army Public Health Command

The U.S. Army Public Health Command (USAPHC) promotes health and prevents disease, injury, and disability of Soldiers and military retirees, their Families, and Department of the Army civilian employees and provides full spectrum veterinary service for Army and Department of Defense Veterinary missions.

1.5.4.3.9 20th Support Command

The 20th Support Command integrates, coordinates, deploys, and provides trained and ready chemical, biological, radiological, nuclear and high-yield explosives (CBRNE) forces. Capable of exercising command and control of specialized CBRNE operations to support Joint and Army force commanders primarily for overseas contingencies and warfighting operations, but also in support of homeland defense.

1.5.4.3.10 Other Tenant Organizations

Other organizations which play a significant role at the U.S. Army Garrison, Aberdeen Proving Ground include:

a. U.S. Army Joint Program Executive Office for Chemical Biological Defenses
b. U.S. Army 203rd Military Intelligence Battalion
c. U.S. Army Information Systems Command
d. U.S. Army Civilian Human Resource Agency.
e. Defense Commissary APG
f. U.S. Army Counterintelligence, 902MI
g. U.S. Army Signal Network Enterprise Center APG
h. U.S. Army Chemical Materials Agency
i. Maryland Army National Guard
j. Communications-Electronics Research, Development, and Engineering Center (CERDEC)

1.5.4.4. BRAC and MILCON Impacts

The BRAC process had a large impact on APG C&D generation rates and greatly impacted C&D diversion rates during the construction phases. The most recent BRAC process has been completed and solid waste generation has now moved from C&D to municipal refuse consistent with activities of the organizations that relocated to APG as part of the BRAC process.

There have been a number of large military construction (MILCON) projects that have impacted APG solid waste similar to BRAC. The last of these to be completed is the MRICD campus in the Edgewood Area, which was completed in 2013.

1.5.5 Land Use

The U.S. Army Garrison, Aberdeen Proving Ground can best be classified into four separate land usage categories: industrial, institutional, commercial and residential. APG maintains an installation master plan for planning and controlling development of the installation. In 2004 the plan was updated and entitled APG Strategy 2025. The APG Strategy 2025 addresses several potential development areas, and specifically discusses the Enhanced Use Lease (EUL) process.

The APG Working Group for EUL identified a preliminary list of nine underutilized, yet non-excess, sites as potential EUL sites. These nine sites were further refined to four priority sites to be the focus of initial efforts. These four sites are Phillips Army Airfield, Maryland Boulevard, NIKE Site, and E5800/5900 blocks.

The Maryland Boulevard site is the first of the four sites to be developed. Development was approximately 50% completed as of December 31, 2012 with the completion of several multi-story office complexes. Further development, according to the site plan, will include commercial establishments to support the APG community as well as the civilian population in the greater Aberdeen area. Business types envisioned for inclusion are banks, restaurants, dry cleaners, etc. Solid waste from the EUL facilities is not managed by APG. It is the responsibility of EUL property and business owners and is not included in any of APG's generation or diversion values. Currently, there are 12 buildings on the Enhanced Use Lease site, of which 11 of them are occupied. As of 3 July 2023 617,524 square feet have been constructed out of 2 million that were projected. There has been no new construction since 2013.

1.5.6 Planning Factors

There are numerous factors that influence, and will continue to influence, the population size and activities occurring on-post. Some of these include political, economic, environmental, legal, regulatory, and operational factors. Just as each of these factors impacts the size, mission, and nature of activities, they also influence the quantity and nature of solid waste that is generated. Other factors limit the ability of Aberdeen Proving Ground to manage solid waste on-post. Proximity of the Chesapeake Bay, wetlands, and groundwater criteria influence and restrict the Garrison's management of solid waste on the installation. This plan has been developed to contain a level of flexibility which will enable the U.S. Army Garrison, Aberdeen Proving Ground to manage the impact these factors will have on current and future solid waste generation.

During the life of the previous plan, the Harford County WTE facility reached the end of its operating life and shut down. This eliminated a readily available disposal option for the Garrison. A replacement for the Harford County WTE facility has not yet been determined. However there are local alternatives including the Harford County Waste Disposal Center located north of the Garrison in Scarboro, Maryland that is permitted to accept the Garrison's municipal refuse, and was previously accepting the refuse during periods when the WTE was unable to accept waste. Other options for disposal include the Baltimore City waste to energy facility, regional landfills in Pennsylvania and Virginia, and potentially the Eastern Sanitary Landfill in Baltimore County via an agreement between Harford and Baltimore Counties.

1.6 DoD Strategic Sustainability Performance Plan

The DoD developed the Strategic Sustainability Performance Plan for DoD long term sustainability dated 7 September 2016 which establishes goals for the DoD in areas such as solid waste diversion, water use, greenhouse gas reductions, energy reduction, and the use of hazardous

chemicals. It is the goal of APG to comply with the DoD plan and specifically with the solid waste diversion goals established in the plan. With respect to solid waste diversion, the following table sets the annual minimum goals for APG consistent with the DoD plan.

Table 1-7: APG Diversion Goal Minimums

Goal	2012	2013	2014	2015	2016	2017	2018	2019	2020
Non-hazardous solid waste diversion	44%	46%	48%	50%	50%	50%	50%	50%	50%
C&D Diversion	54%	56%	58%	60%	60%	60%	60%	60%	60%

*Diversion goals are by weight

2.0 INTEGRATED SOLID WASTE MANAGEMENT RESPONSIBILITIES

The purpose of this chapter is to identify current responsibilities for the management of solid waste on-post. This chapter also includes future responsibilities for the coordinator of the qualified recycling program to be established in accordance with this plan. Figure 2-1 depicts the current solid waste reporting chain.

2.1 U.S. Army Garrison

2.1.1 Installation Commander

The Installation Commander will:

(a) Allocate funds and resources for the solid waste management program.

(b) Establish and maintain an organizational structure to plan, execute, and monitor the solid waste management program.

(c) Chair the Environmental Quality Control Committee.

(d) Use the proceeds from the sale of commodities under the QRP program consistent with AR 420-1 including funding, to the extent practicable, all Garrison recycling operations as a first priority.

2.1.2 Directorate of Public Works

The Director of Public Works will:

(a) Maintain contract services for the collection and disposal of solid waste.

(b) Maintain contract services for the collection and recycling of various commodities including but not limited to commercial paper and cardboard.

(c) Identify and initiate other cost effective recycling opportunities to meet the 50% diversion goal by the end of fiscal year 2019.

(d) Ensure all capital projects contracts include a requirement to recycle at least 60% of C&D material.

(e) Establish procedures for in-house construction and demolition activities to recycle at least 60% of C&D material by the end of fiscal year 2019.

(f) Establish a data collection system to ensure all solid waste generation/disposal and recycling efforts are being captured.

(g) Recycle non-hazardous solid waste which is not handled through the Defense Logistics Agency Aberdeen Field Office, when economically feasible and in accordance with Army guidance for Qualified Recycling Plans (QRP).

(h) Ensure that all municipal solid waste collection operations conducted on the installation are performed in accordance with federal, state, local, and Army regulations.

(i) Provide adequate support to ensure the compliance with the installation's rubble landfill post-closure obligations.

(j) Ensure that off-post disposal of solid waste by DPW contractors is conducted in accordance with Aberdeen Proving Ground Regulations 200-50 and 200-60.

(k) Provide all logistics necessary to maintain the Garrison's solid waste program and, when required, provide the resources necessary to maintain those logistics.

(l) Coordinate and work with other organizations to reduce unauthorized dumping of solid waste and clean up unauthorized waste piles.

(m) Ensure that all policies contained in this Integrated Solid Waste Management Plan and in the Aberdeen Proving Ground Regulation 200-50, Solid Waste, are carried out and that all DPW personnel follow these requirements in all their activities.

2.1.3 Directorate of Public Works –Environmental Division

The Director of Public Works, Environmental Division will:

(a) Manage the solid and hazardous waste programs and the recycling program to ensure that the U.S. Army Garrison, Aberdeen Proving Ground is in compliance with all federal, state, local, and Army requirements.

(b) Submit all permit applications and annual reports regarding solid and hazardous waste management to appropriate regulatory agencies and higher headquarters.

(c) Assist in the identification and initiation of other cost effective recycling programs to meet the 50% diversion goal by the end of fiscal year 2015.

(d) Assist in the establishment of a C&D recycling program to meet the 60% C&D diversion goals by the end of fiscal year 2015

(e) Assist in the establishment of a data collection method to ensure all solid waste and recycling efforts are being captured.

(f) Ensure that this waste management plan is updated every five years or as significant changes occur in federal, state, local, or Army regulations.

(g) Identify and approve an adequate number of waste disposal/recycling facilities to satisfy the hazardous and non-hazardous solid waste disposal needs of the installation.

(h) Identify opportunities to reduce solid waste stream volumes, enhance pollution control, and conserve natural resources through source reduction and resource recovery.

(i) Represent environmental concerns at the Installation Environmental Quality Control Committee meetings.

(j) Provide ongoing guidance to generating activities for the proper classification, handling, and management of solid waste.

(k) Develop a public relations campaign and training programs to support the goals and objectives of this plan.

2.1.4 Qualified Recycling Program Coordinator

The Qualified Recycling Program Coordinator will:

(a) Working with DPW establish procedures for segregating and collecting specific materials intended to be recycled.

(b) Perform a life-cycle cost analysis of the QRP program to ensure overall program is profitable.

(c) Operate the QRP in accordance with AR 420-1.

(d) Develop methods for maintaining fiscal accountability of funds received from the sale of recyclable materials and the disbursal of these funds.

2.2 Army Contracting Command

The Directorate of Contracting will:

(a) Ensure that all Garrison contracts include provisions to comply with this plan.

(b) Require the contractor of any construction, demolition or facilities restoration project to develop and submit a plan for approval of how the contractor will achieve at least 60% diversion of C&D materials from landfills and incineration.

(c) As part of the diversion plan in item b, require the contractor to submit reports demonstrating their compliance with their plan to the Directorate of Public Works, Environmental Compliance Division, Solid Waste Coordinator.

(d) Include in all contracts, a requirement that if a contractor is disposing of non-hazardous solid waste through a non-Garrison mechanism, the contractor will use a disposal facility approved by the Directorate of Public Works, Environmental Compliance Division.

(e) Include in all contracts, a requirement that all volumes of non-hazardous solid waste disposed through non-Garrison disposal mechanisms, be reported to the Directorate of Public Works, Environmental Compliance Division within 30 days of the disposal. Information to be reported will be disposal destination, type of materials, and volumes.

2.3 Defense Logistics Agency, Aberdeen Field Office (formerly DRMO)

(a) Will analyze the recycling commodities market on an annual basis and make the findings available to the QRP Manager if requested.

(b) Will conduct sales of recycled and reuse items within the APG QRP returning the proceeds to the Garrison.

2.4 Tenant Organizations

Commanders/Directors of tenant organizations will:

(a) Establish, monitor, and implement programs in solid waste management, which include source reduction, waste minimization, resource recovery, and recycling. These programs will be in accordance with all applicable laws and regulations.

(b) Ensure their operations meet the 50% and 60% diversion goals for municipal solid waste and C&D waste, respectively, identified previously in this plan.

(c) Review the solid waste disposal practices of contractors to ensure compliance with this plan and Aberdeen Proving Ground Regulations 200-50 and 200-60.

(d) Ensure participation in the Senior Environmental Quality Control Committee Meeting and the Working Level Installation Environmental Quality Control Committee Meeting to address solid waste issues.

(e) Include in all contracts, a requirement that if a contractor is disposing of non-hazardous solid waste through a non-Garrison mechanism, the contractor will use a disposal facility approved by the Directorate of Public Works, Environmental Compliance Division.

(f) Include in all contracts, a requirement that all volumes of non-hazardous solid waste disposed through non-Garrison disposal mechanisms, be reported to the Directorate of Public Works, Environmental Compliance Division within 30 days of the disposal. Information to be reported will be disposal destination, type of materials, and volumes.

2.5 Harford County

It is anticipated that Harford County will:

(a) Incorporate the U.S. Army Garrison, Aberdeen Proving Ground Integrated Solid Waste Management Plan into the Harford County Solid Waste Management Plan.

(b) Accept APG recyclables and yard waste.

2.6 Contractors

Contractors will:

(a) Properly classify and dispose of all solid waste generated as a result of their projects. All solid waste generated and characterized as hazardous, must be disposed by the government.

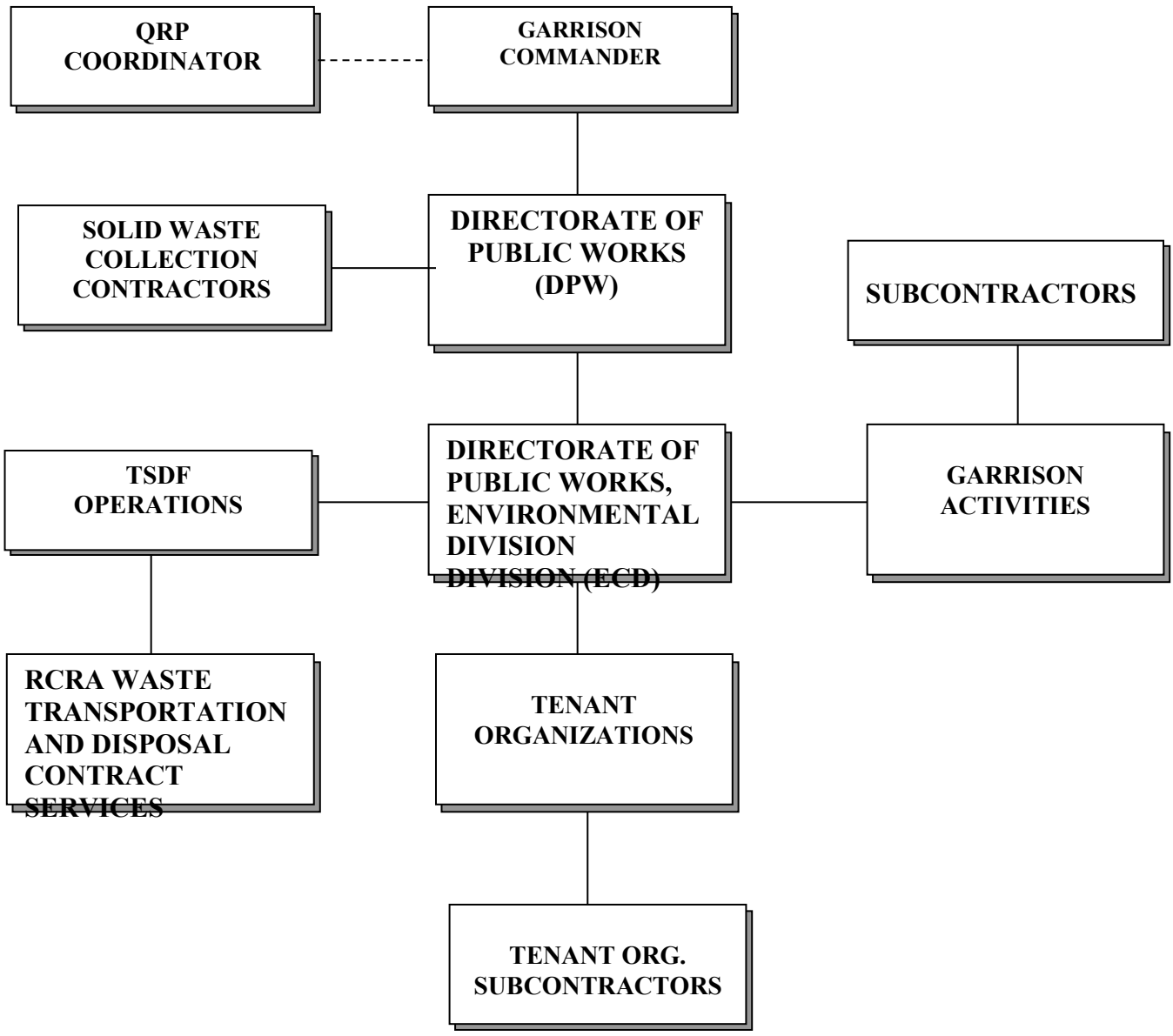
(b) Meet the 50% and 60% diversion goals for municipal waste and C&D waste; respectively, identified previously in this plan.

(c) Manage all solid waste generated in accordance with all applicable federal, state, local, and Army regulations.

(d) Only use disposal facilities approved by the Directorate of Public Works, Environmental Compliance Division.

(e) Report all volumes of non-hazardous solid waste disposed through non-Garrison disposal mechanisms, to the Directorate of Public Works, Environmental Compliance Division within 30 days of the disposal. Information to be reported will be disposal destination, type of materials, and volumes.

Figure 2-1: Solid Waste Reporting Chain



3.0 CURRENT INTEGRATED SOLID WASTE MANAGEMENT PRACTICES

This chapter identifies solid waste categories, waste collection procedures and acceptance facilities utilized by the U.S. Army Garrison, Aberdeen Proving Ground. The Garrison's approach to solid waste management is consistent with the requirements and goals of the U.S. Army, Department of Defense, Federal and state regulations. The management approach at the Garrison follows a hierarchical structure that seeks to eliminate waste at the source, maximize reuse/recycling opportunities consistent with sound economic decisions, and use disposal avenues that return a beneficial use such as energy recovery while minimizing impacts to the environment.

3.1 Solid Waste Management Hierarchy

Traditional solid waste management practices involve solid waste collection, transport and disposal at a landfill. With the enactment of the Pollution Prevention Act (PPA) in 1990, modern efforts use the pollution prevention (P2) approach to reduce both volume and toxicity of the nation's solid waste to minimize impacts to the environment. Pollution prevention is any mechanism that successfully and cost-effectively avoids, prevents or reduces at the source, the use, generation, or release of toxic chemicals, hazardous materials or solid waste. Several benefits resulting from P2 implementation include improved/streamlined regulatory compliance, reduced costs for waste disposal, improved worker safety, reduced liability associated with waste disposal, and less impact on the environment. P2 is a multi-media approach to source reduction and waste minimization. Simply changing the form of waste from one medium to another does not constitute P2. The Department of Defense (DoD) and Army adopted the P2 approach in the establishment of their solid waste management policies and goals.

Although the technical definition of P2 according to the PPA is limited to "waste reduction or source reduction", it can also be achieved through reuse/recycle and resource recovery. APG's preferred solid waste management hierarchy (arrangement in order of rank), inspired by the PPA, is illustrated by the inverted triangle in Figure 3-1. Solid waste will be prevented or reduced at the source whenever feasible. Solid waste that cannot be prevented will be donated, reused or recycled in an environmentally safe manner. Waste that cannot be prevented, reused, or recycled will be subjected to a resource recovery process (e.g., energy recovery from burning). When none of the above options are feasible the waste will be disposed of in an environmentally safe manner as the last resort. Each element within the hierarchy may contain several options. An economic analysis is normally conducted to evaluate the costs, benefits and risks of each option, before selecting a particular option. Following is a discussion on each of the elements in the hierarchy:

3.1.1 Source Reduction

Waste reduction seeks to minimize both the volume and toxicity of solid waste by reducing the waste stream at the source, rather than looking to manage the wastes at the end of the pipe. Waste reduction programs reduce the strain on all other solid waste management activities. It is the first in the hierarchy because it is the most effective way to reduce the quantity of waste, the cost associated with its handling, and its environmental impacts.

Several legislative initiatives such as the Resource Conservation and Recovery Act (RCRA) and the Pollution Prevention Act (PPA), DoD Integrated Solid Waste Management Policy (February 2008), and Army regulation and policies (AR 200-1) require federal agencies to implement waste reduction programs and meet stated diversion goals. Waste reduction can be achieved through:

- *Equipment or Technology Modifications* – Old or inefficient processes often result in excess generation of process wastes. Installation of new equipment or changes in the technology can result in reduced waste generation through improved efficiency. For example the replacement of wet chemistry photography development with digital photography.
- *Product Reformulation/Material Substitution* – Product reformulation involves changing a product's formula so that a toxic or hazardous ingredient is replaced with a less toxic material whereas material substitution can reduce or eliminate both the volume and toxicity of wastes (e.g., substitution of citrus-based solvents and water-based cleaning systems for chlorinated solvents used in parts cleaning).
- *In-process Recycling or Reuse* – This approach consists of reprocessing and reusing a material several times before disposal.
- *Improved Operating Practices* – Improved operating practices such as improved housekeeping, procurement practices, inventory control, and materials management are often the simplest and least expensive means of achieving waste reduction. Examples of procurement practice include: buying products that have reusable components vs. disposable components; procuring items that have less packaging material by purchasing them in bulk, concentrated form, or in lightweight containers, thereby, reducing the solid waste resulting from packaging; and avoiding overstocking via inventory control.
- *Training* - A comprehensive training program is a cornerstone for effective implementation of waste reduction programs in any organization. This can

include informal training sessions at staff meetings, formal class room or field training, or fliers and other educational means.

3.1.2 Reuse

Waste reuse is the use of a product or an item in its same form for the same or similar purpose. APG's Pollution Prevention Office operates an excellent example of waste reuse through their Freebie's Program. APG organizations can offer materials/items that are no longer needed but still useable for other organizations to use/reuse. Freebie categories include chemicals, photographic chemicals and equipment, petroleum products, medical/dental/veterinarian supplies, paints, varnishes and stains.

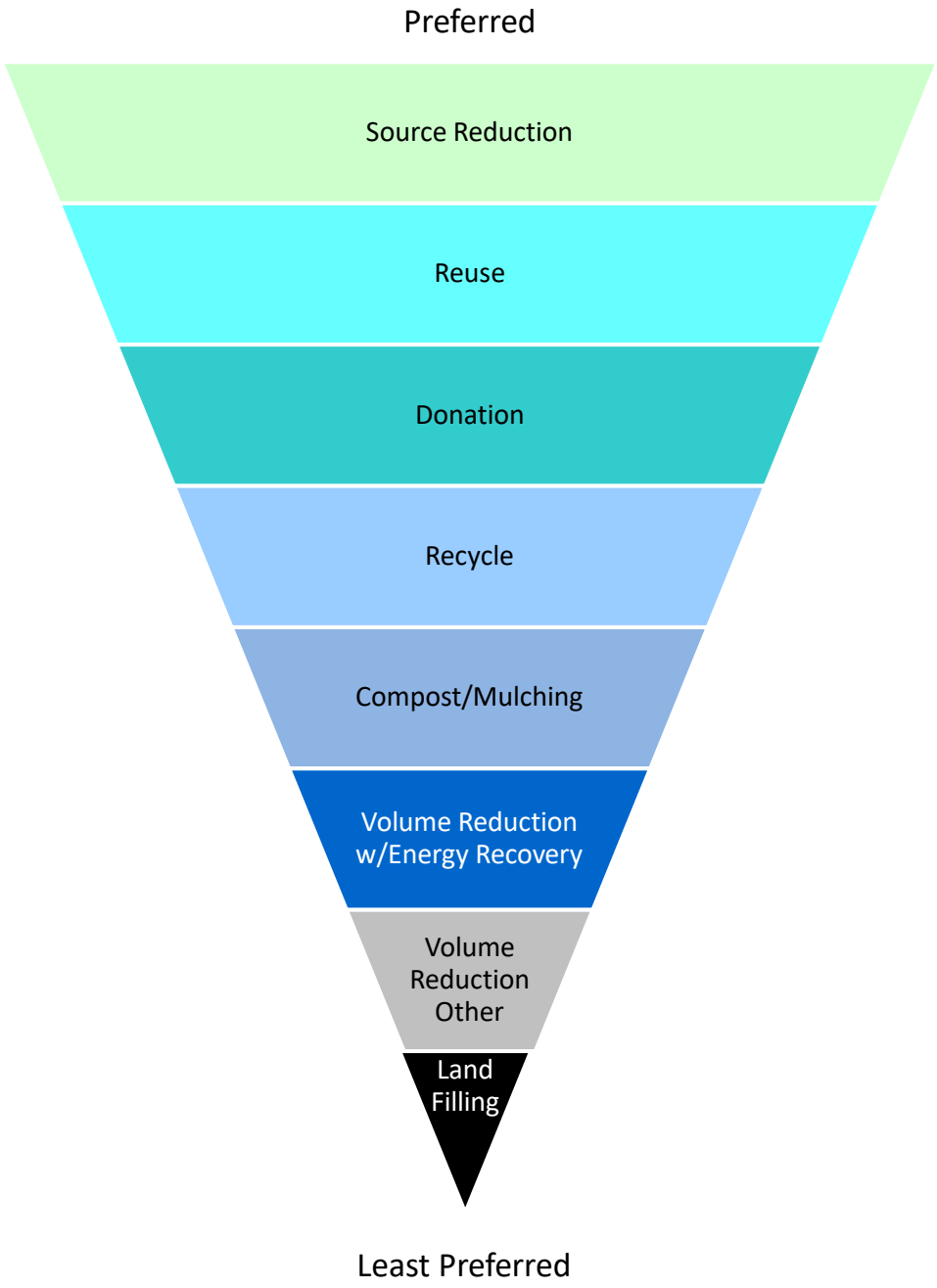
3.1.3 Donations

Donations of surplus or no longer needed but usable equipment is the third most preferable option in the solid waste hierarchy. Numerous groups including other APG offices, other Federal agencies and non-profit organizations may be able to utilize donated goods. The Defense Logistics Agency has an established program to collect and re-distribute or donate equipment. All property book equipment is required to be managed through the Defense Logistics Agency. Non-property book equipment may be appropriate for donation to local non-profit groups diverting what may otherwise be disposed. Either way surplus or usable equipment shall not be discarded until all reuse and donation avenues have been exhausted.

3.1.4 Recycle

Recycling is the result of a set of activities by which materials that would become or remain waste are diverted from the solid waste stream by collection, separation, and processing. The processed wastes are used as raw materials in place of virgin materials in the manufacture of commercial goods. Recyclable materials are collected through drop-off, pick-up, or by a qualified contractor. The drop-off collection method typically consists of placing multiple collection bins in a centralized location, often the recycling center, where participants bring their recyclables. Participation can be increased by placing additional bins in strategic locations throughout the base (e.g., a newspaper collection bin near the commissary). The pick-up collection method is similar to trash collection in that recyclables are picked up at residential and/or commercial units. Recyclables can be collected together and sorted at the recycling center, or participants may be required to separate their materials prior to pick-up. Using a contractor for collection of recyclables is similar to using a contractor for refuse collection. The contract can provide incentives, such as the contractor keeping the material sales proceeds, for the contractor to minimize costs and maximize collection. It is common practice to use a combination of these collection strategies to maximize participation and material collection with the most efficient operation.

Figure 3-1: Integrated Solid Waste Management Hierarchy



The Maryland Recycling Act of 1988 requires Harford County to reduce waste streams by 20% via recycling. Therefore, APG bears a major recycling responsibility, as it is the single largest contributor to Harford County waste. The larger driver for recycling are the DoD goals of reaching 50% diversion for municipal solid waste and 60% diversion for construction and demolition waste; recycling will play a large role in meeting this goal.

In accordance with DoDI 4715.23, each installation shall have a Qualified Recycling Program (QRP) that shall serve all tenant organizations. DoD installations have the option of operating a relatively simple recycling operation as long as they return the sales proceeds to the U.S. Treasury. Under 10 U.S.C. 2577, the installations can keep the proceeds from the sale of recyclable materials to use for covering the costs of operating the recycling programs provided the installation establishes a QRP and operates it in accordance with the law and DoD policies. The Army Regulation, AR 420-1 requires inclusion of a QRP in the integrated solid waste management plans.

3.1.5 Compost/Mulching

The Maryland Composting Act of 1992 prohibits disposal of yard waste ("green waste") into landfills and requires counties to address composting in their recycling plans. The DoD Instruction 4715.23 requires each installation to operate a composting facility or participate in a regional composting program. Composting is a well-known technology that biologically coverts organic wastes into a rich mulch and fertilizer. DPW operates a mulching operation in the Aberdeen Area and the biosolids from the Aberdeen Area wastewater treatment plant are composted by the City of Aberdeen. The biosolids from the Edgewood Area wastewater treatment plant are not acceptable for land application due to limitations in the biosolids treatment capabilities at the plant and are incinerated at an out of state licensed facility.

3.1.6 Volume Reduction with Energy Recovery

Resource recovery is the process of obtaining materials or energy from a solid waste stream. Material recovery for reuse or recycling is discussed under sections 1.3.2 and 1.3.3. This section, therefore, deals only with volume reduction with energy recovery. The energy recovery process is similar to incineration in that the solid waste is destroyed and its volume is significantly reduced. However, at an energy recovery facility, energy from the burning process is converted into heat, steam or electricity. Resource recovery or waste-to-energy programs are regulated by RCRA (40 CFR 245) and Maryland (COMAR 26.13.10) regulations. Proper collection, segregation, handling and storage of solid waste will result in a beneficial resource recovery program. The bulk of APG's municipal solid waste was previously converted to energy via the Harford County Waste-to-Energy (WTE) Facility. The Harford County WTE Facility reached the end of its operating life in 2016 and has since been shut down.

3.1.7 Volume Reduction Other

Volume reduction without energy recovery serves to decrease the volume of waste prior to landfilling thus saving landfill space. Bulky items can consume valuable landfill space. Volume reduction may include shredding or crushing bulky materials.

3.1.8 Landfilling

Solid waste that cannot be reused, recycled, or sent for energy recovery is disposed of in one of the following manners: landfilling, land application, or incineration. Land application is generally used for non-putrescible wastes such as water plant sediments while landfilling and incineration are commonly used methods for putrescible solid wastes.

3.2 Waste Generation

Solid waste generated on-post is managed through a number of organizations; however, the Directorate of Public Works (DPW) has ultimate responsibility for the implementation and monitoring of all solid waste management practices and programs on the installation.

In order to monitor and evaluate source reduction, recycling, and reuse efforts, tracking mechanisms are utilized to trace waste from the generator level, to turn-in/storage, and final destination, whether on or off-post. These tracking mechanisms are maintained by a variety of sources within the Garrison and tenant organizations. Generators, recycling programs, disposal contractors, turn-in documents, and environmental records can supply data for these mechanisms.

Each section below defines a solid waste category and the types of waste generated within the respective category. Section 3.3 discusses the disposal quantities for FY 2018 and disposal projections for the years 2023 and 2028. Projections are based on solid waste generation data, current and projected population, tenant activities, and/or solid waste diversion goals. Unforeseen changes with the Garrison's mission, activities, and size could significantly impact these numbers.

3.2.1 Residential and Commercial Waste

As indicated previously, the RCI program will manage all residential solid waste and recyclables. Therefore this plan does not capture residential generation rates of solid waste/recyclables or make projections of future rates of generation.

Commercial solid wastes, excluding institutional and hazardous wastes, consist of the organic (combustible) and inorganic (noncombustible) solid wastes. Commercial waste is generated from commercial facilities on-post such as warehouses, post exchanges, commissaries, recreation facilities, medical facilities (excluding regulated medical waste), training centers, and administrative offices. Typical commercial waste consists of paper, cardboard, plastics, wood, food waste, glass, metals, special wastes, textile scrap, packing materials, and furniture. When

residential or commercial structures are demolished, the resulting waste is accounted for as construction and demolition (C&D) waste.

Wastes that decompose rapidly, particularly in warmer conditions are also known as putrescible waste. The principal source of such wastes is the handling and preparation of food. Often, the decomposition of such wastes will produce odors, breed flies, and may therefore require special management considerations.

There are more than fifty classifications for paper and several classifications for plastic waste. The waste paper found in commercial waste is generally composed of newspaper, books and magazines, office paper, paper packaging, paperboard, commercial printing, tissue paper and towels, and corrugated cardboard. Plastic found in commercial solid waste may fall into one of seven categories: polyethylene terephthalate, high-density polyethylene, polyvinyl chloride, low-density polyethylene, polypropylene, polystyrene, and other multi-layered plastic materials.

Commercial recycling is done through contracted services and includes the collection and recycling of mixed office paper, cardboard, and plastic, glass and metal containers. Industrial waste recycling efforts such as used oil and tires will be discussed separately. DPW, ECD maintains a contract with a private hauler to collect waste for all buildings on the Garrison and recyclables collection for a portion of the buildings. Buildings are included on the recyclable collection list based on a request to DPW, ECD by the building occupants. Currently there are 142 buildings receiving recyclables collection. The contract is structured such that the proceeds from the sale of the paper and cardboard are used to offset the cost to the Garrison for waste/recyclables collection. Plastic, glass and metal containers are turned over to Harford County, no proceeds are returned to the Garrison or contractor for these recyclables.

3.2.2 Non-hazardous Industrial Waste

Non-hazardous industrial waste is generated by installation operations and manufacturing processes such as vehicle and equipment maintenance and repair, food processing, paint shop operations, metalworking, petroleum tank systems, boiler operations, and laboratory operations. Typical industrial waste consists of used oil, oil contaminated media, recyclable batteries, vehicle tires, scrap metal, kitchen bones and fats, and non-hazardous lab chemicals/waste.

Overall, non-hazardous industrial waste is expected to decrease from the five year average. The five year average is heavily impacted from Installation Restoration (IR) waste generation which hit a five year peak within the averaging period of 19,393 tons in 2009. If that year is thrown out, projections are in the 2,000 tons/year range. However, IR waste generation is the least predictable due to the uncertainty of what may require disposal during any cleanup operation. Non-hazardous industrial waste quantities generated for calendar years 2014 - 2018 and projections for 2023 and 2028 are included in Table 3-1.

3.2.3 Institutional Waste

Institutional waste is generated from schools, hospitals, and other government facilities. However, for the purposes of this plan institutional waste is limited to: infectious materials; potentially infectious materials; medical substances including laboratory animal bedding, animal carcasses, sharps, non-hazardous expired pharmaceutical waste; and medical waste generated by the Medical Research Institute of Chemical Defense, Edgewood Chemical and Biological Center, Army Research Lab, U.S. Army Public Health Command, Edgewood Area Clinic, Kirk U.S. Army Health Clinic and Dental Clinic

3.2.4 Construction and Demolition Waste

Construction and demolition (C&D) waste consists of land-clearing, construction, and demolition debris. Typical waste includes trees, brush, rock, earthen materials, structural steel, plaster, concrete, bricks, asphalt, insulation, roofing, shingles, and asbestos. C&D waste may be re-used on the Garrison, such as concrete and asphalt, or transported off of the Garrison for recycling/disposal at the Honeygo Reclamation Facility in Rosedale, Maryland. Friable asbestos containing waste is disposed at landfills permitted for asbestos waste disposal. The Honeygo Reclamation Facility is also a recycler of C&D waste, specifically aggregates. Concrete, brick and asphalt are crushed and recycled into various size aggregate for resale.

C&D waste generation has declined sharply during the life of the previous plan with the completion of the BRAC process which, due to its scale, had a significant impact on C&D generation/diversion rates. The next initiative that will have an impact on C&D generation, but to a much lesser extent, is the Facilities Reduction Program which will involve the demolition of 22 buildings and 38 concrete slabs in the Aberdeen and Edgewood Areas. The size of buildings/slabs included in the program range from as little as 25 square feet to as much as 40,000 square feet.

The C&D quantities generated for calendar years 2014 – 2018 and projections for 2023 and 2028 are included in Table 3-1.

3.2.5 Wastewater Treatment Plant Sludge

The U.S. Army Garrison, Aberdeen Proving Ground currently operates one wastewater treatment plant in the Edgewood Area. Biosolids generated from the plant are transported off post for incineration due to the inability of the current digester system to produce biosolids suitable for land application. The quantity of wastewater treatment plant biosolids generated for calendar years 2014 - 2018 and projections for 2023 and 2028 are included in Table 3-1.

The City of Aberdeen operates the plant in the Aberdeen Area of APG. It too produces biosolids which are taken to the City's composting facility. Biosolids from the Aberdeen Plant are not included in APG's biosolids rates.

3.2.6 Water Treatment Plant Sediments

The U.S. Army Garrison, Aberdeen Proving Ground currently operates one water treatment plant, the Van Bibber Water Treatment Plant in the Edgewood Area. The Edgewood water plant produces one type of sediment. This sediment is liquid with a solids content of approximately one percent. This sediment is generated once or twice per year when the sedimentation basins are cleaned. The sludge waste is transported off post by a contractor and is land-applied as agricultural fertilizer. The quantity of water treatment plant sediment generated for calendar years 2014 - 2018 and projections for 2023 and 2028 are included in Table 3-1.

As is the case for the Aberdeen Area sewage plant, the City of Aberdeen operates the Aberdeen water plant known as the Chapel Hill Water Treatment Plant. The plant produces an alum sludge. However, water produced by the plant is not necessarily dedicated to APG as there are interconnections between the Chapel Hill Plant and the City of Aberdeen's water system and Harford County's water system. Therefore the sludge numbers produced by the plant will not be considered by this plan.

3.2.7 Installation Restoration Program

The Installation Restoration Program has for many years undertaken investigations to assess the impact of previous hazardous materials management and disposal practices on the Aberdeen, Edgewood, Carroll Island, and Graces Quarters Areas of the Aberdeen Proving Ground. These investigations have led to the installation of groundwater treatment systems, removal actions, and natural attenuation with long term monitoring as remedies for past disposal actions. Removal actions can have a short term but significant impact on solid waste generation rates due to their episodic nature; i.e. large volumes are often generated during the action which ends upon the completion of the removal action. Due to the presence or potential presence of contamination associated with removal actions, nearly all of the material is disposed into secure landfills or incinerated. During these generation spikes, APG's diversion rate can be negatively impacted. Projections for such waste are difficult to determine as the amount can be affected by findings in the field during a removal action. Table 3-1 includes recent Installation Restoration Program waste generation and projection rates.

3.2.8 Prototype Detonation Test and Destructive Facility

The APG intermittently operates a Prototype Detonation Test and Destruction Facility to test various methods of detonating explosively configured unexploded ordnance (UXO) in a manner which is safe and protective of human health and the environment and reduces the noise level from conventional open detonation techniques. The volume of waste generated is relatively low with the majority handled as hazardous waste in accordance with Aberdeen Proving Ground Regulation 200-60. Non-hazardous liquid and solid waste are also generated by the facility including gray water, used oil, and additional non-hazardous solid waste. These materials will be segregated and

recycled/disposed in the same manner as non-hazardous industrial waste; i.e. via the hazardous waste tracking system.

3.3 Generation Rates and Future Projections

Projections for future solid waste generation, recycling, reuse, and disposal are primarily based on installation population data and projections obtained from the APG Master Planner. Average solid waste per capita generation rates were calculated based on data obtained from the fiscal year 2014 through 2018 APG Solid Waste Annual Reports. These rates were then multiplied by the appropriate population projections for 2023 and 2028 to obtain the base generation, recycling, reuse, and disposal projections for the five and ten year calendar years, respectively. The following subsections detail the specific methodology utilized in calculating the projections for each of the solid waste categories included in this plan.

All of the population and solid waste data may be found in Table 3-1: Population and Solid Waste Data. The table contains 2014 through 2018 actual data as well as the corresponding five and ten year average and projections for 2023 and 2028. In addition, Figure 3-1: Current Solid Waste Production and Future Projections, graphically depicts the 2018, 2023, and 2028 volumes of the major subcategories of solid waste.

3.3.1 Installation Population

Information gathered from the APG Master Planner was used to develop current and projected population data. The base year for this plan is 2018. Population data reveals 2,409 military and 18,646 civilian personnel at APG during 2018. As predicted in the 2014 version of this plan, the BRAC and EUL processes have altered the total number of personnel as well as the ration of military to civilian. The military population has greatly diminished with the relocation of the U.S. Army Ordnance Center and School while the civilian population has increased primarily as a result of the relocation to APG of the C5ISR complex.

3.3.2 Commercial Waste

Average commercial waste generation, recycling, reuse, and disposal totals were obtained from information contained in the 2014 through 2018 APG Solid Waste Annual Reports. Average per capita rates for each component of commercial waste were calculated using the average waste generation totals and average installation population over the five-year period. These rates were then multiplied by the projected installation population in 2023 and 2028 to obtain the five and ten-year commercial waste generation, recycling, reuse, and disposal projections. Current and projected future commercial waste generation figures are presented in Table 3-1.

3.3.3 Non-hazardous Industrial Waste

Average non-hazardous industrial waste generation, recycling, reuse, and disposal totals were also obtained from the 2014 through 2018 APG Solid Waste Annual Reports. It is assumed that non-hazardous industrial waste generation is influenced to a greater extent by the population working

on post rather than the residential component of installation population. Therefore, average per capita rates for each component of non-hazardous industrial waste were calculated using the average waste generation totals and average military and civilian workforce population over the period from 2014 through 2018. These rates were then multiplied by the projected military and civilian population in 2023 and 2028 to obtain the five and ten-year non-hazardous industrial waste generation, recycling, reuse, and disposal projections presented in Table 3-1.

3.3.4 Institutional Waste

Average institutional waste totals were calculated from the 2014 through 2018 APG Solid Waste Annual Reports. It is assumed that institutional waste, unlike non-hazardous industrial waste, is influenced by the total population including residential population that utilizes the medical and dental facilities on the Garrison. Therefore, average per capita rates for each component of institutional waste were calculated using the average waste generation totals and average total population over the period from 2014 through 2018. These rates were then multiplied by the projected total population in 2023 and 2028 to obtain the five and ten-year institutional waste generation, recycling, reuse, and disposal projections. Current and projected future institutional waste generation figures are also presented in Table 3-1.

3.3.5 Construction & Demolition Waste

The average amount of construction and demolition (C&D) waste generated and disposed from 2014 through 2018 was calculated from data contained in the APG Solid Waste Annual Reports. The 2014-2018 five year average was used to project future disposal and diversion rates. These projections are included in Table 3-1.

3.3.6 Water and Wastewater Treatment Waste

Sewage sludge and water sediment generation projections for 2023 and 2028 are based on total installation population projections and average per capita generation rates calculated from data contained in the 2014 through 2018 Solid Waste Annual Reports. Current and projected future wastewater treatment waste totals are presented in Table 3-1. Projections are a function of per capita biosolid generation rates and population projections for 2023 and 2028.

Table 3-1: Population and Solid Waste Data

								PROJECTED		
		C.Y. 2014	C.Y. 2015	C.Y. 2016	C.Y. 2017	C.Y. 2018	5-YEAR AVG	C.Y. 2023	C.Y. 2028	
INSTALLATION POPULATION										
Total Military and Reserves		2,606	2,994	3,760	2,429	2,409	2,840	2,168	1,689	
Total Civilians		19,566	18,863	18,967	18,407	18,646	18,890	17,282	16,134	
Military Family Members		1,015	1,080	980	950	763	958	514	197	
Total Installation Population		**23,187**	**22,937**	**23,707**	**21,786**	**21,818**	**22,687**	**19,451**	**17,823**	
50 % Diversion Standard			**All Values in Tons**							
COMMERCIAL WASTE										
MSW - Incinerated for Energy Recovery	Disposed	3673	2993	189	0	0	1371	879	818	
MSW - Landfilled Off-Post	Disposed	78	51	1734	3768	2784	1683	1079	1004	
Commercial Recyclables (Paper/Cardboard)	Recycled	614	508	294	429	251	419	269	250	
Electronic Equipment	Recycled	0.00	1.37	0.26	0.29	0.22	0.43	0.27	0.26	
Total Commercial Waste		**4365**	**3553**	**2217**	**4197**	**3035**	**3474**	**2,227**	**2,073**	0.84lbs/capita/day
NONHAZARDOUS INDUSTRIAL WASTE										
Bones, Fat, Cooking Oils	Recycled	2.0	0.0	0.0	0.0	0.0	0	0.26	0.24	
Oil/Petroleum Contaminated Soil	Recycled	607	430	0	306	288	326	210	195	
Latex Paint	Disposed	1.0	1.0	1.0	1.0	0.0	1	0.51	0.48	
IR Waste	Disposed	44	190	206	1828	66	466.80	300	280	
Ink Cartridges	Recycled	1.63	0	0	0	0.00	0	0.21	0.20	
Tires	Recycled	23	24	34	27	15	25	16	15	
Used Oil	Recycled	313	98	67	332	141	190	122	114	
Metals	Recycled	1573	2002	654	2694	1223	1629	1048	976	
Recycled Antifreeze	Recycled	1.0	8.0	44.7	4.3	2.7	12	8	7	
Flourescent Light Tubes	Recycled	1.0	2.6	4.0	2.0	20.7	6	4	4	
Mercury	Recycled	0.05	0.94	0.75	0.70	1.11	1	0.46	0.42	
Batteries	Recycled	21	26	21	49	16	27	17	16	
Various Non-Regulated Wastes	Recycled	456	2988	414	580	61	900	579	539	
Total Nonhazardous Industrial Waste		**3043**	**5770**	**1446**	**5824**	**1834**	**3584**	**2306**	**2147**	0.87lbs/capita/day
INSTITUTIONAL WASTE										
Medical Waste	Disposed	54	23	15	21	13	25	16	15	
Dental Amalgam	Recycled	0.00	0.00	0.00	0.00	0.02	0	0.0026	0.0024	
Total Institutional Waste		**54.00**	**22.99**	**14.74**	**21.19**	**12.81**	**25.15**	**16.17**	**15.05**	0.0061lbs/capita/day
WATER & WASTEWATER TREATMENT WASTE										
Sewage Sludge - Incinerated Off-Post	Disposed	408	0	0	118	238	153	99	92	
Water Sediment - Land Applied Off-Post	Reused	212	130	181	539	422	297	193	179	
Total		**620**	**130**	**181**	**657**	**660**	**450**	**292**	**271**	0.11lbs/capita/day
Total Non-C&D Waste		**8082**	**9477**	**3859**	**10700**	**5542**	**7532**	**4841**	**4506**	
Non C&D Diversion Goal Total	50%	**4041**	**4738**	**1930**	**5350**	**2771**	**3766**	**2421**	**2253**	
Disposed		**4258**	**3258**	**2145**	**5736**	**3101**	**3700**	**2374**	**2210**	
Diverted (Recycled)		**3823**	**6219**	**1715**	**4963**	**2441**	**3832**	**2467**	**2296**	
Diverted %		**47%**	**66%**	**44%**	**46%**	**44%**	**50%**	**51%**	**51%**	
60 % Diversion Standard										
C&D										
Rubble Waste - Landfilled Off-Post	Disposed	175	363	225	213	307	257	279	337	
Rubble Waste - Recycled Off-Post	Recycled	5905	4889	218	241	8283	3907	3929	3982	
Asbestos - Landfilled Off-Post	Disposed	23	0	307	0	68	80	98	142	
Total Rubble Waste		**6103**	**5252**	**750**	**454**	**8658**	**4243**	**4274**	**4430**	
Total C&D Waste		6103	5252	750	454	8658	4243	4306	4461	
Diversion Goal Total	60%	**3662**	**3151**	**450**	**272**	**5195**	**2546**	**2565**	**2658**	
Disposed		**198**	**363**	**532**	**213**	**375**	**336**	**377**	**479**	
Diverted (Recycled)		**5905**	**4889**	**218**	**241**	**8283**	**3907**	**3929**	**3982**	
Diverted %		**96.8%**	**93.1%**	**29.1%**	**53.0%**	**95.7%**	**74%**	**91.9%**	**89.9%**	

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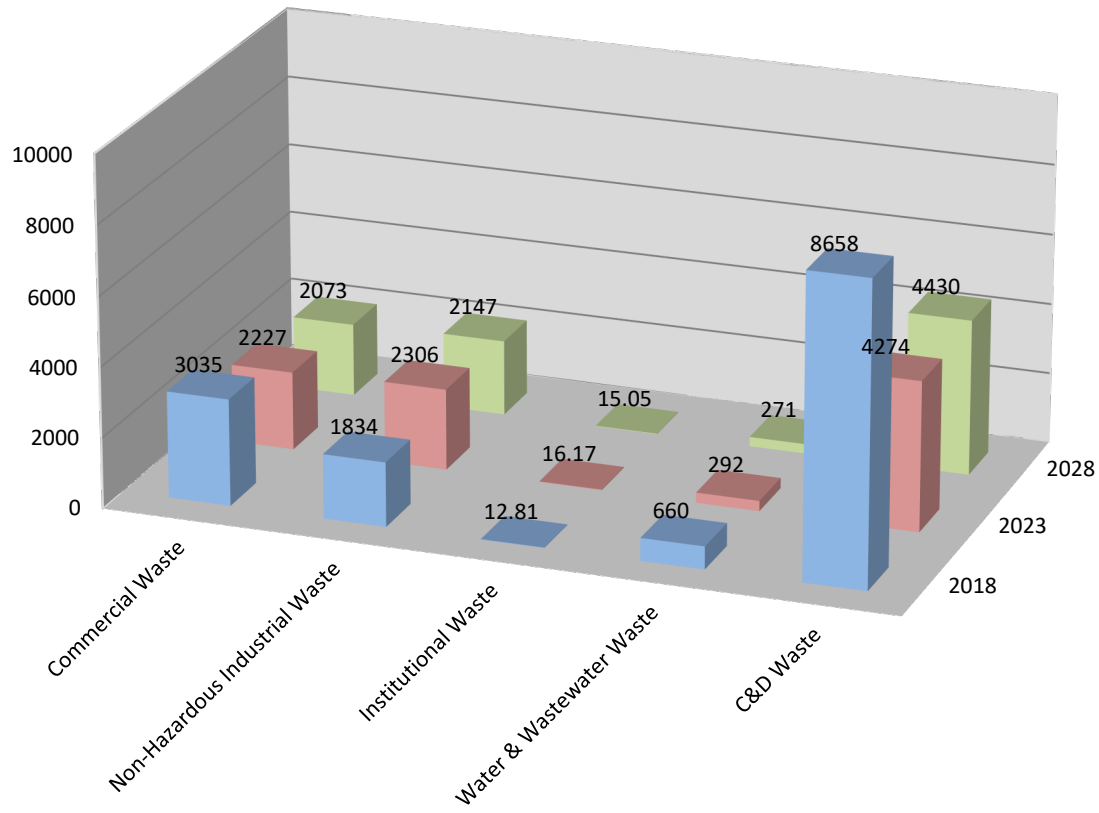
Figure 3-2: Current Solid Waste Production and Future Projections



	Commercial Waste	Non-Hazardous Industrial Waste	Institutional Waste	Water & Wastewater Waste	C&D Waste
2018	3035	1834	12.81	660	8658
2023	2227	2306	16.17	292	4274
2028	2073	2147	15.05	271	4430

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3.4 Solid Waste Collection

It is the intention of the Garrison to manage solid waste streams in accordance with good environmental and sanitary health practices and in the most cost-effective manner. The collection of solid waste will follow these goals. This chapter outlines how these activities will be accomplished.

All personnel who handle solid waste will perform their responsibilities in a safe manner that minimizes the risk of harm to themselves, other personnel and the environment. Where applicable, all solid waste will be collected on a regular and systematic basis from designated pickup sites by the Directorate of Public Works or a private contractor. The collection frequency will be established to keep costs at a minimum while maintaining sanitary conditions; however, this collection will occur at least once every seven days.

3.4.1 Municipal Solid Waste (50% Diversion Standard)

The Garrison, through the Directorate of Public Works (DPW) and contract service with refuse haulers, is responsible for the collection of all municipal solid waste as well as many of the recycled items. Refuse is collected from all buildings on the Garrison by a contract hauler. Haulers change periodically in response to competitive procurements. Refuse is taken directly to the Harford County WTE for incineration and energy recovery. Recyclables are commingled with similar material collected throughout Harford County which then arranges for transport to processing facilities. The commercial paper and cardboard are taken to Building 3558 in the Aberdeen Area where it is compacted and sent to a paper broker for sorting, bailing and shipment to paper mills worldwide.

Refuse collection is based upon need and may vary from daily to once every week. Recyclables are collected once or twice per week depending upon generation rate. Commercial recyclables are collected via dumpsters and an office service program. There are 429 dumpsters located throughout APG for mixed office paper and cardboard, as well as other municipal waste. Material is deposited into the dumpsters by employees, janitorial staff or contract refuse haulers depending upon factors unique to each building such as security issues, generation rates, etc. Recycling of plastic, glass and metal containers within offices only takes place within the buildings serviced by the office service program. Separate toters are used for paper and non-paper materials.

In addition to contract services, DPW is responsible for a number of other solid waste collection and management functions including:

(1) Two Convenience Drop-off Centers are operated by the DPW for various residential and commercial materials at Building 3558 (AA) and E1376 (EA). Hours of operation are Aberdeen - Tuesdays and Thursdays and Edgewood – Monday and Wednesday. Both locations are open from 7:30 a.m. until 3:30 p.m.

(2) Oil contaminated soils collection and management from wash racks and spills.

(3) Used oil tank bottoms removal.

(4) Water plant sediments and wastewater plant "grit" and biosolids.

(5) Limited yard and wood waste mulching.

(6) Uncontaminated soil stockpiling and reuse.

3.4.1.1 Defense Logistics Agency, Aberdeen Field Office

The Defense Logistics Agency Aberdeen Field Office either directly transports solid waste or maintains contracts with various haulers to collect and transport materials at APG. The Aberdeen Field Office participates in the following solid waste collection and transport activities.

1. Segregation and sales of all scrap metals including demilitarized range residue.
2. Used oil collection through contract services and sales by DLA. Large used oil generator ATC uses the Army's closed loop system through Richmond Supply.
3. Collection and shipment of electronics.
4. Collection and sales of surplus government equipment.
5. Collection and disposal of the bones, fats, meats and scraps from the commissary through contract services.
6. White goods received by the Aberdeen Field Office are transported by DPW to the Harford County Waste Disposal Center where the refrigerant is captured and recycled. The weight tickets for the white goods come back to DPW and become part of the reported metal recycling numbers.

3.4.1.2 Non-Hazardous Miscellaneous Solid Waste

APG activities generate a substantial volume of non-hazardous solid waste that is handled unlike regular municipal waste; see Table 3-1. This waste is often industrial in nature, inert and therefore cannot go to the WTE, or simply not acceptable to the Harford County landfill. The material is managed through a variety of avenues including the APG Hazardous Waste Tracking System (HWTS) and various vendors. Depending upon the material it is either recycled such as in the case of kitchen grease/bones and antifreeze or disposed as in the case of the materials going through the APG HWTS. Veolia Environmental Services is the current contract hauler for collection, transport and disposal of both non-hazardous and hazardous wastes managed through the HWTS. The waste is transported to various disposal facilities for ultimate disposition.

Within this category are three major components; various miscellaneous non-hazardous wastes, metals and installation restoration wastes. These three components make up about 90% of the category. Metals are recycled via the QRP or the Defense Logistics Agency, Aberdeen Field Office. Installation restoration wastes and various non-regulated wastes are nearly universally disposed; i.e. no recycling or reuse.

3.4.1.3 Scrap Tires

APG operates a permitted secondary scrap tire facility located at Building 530 in the Aberdeen Area. Up to 1,500 tires may be stored at any given time. Tires are transported from various generators either directly by the generator in cases where public roads are not used or by DPW if public roads are used; i.e. from Edgewood to Aberdeen. A Maryland Scrap Tire Hauler permit is maintained to allow transport on public roads. The Defense Logistics Agency, Aberdeen Field Office holds the contract for the removal and recycling of the used tires from APG's permitted storage facility. Tires are either re-treaded or recycled into rubber products.

Some smaller operations such as Melvin's Tire (private operator) and the Self-Help Garage (non-appropriated fund facility), dispose of their scrap tires through independent vendor relations.

3.4.1.4 Medical/Dental Waste

Medical/dental waste is generated from patient and laboratory activities at the Kirk Army Hospital, the Dental Clinics, ECBC, Army Research Lab, MRICD, and U.S. Army Public Health Command. The waste includes infectious wastes, animal carcasses, animal bedding, expired pharmaceuticals, sharps, dental amalgam and other institutional waste. The material is collected by contract services and disposed via incineration or landfilled following sterilization by autoclave. In the case of dental amalgam, the Dental Clinic in Edgewood uses filtration units to capture the amalgam. Approximately once per year, the filters are replaced by a contracted vendor. The vendor captures and recycles the mercury contained within the filters.

3.4.2 Construction & Demolition Waste (60% Diversion Standard)

Construction and Demolition waste (C&D) generation are loosely correlated to population. Rates of generation are more variable coinciding with periods of capital improvements rather than population fluctuations. Therefore the five year average rate of C&D generation in Table 3-1 is used to project C&D generation rates for 2023 and 2028. Generation of C&D will correspond to routine renovation and demolition work and larger more intensive capital improvement programs.

One such capital improvement program is the Facilities Reduction Program which will involve the demolition of 22 buildings and 38 concrete slabs in the Aberdeen and Edgewood Areas during the five year life of this plan. This initiative will generate asbestos waste, universal waste (primarily fluorescent bulbs and fixtures), wood waste, roofing waste, metal structural and otherwise, and concrete. APG has awarded a contract to conduct the work which includes recycling the building components to the extent possible. All concrete and asphalt will be crushed for re-use, structural steel and other metal will be removed for recycling, high quality wood and beams will be segregated and recycled, fluorescent light tubes will be removed prior to demolition to recycle the mercury content, and miscellaneous items such as fire extinguishers, office furniture, electronics, etc. will be removed and re-used/recycled to the greatest extent possible.

Army requirements for C&D diversion and the requirement to include the diversion goal into capital project contracts, has produced significant success in meeting and exceeding the diversion goals. For example, during the BRAC process, contractors were able to recycle all metals, all concrete/brick, all of the asphalt, and many other materials. During the construction of the C4ISR complex in the Aberdeen Area, all of the aggregate materials were recycled and used at APG.

C&D waste is collected and disposed by two primary means. For most projects particularly large projects, the primary contractor is responsible for disposal. For in-house jobs performed by DPW and some smaller projects, DPW makes roll off dumpsters available at their two drop off centers. Materials are source separated at the drop off centers to the extent practicable segregating those materials that can be recycled.

3.5 Solid Waste Disposition

3.5.1 Municipal Solid Waste (50% Diversion Standard)

3.5.1.1 Landfilling and Incineration

During calendar year 2018, APG incinerated and/or landfilled 55.7% of its non-hazardous solid wastes. The 5 year average (2014-2018) is 50.4%. Landfilling and incineration of APG waste has gone from 52.7 % in 2014 to 55.7% in 2018; see Table 3-1.

APG had previously been delivering the majority of its non-recyclable municipal solid waste (MSW) to the Harford County Waste-to-Energy Facility (WTE) via contract hauler or Army assets. As stated previously, the Harford WTE Facility shut down in 2016. A replacement for the facility has not yet been determined. Research is being done to find an alternative which would decrease the amount of waste being landfilled. That which was not sent for energy recovery via incineration, is disposed at local non-Army sanitary landfills. The five year annual averages, 2014-2018, for energy recovered and landfilled disposal of non-hazardous municipal solid waste are 1,371 tons and 1683 tons; respectively. No waste was incinerated for energy recovery in 2017 or 2018.

Limited quantities of residential and commercial waste are landfilled at the Harford Waste Disposal Center. The municipal sanitary landfill within the Harford Waste Disposal Center occupies approximately 41 acres of the 259-acre site. The landfill receives residential and commercial waste (including regulated non-Resource Conservation and Recovery Act, Subpart C industrial and institutional waste) generated within the county. It also receives grit from the APG Edgewood wastewater treatment plant. Table 3-2 provides a listing of all acceptable and unacceptable wastes that may be landfilled at the Harford Waste Disposal Center. It also provides a listing of the wastes that were previously transported to the WTE.

The solid waste that is either landfilled or incinerated is made up of medical waste, sewage sludge, installation restoration wastes, various non-hazardous solid waste that are disposed through the HWTS, and several miscellaneous waste types.

3.5.1.2 Diversion

During calendar year 2018, APG recycled or reused 47% of its non-hazardous solid wastes which falls short of the DoD goal for 2018 of 50%. The 5 year average (2014-2018) is 50% recycled or reused which meets the Army and DoD 50% diversion standards; see Table 1-7. The diversion rate in 2015 exceeded the diversion standards due to the increased recycling of testing byproducts. Scrap metal, paper/cardboard and water plant alum sludge account for the majority of the 5 year average diverted stream at APG based upon weight. All other items make up lesser percentages.

DPW and the QRP are primarily responsible for the current diversion programs at APG. The QRP operates the scrap metal storage and transfer yard in the Aberdeen Area on the east side of Michaelsville Road, one mile south of Aberdeen Boulevard. Scrap Metal is delivered to the scrap yard, or sold in place if the quantity is sufficient to attract bidders. Scrap metals processed include various ferrous and nonferrous grades sold separately or mixed. Processed materials include: certified munitions boxes, drums, gas cylinders, cable, wire, gun tubes, munitions tested aluminum, and white goods. Table 3-2 provides a listing of all acceptable and unacceptable materials that may be brought to the scrap yard.

The Defense Logistics Agency, Aberdeen Field Office also operates several warehouses on-post for the collection of excess materials generated from activities physically located at APG. The Aberdeen Field Office disposes of property for the Garrison and other tenant organizations through reutilization, transfer, donation, and sale of government excess/surplus property. Current storage warehouses are located at Building E5707 in the Edgewood Area and Building 277 in the Aberdeen Area of APG. The Aberdeen Field Office utilizes a contractor, Government Liquidations, which handles sales of surplus/excess property for the DoD. The Aberdeen Field Office will continue to accept material at these locations providing full time personnel to operate the warehouse service locations. For the disposal of such items like batteries and antifreeze, the generator can receive assistance with such commodities through the Aberdeen Field Office on a case-by-case basis. Arrangements for collection are made between the generator and the Aberdeen Field Office. Table 3-2 provides a listing of all acceptable and unacceptable materials that may be brought to the Aberdeen Field Office locations.

DPW maintains the contracts for commercial paper/cardboard recycling. DPW and the Aberdeen Field Office work in concert to recycle scrap tires and used oil with DPW providing the operations support and the Aberdeen Field Office providing contract services to haul the materials from APG. In addition to these recycling activities, there are a variety of other recycling and re-use activities for other materials.

3.5.2 C&D Waste (60% Diversion Standard)

The five year average diversion rate for C&D at APG is 74%. Wood shredding and crushing/reuse of concrete and asphalt are the primary materials diverted from landfills. DPW operates a limited wood shredding operation and some of the crushing/reuse of concrete and asphalt. Consistent with

Army policy, all major capital contracts have incorporated the 60% diversion goal. This has resulted in the high diversion rate well in excess of the Army and DoD goals.

Local landfills are used for the disposable portion of C&D waste with Honeygo Reclamation Center in White Marsh, Maryland being the primary receiving point. Honeygo can accept all C&D waste except asbestos waste. Table 3-2 provides a listing of all acceptable and unacceptable materials that may be brought to the Honeygo Reclamation Center. Asbestos waste is sent to a variety of permitted landfills depending upon the contract specifications.

3.5.3 Soil Management

It has become necessary to actively manage soil from construction activities at APG due to the volumes recently generated, the potential for historical contamination, the potential for unexploded ordnance, past inappropriate storage and the potential presence of the corn cyst nematode. Due to these issues, there are restrictions on the importation and exportation of soil generated at APG.

The DPW Environmental Division is responsible for management of excess soil and has produced a soil management policy with instructions on do's and don'ts with respect to soil. For the purposes of the Integrated Solid Waste Management Plan, soil is not considered as a waste unless it is contaminated soil requiring off site treatment/disposal such as oil contaminated soil, or clean soil that is being used in a landfill as for example as cover material. If the soil is otherwise not destined for a landfill, soil, by Army policy, is not to be considered solid waste nor counted toward diversion rates [Army Integrated (Non-Hazardous) Solid Waste Management Policy, 15 August 2008].

Table 3-2 Acceptable and Unacceptable Construction, Demolition and other Solid Wastes at DPW Approved Recycling and Disposal Facilities

Combustible Solid Waste:	DLA	DPW	WTE	Honey Go	HWDC	Specifications:
Asphalt roofing shingles	U	U	**A**	a	a	
Carpet	U	U	**A**	a	a	RRF: <6" diam
Cardboard	U	U	**A**	a	A	
Fabrics	U	U	**A**	a	a	
Lumber	U	U	**A**	a	a	RRF: <5" thick
Pallets	**A**	U	A	a	a	
Paper	U	U	**A**	a	A	
Plastics	U	U	**A**	a	a	RRF: <10% of load
PVC plastics	U	U	U	**A**	a	
RR ties & poles	U	U	**A**	a	a	RRF: chipped
Tree branches	U	**A**	**A**	a	A	
Tree logs	U	**A**	U	**A**	U	
Wooden furniture	**A**	U	**A**	a	a	
Yard waste	U	**A**	U	U	A	

Non-combustible Solid Waste:	DRMO	DPW	WTE	Honey Go	HWDC	Specifications:
Appliances - white goods	**A**	U	U	U	U	DRMO: Certified ODS free
Asphalt	U	U	U	**A**	a	
Bricks	U	U	U	**A**	a	
Ceiling Tile	U	U	U	**A**	U	
Concrete	U	U	U	**A**	a	Honey go: Rebar ok
Empty containers (paint,caulk,glaze)	U	U	U	a	**A**	Honey go: No residues
Floor Tile	U	U	U	**A**	U	
Glass	U	U	U	**A**	U	
Insulation	U	U	U	**A**	a	
Plaster board	U	U	U	**A**	a	
Soil	U	**A**	U	a	a	
Steel cable	**A**	U	U	a	A	
Steel Fencing	**A**	U	U	a	A	
Steel scrap	**A**	U	U	a	A	
Wire	**A**	U	U	a	A	

LEGEND:

A - Best Option
A - Most Acceptable
a - Acceptable
U - Unacceptable

WTE - Harford County Resource Recovery Facility (Incinerator)
Honey Go - Honey Go Run Reclamation Center (Rubble Landfill)
HWDC - Harford Waste Disposal & Recycling Center (Landfill & Recycling)

Source separated recyclables
Disposal

3.5.4 Qualified Recycling Program

APG operates a qualified recycling program (QRP) in accordance with Army and Federal regulations for QRP programs. The program is managed by the DPW Environmental Division from which a QRP Manager has been assigned. APG no longer uses the Defense Logistics Agency Aberdeen Field Office as the broker for the materials in the QRP, but rather runs the metal scrap yard internally. The scrap yard was taken over by the DPW Environmental Division in 2017. Proceeds from the sale of the recycled materials are returned to APG consistent with Federal regulations. Currently metals are the only recyclable items included in the APG QRP with metals serving as the primary recyclable and generator of income for the QRP. A 28 February 2013 memorandum from the APG Commander to the Directorate of Logistics (DOL) and Defense Logistics Agency (DLA) Aberdeen Field Office provided further clarification of the roles of these two organizations vis a via the QRP. The memorandum instructs DOL and DLA to include all eligible materials in the QRP and provides each agency with the APG QRP account number that will ensure sale proceeds are returned to the APG QRP account.

Previous proceeds to the QRP program came from funds that were due from the Defense Logistics Agency. Proceeds from the QRP have been distributed to cover the costs of the metals recycling program and to support moral and welfare programs, when possible. Metals included in the QRP consist of structural steel from demolition projects as well as range residue, wire, aluminum, and a variety of other metals.

Items that eligible for QRP reimbursement include:

- High quality paper and paper products
- Mixed paper
- Newspaper
- Cardboard
- Plastic
- Glass
- Used non-hazardous oil
- Batteries
- Tires
- Firing range scrap metal*
- Metal cans

*Per DoD 4715.23, consult DPW QRP for assistance.

Items that are ineligible for QRP participation included:

- Government furnished material
- Precious metal scrap
- Hazardous waste
- Ozone depleting substances
- Electrical components
- Unopened containers of solvents, paints, or oils
- Fuels
- Materials that can be sold as a usable item
- Repairable items that can be used again for original intended purpose
- Personal property
- Non-demilitarized items*
- All Munitions List Items (MLI) and Strategic List Items (SLI)*

- Scrap from Defense Business Operations Fund
- Commissary surcharge fund purchased property
- GSA owned automatic data processing equipment
- Property purchased for the Military Assistance Program or purchased with Foreign Military Sales Administrative funds
- Non-appropriated fund activity equipment
- Property owned by a country or international organization
- Bones, fats and meat trimmings

*Per DoD 4715.23, consult DPW QRP for assistance.

3.5.4.1 APG Mandatory Recycling Policy

Aberdeen Proving Ground is committed to minimizing the generation of solid waste through source reduction and recycling. In support of this commitment, APG is implementing a mandatory recycling policy to ensure maximum participation and dedicated effort to achieving solid waste management and diversion goals. This policy applies to all Soldiers, civilians, tenant organizations, contractors, and visitors at APG or using APG facilities, and applicable recyclable materials. Applicable recyclable materials include: cardboard, paper, glass, aluminum, tin and steel cans, plastics, batteries, brass, tires, electronics, pallets, scrap metal, appliances, used oil, and yard waste.

3.5.4.2 QRP Business Plan

Recycling is an integral part of solid waste reduction and reaching the diversion standards. It enables APG to convert used materials into valuable resources to generate appropriated funds. Since the establishment of the QRP program, it has been operated according to the Standard Operating Procedures (SOP) and the QRP Business Plan. The purpose of the business plan is to establish operating procedures for day to day operations of APG's QRP. To view the full plan, see Appendix A.

3.5.4.3 Oversite Committee Charter

The QRP Oversite Committee is primarily set up to advise the Garrison Commander of program objectives to maximize revenue and minimize solid waste disposal. Additional responsibilities of the Oversite Committee include establishing and supporting QRP goals and initiatives; reviewing the annual QRP budget, business plan, audits and waste characterization studies; and evaluating submittals and feedback from the QRP subcommittee. The full Oversite Committee Charter is located in Appendix B.

3.5.5 Special Considerations

Throughout the course of any given year, a number of solid waste streams will be generated which are not normally a part of the solid waste stream. These are generally small volumes and their existence is only temporary. These materials may include, but are not limited to, range target material, Kevlar™ materials, and military items. The current disposal systems can handle any of these materials either as non-hazardous solid waste or as an industrial/hazardous waste through the hazardous waste tracking system.

4.0 INTEGRATED SOLID WASTE PLAN OF ACTION

Initiatives for the APG Solid Waste Program during the course of this plan will be maintaining diversion rates consistent with the Army and DoD diversion goals. To accomplish this goal, the following objectives are to be achieved:

- Expand existing recycling opportunities.
    - Expand printer cartridge recycling.
    - Improve paper and cardboard recycling through a review of current recycling locations and modification to meet the new APG; i.e. post BRAC.
    - Expand battery recycling inclusive of all battery types
    - Put into place the findings of the January 2010 report entitled, "Evaluation of the APG Non-Hazardous Solid Waste Stream and Current Recycling Market," (General Physics Corp, January 4, 2010)
- Improve solid waste data capture.
    - Establish a process for source data identification and collection that is consistent and captures the recycling and disposal data of importance to this plan and diversion goals.
    - Incorporate property book turn-ins into data collection.
- Review non-hazardous waste disposal utilizing the hazardous waste tracking system.
    - Better identify what is being recycled and disposed
    - Analyze waste generation practices and determine waste reduction opportunities
- Review Installation Restoration program waste generating activities and identify opportunities for diversion.

The programs of the future must be cost effective as well as environmentally sound. Cost benefit analyses will be used to justify diversion programs. Unlike in past years when each recycling or reuse effort had to stand on its own cost merits, Army guidance has changed allowing the cost benefit to reflect the overall diversion program. The QRP is allowed to include other recycling commodities other than just scrap metal as long as the QRP program as a whole reports a net cost benefit. Decisions regarding waste reduction, reuse, recycling, and disposal must be based upon sound economic and environmental principles and must not be enacted until a thorough analysis of all costs and benefits has been completed. Often, programs that appear to be environmentally friendly on the surface, in reality require more resources than were originally believed because a thorough evaluation was not conducted.

The following section describes APG's current and projected needs with respect to meeting the goals and objectives of this plan. These needs are based upon an analysis of current solid waste program elements, APG specific factors, and the goals set by controlling Executive Orders, DoD and DA policy. Section 4.2 expands upon these needs and presents an implementation plan containing action items necessary to resolve the needs. Following Section 4.2 is a summary table,

Table 4-3, which summarizes the needs, action items and appropriate performance indicators from Chapter 5.

4.1. Waste Diversion

As indicated, APG has surpassed the Army 50% diversion goal and the DoD Sustainability Performance Goals in 2015, but has dropped below the diversion goals in the years to follow. The projections for 2023 and 2028 indicate APG will fall below the Army and DoD diversion goals but those projections are based on the five year period from 2014 – 2018 during which diversion rates were below the goals every year except 2015.

4.2 Waste Reduction

APG established an affirmative procurement program (APP) to meet the requirements of Section 6002 of the Resource Conservation and Recovery Act, Executive Orders 13101 and 13148, and the July 1995 memo from the Office of the Secretary of Defense entitled, *The Affirmative Procurement Program, Recycling, Waste Prevention and Acquisition Benefit the National Environment.* The DPW-ED P2 Office in conjunction with the DPW-ED Solid Waste Program Manager, administer the APP. The P2 Office as well as the Solid Waste Program Manager, sponsor affirmative procurement and pollution prevention training. The goal of the training is to introduce personnel to the benefits of buying recycled items, instruct in the regulatory requirements for affirmative procurement including the list of materials for which there are recycled content requirements.

Currently customers shopping at the Aberdeen Self-Service Supply Center (Center) are able to identify a number of environmentally preferred products. Products that meet the following criteria are considered environmentally preferred in comparison with similar products:

- Non-aerosol
- Recycled content
- Reusable or durable
- Nonchemical (e.g. a feather duster instead of dusting spray)
- Reduced or non-volatile organic compounds
- Not reportable under the Superfund Amendments and Reauthorization Act (SARA)

The DSHE P2 Office conducts routine inspections of the Center to ensure environmentally preferred products are being stocked and to educate Center employees about opportunities for additional products.

APG also operates a hazardous materials pharmacy program in which users are provided with materials in quantities suitable for a particular job request. Surplus materials can be returned to the pharmacy upon job completion. The pharmacy concept reduces the amount of generating

waste by controlling the distribution of raw materials and allowing for the return of surplus materials thus reducing end of shelf life generated wastes.

4.3 Waste Reuse

The APG P2 Program operates a reuse program entitled Freebies. This program allows activities and tenants to post no longer needed but usable chemicals and equipment on the P2 website. Other activities and tenants can obtain and use these materials free of charge resulting in a reduction of solid and/or hazardous wastes. The P2 program promotes the Freebies program through outreach and training.

4.4 Waste Recycling

Currently there are numerous recycling efforts on-going at APG. These include the reuse of vehicle antifreeze following on-site recovery, scrap metal, office paper, plastic/glass/metal containers, cardboard, used motor oil, batteries, tires, appliances, and gas cylinders or other containers and utilization of closed loop supply services such as the Defense Supply Center Richmond's re-refined oil and battery program. Table 4-1 summarizes the recycling efforts at APG.

Table 4-1: APG Recycling

Recycled Material Category	Types Recycled	Recycling Mechanism	QRP Eligible (Yes/No)
Paper	Mixed office paper Shredded paper Newsprint/Magazines Phone Books/Other	In office collection via toters by contract personnel or collected in dumpsters by office personnel depending upon generation rate. Consolidated, bailed and shipped from Bldg. 3558 to recyclers.	Yes
Cardboard	Cardboard	Collected in dumpsters. Consolidated, bailed and shipped from Bldg. 3558 to recyclers.	Yes
		Commissary – bailed and shipped directly to recyclers.	Yes
Containers	Plastic, glass and metal containers	In office collection by contract personnel. Delivery to Harford County recycling program.	Yes
Metal	Range residue Structural Steel Copper/brass	Consolidation, sorting and sold by Defense Logistics Agency,	Yes

Recycled Material Category	Types Recycled	Recycling Mechanism	QRP Eligible (Yes/No)
	Aluminum Wire Miscellaneous	Aberdeen Field Office Bldg. 278; recycled.	
Vehicle Waste	Used Oil	Picked up at generation site by contractor for either Defense Supply Richmond or Defense Logistics Agency, Aberdeen Field Office; recycled. Self-help garage and Melvin's Tires use private recyclers.	
	Oil/fuel filters, metal	Delivered to Defense Logistics Agency, Aberdeen Field Office; sorted, Bldg. 278, sold to recyclers.	Yes
	Anti-freeze	Filtered and re-used on site.	No
	Tires	Collected by DPW, stored at Bldg. 530, recycled by Defense Logistics Agency, Aberdeen Field Office Self-help garage and Melvin's Tires use private recyclers	Yes
	Batteries	Vendor pickup and return or delivery to DPW-HWB Bldg. 5110 or TSDF in EA for recycling as a universal waste	Yes
Batteries	Non-automotive	Deliver to DPW-HWB Bldg. 5110 or TSDF in EA. Hazardous Waste contractor disposes or recycles as a universal waste depending upon market conditions.	Yes
Kitchen Waste	Bones, fats, cooking oils	Collected at generation point, contractor removal through Defense Logistics Agency, Aberdeen Field Office; recycled.	No

Recycled Material Category	Types Recycled	Recycling Mechanism	QRP Eligible (Yes/No)
Mercury Containing	Fluorescent light tubes Thermometers Thermostats Mercury switches	Collection by DPW-HWB, consolidation at TSDF in EA or 5110, shipped as universal waste for mercury recycling	No
Electronics	All property book items	Deliver to Defense Logistics Agency, Aberdeen Field Office, Bldg. 278, shipped to Defense Supply Richmond for re-use or recycling.	No
Dental Amalgam	Dental amalgam	Captured by contractor supplied filters in dental facilities, shipped to contractor for recycling.	No
Precious metals	Silver photographic solutions	Collected at generation facility, shipped to Army Precious Metals Monitor, Ft Meade, MD for recycling.	No
C&D	Asphalt Concrete Brick	Crush and re-use on site or send to Honeygo Reclamation Center for recycling.	No
Wood	Brush, trees, branches, etc.	Deliver to DPW yards in EA or AA for mulching and reuse.	No

A Qualified Recycling Program (QRP) has been established under which the recycling of scrap metal generated at APG occurs. Sorting the various scrap metals generated on APG can improve the resale value. Table 4-2 provides a guide based on the local scrap metal market for sorting by metal types. Providing this level of sorting is expected to make the material economically attractive in the Baltimore, Maryland area.

Table 4-2: Scrap Metal Sorting Guide

Metal Type	Grade	Specification
Ferrous	Unprepared	1) #1 Heavy (> 1" thick, cut to truck hauling specs). 2) Shredded (sheet metal, appliances, mixed)
	Military Vehicles	No spec
	Steel Cans	Crushed
	Stainless Steel	1) Clean, no contamination 2) Contaminated (mixed with unprepared or shredded ferrous
Copper	Copper Wire	1) Stripped (can be mixed with #1 copper pipe) 2) Not stripped, must be >3/4 inch whole wire diameter
	Copper Pipe	1) #1 clean, no solder, paint, or other contamination (can be mixed with stripped copper wire) 2) #2 Sheet (used pipe, paint/contamination ok. Copper/brass mix ok)
Brass	Shell Casings	Clean, no contamination
	Mixed	Valves, faucets, radiators (can be mixed with #2 copper)
Aluminum	Insulated	No spec
	Mixed	No ferrous, paint ok
	Aircraft/specialty	Dismantled
Zinc/Titanium	Single alloy	No spec
	Mixed alloy	Aircraft engines

Other materials may be brought under the QRP as the market for scrap metal has historically been strong producing surplus funds. These funds could be used for further recycling initiatives or to offset the costs of current programs.

A 2010 report by the General Physics Corporation entitled, Evaluation of the APG Non-Hazardous Solid Waste Stream and Current Recycling Market, provided APG with an analysis of the composition of the solid waste stream as represented by the materials found within APG refuse dumpsters and identified potential recycling markets. That report should be used as a guide for expansion of recycling activities at APG. The report satisfies Army requirements for market analysis of recycling opportunities prior to launching recycling initiatives and demonstrates what materials would be most cost effectively recycled in the APG market area. During the life of this plan, the conclusions of the 2010 General Physics report should be put into place. These included:

- Expansion of cardboard recycling
- Expansion of mixed paper recycling and potentially white paper segregation and recycling due to its high market value.
- Improving the battery recycling program.
- Instituting an ink jet/laser printer cartridge recycling program.

- Expanding office recycling of glass/plastic/metal containers not for its economic value but high visibility value and willing participation.
- Develop a pallet recycling program.
- Develop a recycling program for tank tred rubber pads

The recycling market is a commodity driven market with prices fluctuating based upon market pressures of supply and demand. In order to maintain cost effective recycling initiatives, a regular analysis of APG recycling efforts must be conducted in light of the prevailing markets. Recycling efforts should not continue if the market cost factors, including cost avoidance, are not in favor of recycling a given commodity. A routine analysis system must be developed so as to ensure a cost-effective program.

4.5 Disposal

APG accomplishes the disposal of its waste through the various outlets identified previously in this plan. There is adequate capacity in the area for APG's MSW and C&D disposal needs. The Harford County WTE closed in 2016, the costs for disposal of MSW may increase with increased haul distances until a replacement or similar upgrades are undertaken. The Honeygo Reclamation Center projects their fill will remain open for 45 years due to the opening of additional cells and the economic down turn that significantly reduced the amount of construction and demolition activities in the area. Maintaining the C&D recycling rate at 60% will lessen APG's dependence on C&D fill availability and with the majority of demolition and construction completed, there will be less of a need for C&D fill availability during the life of this plan.

IR waste is a potential area for reductions in the amount of material requiring disposal. The volume of material requiring disposal is primarily driven by the number, scope and size of the removal actions taking place at any given time. Most of the known large removal actions will conclude during the life of this plan which will lower the overall disposal rate of solid waste and consequently raise the overall recycling rate assuming recycling stays at least constant. An area of IR waste reduction opportunity is to examine the feasibility of managing certain wastes on the post rather than disposal off post. In particular are non-hazardous liquids such as decon and well development waters. It may be advisable to process these materials through one of the operating groundwater treatment systems currently operating under the IR program or simply discharging to the ground. The Maryland Department of the Environment has given approval to ground discharge if contaminate free. Second is in the area of non-hazardous dirt and drill cuttings. Rather than disposing of these off post, if they are managed at the site it will reduce the amount of solid waste disposed, disposal costs, and increase recycling through a lower total volume of solid waste disposal. Likewise metals, often unearthed during removal actions, potentially could be recycled rather than disposed.

4.6 Life Cycle Analysis

Life Cycle Cost Analyses should be used to factor environmental and financial considerations into government purchasing, recycling, and disposal decisions. By properly accounting for environmental costs, from product design to ultimate disposal, APG will be better equipped to make appropriate decisions to cost-effectively maximize the purchase of products and technologies that prevent pollution. In addition, such analyses will allow APG to identify cost-effective opportunities to expand recycling and reuse initiatives and eliminate those programs that are not cost effective. Several analytical methods may be implemented including the following:

- Life-Cycle Cost Analysis (LCC) – involves quantification of economic and societal costs with pollution prevention opportunities over an extended time horizon, and represents these costs as a single value. LCC facilitates the evaluation of various acquisition, pollution prevention, and recycling initiatives to determine the most cost-effective opportunities.
- Life-Cycle Analysis (LCA) – involves quantification of total environmental releases and impacts of a specific product. LCAs typically track the development of a product from raw material through production, use, reuse, recycling, and ultimate disposal. They are particularly useful in conjunction with LCC when evaluating the costs and benefits of various acquisition, recycling, and disposal options.

These methods are standard and well developed analytical techniques for cost evaluation. In order to gain consistency in cost benefit analysis, APG will develop a standard method based upon documented cost accounting principles. The APG cost benefit accounting method will be documented in APGR 200-50, Solid Waste Management, so that it is universally accepted and implemented.

4.7 Data Reporting and Recordkeeping

APG will develop an improved data and recordkeeping system for solid waste disposal and diversion. The goal will be to identify and capture the relevant information from all of the generators of non-hazardous solid waste inclusive of Garrison activities, tenants, and contractors working for Garrison activities and tenants. With the need to demonstrate adherence to the 50% and 60% diversion rates and the elimination of WTE as diversion, expanded and accurate data collection and recordkeeping are needed. Any new system will not replace the Army's Solid Waste Annual Reporting System (SWARs). SWARs will continue to be used to report data to headquarters but the mechanism of collecting the input for SWARs will be revamped during the life of this plan.

The Solid Waste Manager will administer an annual review of procedures, data collection, record keeping, disposal and recycling rates, recycling market conditions and activity/tenant compliance. Recycling data will also be used to determine and evaluate APG's progress in meeting recycling and integrated solid waste management measures of merit and program goals.

Table 4-3: Needs and Action Items Summary

NEEDS	ACTION ITEMS	PERFORMANCE INDICATORS
Demonstrate consistent adherence to 50% diversion rate for non-C&D waste	1. Expand electronic recycling efforts 2. Expansion of cardboard recycling 3. Expansion of mixed paper recycling and potentially white paper segregation and recycling due to its high market value. 4. Improving the battery recycling program. 5. Instituting an ink jet/laser printer cartridge recycling program. 6. Expanding office contain recycling not for its economic value but high visibility value and willing participation. 7. Develop a pallet recycling program. 8. Develop a recycling program for tank tred rubber pads	1. Document electronic recycling rate and expansion 2. Addition of new buildings receiving paper recycling service 3. Development of educational materials and demonstrated improvement in recycling rates 4. Development and launch of new recycling programs
Demonstrate consistent adherence to the 60% diversion goal for C&D	1. Develop data collection and record keeping system	1. Maintaining the diversion goal. 2. Develop and launch data reporting system
Develop solid waste data collection and record keeping method	1. Identify classifications of solid waste that APG wants to track 2. Understand generators and generation rates 3. Determine how to capture data and develop reporting method consistent with SWARweb needs	1. Completed list of data parameters to be tracked. 2. Completed list of generators to be tracked 3. Develop and launch data reporting method

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5.0 PERFORMANCE INDICATORS

Successful fulfillment of the goals and objectives of this plan will be measured by the indicators outlined in this chapter. Figures 5-1 and 5-2 depict current and future status of the major goals of this plan.

5.1 Solid Waste Management Goals

5.1.1 MSW – 50 % Diversion

The Department of Defense, Strategic Sustainability Performance Plan, has instructed all Armed Services to divert 50% of their non-C&D solid waste stream from landfills and incineration by 2015. The development of the plan was in response to Executive Orders 13423 and 13514 and DoD's need to maintain its ability to operate without decline DoD has selected 50% as an attainable diversion goal. This plan and APG will be successful once a minimum of 50% of the non-C&D waste stream is diverted from landfilling and incineration. In the past DoD had considered incineration at a WTE to be considered diversion in recognition of the energy recovered. Consequently APG had easily been meeting, even exceeding, a 50% diversion rate. As a result of DoD's decision to exclude WTE from diversion, APG will need to increase its recycling, reuse and other diversion measures to meet the goal.

The diversion trend has been upward since 2010 allowing APG to meet or exceed the annual goals. As noted previously, future predictions which indicate not meeting the goals, are skewed downward due to the large volume of IR waste that was disposed in 2008 and 2009. The projections are based in part on the five year average which includes these two years. Barring any large IR waste disposal years, it is likely that the division trend experienced since 2010 will continue and APG will meet or exceed the goals. However part of the action items for the life of the plan includes identifying opportunities to recycle a portion of the IR waste.

Executive Order 13423 and Army policy continue to require a cost benefit analysis for all diversion activities. A positive cost benefit is required which is to include not only direct costs associated with the diversion effort such as revenues from the sale of recycled items, but also avoided costs such as tipping costs for landfill disposal. Recycling can continue to occur within or out of a QRP. The cost benefits of scrap steel can be used to toward recycling other items provided the overall QRP costs are positive; i.e. demonstrate savings to APG.

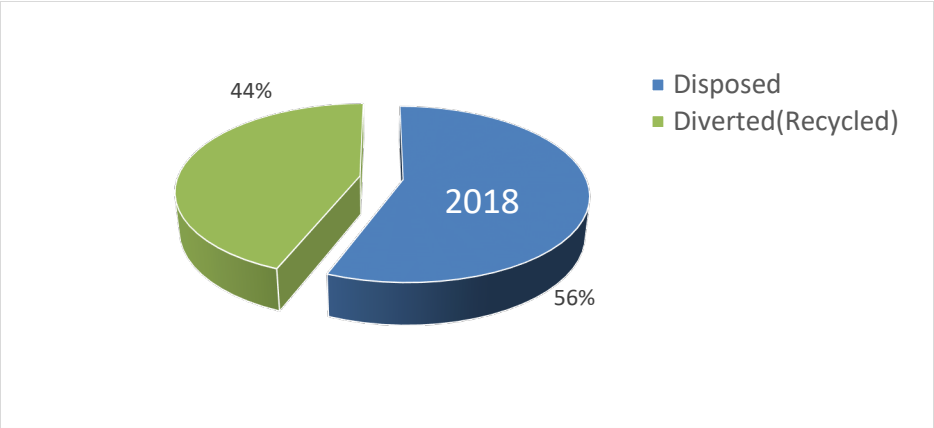
5.1.2 C&D – 60% Diversion

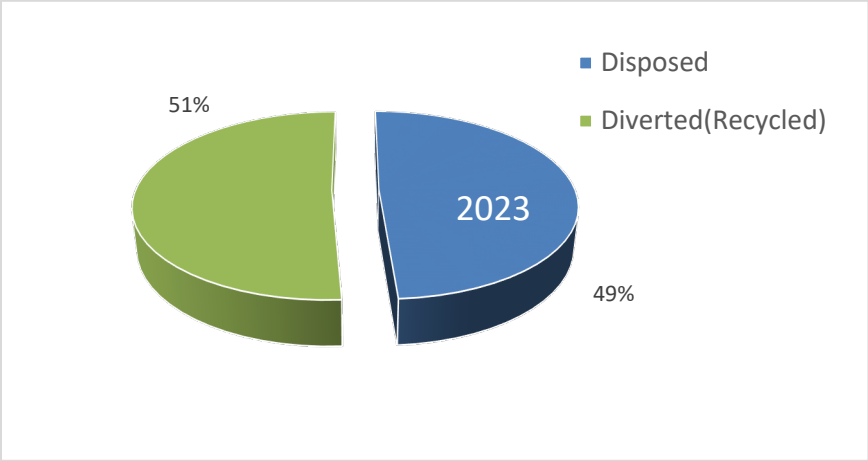
DoD's diversion goal for C&D waste as stipulated in the Strategic Sustainability Performance Plan, is 60% by 2015. Army requirements include terms for all BRAC, MILCON Army, MILCON Army Reserves, MILCON National Guard Bureau, Family Housing Construction, Facilities Reduction Programs (FRP) and installation Operation and Maintenance construction and demolition contracts to include the development of a project solid waste management plan that will detail how the project will meet the 60% diversion goal. Managers of these projects will have

to report C&D waste activities inclusive of disposal and diversion volumes and material types to the APG Solid Waste Coordinator or via a data reporting system as appropriate.

The Garrison will develop an overall plan for meeting the 60% diversion goal inclusive of the same project based goal. There are numerous smaller C&D projects that will need to incorporate a separation and recycling component. This will require not only logistically support and planning but potential training to change the mindset of individuals involved.

Figure 5-1: Current & Projected MSW Diversion Rates
50% Diversion Standard





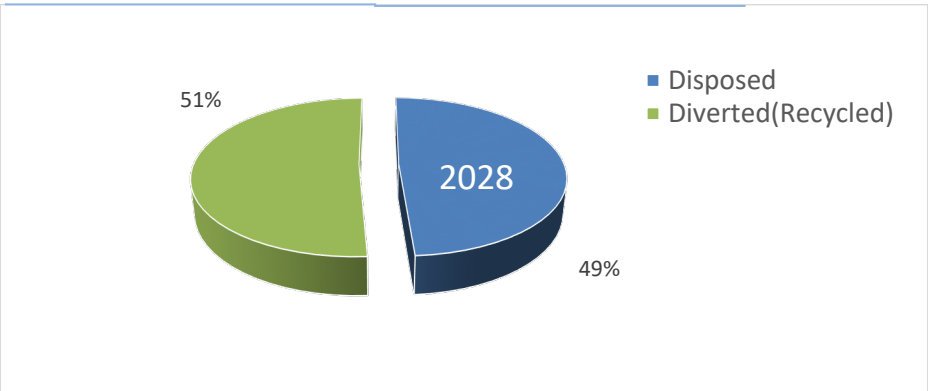
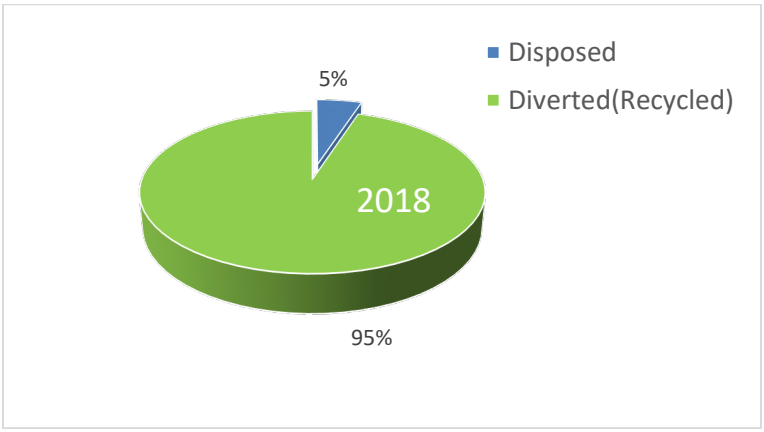
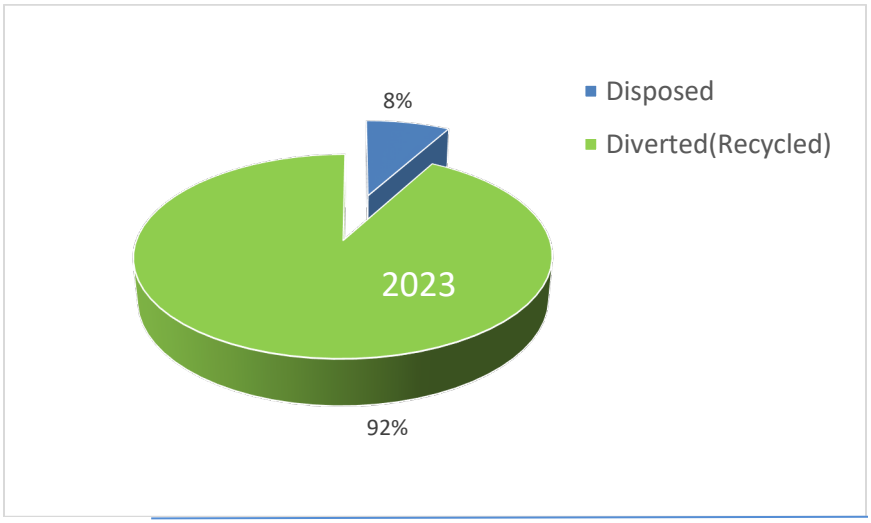
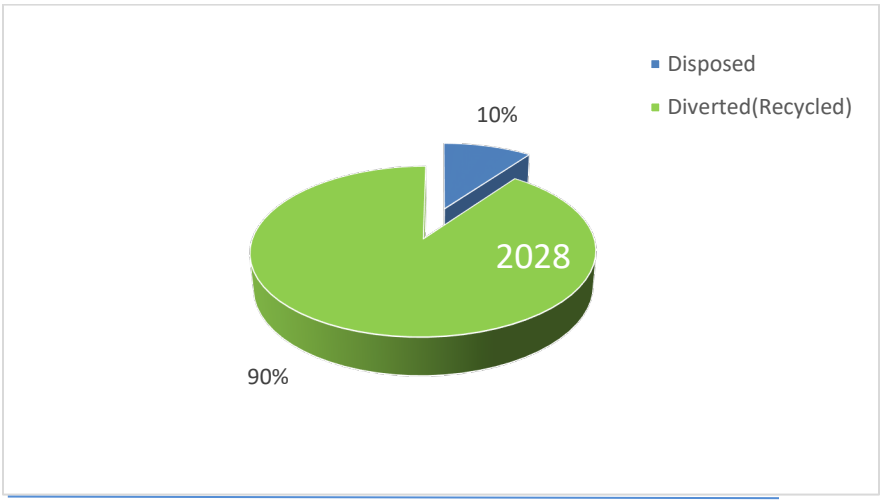


Figure 5-2: Current & Projected C&D Diversion Rates
60% Diversion Standard







5.2 Data Management

In order for Garrison Aberdeen Proving Ground to meet the recycling goals of this plan, regulatory requirements contained in RCRA 6002 and Executive Order 13423, and effectively manage its solid waste program, a complete data management system is required. The Department of Army, affective 31 August 1998, selected an online data management system known as the Solid Waste Annual Reporting System or SWARweb. SWARweb was developed by the US Navy and has been modified for use by the Army. SWARweb allows Garrison APG to track solid waste disposal costs, methods, and transactions; recycling costs, solid waste generation, disposal, and recycling rates; and historical information. As a result, Garrison APG is able to conduct trend analyses to determine progress towards meeting source reduction and recycling goals and regulatory compliance. Garrison APG provides annual reports using SWARweb to IMA to support the regulatory and executive order requirements for agency reporting.

The management of SWARweb has been assigned to the Directorate of Public Works, Environmental Division by the Garrison Commander. All activities, tenants and contractors generating, recycling, reusing, recovering or disposing of non-hazardous solid waste at Garrison APG, report such information to the DPW. The Environmental Division determines how the data is to be reported; i.e. units, quantities, etc. Non-hazardous waste that is managed through normal Garrison support services (dumpster, roll off service, recyclables collection service, hazardous waste tracking system, etc.) has already been accounted for and need not be reported separately by tenants, activities, or contractors. Activities which manage non-hazardous solid wastes outside of the Garrison support systems must report such information; e.g. antifreeze recycling by ATC and DLA recycling activities.

While SWARweb is used to report APG activities to headquarters, a better system within the Garrison is severely needed. A goal of this plan for the next five years is to design, construct and implement such a reporting system. The system may be an electronic system that allows generators to report their information by email or a web interface. Using the evaluation of the APG solid waste stream conducted by the General Physics Corporation in 2010 and the current data collected for SWARweb, APG will determine the data that needs to be collected to support the solid waste program. Upon a determination of what data is to be collected, a methodology for the collection can be formulated. Effective data collection will improve accuracy, strengthen diversion values, and allow APG to more fully and effectively serve the needs of the Garrison.

5.3 Training

A training program for Garrison personnel will be necessary in order to meet the diversion goals of this plan and to maximize recycling in a cost effective manner. Training need not be limited to classroom training. It may web based training or informational through the APG web, email, social media and newsprint. Regardless of the method, the goal will be to communicate the diversion goals and how Garrison and support activity personnel can participate in meeting the goals.

5.3.1 Garrison Training

Programs have been developed by the Pollution Prevention Program to educate personnel in the elements of the Garrison's solid waste program. The topics include the types of waste generated, APG's disposal options including the Waste-to-Energy agreements, waste reduction methods, recycling programs/markets, and affirmative procurement requirements. The Pollution Prevention Program makes training available at no cost to APG military, civilian, and contract employees. Topics related to solid waste management include:

- Solid Waste Management and Recycling
- Hazardous Material Management
- Pollution Prevention Requirements
- Environmentally Preferable Products
- Life-Cycle Assessment
- Green Building
- Pollution Prevention Awareness, Training, and Opportunity Assessment
- Affirmative Procurement

Pollution prevention training classes are also arranged by the various tenant organizations supported by APG tailored to their specific activities.

5.3.2 DoD Training

The Federal Acquisition Institute (FAI) and the Defense Acquisition University (DAU) provide training to DoD personnel that will aid in the management of solid waste. Garrison Aberdeen Proving Ground procurement officials and program managers shall attend FAI and DAU training as needed to accomplish the elements of this plan.

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Appendix G

Licensed Haulers in Harford County

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Hauler	Account #	Truck Count	Address	Phone #
A-1 Hauling and Roll Off	70023	2	PO Box 552 Churchville, MD 21028	410-893-5171
A&C Services	70054		2009 Tower Road Aberdeen, MD 21001	443-876-1460
A Cut Above Services	70066	1	3304 Conowingo Road Street, MD 2154	410-322-5174
Ace Roll Off	70046	6	8 Highshire Court Baltimore, MD 21222	410-288-3867
A Better Haul LLC	73574	1	3107 Woolsey Drive Churchville, MD 21028	410-676-4950
American Sealing LLC (Bumble Bins)	76575	2	1245 Old Pylesville Rd. Whiteford, MD 21160	410-459-7777
Baltimore Recycling Center	70062	4		
Bartenfelder	73586		3341 Forge Hill Road Street, MD 21050	410-457-5550
Bratton Contracting LLC	73588	3	3897 Rock Run Road Havre de Grace, Md 21078	410-688-7611
Bumble Junk	70053	5	186 Campus Lakes Court Bel Air, MD 21015	888-286-2535
Cam Healthy Services	70035	3	408 S. Tollgate Rd. Bel Air, MD 21014	410-937-2560
Casella	73584		3634 Conowingo Rd. Street, MD 21154	410-457-0404
City of Aberdeen	73509	9	60 North Parke Street Aberdeen, MD 21001	410-272-1600
Clayton's Tree Service	78608	1	3700 Aldino Road Aberdeen, Md 21001	410-914-5921
Cockey's Enterprises, Inc.	73587	70	3300 Transway Road Baltimore, MD 21153	410-242-3344
Cortez & Co.	70073	1	2907 Willoughby Beach Rd. Edgewood, MD 21040	443-490-2948
Crass Hauling	73927		809 Broad Street Delta, PA 17314	410-688-7569
Dan's Hauling	73967	2	1409 Ontario St. Havre de Grace, MD	410-939-5035
Denver Companies	70030	10	11116 Red Lion Rd. White Marsh, MD 21162	410-995-8389
Draw Inc. (1-800-Got-Junk)	73580	8	12528 Unica Road Greenwood, DE 19950	443-523-6316
Dump Rite Dumpsters	70058	4	3110 Roger Road Baltimore, MD 21219	443-910-7918
Eagle Transfer Services, Inc.	70063	Inactive		
Gerbers, Inc	73515	8	200 Cockeysville Rd. Cockeysville, MD 21030	410-771-1321
Grassworks	70067	1	3323 Charles Street Fallston, MD 21047	410-688-8868
G.T. Lawn and LLC	70055	1	204 Garnett Road Joppa, MD 21085	443-823-1592
Harford County Highways	73501	6	1807 North Fountain Green Road Bel Air, MD 21015	410-638-3532
Harford County DPW/Solid Waste Management	73484	17	HWDC Landfill	410-638-3018
Harford County Government Parks and Rec.	73483	6	1809 Fallston Road Fallston, MD 21047	410-638-3535
Harford County Public Schools	73507	5	102 South Hickory Ave. Bel Air, MD 21014	410-638-4088
Harford County Trash Services	70051	8	3511 Hughes Road Darlington, MD 21034	443-841-6253
Humpty Dumpsters	70036	8	1906 W. Grove Ave. Fallston, MD 21047	410-879-5589
J.D.Lawn	73483	2	539 Craigs Corner Rd. Havre de Grace, MD 21078	410-734-0228

Hauler	Account #	Truck Count	Address	Phone #
JMH Construction	70033	1	1118 Sparrow Mill Road Bel Air, MD 21015	410-322-0816
J.R. 's Hauling	70054	3	8515 Bradshaw Road Kingsville, MD 21087	443-286-3284
Kennys Cans	102913	2	860 Gilbert Road Aberdeen, MD 21001	443-567-3866
L.G. Almony & Sons	70048	1	2108 Jerry's Road Street,MD 21154	410-692-5521
Lehnhoff's LLC	70050	3	2708 Belair Road Fallston,MD 21047	410-510-7646
Macias Junk Removal	70045	On Hold per HQ	809 S. Fountain Green Road Forest Hill	443-699-4607
Maryland Pickers	75710	4	1006 Calvary Road Churchville, MD 21028	410-688-1803
McMahon Management Inc.	73590	Inactive	PO Box 984 Havre De Grace, MD 21078	443-299-8736
MRA Property Management, Inc.	75373	3	3103 Emmorton Road Abingdon, MD 21009	410-515-7390
Precision Transportation Services	70034	2	728 Belair Rd. Suite 108 Bel Air, MD 21014	256-312-2712
R&R Clean Up	70017	1	808 Pine Road Joppa, MD 21085	443-791-8886
Randy's Rain Gutter Cleaning and Services, Inc.	73577	1	3103 Rolling Green Dr. Churchville, MD 21028	443-206-0456
Raven Junk Removal				
Republic Services	73504		260 W. Dickman Street Baltimore, MD 21230	410-347-5140
Roger That Roll Off LLC	70068	3	11 Ann Ave. Essex, MD 21221	410-638-9673
Ron's Bulk Pick Up Service	70021	1	1007 Conowingo Rd. Bel Air, MD 21014	410-937-6576
Ryan Furniture Co	73487	1	2121 Pulaski Highway Havre de Grace, MD 21078	410-272-2727
Safe Haven Properties	70057	2	PO Box 9 Edgewood, MD 21040	410-652-6969
SHA-MDOT	73498	8	3050 Churchville RD Churchville, MD 21028	410-838-7788
Tap's Landscaping Inc.	75784	2	1318 South Philadelphia Blvd. Aberdeen, MD 21001	410-977-3661
Tar Heel Construction Group	70052	1	1212 E. Churchville Road Suite 101, Bel Air, MD 21014	410-638-7021
Thompson's Dumpster Service, LLC	73581	3	1702 Conowingo Rd Bel Air, MD 21014	410-399-2381
THR Landscaping	70056	1	414 Northfields Court Edgewood, MD 21040	
Total Waste LLC	78268	4	22 W. Pennsylvania Ave. Suite 302 Towson, MD 21204	888-818-5454
Town of Bel Air Public Works	73489	17	705 E. Churchville Road Bel Air, MD 21014	410-638-4571
Trash Panda Dumpsters	70044	1	1518 Balmoral Drive Bel Air, MD 21014	410-688-5457
Vincent Engineering	70071	1	4217 Rocks Road Street, MD 21154	443-465-0169
Waste Management	73520	27	3545 Fairfield Rd. Baltimore, MD 21226	410-977-9421
Wee Haul Junk MD LLC	73966	3	2440 Maxa Meadows Lane Forest Hill, MD 21050	410-905-3286
Wilburn Hauling, Inc. (APG)	70070	4	6305 Ivy Lane Suite 380 Greenbelt, MD 20770	240-876-5542
Wreck Creation Breakroom	70061	1	517 Green Street Havre de Grace, MD 21078	301-655-3102

Appendix H

Harford Waste Disposal Center
Site Layout and Land Use Plan

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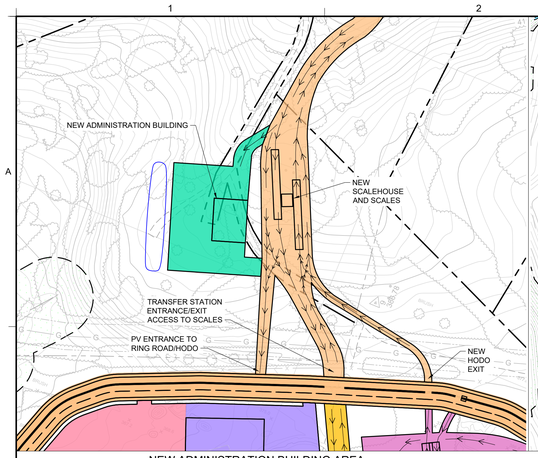
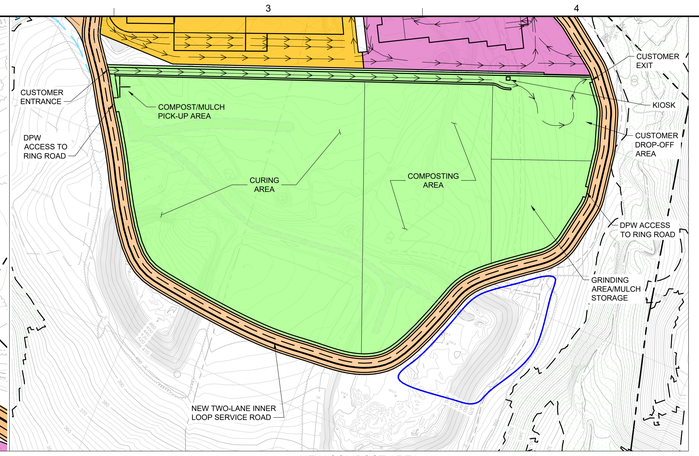


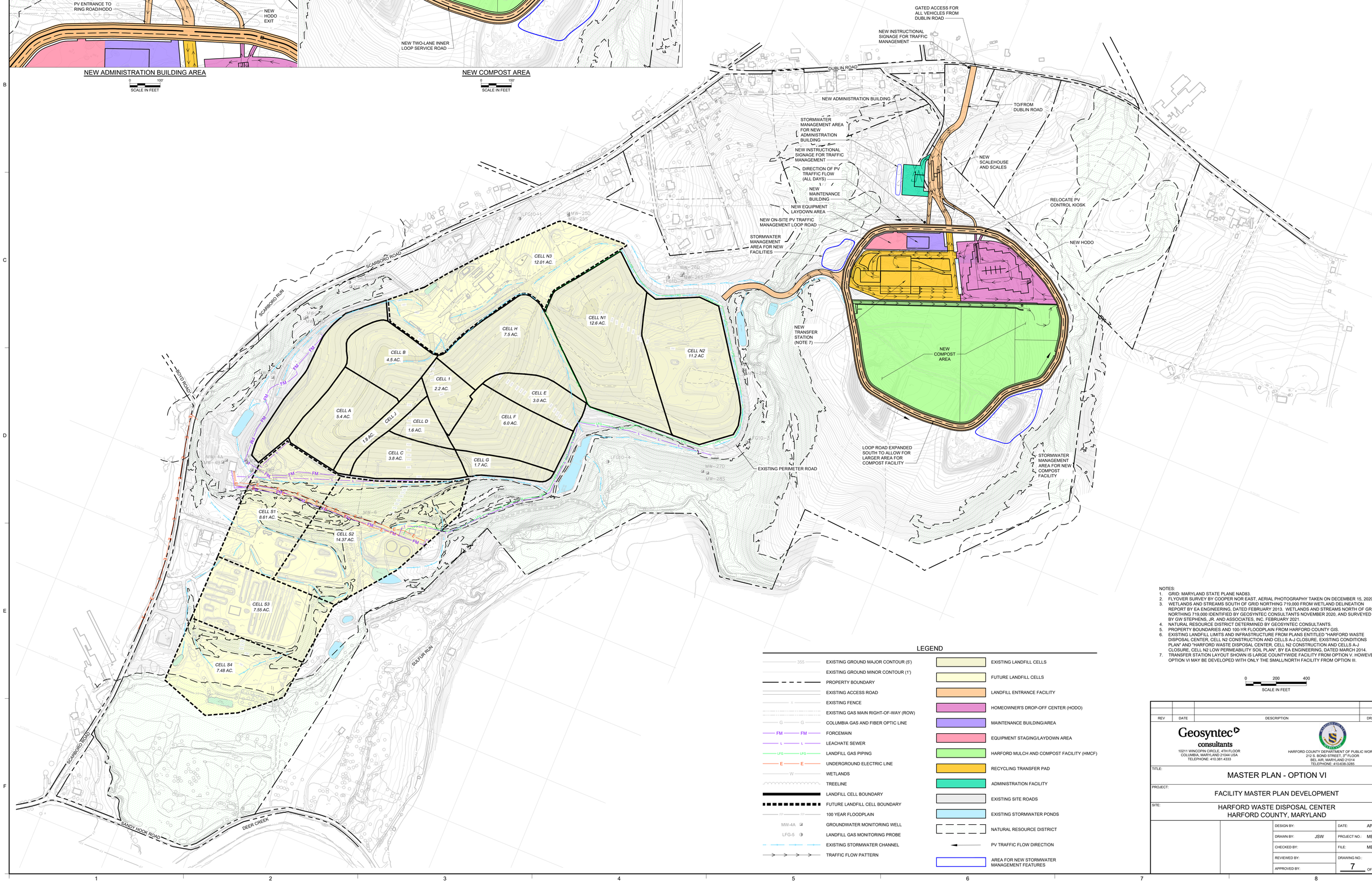
NEW ADMINISTRATION BUILDING AREA

0 100'
SCALE IN FEET



NEW COMPOST AREA

0 150'
SCALE IN FEET



LEGEND

- EXISTING GROUND MAJOR CONTOUR (5')
- EXISTING GROUND MINOR CONTOUR (1')
- PROPERTY BOUNDARY
- EXISTING ACCESS ROAD
- EXISTING FENCE
- EXISTING GAS MAIN RIGHT-OF-WAY (ROW)
- COLUMBIA GAS AND FIBER OPTIC LINE
- FORCEMAIN
- LEACHATE SEWER
- LANDFILL GAS PIPING
- UNDERGROUND ELECTRIC LINE
- WETLANDS
- TREELINE
- LANDFILL CELL BOUNDARY
- FUTURE LANDFILL CELL BOUNDARY
- 100 YEAR FLOODPLAIN
- GROUNDWATER MONITORING WELL
- LANDFILL GAS MONITORING PROBE
- EXISTING STORMWATER CHANNEL
- TRAFFIC FLOW PATTERN
- EXISTING LANDFILL CELLS
- FUTURE LANDFILL CELLS
- LANDFILL ENTRANCE FACILITY
- HOMEOWNER'S DROP-OFF CENTER (HODO)
- MAINTENANCE BUILDING/AREA
- EQUIPMENT STAGING/LAYDOWN AREA
- HARFORD MULCH AND COMPOST FACILITY (HMCF)
- RECYCLING TRANSFER PAD
- ADMINISTRATION FACILITY
- EXISTING SITE ROADS
- EXISTING STORMWATER PONDS
- NATURAL RESOURCE DISTRICT
- PV TRAFFIC FLOW DIRECTION
- AREA FOR NEW STORMWATER MANAGEMENT FEATURES

NOTES:
1. GRID: MARYLAND STATE PLANE NAD83.
2. FLYOVER SURVEY BY COOPER NOR EAST, AERIAL PHOTOGRAPHY TAKEN ON DECEMBER 15, 2020.
3. WETLANDS AND STREAMS SOUTH OF GRID NORTHING 719,000 FROM WETLAND DELINEATION REPORT BY EA ENGINEERING, DATED FEBRUARY 2013. WETLANDS AND STREAMS NORTH OF GRID NORTHING 719,000 IDENTIFIED BY GEOSYNTEC CONSULTANTS NOVEMBER 2020, AND SURVEYED BY GW STEPHENS, JR. AND ASSOCIATES, INC. FEBRUARY 2021.
4. NATURAL RESOURCE DISTRICT DETERMINED BY GEOSYNTEC CONSULTANTS.
5. PROPERTY BOUNDARIES AND 100-YR FLOODPLAIN FROM HARFORD COUNTY GIS.
6. EXISTING LANDFILL LIMITS AND INFRASTRUCTURE FROM PLANS ENTITLED "HARFORD WASTE DISPOSAL CENTER, CELL N2 CONSTRUCTION AND CELLS A-J CLOSURE, EXISTING CONDITIONS PLAN" AND "HARFORD WASTE DISPOSAL CENTER, CELL N2 CONSTRUCTION AND CELLS A-J CLOSURE, CELL N2 LOW PERMEABILITY SOIL PLAN", BY EA ENGINEERING, DATED MARCH 2014.
7. TRANSFER STATION LAYOUT SHOWN IS LARGE COUNTYWIDE FACILITY FROM OPTION V. HOWEVER, OPTION VI MAY BE DEVELOPED WITH ONLY THE SMALL/NORTH FACILITY FROM OPTION III.

0 200 400
SCALE IN FEET

REV.	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants
10211 WINCOPIN CIRCLE, 4TH FLOOR
COLUMBIA, MARYLAND 21044 USA
TELEPHONE: 410.381.4333

HARFORD COUNTY DEPARTMENT OF PUBLIC WORKS
212 S. BOND STREET, 3RD FLOOR
BEL AIR, MARYLAND 21014
TELEPHONE: 410-638-3285

TITLE: MASTER PLAN - OPTION VI

PROJECT: FACILITY MASTER PLAN DEVELOPMENT

SITE: HARFORD WASTE DISPOSAL CENTER
HARFORD COUNTY, MARYLAND

DESIGN BY:		DATE:	APRIL 2021
DRAWN BY:	JSW	PROJECT NO.:	ME1957
CHECKED BY:		FILE:	ME1957-003
REVIEWED BY:		DRAWING NO.:	
APPROVED BY:			7 OF 7

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Appendix I

Public Opinion Survey Results

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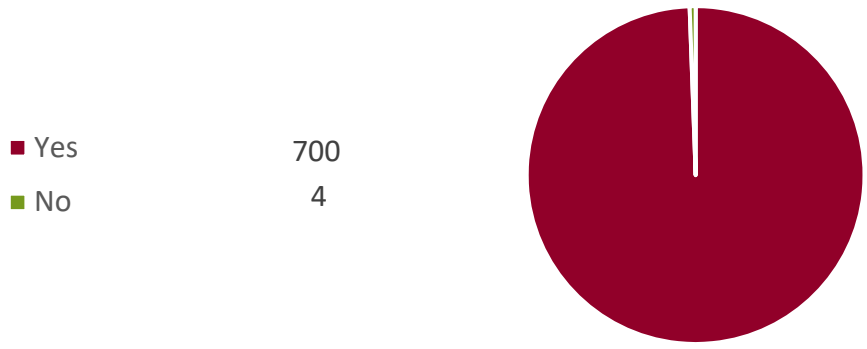
Harford County Public Opinion Survey 2025-2034
Solid Waste Plan Update

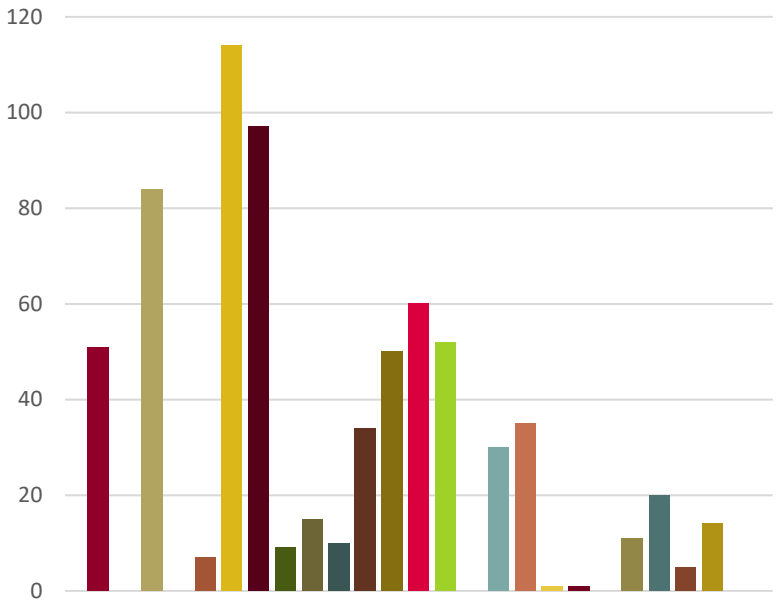
704	06:51	Closed
Responses	Average time to complete	Status

1. Do you currently reside in Harford County?



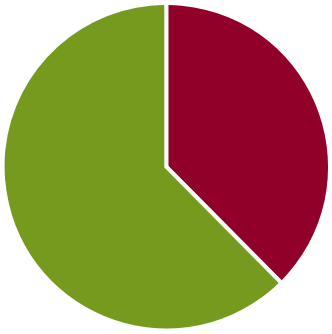
2. Please select the zip code you live in.

21001 (Aberdeen)	51
21005 (Aberdeen Proving Ground)	0
21009 (Abingdon)	84
21010 (Gunpowder)	0
21013 (Baldwin)	7
21014 (Bel Air)	114
21015 (Bel Air)	97
21017 (Belcamp)	9
21028 (Churchville)	15
21034 (Darlington)	10
21040 (Edgewood)	34
21047 (Fallston)	50
21050 (Forrest Hill)	60
21078 (Havre de Grace)	52
21082 (Hydes)	0
21084 (Jarrettsville)	30
21085 (Joppa)	35
21087 (Kingsville)	1
21111 (Monkton)	1
21130 (Perryman)	0
21132 (Pylesville)	111
21154 (Street)	20
21160 (Whiteford)	5
21161 (White Hall)	14
Other	0



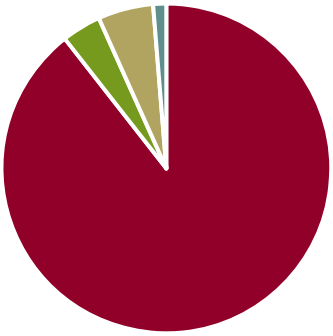
3. Do you live within the municipal limits of the city/town?

Yes	118
No	196



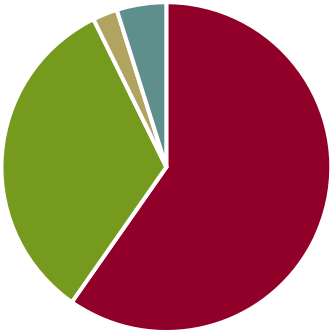
4. How is trash/garbage collected from your home?

Collected curbside	626
Placed in an onsite communal trash dumpster/receptacle	27
Transported in your own vehicle to the Harford Waste Disposal Center	38
Other	9



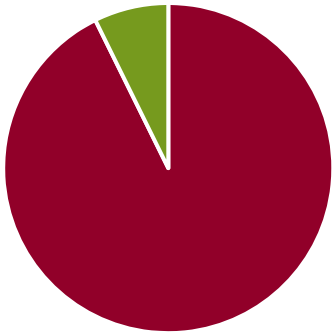
5. How frequent is trash/garbage collected from your home?

Weekly	418
Two times per week	231
Unknown	17
Other	34



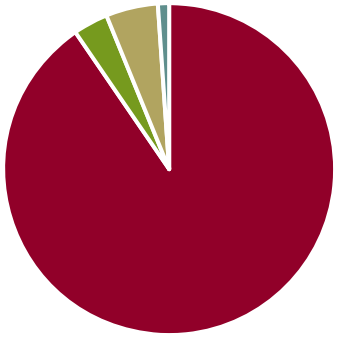
6. Do you recycle at your home?

Yes	649
No	51



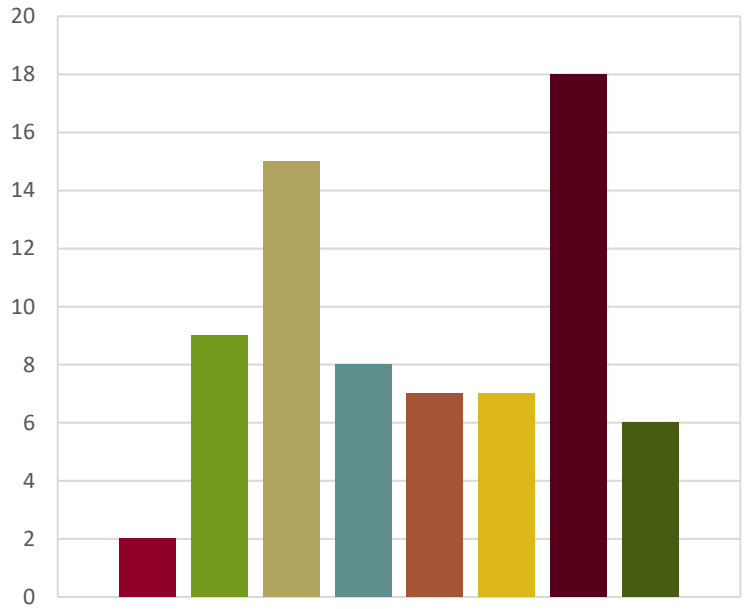
7. How are recyclable materials collected from your home?

Collected curbside	587
Place in an onsite communal recycling dumpster/receptacle	22
Transported in your own vehicle to the Harford Waste Disposal Center	33
Other	7



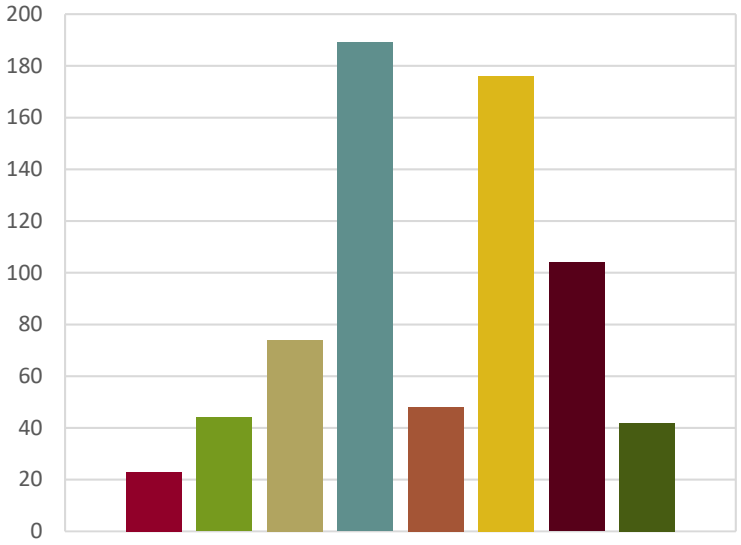
8. Which of the following reasons best describes why you do not recycle at home? (Select all that apply)

I do not believe it is important	2
It is not worth my time to separate materials for recycling	9
I do not have room/space for separate recycling containers in my home	15
My waste collector and/or property manager does not provide recycling bins or containers	8
Recycling collection costs extra	7
It is confusing, not enough information is available	7
I do not think the materials are actually recycled	18
Other	6



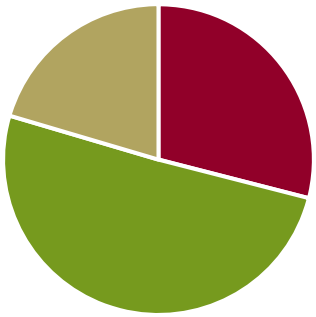
9. What do you do with yard waste (i.e. leaves, branches, grass clippings, etc.) generated at your home?

Not applicable (i.e. live in an apartment or condo, do not have a yard, etc.)	23
Collected and managed by my private lanscaping service provider	44
Separate yard waste from trash/recyclable materials and place curbside for collection by my private hauler or town/city	74
Keep yard waste separate from trash/recyclable materials and transport in your own vehicle to the Harford Mulch and Compost facility or to the Tollgate Residential Drop-off Site	189
Keep yard waste separate from trash/recyclable materials and transport in your own vehicle to another disposal facility	48
Compost yard waste in backyard	176
Nothing - leave on yard	104
Other	42



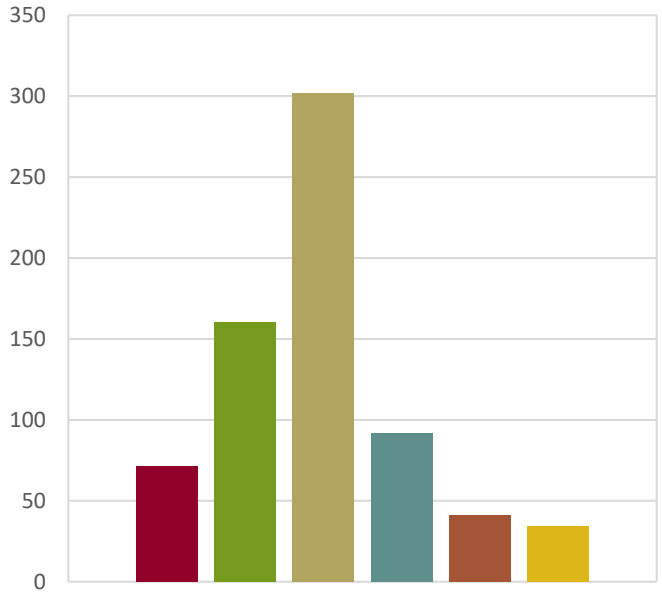
10. If the County offered a yard waste drop-off facility in the southern portion of the County (below I-95), would that be more convenient for you to drop-off yard waste?

Yes	203
No	354
I don't know/Unknown	143



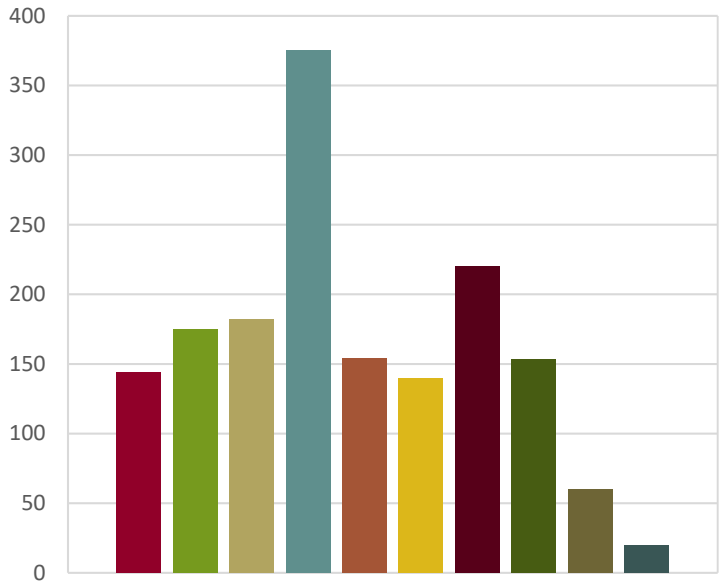
11. On average, how many times *per year* do you use the Harford Waste Disposal Center (located on Scarboro Road in Street) to dispose of materials?

None - I did not know this facility existed	71
None- I am aware this facility is available for my use, but I have chosen not to use it	160
1 to 4 times	302
5 to 8 times	92
9 to 12 times	41
13 or more times	34



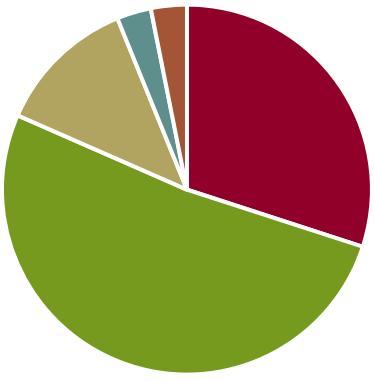
12. Please select which material(s) you bring to the Harford Waste Disposal Center in Street for disposal. (Select all that apply)

Household trash/garbage	144
Recyclable materials	175
Yard waste	182
Bulky waste (i.e. furniture, mattresses, etc.)	375
Construction and/or demolition debris	154
Motor oil/antifreeze	140
Electronics	220
White goods/scrap metal	153
Tires	60
Other	20



13. In the last year have you picked up or purchased mulch or compost from the County's Mulch and Compost Facility?

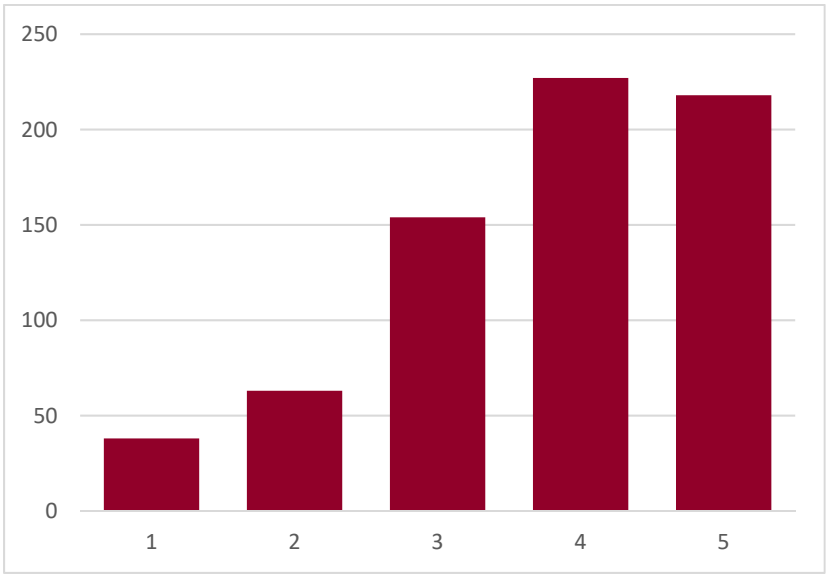
No - I did not know this facility/service was available	210
No - I am aware this facility/service is available for my use	361
Yes - 1 or 2 times	86
Yes - 3 or 4 times	21
Yes - 5 or more times	22



14. Overall, how satisfied are you with the solid waste and recycling services and programs provided by and available in Harford County?

3.75

Average Rating



15. Please comment on your rating above.

428

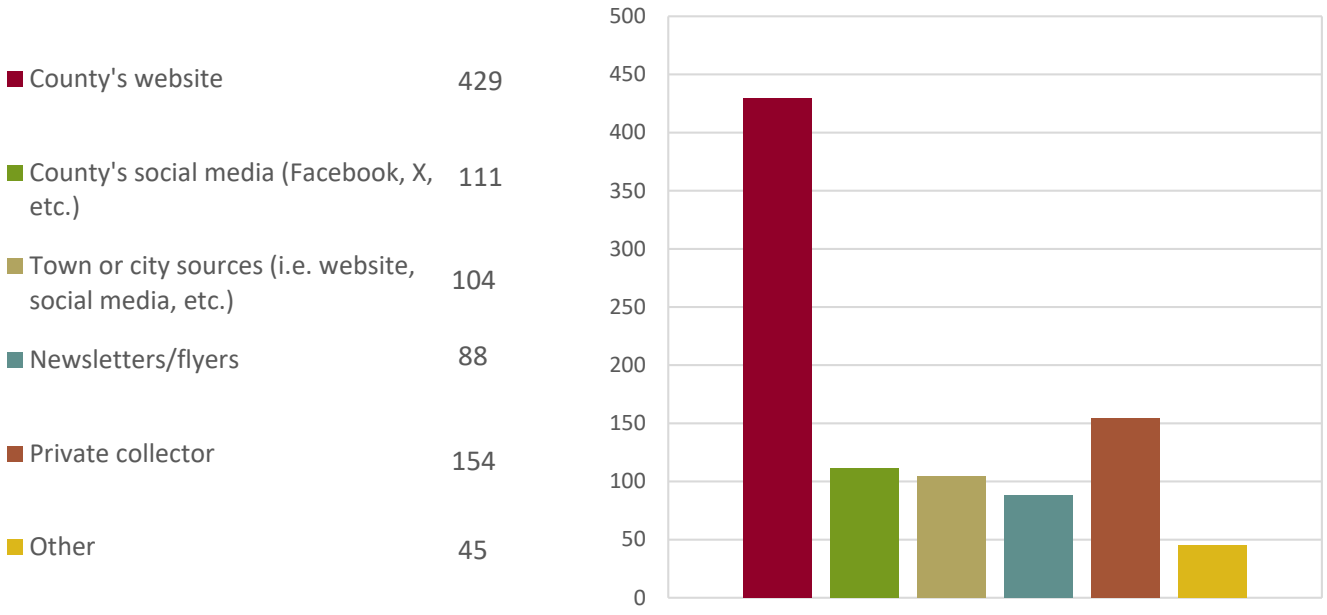
Responses

Latest Responses

"One site is not enough"

"Expand composting as an option, curbside composting collecti…

16. What is your primary source of information for questions on solid waste and recycling programs or services in Harford County? (Select all that apply)



17. If you could improve an existing or add an additional solid waste and/or recycling service in Harford County, what would it be and why?

384

Responses

Latest Responses

"Hazardous, bulk, and compostable waste products facility in sou…

"Expand composting as an option, curbside composting collecti…

88 respondents (**23%**) answered **County** for this question.

Appendix J

Waste Diversion by Commodity

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Waste Diversion by Commodity

Year	MRA Rate (%)	Waste Diversion Rate (%)	Maryland Recycling Act (MRA) Materials (tons)							Non-MRA Recyclables (tons)[2]	Total Recycling (tons)
			Compostables	Glass	Metals	Paper	Plastic	Misc.[1]	Subtotal		
2010	56.77	59.77	58,542	2,011	7,960	48,510	650	38,107	155,780	17,924	173,704
2011	55.46	59.46	51,392	2,312	9,300	62,027	747	36,095	161,873	9,343	171,216
2012	54.79	59.79	59,946	2,304	2,419	63,506	744	21,157	150,076	108,780	258,856
2013	49.92	59.92	57,512	2,570	7,424	54,590	830	4,929	127,856	5,713	133,569
2014	47.56	52.56	53,265	2,923	8,342	25,702	1,767	16,848	108,847	35,424	144,271
2015	43.70	48.70	36,258	4,086	11,596	25,192	3,125	12,971	93,228	28,310	121,538
2016	45.63	50.63	50,806	3,874	7,800	25,280	2,883	2,691	93,334	21,109	114,443
2017	40.91	45.91	35,559	5,262	11,882	29,627	3,738	12,483	98,551	30,604	129,155
2018	43.24	48.24	47,696	4,684	14,394	34,030	3,333	8,892	113,029	67,127	180,156
2019	44.41	49.41	41,550	4,027	11,724	30,704	3,075	32,127	123,207	275,432	398,639
2020	40.02	45.02	51,410	658	9,952	22,405	2,250	31,648	118,323	98,360	216,683
2021	44.67	49.67	56,005	4,278	20,886	35,559	3,337	20,790	140,855	98,310	239,165
2022	48.33	53.33	69,844	3,839	11,433	35,358	2,073	46,563	169,110	198,604	367,714

[1] Miscellaneous items include textiles, electronics, pallets, animal protein.

[2] Non-MRA recyclables include antifreeze, oil, soil, and construction and demolition debris.

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Appendix K

Water Source Protection Districts

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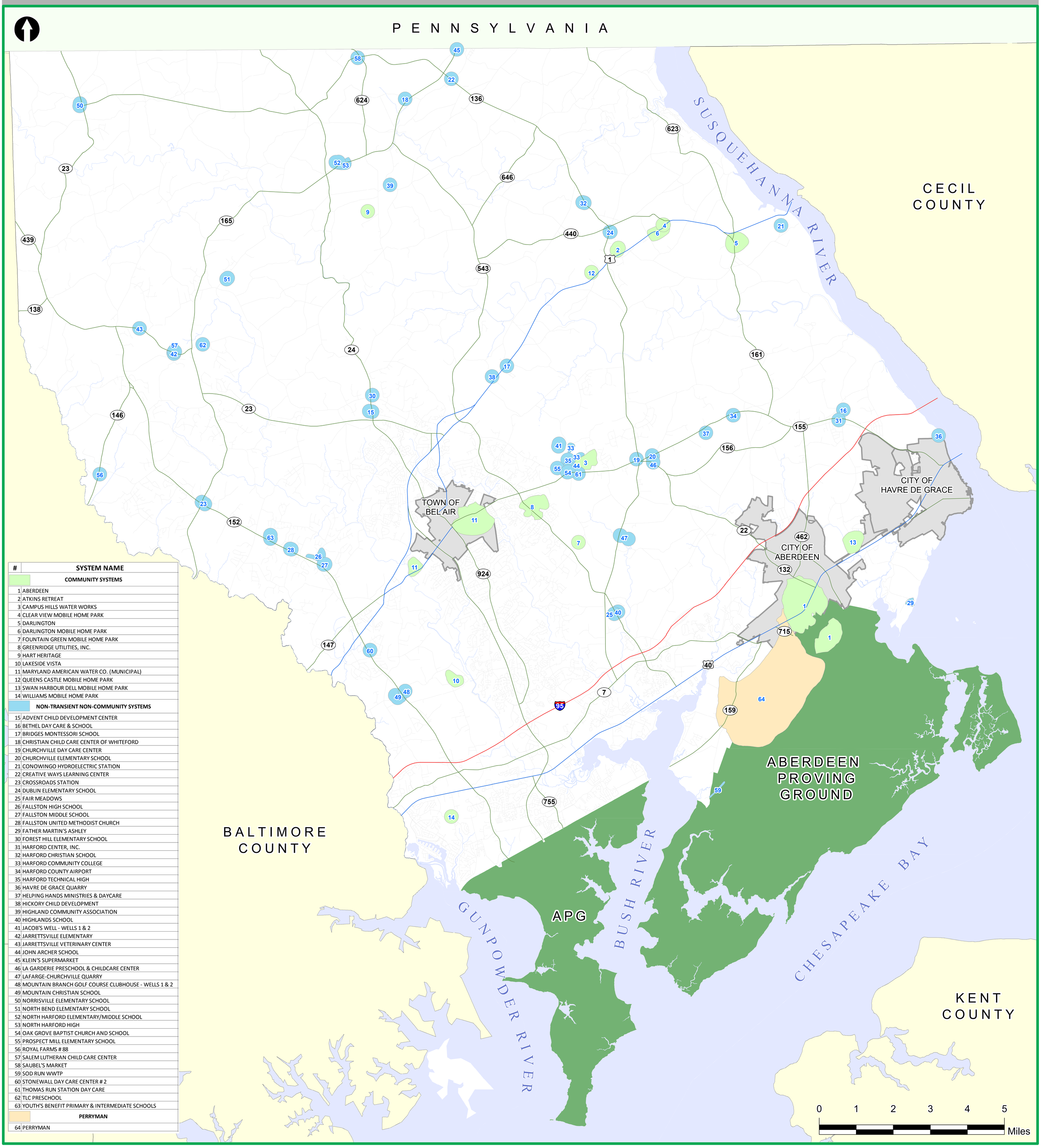
WATER SOURCE PROTECTION DISTRICTS
HARFORD COUNTY, MARYLAND



#	SYSTEM NAME
	COMMUNITY SYSTEMS
1	ABERDEEN
2	ATKINS RETREAT
3	CAMPUS HILLS WATER WORKS
4	CLEAR VIEW MOBILE HOME PARK
5	DARLINGTON
6	DARLINGTON MOBILE HOME PARK
7	FOUNTAIN GREEN MOBILE HOME PARK
8	GREENRIDGE UTILITIES, INC.
9	HART HERITAGE
10	LAKESIDE VISTA
11	MARYLAND AMERICAN WATER CO. (MUNICIPAL)
12	QUEENS CASTLE MOBILE HOME PARK
13	SWAN HARBOUR DELL MOBILE HOME PARK
14	WILLIAMS MOBILE HOME PARK
	NON-TRANSIENT NON-COMMUNITY SYSTEMS
15	ADVENT CHILD DEVELOPMENT CENTER
16	BETHEL DAY CARE & SCHOOL
17	BRIDGES MONTESSORI SCHOOL
18	CHRISTIAN CHILD CARE CENTER OF WHITEFORD
19	CHURCHVILLE DAY CARE CENTER
20	CHURCHVILLE ELEMENTARY SCHOOL
21	CONOWINGO HYDROELECTRIC STATION
22	CREATIVE WAYS LEARNING CENTER
23	CROSSROADS STATION
24	DUBLIN ELEMENTARY SCHOOL
25	FAIR MEADOWS
26	FALLSTON HIGH SCHOOL
27	FALLSTON MIDDLE SCHOOL
28	FALLSTON UNITED METHODIST CHURCH
29	FATHER MARTIN'S ASHLEY
30	FOREST HILL ELEMENTARY SCHOOL
31	HARFORD CENTER, INC.
32	HARFORD CHRISTIAN SCHOOL
33	HARFORD COMMUNITY COLLEGE
34	HARFORD COUNTY AIRPORT
35	HARFORD TECHNICAL HIGH
36	HAVRE DE GRACE QUARRY
37	HELPING HANDS MINISTRIES & DAYCARE
38	HICKORY CHILD DEVELOPMENT
39	HIGHLAND COMMUNITY ASSOCIATION
40	HIGHLANDS SCHOOL
41	JACOB'S WELL - WELLS 1 & 2
42	JARRETTSVILLE ELEMENTARY
43	JARRETTSVILLE VETERINARY CENTER
44	JOHN ARCHER SCHOOL
45	KLEIN'S SUPERMARKET
46	LA GARDERIE PRESCHOOL & CHILDCARE CENTER
47	LAFARGE-CHURCHVILLE QUARRY
48	MOUNTAIN BRANCH GOLF COURSE CLUBHOUSE - WELLS 1 & 2
49	MOUNTAIN CHRISTIAN SCHOOL
50	NORRISVILLE ELEMENTARY SCHOOL
51	NORTH BEND ELEMENTARY SCHOOL
52	NORTH HARFORD ELEMENTARY/MIDDLE SCHOOL
53	NORTH HARFORD HIGH
54	OAK GROVE BAPTIST CHURCH AND SCHOOL
55	PROSPECT MILL ELEMENTARY SCHOOL
56	ROYAL FARMS # 88
57	SALEM LUTHERAN CHILD CARE CENTER
58	SAUBEL'S MARKET
59	SOD RUN WWTP
60	STONEWALL DAY CARE CENTER # 2
61	THOMAS RUN STATION DAY CARE
62	TLC PRESCHOOL
63	YOUTH'S BENEFIT PRIMARY & INTERMEDIATE SCHOOLS
	PERRYMAN
64	PERRYMAN

Source: Harford County Health Department and Maryland Department of the Environment, September 2021

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