

Baltimore County Water Supply and Sewerage Plan

2017 Triennial Review

Report of the Review as adopted by the Baltimore County Council March 5, 2018

Errata & Addenda
April 20, 2018

1. Insert County Council Resolution
2. Reinsert pages II-17 through II-21

Errata & Addenda
April 23, 2018

1. Insert Transmittal Letter from Director, DPW.

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Map Maintenance Policy

Water Supply and Sewerage Plan Designations

Disclaimer

Water Plan Maps

Countywide Map 1"= 1 Mile

Map Set 1"= 2000'

Sewer Plan Maps

Countywide Map 1"= 1 Mile

Map Set 1"= 2000'

Appendices

Water Central System Report (2003)

Comprehensive Wastewater Facilities Master Plan (2004)

Water Agreement with Baltimore City

Sewer Agreement with Baltimore City

Sewer Agreement with Anne Arundel County

Sewer Agreement with Howard County

Sewer Agreement with the Maryland Aviation Administration

Board of Arbitration Decision of 1991

Reservoir Watershed Management Agreement (1979) between
Baltimore City, Baltimore County and Carroll County

Watershed Agreement (2006) between Baltimore City and County

Consent Decree & Appendices

INTRODUCTION

The Environmental Article of the Annotated Code of Maryland (Section 9-503) requires Baltimore County to adopt a Plan for the provision of adequate water supply and sewerage throughout the County that is consistent with the County comprehensive land use plan. This Plan is to be reviewed by the County governing body at least once every three years.

The 10-year Baltimore County Water Supply and Sewerage Plan 2014 Triennial Review was adopted on December 15, 2014 by County Council Resolution No. 116-14.

Baltimore County *Master Plan 2020* was adopted by County Council Resolution 94-10 on November 15, 2010.

The 2014 Triennial Review was approved by Maryland Department of the Environment (MDE) in the letter from MDE's Director of the Water Management Administration dated May 21, 2015.

The next Triennial Review is due for submission to MDE in 2017.

Statements and Certifications

Upon approval of the *Water Supply and Sewerage Plan 2017 Triennial Review*, COMAR 26.03.01.04 requires the following statements to be provided in this Introduction:

1. Statement certifying that the county governing board has officially adopted the plan. This will be the County Council Resolution, endorsed by the County Executive, adopting the *Triennial Review*.
2. Statement certifying that the plan incorporates subsidiary plans. This is not applicable to Baltimore County in that there are no subsidiary jurisdictions within the County.
3. Statement certifying that the sections covering the engineering aspects of water and sewerage projects have been prepared and reviewed for adequacy by a registered engineer licensed in the State. This statement is usually made in the letter from the Director of Public Works submitting the *Triennial Review* to the Maryland Department of the Environment.
4. The letter of approval from the Maryland Department of the Environment.

Statements and certifications will be attached when the Plan is adopted and approved.



**County Council
of
Baltimore County**

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FIRST DISTRICT

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SEVENTH DISTRICT

Thomas J. Peddicord, Jr.
LEGISLATIVE COUNSEL
SECRETARY

March 6, 2018

Steven A. Walsh, Director
Department of Public Works
County Office Building
111 W. Chesapeake Avenue
Towson, Maryland 21204

Dear Mr. Walsh:

Attached please find a copy of Resolution 5-18 adopting the report of the 2017 Triennial Review of the Baltimore County water supply and sewerage plan.

This Resolution was approved by the County Council at its March 5, 2018 meeting and is being forwarded to you for appropriate action.

Sincerely,

A handwritten signature in cursive script, appearing to read "Thomas J. Peddicord, Jr.", is written over a light blue horizontal line.

Thomas J. Peddicord, Jr.
Legislative Counsel/Secretary

TJP:jlh
Enclosure

cc: Dave Thomas

COUNTY COUNCIL OF BALTIMORE COUNTY, MARYLAND
Legislative Session 2018, Legislative Day No. 1

Resolution No. 5-18

Mr. Tom Quirk, Chairman
By Request of County Executive

By the County Council, January 2, 2018

A RESOLUTION adopting the report of the 2017 Triennial Review of the Baltimore County water supply and sewerage plan.

WHEREAS, pursuant to Title 9, Subtitle 5 of the Environment Article of the Annotated Code of Maryland, Baltimore County has adopted a comprehensive 10-year Water Supply and Sewerage Plan; and

WHEREAS, the Plan was adopted on December 15, 2014 by Resolution 116-14; and

WHEREAS, the County is required by State law to review the Plan every three years and to submit a report of its review, together with amendments thereto or revisions thereof, to the Maryland Department of the Environment; and

WHEREAS, the Planning Board did on July 20, 2017 hold an advertised public hearing on the 2017 Triennial Review; and

WHEREAS, the Planning Board did on September 7, 2017 vote to recommend that the 2017 Triennial Review be adopted;

NOW, THEREFORE, be it resolved by the County Council of Baltimore County, Maryland, that the 2017 Triennial Review of the Baltimore County Water Supply and Sewerage Plan, as amended, is hereby adopted; and

BE IT FURTHER RESOLVED, that this Resolution be submitted to the County Executive for his approval; and

BE IT FURTHER RESOLVED, that a copy of this Resolution together with the 2017 Triennial Review be submitted to the Maryland Department of Environment;

AND BE IT FURTHER RESOLVED, that this Resolution shall take effect from the date of its passage by the County Council.

READ AND PASSED this 5th day of MARCH, 2018

BY ORDER

A handwritten signature in cursive script, appearing to read "Thomas J. Peddicord, Jr.", written over a horizontal line.

Thomas J. Peddicord, Jr.
Secretary

A handwritten signature in cursive script, appearing to read "Kevin B. Kamenetz", written over a horizontal line.

Kevin B. Kamenetz
County Executive

ITEM: RESOLUTION 5-18



KEVIN KAMENETZ
County Executive

STEVEN A. WALSH, *Director*
Department of Public Works

April 26, 2018

D. Lee Currey, Director
Water and Science Administration
1800 Washington Boulevard, Suite 405
Baltimore, Maryland 21230-4718

Subject: Baltimore County Water Supply & Sewerage Plan
Triennial Review 2017

Dear Mr. Currey:

Baltimore County has completed its 2017 Triennial Review of the Water Supply and Sewerage Plan.

A preliminary draft of the Review was made available via e-mail to the Maryland Department of the Environment on September 19, 2017 with copies to the Maryland Department of Planning. The Baltimore County Planning Board held a hearing on July 20, 2017 and passed a resolution endorsing the Review on September 7, 2017. The report of the Review was adopted by the local governing body by County Council Resolution 5-18 signed by the County Executive on March 5, 2018.

I am forwarding one printed copy of the 2017 Triennial Review document, maps and appendices for review and approval. In lieu of additional paper copies the entire report, maps and appendices are available for viewing and download at:

<https://ftp.baltimorecountymd.gov/EFTClient/Account/Login.htm>

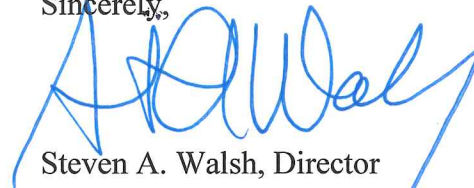
User: **Baltcodpw**

Password: **BCmaps01**

Please see files **Triennial 2017 Part 1 – Ch I-IV and maps.pdf**
and **Triennial 2014 and 2017 Part 2 – Appendices.pdf**

This Plan was prepared and processed following the requirements of COMAR 26.03.01, Regulation .02B. Sections covering engineering aspects of the plan have been prepared and reviewed for adequacy by David L. Thomas, a PE licensed in the State of Maryland. If there are any questions, please feel free to contact Dave at (410) 887-3984.

Sincerely,



Steven A. Walsh, Director

SAW/DLT/s

Attachment; One paper copy of the 2017 Triennial Review

CC: Janice Outen, MDE; Robin Pellicano, MDE; Steve Allan, MDP; Thomas J. Peddicord, Jr.; Michael E. Field; Donna Morrison; Andrea Van Arsdale; Kevin Koepenick; Tom Kiefer; Jeff Peluso; Mike Mazurek; Glen Keller

CHAPTER I: GOALS AND ORGANIZATION

Goals of the County Consistent with Comprehensive Planning

Master Plan 2020:

To promote policies and actions resulting in a safe, sustainable environment for future generations, the County Council in partnership with the Citizens of Baltimore County, Maryland, adopted *Master Plan 2020* on November 15, 2010 (Resolution 94-10). The goals of the plan are as follows:

Goal One: Continue the Success of Growth Management

- Direct the future growth within the Urban-Rural Demarcation Line (URDL)
- Protect and enhance Community Conservation Areas
- Promote redevelopment with an emphasis on ailing commercial or industrial properties
- Develop compact, mixed-use, transit-oriented and walkable neighborhoods
- Advance economic well being by promoting a high quality labor force
- Provide a mixture of housing types for an emerging diversity of residents
- Support quality public schools to enhance communities
- Prioritize infrastructure improvements via the Capital Improvement Program to endorse sustainable development
- Protect the character and economic vitality of the rural communities

Goal Two: Improve the Built Environment

- Provide adequate open space and recreational opportunities and increase connections to nature by linking open spaces and parks
- Invest in public grounds by tree planting, buffer conservation and habitat restoration
- Expand and deliver multi-modal transportation services
- Reduce pollutant loadings of runoff with enhanced stormwater management
- Meet desire for green communities by providing regulatory incentives
- Ensure integration between regulations and sustainability programs such as LEED

Goal Three: Strengthen Resource Conservation and Protection

- Protect health of the natural environment and maintain a valuable biodiversity
- Restore ecosystems and encourage fair, efficient use of natural resources
- Preserve cultural assets to establish a tangible sense of community
- Nurture farming activities and importance of the agricultural industry
- Conserve rural characteristics and scenic vistas

Water and Sewer Plan:

Sustainable development has been defined as that which “meets the needs of the present in a responsible manner without compromising the ability of current and future generations to meet their own needs” (United Nations General Assembly (1987)). To help ensure a sustainable community, Baltimore County will continue the following actions to protect the public water supplies and sewer systems:

- Work with Baltimore City and adjacent jurisdictions to protect and enhance the water supply reservoirs;
- Maintain and upgrade all capital facilities as required;
- Implement the water resource conservation practices established in the Baltimore county plumbing code;
- Actively participate in the Metropolitan District;
- Also actively participate in the Susquehanna River Basin Commission.

Master Plan 2020 was prepared in accordance with Article 66B of the Annotated Code of Maryland, Section 523 of the Baltimore County Charter, and pertinent sections in the Baltimore County Code. Development of the master plan involved all “stakeholders”, such as citizens and community associations, county and state agencies, government officials, and businesspersons. Similarly, in preparing this Water and Sewer Plan, the appropriate comprehensive planning agencies were consulted: the Maryland Department of Planning, the Baltimore County Department of Planning, and the regional planning group, the Baltimore Metropolitan Council (BMC). This unified effort helped to ensure the Water and Sewer Plan is indeed consistent with, and in fact supportive of the County’s goals of comprehensive planning.

The Water and Sewer Plan shall remain in effect concurrently with the Master Plan. Any revision to one plan that has substantive impact on the other will require commensurate modification of the other plan.

Growth Tiers

Per the Sustainable Growth Act (SB 236) the Septic Tiers Map was adopted on December 20, 2012, and was revised by Council Resolution 54-17 on June 5, 2017. The map is available on the County Department of Planning web site at:

<https://www.baltimorecountymd.gov/Agencies/planning/devrevandlanduse/growthtiers.html>

Additional Plans

Additional plans and studies contained in *Master Plan 2020*, which further define land use and growth management strategies countywide, and for specific areas of the County are available on the County Department of Planning’s web site at:

<https://www.baltimorecountymd.gov/Agencies/planning/masterplanning/adoptedcommunityplans/index.html>

Other Adopted Plans and Studies

Land Preservation, Parks and Recreation Plan (Council Res. 55-17)
Water Resources Element

Adoption

06/05/17
11/15/10

Land Use Article (formerly Article 66B)

In response to directives from the United States Environmental Protection Agency (EPA), the General Assembly of Maryland passed legislation amending Article 66B of the Annotated Code of Maryland. Specifically House Bill 1141 (HB 1141, 2006) required, among other items, a thorough examination of the safety and adequacy of all drinking water supplies and sewerage disposal systems for existing and future populations. The analysis contained in the master plan, called a Water Resources element (WRE), revealed that, with continued maintenance and protection, the public water supply and sewerage systems serving Baltimore County will be safe and adequate for the projected population until at least 2035. The WRE had a major influence on the policies and actions developed in *Master Plan 2020*, especially concerning protection of surface waters and the Chesapeake Bay. One of the primary goals is to direct virtually all new land development (or *redevelopment*) inside the Priority Funding Area (PFA), which is essentially the urban area closest to Baltimore City. Even with this anticipated population growth, there will be enough potable water in the public supply system, and adequate capacity in the public sewer system.

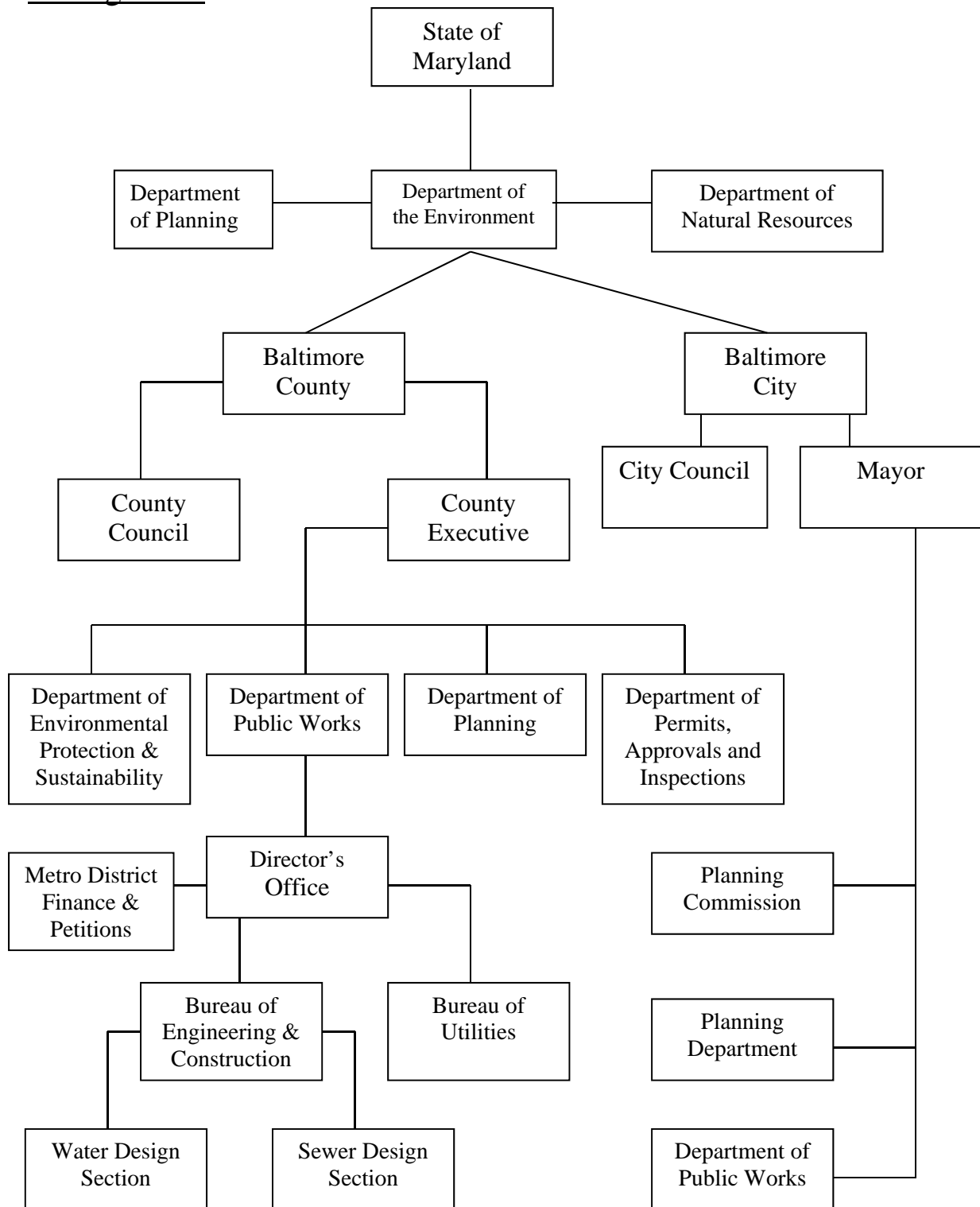
Article 66B has been repealed and replaced by the **Land Use Article**. Please see the Maryland Department of Planning Web Site

<http://planning.maryland.gov/OurWork/localplanning.shtml>

for further information and links to the Annotated code of Maryland.

ORGANIZATIONAL CHART

State & Local Government as Related to Water & Sewer Management



County Government as it relates to Water and Sewerage Management

In order for property to be served by public water and sewer in Baltimore County, it must meet two geographic conditions:

1. Located within the Baltimore County Metropolitan District, and
2. Located within an area designated as Capital Facilities or Existing Service on the Water and Sewerage Plan Maps.

Metropolitan District

Under the Metropolitan District Act (established by the Acts of the General Assembly of Maryland of 1924, Chapter 539) the Baltimore County Metropolitan Sewer and Water Operating District (the “Metro District”) was created as a separate and financially self-supporting entity under the jurisdiction of the County to supply water and to provide sewer and wastewater systems to residents of the County living within certain prescribed areas primarily in the most densely populated areas. The extension of these boundaries is subject to the approval of the County Council with the consent and approval of the Mayor and City Council of Baltimore. The Department of Public Works under the direction of the County Administrative Office carries out the administration of the Metropolitan District. The Metro District has its own revenue and bond issuance powers, subject to authorization by the County Council. The Metropolitan District Act requires the City of Baltimore (the “City”) to provide water to the Metro District at cost. Although the Metro District constructs water facilities within its boundaries, under an agreement between the City and the County, the City maintains and operates the facilities at cost, including billing and collecting water usage. Under said agreements, the City and the County have also agreed to pay for certain new capital projects and the repair and enlargement of additions or improvements to certain existing water facilities on a specified pro-rata basis. In addition, the County, from time to time, has entered into agreement with adjacent Anne Arundel and Howard counties under which, certain of the County’s water facilities are made available to each of said counties. For such use, these other jurisdictions have agreed to pay for a pro-rate share of capital and operating costs.

The Metro District is operated like a regulated utility company. However, instead of using a quasi-public commission or appointed authority, the system is managed, financed and operated directly by Baltimore County. The County Charter states that all funds expended by the County must be appropriated and be contained in an operating or capital budget that has been approved by County Council. Therefore, the Metro District’s Capital Improvement Program (CIP) is part of the overall County CIP.

Water and Sewerage Plan Maps, Annual Amendment Cycle

Owners of properties for which public water and sewer utility service is desired but are not within Capital Facilities or Existing Service areas must petition the County for a map amendment. The executive order of April 11, 1990, established an **annual amendment cycle** for this purpose. Petitions for map amendments must be submitted by May 1 of each year. After being reviewed by Planning, DEPS and DPW, staff recommendations are forwarded to the Planning Board for public hearing and report to the County Executive. The County Executive may then forward any favorable recommendations to the County Council for approval. The County Council resolution approving any map amendments is then forwarded to the State Department of the Environment (MDE) for final approval. MDE uses this information during review of permits under its jurisdiction.

Properties having designations W-4 or S-4, W-5 or S-5, W-6 or S-6 must petition for amendment to receive any service. The special designation W-5X or S-5X automatically becomes W-3 or S-3 when the property is included in the Metro district. When capital facilities are completed in W-3 or S-3 areas, those areas become W-1 or S-1 areas automatically (see map maintenance policy). Properties designated as W-7 or S-7 (No Planned Service) are served by private well water and sewage disposal systems. Properties using in excess of 5000 gallons per day must be added to the list of “multi-use facilities” and so designated on the maps. Two or more properties served by the same well water supply or sewage disposal system must be listed as a “community system” and so designated on the maps. Although the Water and Sewerage Plan is primarily intended as a tool for ensuring public health and safety, there are land uses permitted by right under certain RC zones for which density may be controlled only through the Water and Sewerage Plan cycle amendment process.

Water and Sewerage Plan Variances

Variances to the Water and Sewerage Plan Maps are given consideration under certain circumstances. A property designated W/S-1, 2, 3 or 4 but for which it is demonstrated that extension of public utility mains is not feasible may apply for a variance to allow private well or septic service as appropriate, subject to the approval of both DEPS and DPW. In such cases, the petitioner must execute and record an “interim agreement” which requires the owner of such property to connect to any future public utility main extension, including participation in all costs and assessments as required. Properties designated W/S-5 or 6 may be served by private water supply and/or sewage disposal systems not of an interim nature. See COMAR 26.03.01.05 for authority to allow interim systems.

CHAPTER II – BACKGROUND INFORMATION: PHYSICAL, POPULATION PROJECTION, LAND USE

COMPREHENSIVE PLAN

Master Plan 2020 is the guiding document for Baltimore County in the next ten years and beyond, directing future development within the landmark Urban Rural Demarcation Line (URDL). The Plan embodies the broad goals of protecting the environment, preserving agriculture, and ensuring safe and attractive places to reside and work. *Master Plan 2020* is based on the principle of sustainability for sensible development, environmental protection, and resource conservation. The county's Water & Sewer Planning is based on the URDL, which also corresponds to the state's Priority Funding Area (PFA) boundaries delineated for the state permitting and financing.

Since the establishment of URDL in 1967, the residential construction and redevelopment within the URDL has continued to prove that the County excels in conserving its urban and rural communities by revitalizing existing communities and directing new development into the County's community conservation and designated growth areas. Water and sewer planning to allow those public utilities only in urban areas ensures development is concentrated inside the URDL, thus reducing sprawl. Since the adoption of *Master Plan 2020*, there have been several amendments to it:

Amendment to the URDL. On November 15, 2012, the Baltimore County Planning Board voted to shift 195 acres off Gun Road near Patapsco Valley State Park from the urban side to the rural area of the Urban Rural Demarcation Line (URDL). The move is appropriate for land zoned for rural residential use.

MD 43 Overlay District. In January 2013, the County Council enacted Bill No. 5-13, concerning the MD 43 Overlay District for the purpose of authorizing residential uses in the MD 43 Overlay District under certain conditions. This overlay district is within the Middle River Redevelopment Area designated in *Master Plan 2020*, enhancing vibrancy of the communities along the dynamic Route 43 corridor.

Growth Tiers. In December 2012, Director of Planning administratively adopted the official Baltimore County Growth Tier Map. The Growth Tiers, developed as a requirement of the *Maryland Sustainable Growth and Agricultural Preservation Act of 2012*, establishes growth tier designations for every residential property. The County has implemented the requirement of the Act through its Growth Tier Map as amended on June 5, 2017 adopted in the County Council Resolution No. 54-17 to incorporate the Growth Tiers and Map into *Master Plan 2020*.

Sustainable Community Designations. Between February 2013 and February 2015, the Maryland Department of Housing and Community Development (DHCD) indicated to Baltimore County that the Maryland Smart Growth Subcabinet approved the applications for seven (7) County areas for the state sustainable community designations within the URDL. The seven areas are Pulaski Highway Redevelopment Area, Catonsville/Patapsco, Greater Dundalk, Hillendale/Parkville/Overlea, Towson, Reisterstown Main Street, and Northwest Gateway. Those seven sustainable community designations are eligible to apply for the resources in order to strengthen reinvestment and revitalization in those communities within the URDL.

Comprehensive Zoning Map Process (CZMP). The County has been consistent to achieving its growth management goals outlined in *Master Plan 2020*. In the 2016 Comprehensive Zoning Map Process (CZMP) adopted by the County Council on August 30, 2016, there was no adjustment to the URDL. There were 515 issues, amounting to 3.79% of the total acreage of the County (389,400 acres). In fact, a notably large amount of the County's land remained unchanged. Among all 515 issues, 80.19% were inside the URDL, accounting for 9,592 acres or 79.99% of the land area. Moreover, there was an increase in land areas in rural zones in CZMP 2016, shifting 153 acres from the urban to rural areas, further maintaining rural characters and preserving resources.

POPULATION TRENDS

Information in Table 1 is computed on the basis of the Baltimore County's Round 8B (Plus) population forecasts. The forecast data set is furnished by the transportation zone (TZ) for the regional transportation planning purposes. To correctly account for the URDL, the TZ's were divided into more than 15,000 component census blocks from Census 2010 using the urban and rural rates in the forecast dataset.

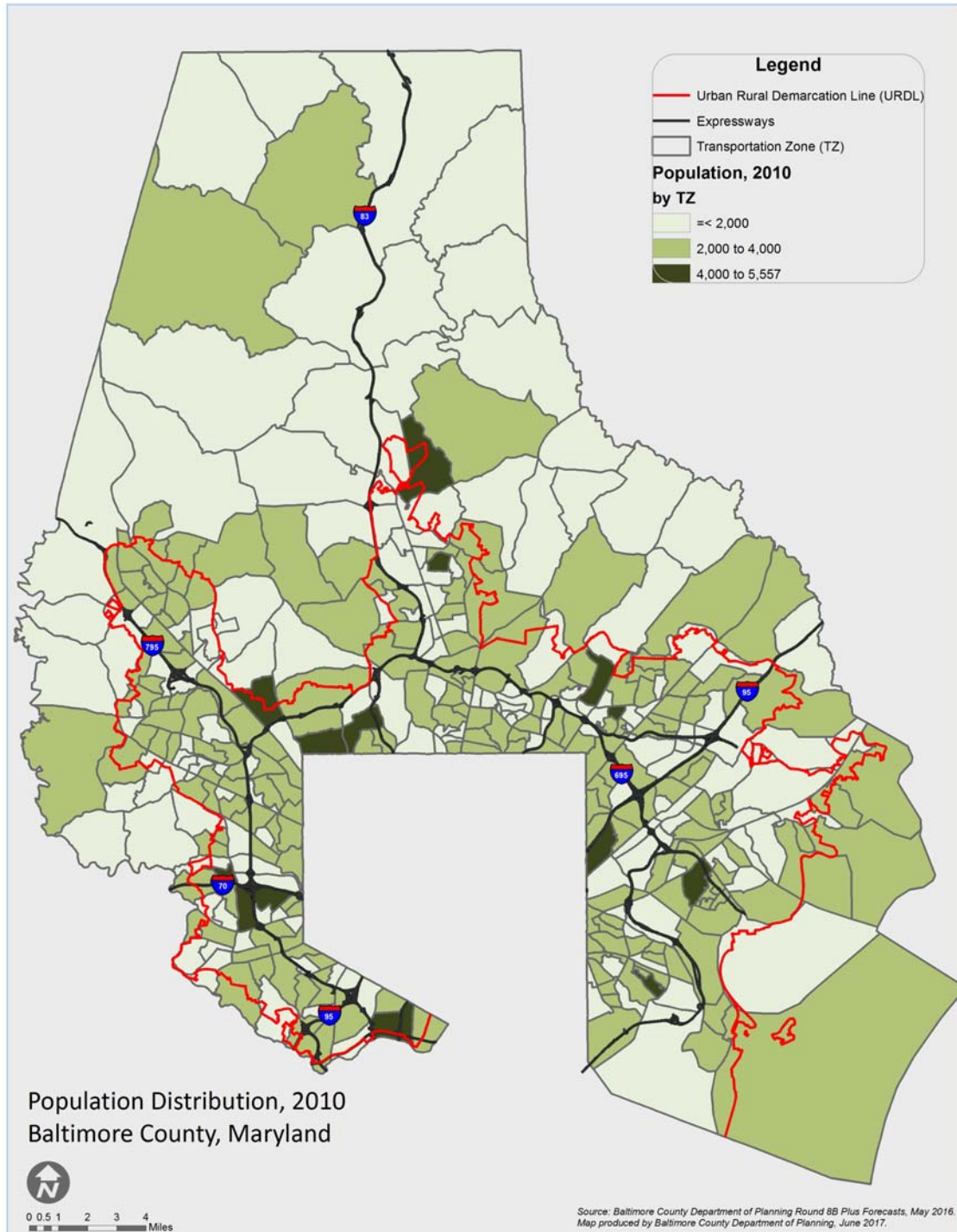
Table 1: Population Forecasts

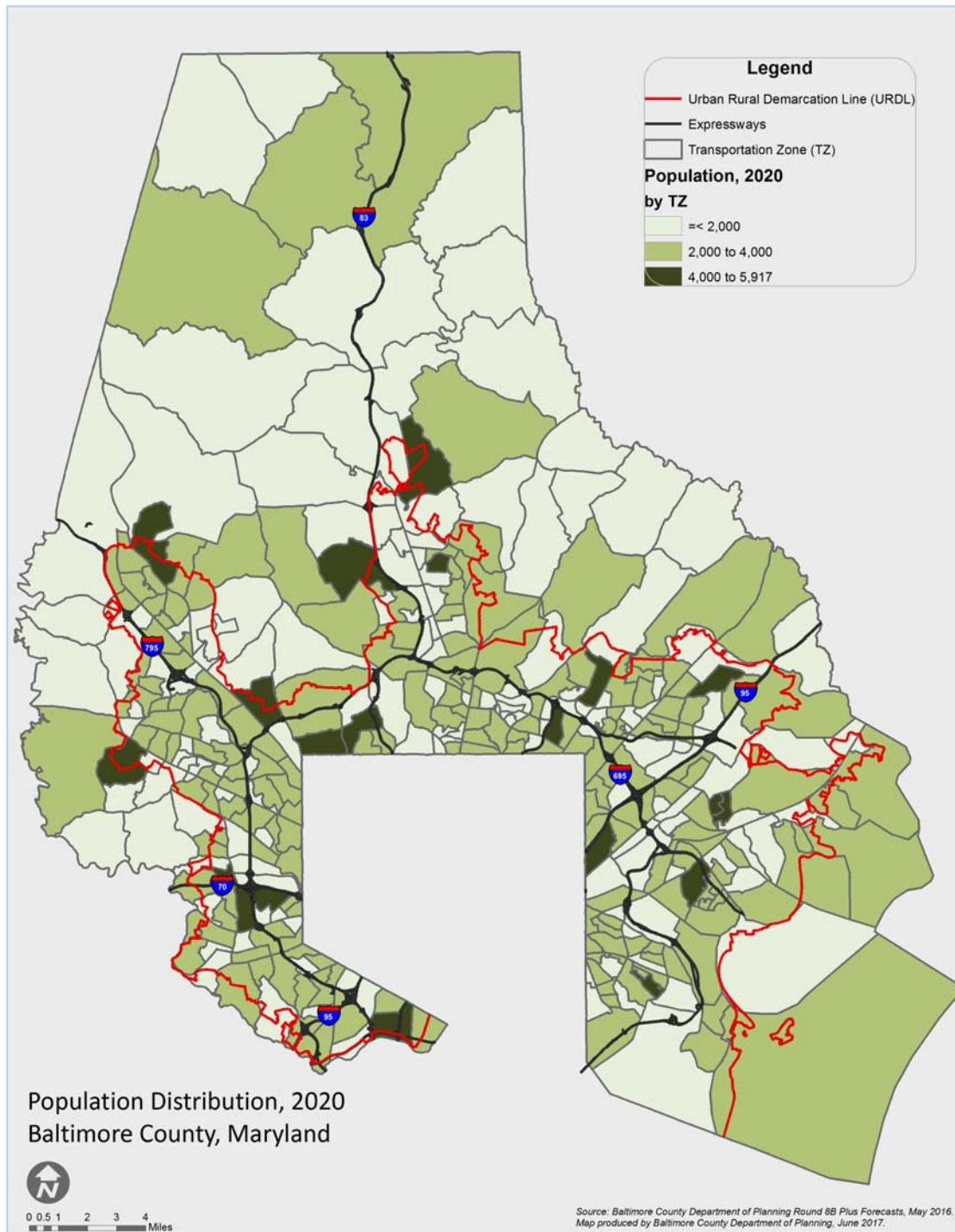
Forecast Year	Population Forecasts				
	Urban (Inside URDL)		Rural (outside URDL)		Total
	Total Urban	% County Total	Total Rural	% County Total	
Census 2010	716,632	89.02%	88,397	10.98%	805,029
2015	736,595	89.06%	90,470	10.94%	827,065
2020	742,320	88.98%	91,967	11.02%	834,288
2025	755,964	89.00%	93,458	11.00%	849,423
2030	768,573	89.06%	94,430	10.94%	863,004
2035	779,849	89.12%	95,172	10.88%	875,021
2040	789,960	89.18%	95,815	10.82%	885,775

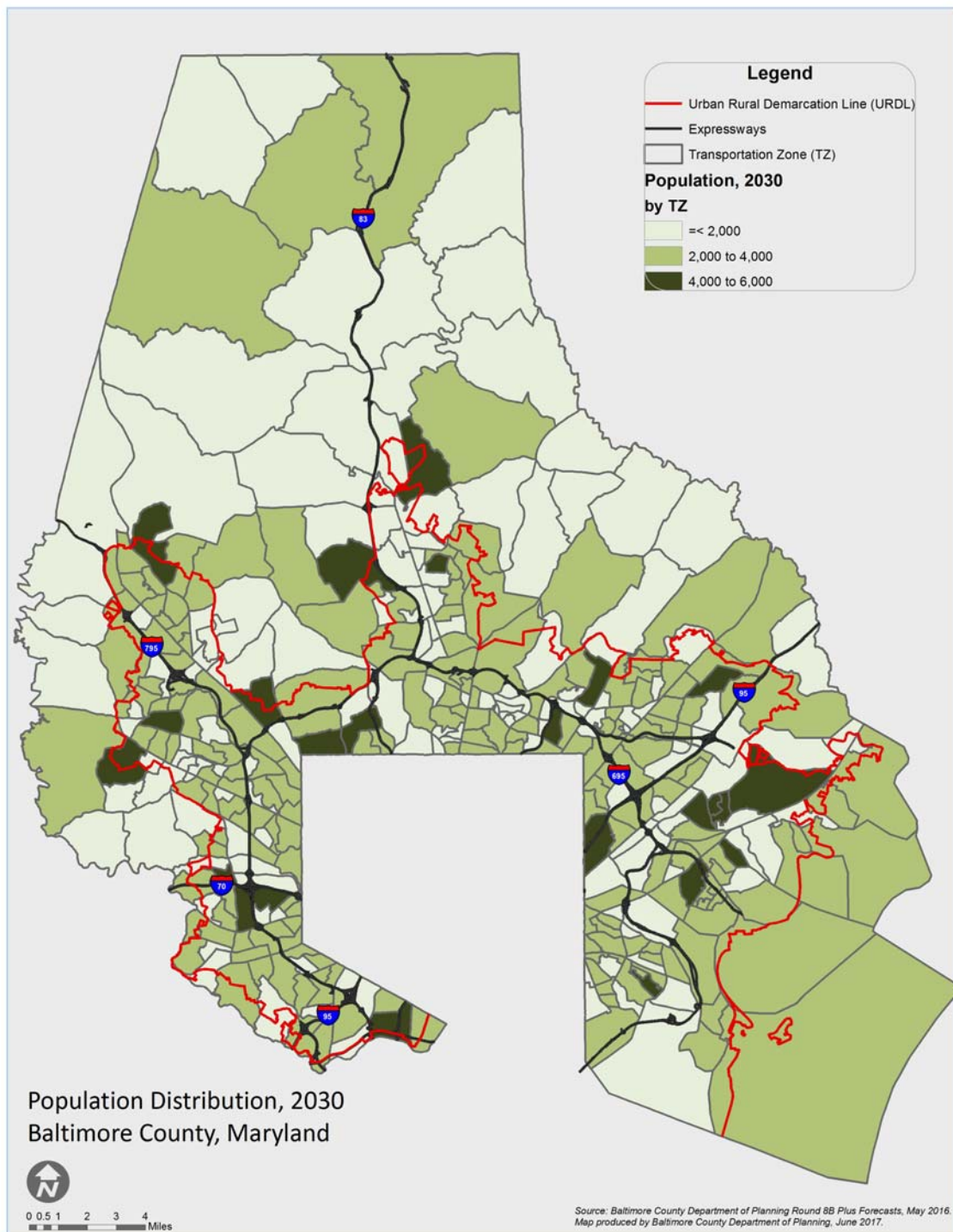
Source: Baltimore County Department of Planning, Round 8B (Plus) Forecasts, May 2016.

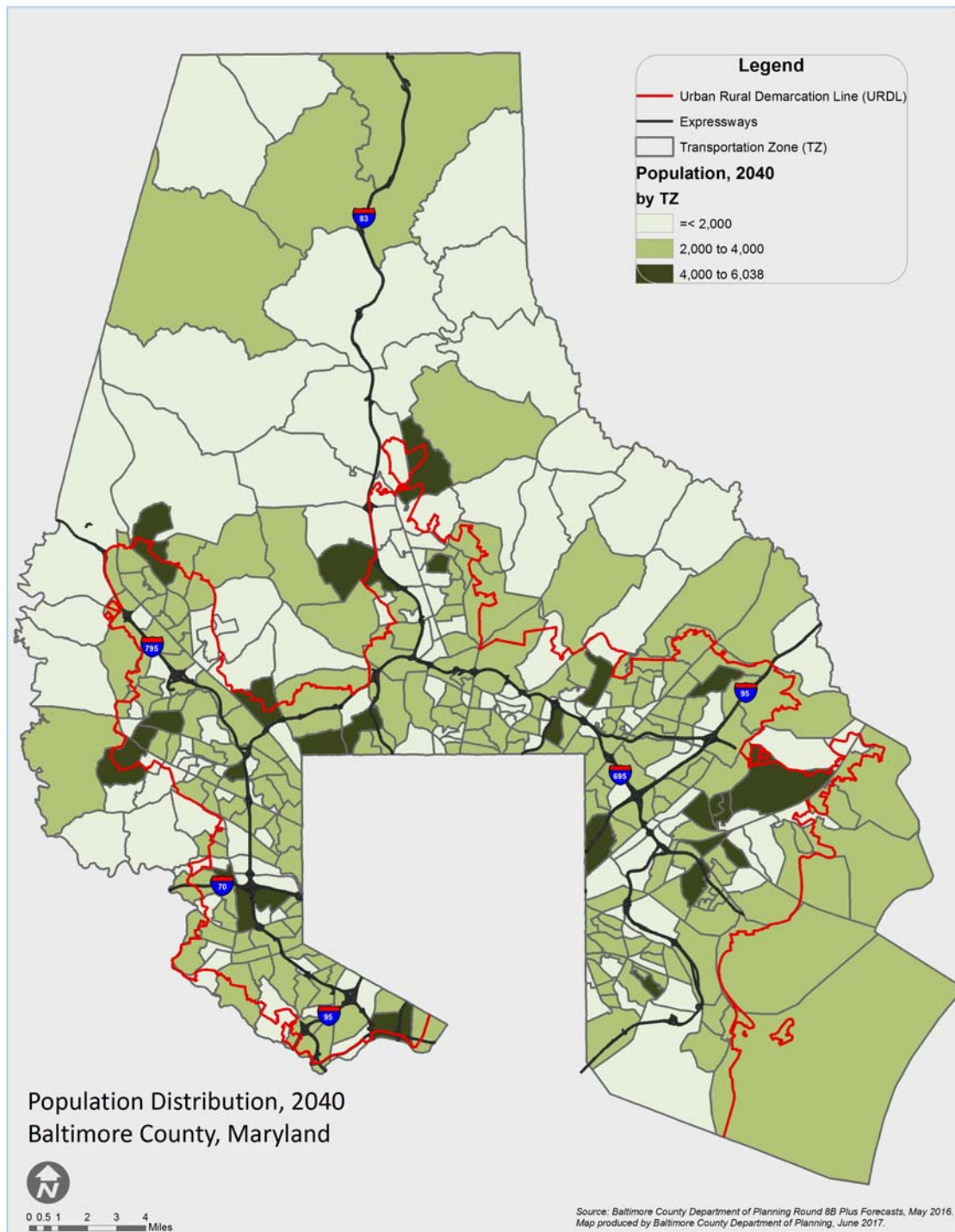
The results of this analysis confirms that nearly 90% of the County's population resides within the URDL, which takes up one-third of the County's land area (640 square miles).

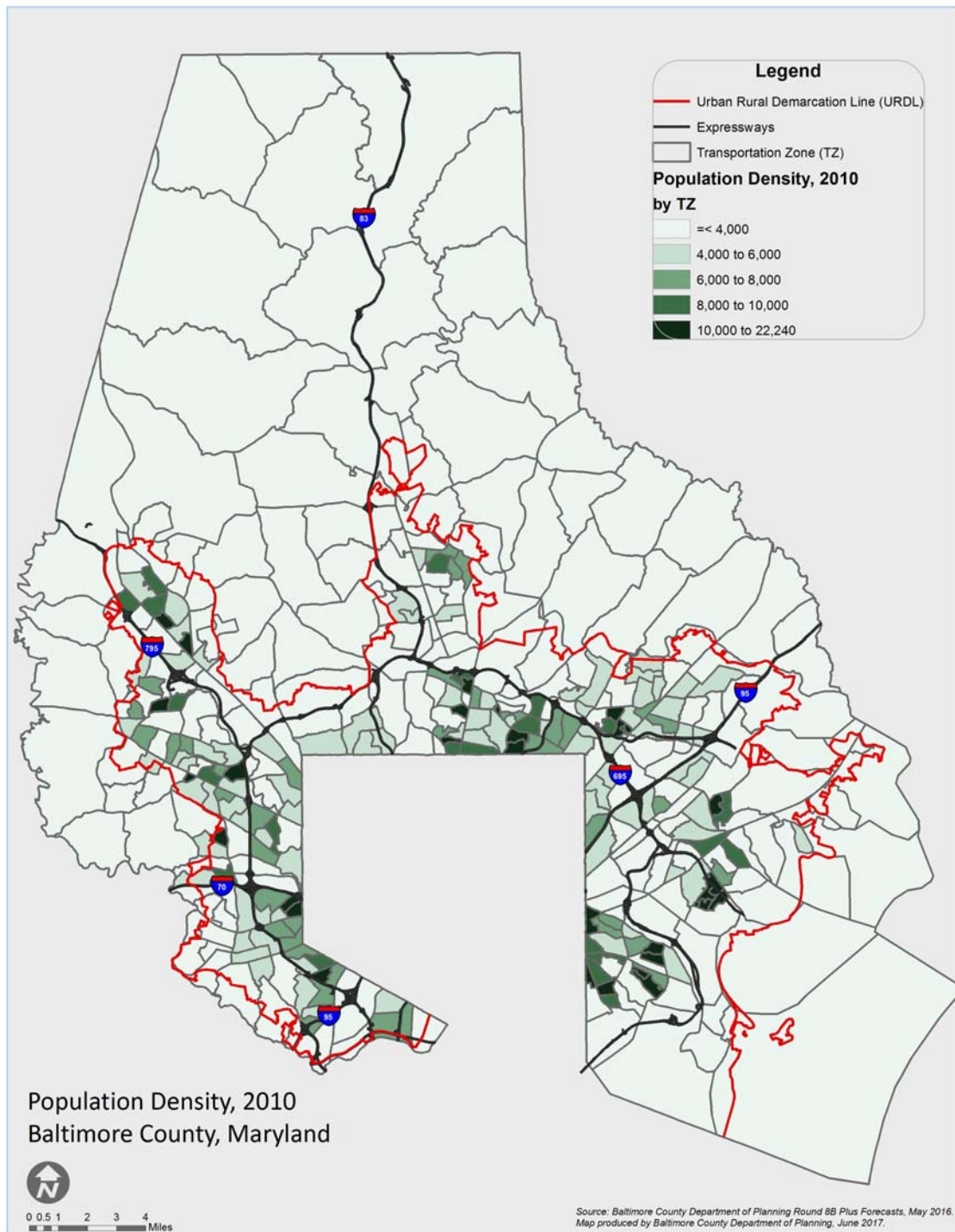
Moreover, even though the TZ structure may not flawlessly correspond to the URDL, the following maps (one through eight) by TZ evidently help portray a meaningful picture of population distribution patterns and trends throughout the County.

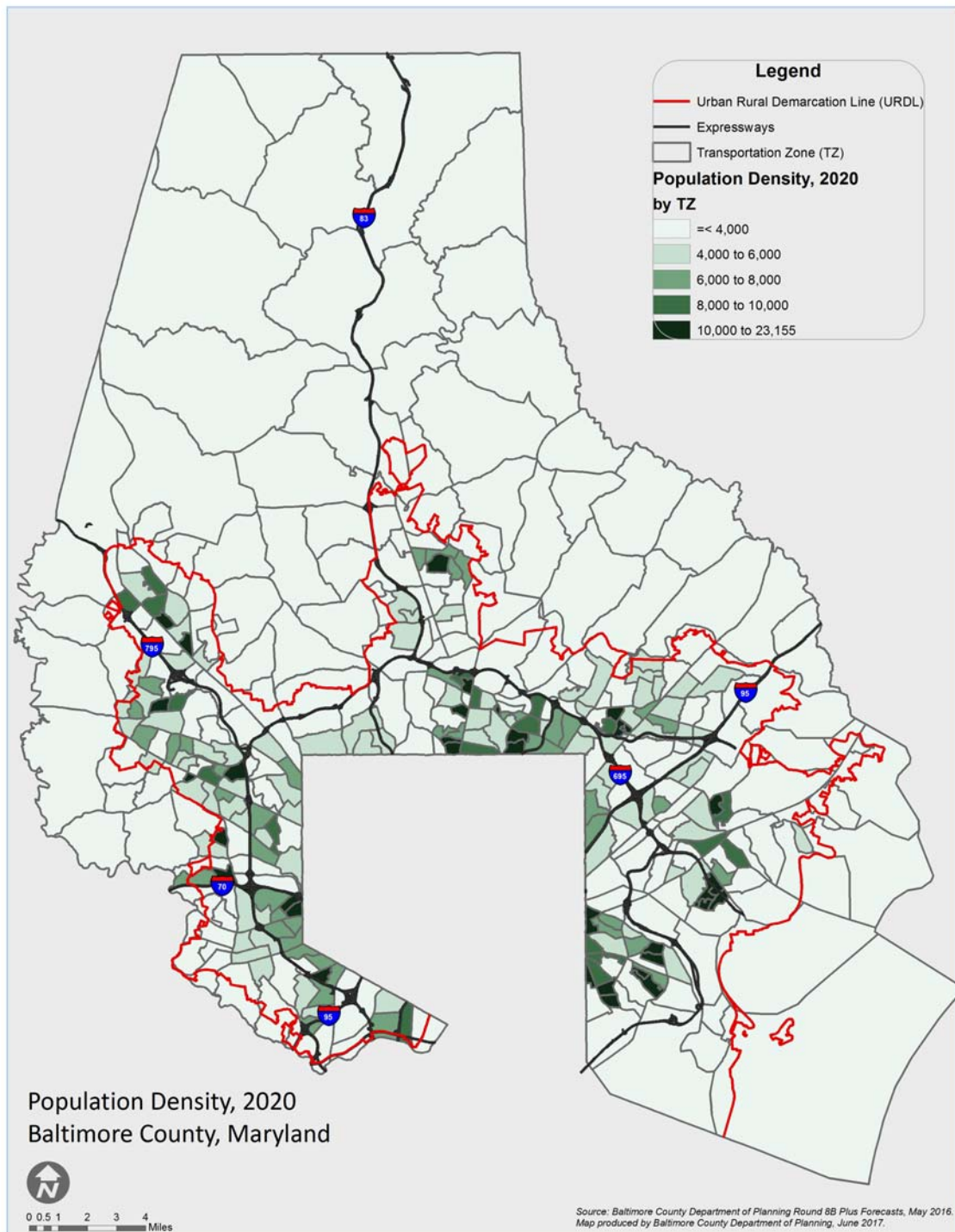


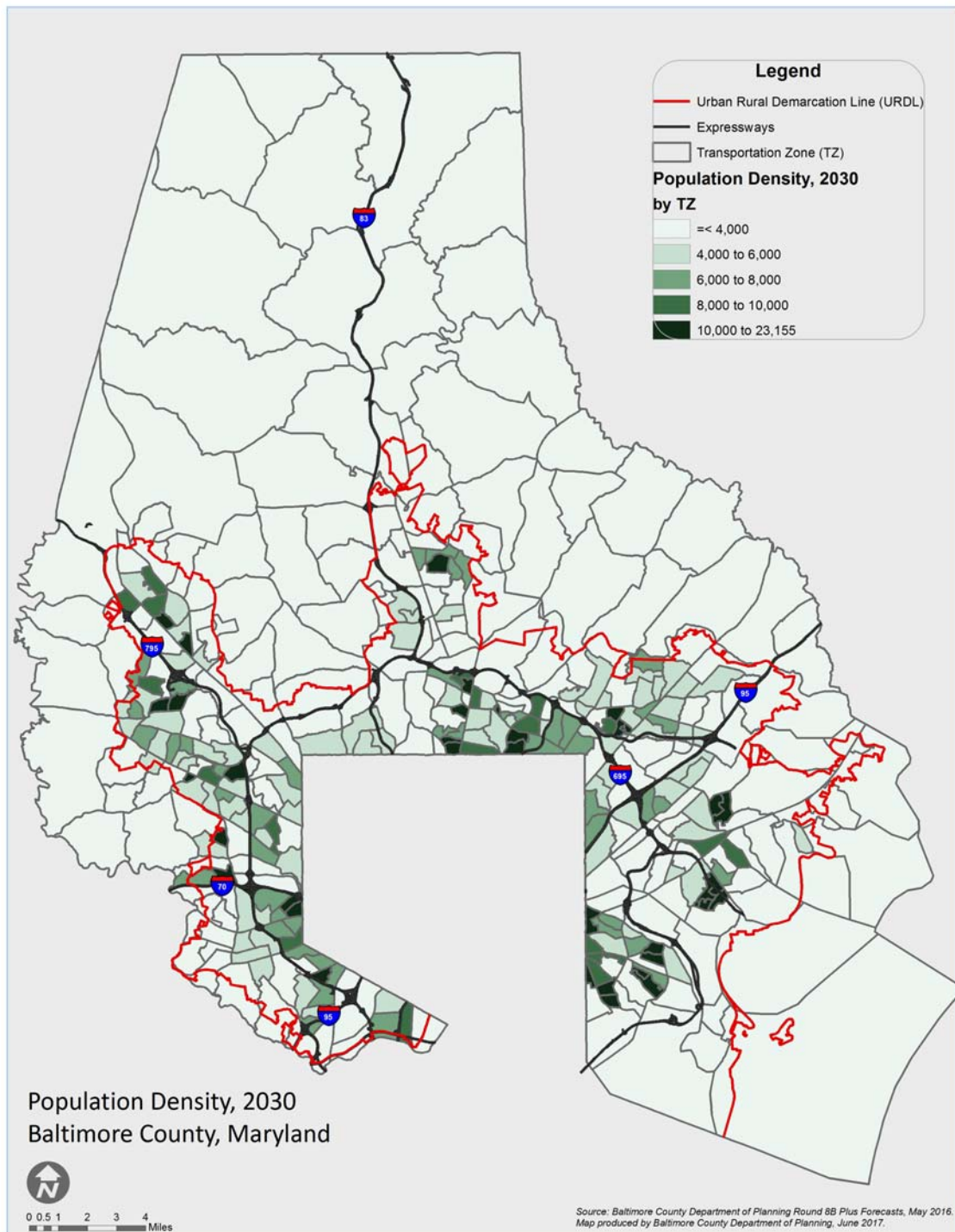












LAND USE AND ZONING

The existing land use data table (Table 2a) shows that among all the land use types, the largest amount and percent share of the County's total land area is rural residential, followed by land preservation (including agriculture and resources) and open space. Those types of the land use account to 58.79% of the total land acreage of Baltimore County¹. The land use data demonstrate the County's commitment and endeavor on sensible development and resource preservation.

Table 2a: Existing Land Use

Land Use Type	Acreage	Percent Total
Commercial	7,219	1.85%
Industrial	11,156	2.86%
Institutions	17,236	4.43%
Land Preservation	64,393	16.54%
Landfill	1,315	0.34%
Mixed Use	871	0.22%
Multifamily	5,183	1.33%
Office	1,386	0.36%
Open Space	61,320	15.75%
Rural Residential *	103,203	26.50%
Single Family Attached**	4,335	1.11%
Single Family Detached	40,960	10.52%
Transportation	27,447	7.05%
Environmentally Constrained	2,908	0.75%
Utility	6,213	1.60%
Vacant***	34,255	8.80%
TOTAL	389,400	100.00%

Data compiled by Baltimore County Department of Planning, June 2017.

*: Includes agricultural residential.

** : Includes single family semi-detached.

***: Includes pipelines.

This land use pattern is determined by the zoning classifications, one of the most effective tools to implement *Master Plan 2020*. The zoning classification table (Table 2b) summarizes that the majority of the land acres is set aside for agricultural preservation and resource conservation (36.82% and 30.25% correspondingly). The zoning for residential uses ranks third, representing 24.36% of the County's land area, which includes low, medium, and high density. Land zoned for business, manufacturing, and office combined amount to 8.57% of the County's total acreage.

¹ There have been some changes to land use coding classifications in GIS since 2014.

Table 2b: Zoning Classifications

Zoning Classification	Acreage	Percent Total	Zone(s) in Each Category
Agricultural Preservation	143,391	36.82%	RC 2, RC 50
Resource Conservation	117,812	30.25%	RC 20, RC3, RC 4, RC 5, RC 6, RC 7, RC 8, RCC
Residential:	94,847	24.36%	(As listed below):
<i>Low Density Residential</i>	49,769	12.78%	<i>DR 1, DR 2, DR 3.5</i>
<i>Medium Density Residential</i>	33,211	8.53%	<i>DR 5.5</i>
<i>High Density Residential</i>	11,866	3.05%	<i>DR 10.5, DR 16, RAE 1, RAE 2</i>
Business	9,836	2.53%	BL, BLR, BM, BMB, BMM, BMYC, BR, CB
Manufacturing	20,644	5.30%	MH, ML, MLR, MR
Office	2,870	0.74%	O 3, OR 1, OR 2, OT, RO, ROA, SE
TOTAL	389,400	100.00%	-

Data compiled by Baltimore County Department of Planning, June 2017.

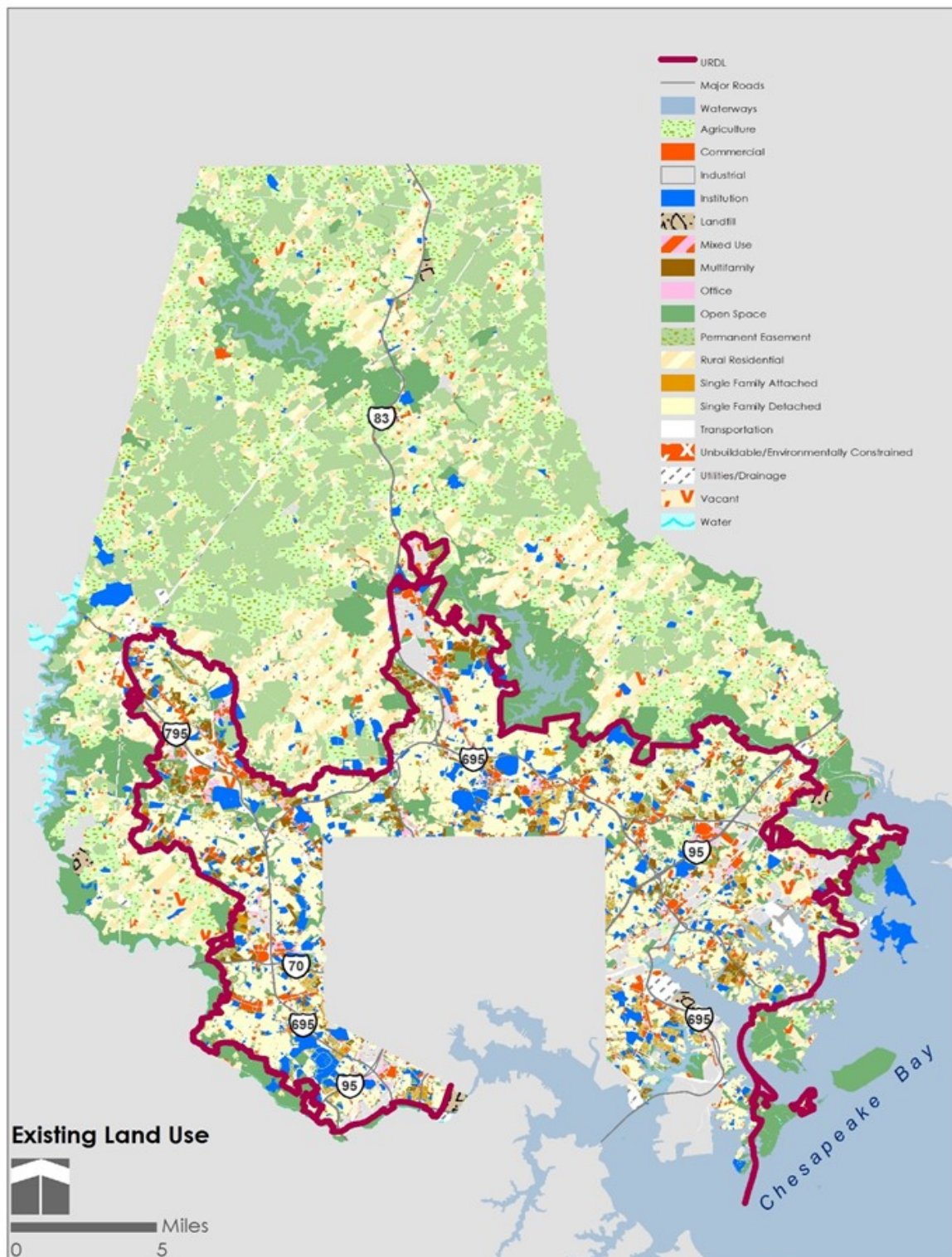
As indicated in *Master Plan 2020* (p. 27 to 31), the transect “T-zones” are a framework that identifies a range of habitats from the most natural to the most urban. Its continuum, when subdivided, lends itself to the creation of zoning categories (Table 2c). The standards overlap, reflecting the sequential pattern of development and ecosystems.

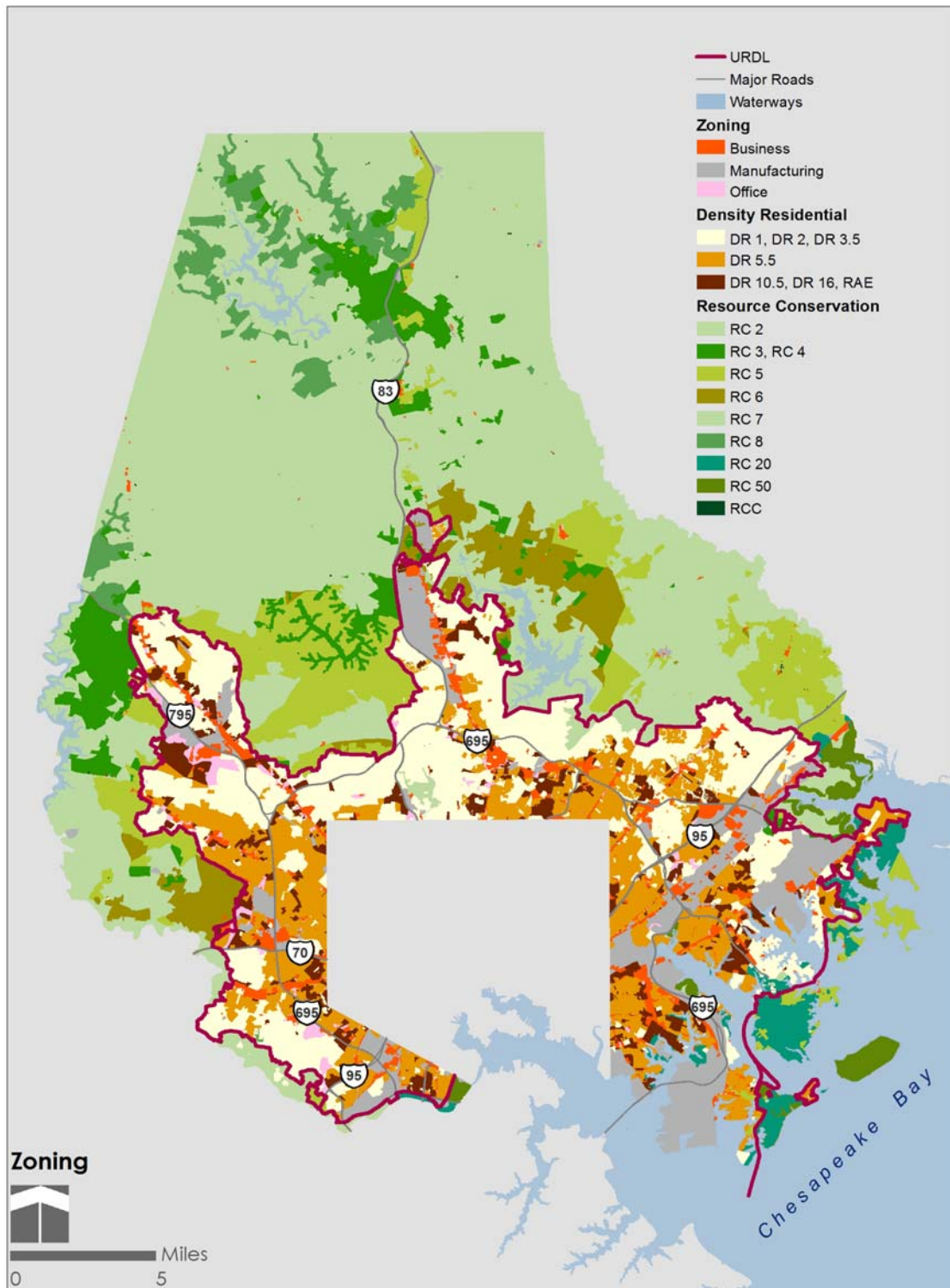
Table 2c: Proposed Land Use

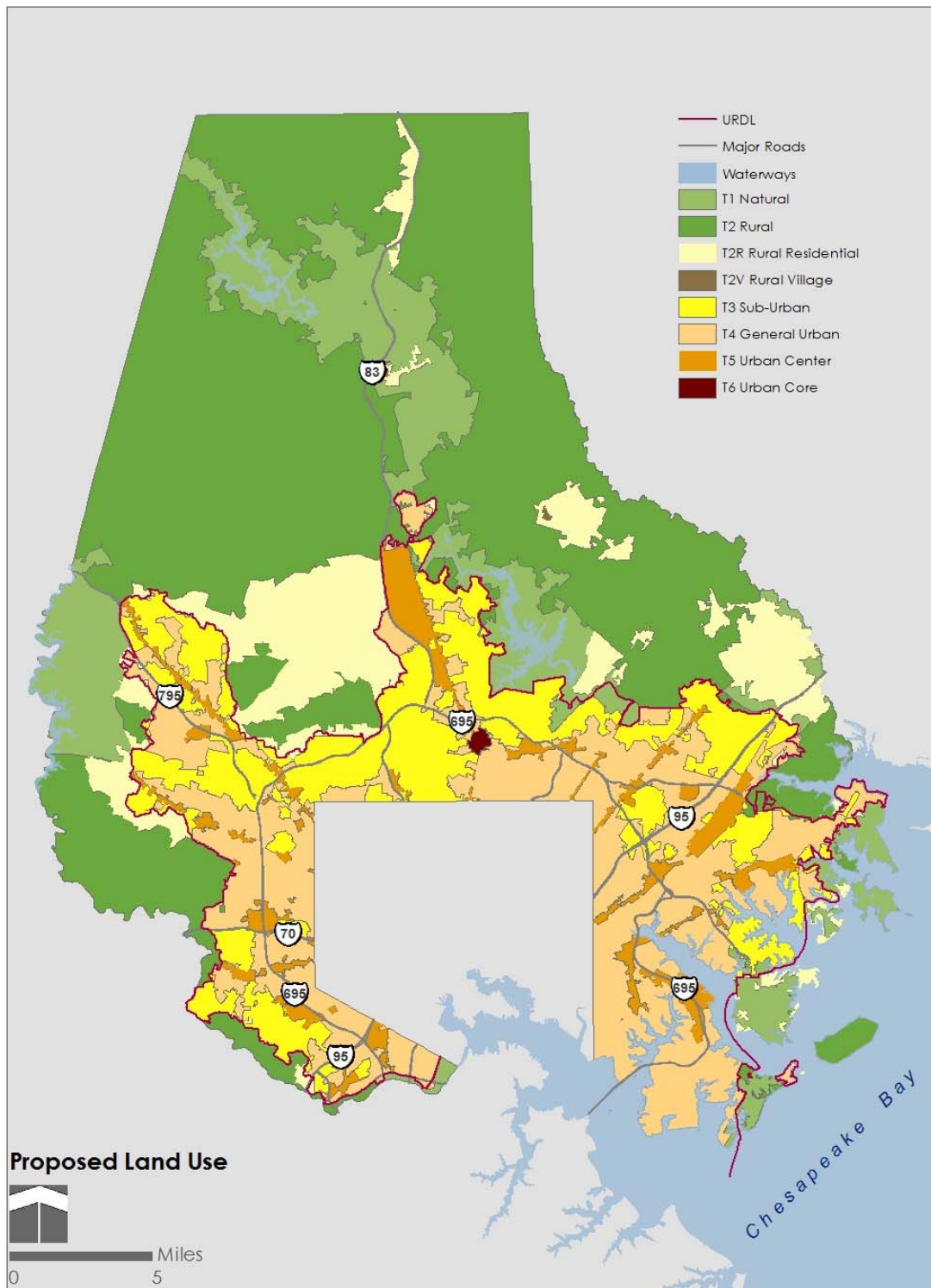
Smart Code	Land Use Type	Acreage	Percent Total
T1	Natural	53,051	13.62%
T2	Rural	172,474	44.29%
T2 R	Rural Residential	35,055	9.00%
T2 V	Rural Village	175	0.04%
T3	Suburban	46,180	11.86%
T4	General Urban	67,726	17.39%
T5	Urban Center	14,419	3.70%
T6	Urban Core	320	0.08%
TOTAL		389,400	100.00%

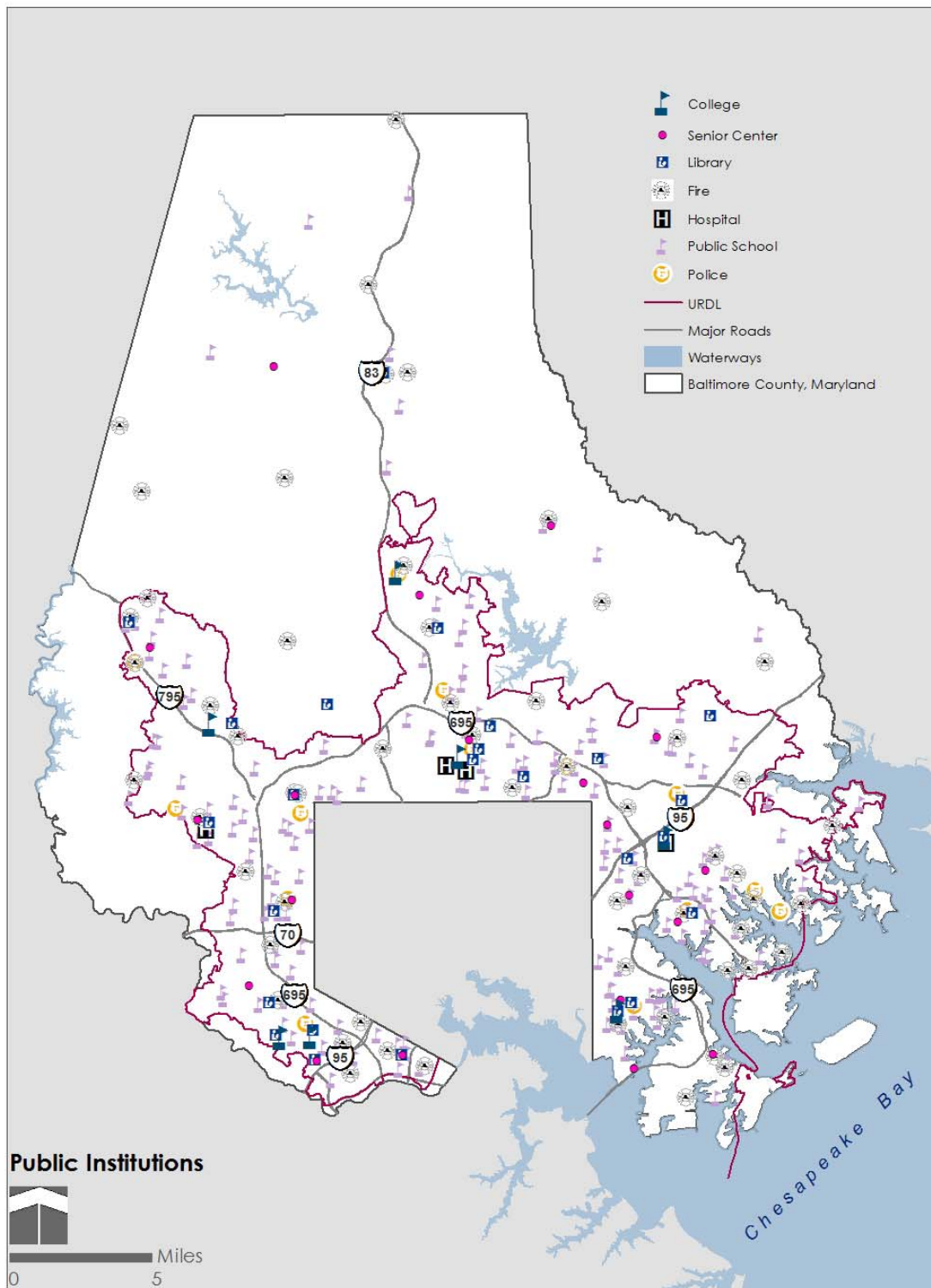
Data compiled by Baltimore County Department of Planning, June 2017.

The existing land use map shows the land use in accordance with the current zoning classifications. The zoning map reflects the final decisions by the County Council on CZMP 2016. The proposed land use map illustrates the transect “T-zones” designed for the intent to support compact mixed-use communities within the URDL and protect natural resources outside the URDL. It provides general direction for the County’s future land use decisions that are subject to amendments to the *Master Plan 2020*.









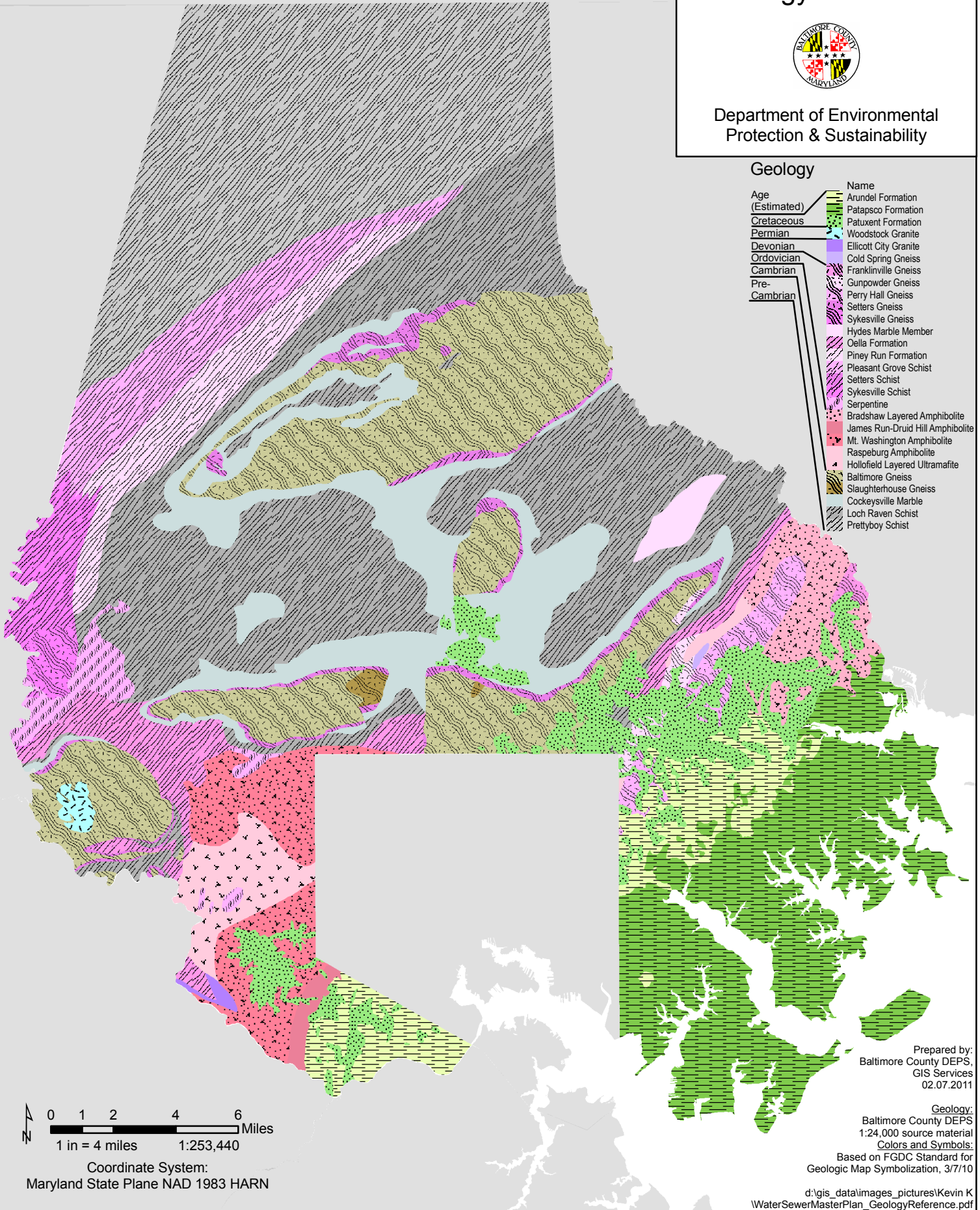
Baltimore County Geology Reference



Department of Environmental
Protection & Sustainability

Geology

Age (Estimated)	Name
Cretaceous	Arundel Formation
Permian	Patapsco Formation
Devonian	Woodstock Granite
Ordovician	Elliott City Granite
Cambrian	Cold Spring Gneiss
Pre-Cambrian	Franklinville Gneiss
	Gunpowder Gneiss
	Perry Hall Gneiss
	Setters Gneiss
	Sykesville Gneiss
	Hydes Marble Member
	Oella Formation
	Piney Run Formation
	Pleasant Grove Schist
	Setters Schist
	Sykesville Schist
	Serpentine
	Bradshaw Layered Amphibolite
	James Run-Druid Hill Amphibolite
	Mt. Washington Amphibolite
	Raspeburg Amphibolite
	Hollofield Layered Ultramafite
	Baltimore Gneiss
	Slaughterhouse Gneiss
	Cockeysville Marble
	Loch Raven Schist
	Prettyboy Schist



0 1 2 4 6 Miles
1 in = 4 miles 1:253,440

Coordinate System:
Maryland State Plane NAD 1983 HARN

Prepared by:
Baltimore County DEPS,
GIS Services
02.07.2011

Geology:
Baltimore County DEPS
1:24,000 source material
Colors and Symbols:
Based on FGDC Standard for
Geologic Map Symbolization, 3/7/10

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WaterSewerMasterPlan_GeologyReference.pdf

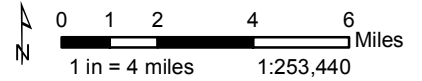
Baltimore County Critical Well Yield Areas



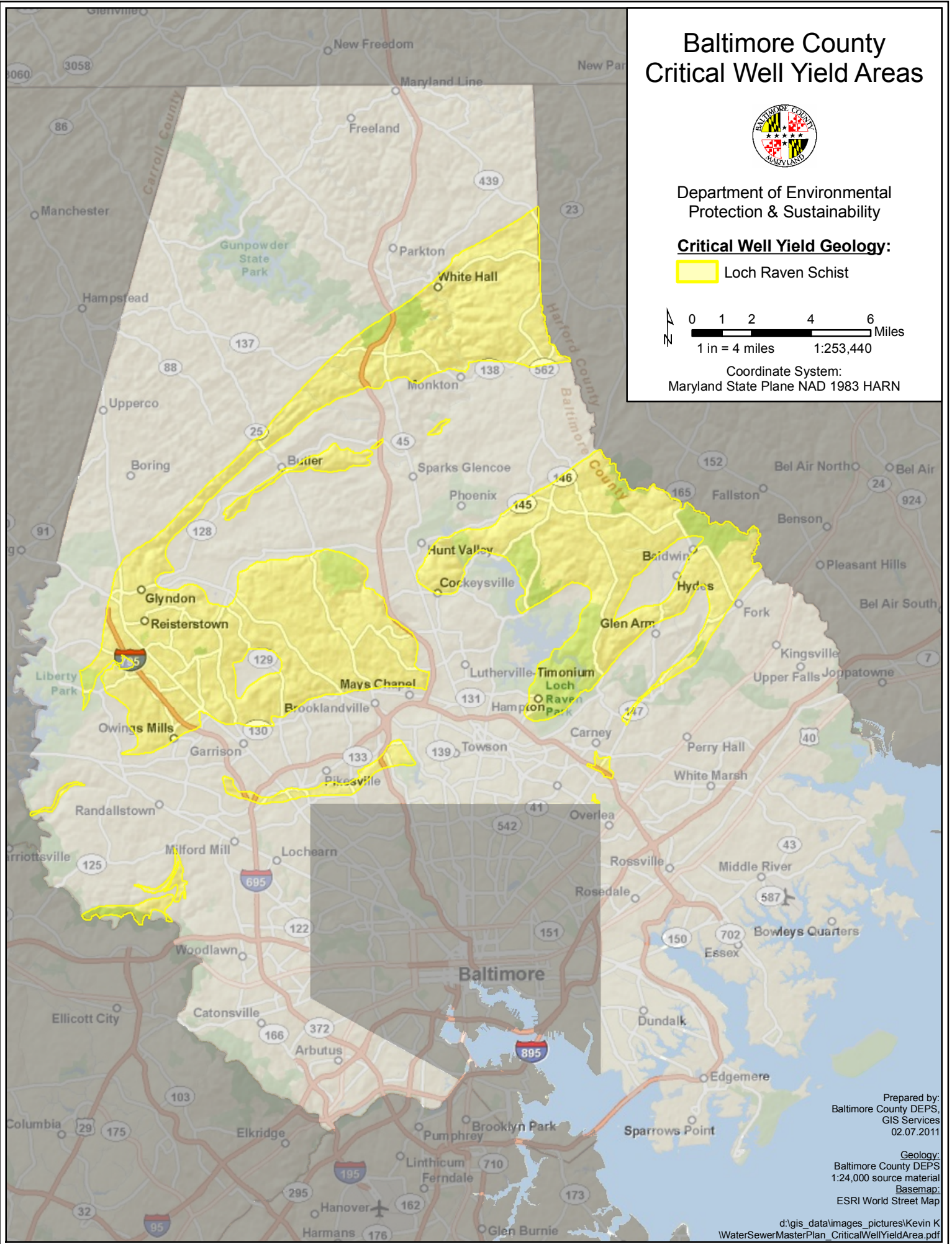
Department of Environmental
Protection & Sustainability

Critical Well Yield Geology:

Loch Raven Schist



Coordinate System:
Maryland State Plane NAD 1983 HARN



Prepared by:
Baltimore County DEPS,
GIS Services
02.07.2011

Geology:
Baltimore County DEPS
1:24,000 source material
Basemap:
ESRI World Street Map

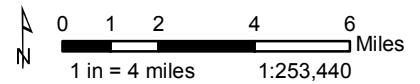
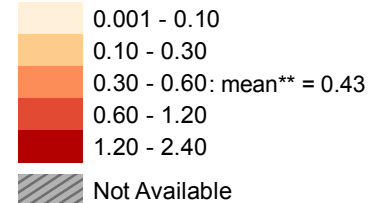
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WaterSewerMasterPlan_CriticalWellYieldArea.pdf

Baltimore County Soil Erosion Potential



Department of Environmental
Protection & Sustainability

Soil Erosion Potential*



Coordinate System:
Maryland State Plane NAD 1983 HARN

* Soil Erosion Potential (Ep) is defined as:

$E_p = K * S$, where

K = Soil Erodibility Factor, rock free soil, dominant condition of soil mapping unit

S = Steepness Factor of AH703 (Renard et al. 1997), where

$$S = \begin{cases} 10.8\sin(s) + 0.03, & s < 9\% \\ 16.8\sin(s) - 0.50, & s \geq 9\% \end{cases}, \text{ where}$$

s = Representative Slope (% slope) of soil mapping unit

** mean is the area weighted average, excluding areas where Ep is Not Available.

Prepared by:
Baltimore County DEPS,
GIS Services
02.07.2011

Soils:
USDA NRCS
1:12,000 compilation scale
Colors:
ColorBrewer2.org

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WaterSewerMasterPlan_SoilErosionPotential.pdf

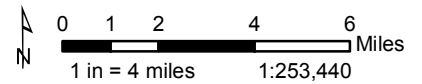
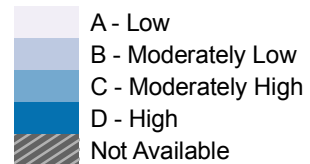
Baltimore County Hydrologic Soil Groups



Department of Environmental
Protection & Sustainability

Hydrologic Soil Group

Saturated Runoff Potential, Undrained



Coordinate System:
Maryland State Plane NAD 1983 HARN

Prepared by:
Baltimore County DEPS,
GIS Services
02.08.2011

Soils:
USDA NRCS
1:12,000 compilation scale
Colors:
ColorBrewer2.org

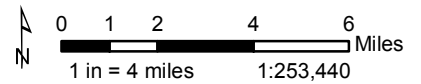
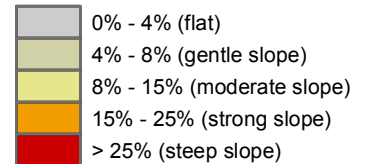
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WaterSewerMasterPlan_HydrologicSoilGroups.pdf

Baltimore County Slope Evaluation



Department of Environmental
Protection & Sustainability

Slope Evaluation Percent Slope



Coordinate System:
Maryland State Plane NAD 1983 HARN

Prepared by:
Baltimore County DEPS,
GIS Services
02.08.2011

Slope:
USGS National Elevation Dataset
30m DEM

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WaterSewerMasterPlan_SlopeEvaluation.pdf

CHAPTER III - WATER SUPPLY PLAN

GENERAL BACKGROUND

Baltimore County has received virtually all its public water supply from the Metropolitan Water System which began in Baltimore City. As early as 1881, Baltimore built a stone dam across the Gunpowder River and a tunnel to bring water into the City. In 1915, a second dam was constructed across the river at Loch Raven which is being used today along with Prettyboy Dam, built in 1936.

Owing to the need for additional raw water, Baltimore erected Liberty Dam in 1954 to impound the Patapsco River. Twelve (12) years later the Susquehanna River was tapped as a third source of water by the City. Since all of the water sources in Maryland belong to the State, Baltimore secured the State's approval to use these rivers for water supply.

The Maryland State Legislature, in 1908, granted the City exclusive use of the entire Gunpowder River¹ watershed above Loch Raven. It also granted the City the right to use the entire Patapsco River² watershed in 1931; and in 1931 and in 1955, the City received the legislature's approval to withdraw water from the Susquehanna River³ above the Conowingo Dam.

The present Baltimore County water system is actually an extension of the City system. This resulted from the 1918 annexation⁴ of nearly 50 square miles of County land surrounding Baltimore and Acts of the Legislature previously mentioned. As development took place along primary County roads, the distribution system was extended to serve the people. Water was brought into the City filtration plants from the impoundment reservoirs in the County, treated, and returned to the County consumers. So both the City and County are physically and legally wedded to a common water system. In looking at the history of the marriage, one might say that it has been quite successful in view of the service rendered to the people.

¹ Acts of the Maryland General Assembly - 1908, Chapter 214, Sec. 1-16

² Acts of the Maryland General Assembly - 1931, Chapter 521, Sec. 1-8

³ Acts of the Maryland General Assembly - 1955, Chapter 203, Sec. 1-12

⁴ Acts of the Maryland General Assembly - 1918, Chapter 82, Sec. 1-18

DESCRIPTION OF EXISTING SYSTEM

Water served to consumers in Baltimore County is secured from three (3) surface supplies: the Gunpowder River, the North Branch of the Patapsco River and the Susquehanna River. Baltimore City developed these rivers as water supply sources as they were needed.

Gunpowder River

The Gunpowder River development consists of two (2) concrete gravity dams: one (1) at Loch Raven and the other near the mouth of Prettyboy Creek. Raw water is conveyed in a 12-foot-diameter tunnel from Loch Raven Dam to the Montebello Filtration Plant. These two dams impound 43-billion gallons of water collected as runoff from the 333 square mile watershed. Loch Raven is located about one-half (1/2) mile north of Cromwell Bridge Road, and Prettyboy Dam is located about three (3) miles southwest of Parkton.

North Branch of the Patapsco River

The Patapsco River development consists of the concrete, gravity Liberty Dam located near Falls Run on the North Branch of the river and a 10-foot diameter tunnel from the dam to the Ashburton Filtration Plant. Liberty Dam impounds 43-billion gallons of water. The reservoir collects runoff from the 164-square mile watershed.

See Impoundment and Safe Yield Data.

Susquehanna River

The Susquehanna River development consists of an intake structure at Conowingo, a 12-foot diameter tunnel and pipeline from the intake to the Deer Creek Pumping Station, a 9-foot diameter pipeline extending to Fullerton, and an 8-foot diameter pipeline from that point to the Montebello Filtration Plant. The intake structure and 12-foot line permit withdrawal of 500 million gallons per day (MGD) from the Susquehanna River which flows by gravity to the Deer Creek Pumping station and discharge line which are sized for an approximate flow of 200 MGD. At present, there are four (4) 62.5 MGD variable speed pumps in the station with one pump remaining on standby. The pipeline decreases in size to 8 feet at Fullerton in anticipation of the construction of a plant to filter the Susquehanna supply.

The Susquehanna River drains 27,000-square miles of land in New York, Pennsylvania and Maryland.

METHOD OF OPERATION

Under normal operating conditions, water flows by gravity from Loch Raven Reservoir to the Montebello Filtration Plant through the 12-foot diameter, concrete-lined tunnel which is 7 miles long.

When water in Loch Raven Reservoir recedes to about 9 feet below the crest of the dam, gates in Prettyboy Dam are opened and water flows down to Loch Raven to maintain the desired level in the reservoir. If the water level at Loch Raven continues to drop below certain elevations, low lift pumps must be started at Montebello to pump water into the filter plants and/or the Deer Creek Pumping Station must be brought into operation.

Water from the Liberty Reservoir flows by gravity through a 10-foot diameter concrete-lined tunnel to the Ashburton Filtration Plant. In low water situations, low lift pumps at Ashburton can be used to deliver water from Liberty Reservoir to the filtration plant.

All water from the Susquehanna River which enters the Baltimore System is presently pumped into the Montebello Filtration Plants. Currently, the Susquehanna supply is not used unless the water levels of the reservoirs on the Gunpowder and the Patapsco rivers drop below predetermined elevations. This method of operation is used so that water in the upland reservoirs can be drawn by gravity into the filter plants in quantities which approach what would be the total yield of the streams without the Susquehanna supply. This usually results in economical operation of the reservoirs. Some of the runoff which formerly flowed over the spillways and was lost during periods of heavy rainfall can be impounded behind the dams. This operation also diminishes pumping time and costs at Deer Creek.

FILTRATION

Water drawn from the three (3) rivers is filtered before it reaches the public. Gunpowder and Susquehanna water is treated at the Montebello Filtration Plant. There are two (2) complete filter plants at Montebello. The first plant was built in 1915, has 32 filter units and a capacity of 128 MGD. The second was constructed in 1928, has 28 filter units and a capacity of 112 MGD. The Ashburton Filtration Plant was erected in 1956, has 20 units and a capacity of 120 MGD.

The treatment process consists of chlorination, chemical treatment, coagulation, sedimentation, filtration and fluoridation. After the water leaves the filter plants, additional chlorine is added at each distribution reservoir and remote pumping station to keep it as sterile as possible. Soda ash also is added at a distribution reservoir to control the pH of the water.

Careful supervision is exercised in the treatment process with samples of water taken every two (2) hours at various points through the filter plant. Other samples are collected from many points in the distribution system by both the City Environmental Services Division and the State Health Department. These samples are analyzed for the chemical and bacteriological composition of the water.

FUTURE FULLERTON FILTRATION PLANT

The new Fullerton Water Treatment Plant, anticipated to be in operation in the year 2026, will be the most significant addition to Baltimore's regional water supply system since the development of the Susquehanna River supply and the construction of the Susquehanna Transmission Main and the Deer Creek Pumping Station in the 1960s.

The Fullerton Plant will be located on a large tract of land in the Fullerton area of Baltimore County north of the intersection of the Baltimore Beltway and Interstate-95. The land was acquired by the City as part of the implementation of the Susquehanna River system.

The Fullerton Plant will be designed to meet the following objectives:

- Facilitate more use of the Susquehanna River supply to augment other water supplies especially during times of drought
- Increase the total water filtration capacity for the regional system to help reliably meet future needs
- Help in distributing finished water to the growing areas of Northeast Baltimore County
- Increase the overall dependability of the regional system by providing alternative means to obtain, treat, and supply water in the event that another major component of the water system is out of service, under maintenance, or experiencing emergency conditions.

The Fullerton Plant's ultimate filtration capacity will be 120 MGD.

DISTRIBUTION

The Baltimore distribution system is one of the most complex systems in the United States. This is due not only to its size (although it is one of the ten (10) largest systems in the country), but also to the large number of zones of service which are established to serve areas with significantly different ground elevations. At present, there are thirteen (13) distinct zones of service. They are linked together by a series of pumping stations, transmission mains, storage reservoirs, and elevated tanks.

Water from Montebello flows by gravity into areas on the east side of the County adjacent to the harbor, and it is pumped into the north and northeast areas of Baltimore County through several pumping stations. Water leaving the Ashburton plant flows by gravity to the southwest area of the County and is pumped into the western and northwestern parts of the County.

SERVICE AREA

The service area contains about 120-square miles of land in Baltimore County in addition to the City and other adjacent counties. Elevations in the area vary from sea level at the harbor to 750 feet above sea level in Reisterstown. Most of the heavy industry is located near the harbor while commercial development is scattered throughout the County with primary land use devoted to residential subdivisions.

Residents in the Metropolitan District⁵ are eligible for water service although some people who live in the District have their own private systems. Water lines may be extended if property owners, who own 60% of the frontage, submit a petition to the County or if the Department of Environmental Protection and Sustainability deems there is a health problem.

WATER CONSUMPTION

In fiscal year 2016, Baltimore County used about 79 MGD from the Baltimore system. This amounts to about 40.5% of the average day water demand of 195.5 MGD. About 3.4% of the 79 MGD is used by commerce and industry. Residential consumption accounts for the remaining 96.6%.

FIRE PROTECTION

The County system also supplies water for fire protection. Currently, all fire flow data is collected by Baltimore City and is distributed to Baltimore County for permanent record and future inquiries. Those areas found to be deficient are included in a yearly list (the Basic Services Map; see section 4A02 of the Baltimore County Zoning Regulations) that precipitates capital improvement programs to eliminate these deficient areas. All Basic Services deficient areas identified in the water system have been addressed as of the 2017 Basic Services map update.

The American Insurance Association conducted a study in 2008 of fire flow in Baltimore County. This study is available from the Baltimore County Fire Department.

FINANCES

The County finances the water system from a number of charges including water rates, service charges, front-foot assessments, system connection charges, and water distribution charges. Revenue from the water rates is used to reimburse the City for the County's share of the City's operation and maintenance expenses. The Metropolitan District Operations Special Revenue Fund receives any net surplus on the sale of water or water service charge.

RELATIONSHIP WITH CITY AND ADJACENT COUNTIES

Baltimore County has as its neighbors the City, the four (4) counties of Anne Arundel, Howard, Carroll and Harford, and the State of Pennsylvania. All of these political subdivisions are interrelated by the use of water from the Baltimore System. Pennsylvania is involved only because of its location with respect to surface waters. The Gunpowder River has its origin in this state, and about 80% of the Susquehanna Basin lies in Pennsylvania.

Anne Arundel and Howard Counties are supplied with water from Baltimore City which flows through the Baltimore County distribution system. Although present consumption in these two (2) counties is relatively small (22.6 MGD for Howard and 4 MGD for Anne Arundel), both counties must rely heavily on the Baltimore System for future water supply. Howard County recognized

⁵ See Title 35, Baltimore County Code.

this fact in 1957 when it entered into an agreement with the City and Baltimore County for the joint financing of distribution facilities to supply them with 5 MGD from the Western Third Zone of service. The City and Baltimore, Howard and Anne Arundel counties also signed an agreement in 1969 for construction of pipelines in the western part of the Second Zone.

In 1968, Carroll County signed an agreement with the City to purchase a maximum of 3 MGD from the Liberty Reservoir to serve the Freedom District. Although Carroll County is not consuming filtered water, it is using part of the total raw water supply. Harford County is also a raw water customer. By legislative acts, they have the right to a maximum of 25 MGD from the Susquehanna pipeline. When the Deer Creek Pumping Station (Susquehanna water) is off, Harford County uses raw water from Loch Raven Reservoir.

The relationship between Baltimore County and the City includes legal, financial, and practical arrangements for the operation and maintenance of the County water system. Legally, the City must supply water to the County at cost.⁶ The question of cost has been the source of debate between the two (2) jurisdictions since 1945. An agreement resolving many cost problems was executed by the City and County on September 20, 1972⁷.

Under the present method of operation, Baltimore County builds and finances improvements to its distribution system; and the City operates and maintains it. The City reads the water meters and bills the County consumers. The water revenue is used to pay the City for its services. Any excess is returned to the County. Any deficit is paid to the City by the County.

THE PRESENT SYSTEM – ITS STRENGTHS AND WEAKNESSES

The quality of water in the Gunpowder and Patapsco Rivers is usually excellent, but the Susquehanna River presents a serious quality problem during periods of low stream flow (less than 10,000 CFS) which occurs during drought years in the late summer and fall. During these periods, the sulfate hardness increases. When this water is used in the system, complaints can be expected from the consumers about the hardness and possible red-water conditions which may occur. In addition, when Susquehanna water is filtered at the Montebello Plant, complaints may occur from consumers regarding taste and odor conditions.

A problem of algae blooms has developed in Liberty Reservoir and Loch Raven Reservoir. This is primarily caused by nutrients in untreated waste effluents from industries which flow into the upper reaches of the reservoirs. The problem will intensify as the watersheds are urbanized and more wastes are discharged into the reservoirs. On June 29, 1979, Baltimore County entered into

⁶ See Title 35, Baltimore County Code.

⁷ See Water Agreement, Baltimore City and Baltimore County, dated September 20, 1972.

a reservoir Watershed Management Agreement⁸ with Carroll County and the City to continuously review and evaluate existing problems and proposed actions potentially affecting the water supply watersheds. It is of the utmost importance that the State Water Quality Standards be adhered to in order to secure a pure and constant supply of water.

The following is a summary of the improvements needed in the County water system in each zone of service:

First Zone

The southeastern part of the County is served by gravity flow from the Montebello Filtration Plants. These plants will undergo an extensive rehabilitation after the Fullerton Filtration Plant is in operation. (The Fullerton Transmission Main, connecting the major transmission system to facilities located on the Fullerton site, was completed at the end of 1999). The future reservoir (62 MG) and filtration plant are scheduled to be built by 2020 and 2026 respectively.

Replacement covered reservoirs is scheduled to be built by 2022 to comply with the EPA LT2ESWTR mandate at Druid Lake.

Continued development will necessitate the construction of a 24" transmission main in Pulaski Highway and a 16" transmission main in Campbell Boulevard.

A new 16" transmission main will be needed in Ebenezer Road, between Stumpfs Road and Harewood Road, to provide a redundant source of water (to enhance system reliability) to the Chase area of Baltimore County.

Water main projects to replace fifty year old, failure-prone cast iron pipe are planned for Beachwood (6,000 ft.) and the Turkey Point Peninsula (15,000 ft.).

Numerous rehabilitation and replacement projects need to be done on the existing piping network to ensure adequate pressure, fire protection, and water quality.

Second Zone

The Guilford Reservoir is scheduled to be replaced by covered reservoirs by the year 2020 to comply with the EPA LT2ESWTR mandate.

Replacement covered reservoirs is scheduled to be built by 2023 at Ashburton Reservoir to comply with the EPA LT2ESWTR mandate.

Numerous rehabilitation and replacement projects will be needed on the existing piping network to ensure adequate pressure, fire protection and water quality.

⁸ See Reservoir Watershed Management Agreement, Baltimore City, Baltimore County & Carroll County dated June 29, 1979.

Eastern Third Zone

A new 12" water main is currently under construction in Joppa Road, between Walther Boulevard and Belair Road, to replace a deteriorated 12" cast iron pipe.

Numerous rehabilitation projects need to be done on the existing piping network to ensure adequate pressure, fire protection, and water quality.

Western Third Zone

Numerous rehabilitation and replacement projects need to be done on the existing piping network to ensure adequate pressure, fire protection, and water quality.

Catonsville Fourth Zone

A new suction and discharge main needs to be completed for the Catonsville Pumping Station.

Numerous rehabilitation and replacement projects are needed on the existing piping network in order to ensure adequate pressure, fire protection and water quality.

Pikesville Fourth Zone

Improvements to the transmission system around the Owings Mills Area will need to be completed.

Eventually, a 36" transmission main in Reisterstown Road, from Pikesville pumping Station to Pleasant Hill Road will be needed to support demand during the summer months and provide redundancy to ensure system reliability.

A new 0.3 MG Tank is needed to replace the deteriorated and old Randallstown Tank.

Numerous rehabilitation and replacement projects are needed on the existing piping network in order to ensure adequate pressure, fire protection and water quality.

Towson Fourth Zone

A new 24" water line is needed in York Road, from Padonia Road to Cockeysville Road and also from Cockeysville Road to Shawan Road to replace existing problem-prone water mains.

A new 12" water main is needed along E Joppa Road, from Perring Parkway to Old Harford Road to replace a deteriorating 12" cast iron pipe. As part of the same contract, a new 20" water main is needed along E Joppa Road from LaSalle Road to Drumwood Road and a new 16" water main along Oakleigh Road from E Joppa Road to Yakona Road. Furthermore, existing water services along E Joppa Road between Drumwood Road and Perring Parkway will be transferred from the existing deteriorating 12" cast iron water main to the existing 20" water main.

Numerous rehabilitation projects need to be done on the existing piping network to ensure adequate pressure, fire protection and water quality.

Sparks Fifth Zone

Improvements are needed at the Sparks Pumping Station and the Sparks Tank to improve safety and to maintain reliability.

Reisterstown Fifth Zone

The 16” transmission main in Reisterstown Road needs to be replaced from the Pleasant Hill Tanks to Butler Road.

Increasing demands in the Reisterstown/Glyndon areas of Baltimore County will require the construction of a 2.0 million gallon elevated water storage tank by the year 2025.

Zones not needing Planned Improvements

- Colgate Second Zone
- Pot Springs Fifth Zone
- Sherwood Fifth Zone
- Falls Fifth Zone

IMPOUNDMENT AND SAFE YIELD DATA

<u>Parameter</u>	<u>Loch Raven</u>	<u>Prettyboy</u>	<u>Liberty</u>
Elevation at Crest of Dam	240 feet	520 feet	420 feet
Spillway Length	288 feet	274 feet	480 feet
Total Length of Dam	650 feet	845 feet	740 feet
Height of Crest Above Stream Bed	82 feet	130 feet	160 feet
Capacity of Reservoir (in billions)	23 gallons	20 gallons	43 gallons
Length of Shore Line at Crest Elevation	50 miles	46 miles	82 miles
Area of Land Owned	8,000 acres	7,380 acres	9,200 acres
<u>Safe Yield</u>			
• Loch Raven - Prettyboy	148 MGD		
• Liberty	92 MGD		
• Susquehanna			
108-inch line	250 MGD		
Future Additional Allowance	<u>250 MGD</u>		
<i>Total Available Water:</i>	740 MGD*		

*Total available water is subject to the following:

1. Liberty yield is limited to 82 MGD without the use of Ashburton pumps.
2. Present agreements would allow up to 69 MGD average day for Howard and Anne Arundel Counties.
3. Harford County has State authority for 25 MGD from the Susquehanna.
4. Baltimore City has been approved by the Susquehanna River Basin Commission (SRBC) to withdraw a maximum of 250 mgd from the Conowingo pond depending on system hydraulics, but withdraw is currently limited by its aggregate pumping capacity with three pumps operating to a withdrawal of approximately 137 mgd,. During low flow periods on the Susquehanna River (i.e., when Federal Energy Regulatory Commission Flows (Q-FERC) or lower flows occur), withdraw is limited to 64 mgd measured as a maximum 30-day average and 107 mgd (equivalent to two pumps at Deer Creek Pumping Station) any one day.

WATER DEMANDS

Round 8B Population Forecasts by the Baltimore Metropolitan Council (see Chapter II) indicate over 790,000 persons in the urban area of Baltimore County by the year 2040. The provision of public water services to this many people will require capital expenditures in nearly every zone of water service.

DOMESTIC, COMMERCIAL AND INDUSTRIAL USES

The expected domestic and commercial uses were obtained from the population figures and per-capita consumption for each zone of service. The results indicate an increase of use in some zones by the year 2040.

Industrial use is not expected to increase. It is anticipated that industrial and commercial use will replace the industrial water that was subtracted with the loss of the steel operation at Sparrows Point. After reviewing reports and available data on existing industrial use, zoning, transportation, water requirements and other parameters, it is estimated that industrial and commercial usage should remain constant through the year 2040.

About 52% of the industrial use is expected to be concentrated in the First Zone where most of it is now located. The other 48% will probably be located in existing industrial parks. Substantial water-using industries are not expected to settle in the northern part of the County.

Baltimore County's economic health depends to a significant degree on industry, and water is a prerequisite. Ensuring new industry and an ample water supply will permit some growth and will encourage industrialization where consistent with the County's *Master Plan 2020*.

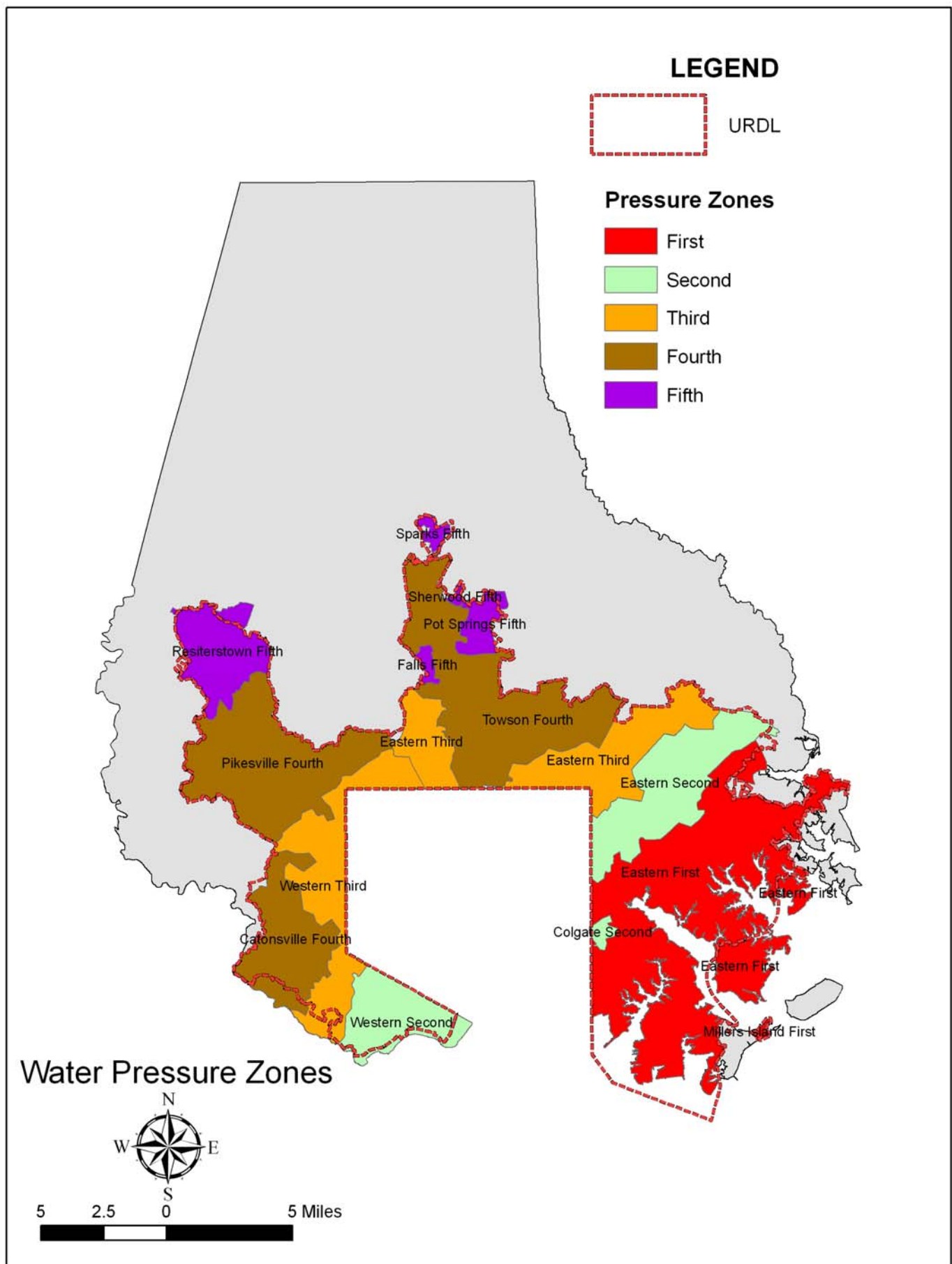
ESTIMATED DAILY USE IN THE YEAR 2040

The estimated Baltimore County 2040 average-day demand is 112.69 MGD. This quantity can be obtained from the existing sources of supply. The maximum-day demand of 201.46 MGD can be obtained from existing, raw water, reservoir storage and the Susquehanna River. Future distribution storage and pumping capacity must be designed to meet the maximum day demands. With the addition of the Fullerton Filtration Plant the water system will be able to handle anticipated future filtration water demands.

WATER DEMANDS – PRESENT TO 2040

Attempts to forecast long-range water use are only estimates based on the best available information and various engineering judgments. Fortunately, Baltimore County has some very valuable historical data which has been used to help predict the water demands through 2040. The present thinking of planners is that the water service area in the year 2040 will be virtually the same as the present one. The pressure zones (which also serve as the planning areas for public water service) are located generally within the URDL, with exceptions only for public health projects (such as in the eastern peninsula areas) and where mains are extended for redundancy

(“looping”) to meet system reliability and water quality requirements. The outline of the service area is shown on the following page.



PER-CAPITA CONSUMPTION

The per-capita consumption is expected to be highest in the First and Second Zones of service where industrial and commercial uses will probably be most extensive. Per-capita use in the upper zones is expected to increase gradually.

For engineering purposes, “per capita” usage figures are derived by dividing the actual observed flow by the population located within the pressure zone in question. This leads to confusion in that it does not accurately reflect actual domestic usage, since it assigns industrial and commercial usage as well as losses due to fire fighting operations, system leakage and water main breaks on a “per-capita” basis. It does, however, provide the information necessary to properly size and maintain the water system. These “per capita” figures were used historically in Table No. 3.

Domestic usage for design purposes is based on 90 gpcd (gallons per capita per day) (See Design Manual adopted August 2, 2010, Chapter 6, Section IV (B)3(c)2 (a) & (b) for complete details. This is the section on sewer design. Water systems are always designed for adequate fire flow and are not usually governed by domestic usage.) This is a conservative figure for system hydraulic design purposes. Actual residential domestic usage is closer to 80 gpcd.

Domestic usage is further refined in the Central System Report, varying from a low of 63 gpcd to a high of 83 gpcd in different pressure zones. The variation is the result of the consultant’s usage estimates based on lot size and type of dwelling typical in those service areas, with larger residences assumed to have a greater number of plumbing fixtures, more lawn watering and other outdoor usage. For all of these reasons, Table No. 3 has been modified to provide a better explanation of water demand.

OTHER SOURCES OF WATER

The rural areas of Baltimore County use ground water, predominantly in the northern part of the County. For more details about the use of ground water supplies, see the section on Rural Baltimore County.

THE FUTURE WATER SYSTEM

Water consumption in Baltimore County is expected to increase slowly through the year 2040.

The Water Analyzer Office has conducted extensive distribution studies of each zone of service. These studies were reviewed in detail to determine the distribution improvements which will be required to meet demands for the next twenty-five years. The improvements include additional pumping capacity, storage capacity, and transmission mains.

WATER CONSERVATION

COMPLIANCE WITH STATE REQUIREMENTS

The County Building Engineer, Building Code Official for the County in the Department of Permits, Approvals and Inspections, advised on January 24, 2011 that Baltimore County complies with the Maryland Water Conservation Plumbing Fixtures Act (see COMAR 26.03.01.07).

BALTIMORE COUNTY WATER CONSERVATION PLAN

The present Baltimore County water system is actually an extension of the City system. Raw water is brought into the City filtration plants from the City-owned impoundment reservoirs in the County, treated and returned to the County consumers through a complex system of transmission mains, distribution mains, storage facilities and pumping stations. Therefore the City and County are physically and legally bound to a common water system.

In fiscal 2016 Baltimore County used about 79 MGD from the Baltimore system. This amounts to about 40.5% of the average day water demand of 195.5 MGD. In fiscal 2016 there was 22.32% unaccountable water in the Baltimore Metropolitan Water System.

In recent years the County has financially participated at a rate of approximately 40% in the following City-managed contracts to reduce the amount of unaccountable water:

- SCADA (Supervisory Control and Data Acquisition) contract to replace or renew all of the telemetry in the system to gain more accurate readings.
- Water audit contracts to calibrate all large meters above 4" in size and to search for other unaccountable water causes.
- Valve and fire hydrant exercising and repair contract to limit leakage from these appurtenances.
- Leak detection contracts to survey large areas of the system to repair water leaks that do not reach the surface.
- Replacement of water tank altitude valves to stop unnecessary water overflows.
- Replacement of old water meters with new smart meters

In addition, Baltimore City and Baltimore County have made a comprehensive effort to find all buried meters in Baltimore County to gain a more accurate overall reading of metered water.

It is estimated that approximately 10% of the unaccountable water system wide is being lost through main breaks. Baltimore City and Baltimore County, like many large municipalities around the country, have a very old infrastructure with large inventories of old cast iron pipes that are prone to breakage, especially during the winter months. Each jurisdiction is allotting more money to replacing mains that have frequent breaks. In the fiscal year 2018 alone, Baltimore County will be replacing over 40,000 linear feet of old cast iron piping which have a history of main breaks. Baltimore City, through its emergency response network, is responding to breaks in a more timely manner to limit the amount of wasted water.

Also, over the last several years, both the City and the County public works officials, police and fire departments have put forth a lot of cooperative effort to stop illegal usage from the system's fire hydrants. Baltimore County has applied updated State standards in regard to plumbing fixtures in new construction to conform to the State's conservation requirements. Baltimore City also mails a water quality report annually to all metered accounts which gives guidance on how consumers can limit and conserve their daily water usage.

It is the objective of both Baltimore County and Baltimore City to reduce the system's unaccountable water to 15% within the next 5 years.

NEIGHBORHOOD EXTENSIONS

A petition process for facilities extensions in existing neighborhoods has been established to determine priorities for facilities planning, design, and construction as directed by Section 35-142 of the Baltimore County Code. In addition, priorities for facilities planning, design and construction are established by the Department of Environmental Protection and Sustainability and the Director of Public Works under procedures established pursuant to Section 35-144.

SUBDIVISION PROJECTS

Priorities for the extension of Metropolitan facilities for new developments (residential, commercial or industrial) are established by negotiation of Public Works Agreements pursuant to the authority of Section 32-4-304 of the Baltimore County Code.

CONSTRUCTION AT HIGHWAY SITES

Facilities are constructed at strategic locations crossing major highway projects to preclude future expenses involved in tunneling under the highways. The priority for this work is established by highway construction schedules.

RURAL BALTIMORE COUNTY

The areas outside of the Urban-Rural Demarcation Line (URDL) are predominantly served by individual “private” well water supplies. Ground water in Baltimore County may be obtained from two (2) geological and physiographical provinces that are separated by the “Fall Line” (which lies approximately along I-95 in Baltimore County). The Piedmont subarea is north of the Fall Line and the Coastal Plain subarea is south of the Fall Line.

Piedmont Subarea

Groundwater supplies in the Piedmont Subarea are generally sufficient to supply only domestic and moderate commercial demands because the yields from individual wells are relatively low, rarely exceeding 50 GPM. Crystalline rocks, including schist, gneiss, gabbro, granite, and marble are the chief aquifers. Groundwater generally occurs under water table conditions in the uppermost 250 feet of the rocks, and most wells and springs yield water from local recharge. The aquifers store groundwater in the more permeable zone of decomposed rock nearest to the land surface.

Well yields vary by geologic formation and within each formation. The following information is generalized yield data in Baltimore County:

<u>Geologic Formation</u>	<u>Well Yield</u>
Marble	Varies from 1- 500 GPM and averages 12 GPM
Pleasant Grove Schist & Prettyboy Schist	Varies from 1- 100 GPM and averages 8.5 GPM
Gneiss & Granite	Varies from 1 - 100 GPM and averages 8.5 GPM
Mafic and Ultramafic	Varies from 1 - 75 GPM and averages 8.0 GPM
Loch Raven Schist	Varies from 1 - 100 GPM and averages 6.5 GPM

Wells in the Loch Ravens Schist, particularly the area known as Chestnut Ridge, are generally the lowest yielding wells in Baltimore County. For this reason the Loch Raven Schist (and Jones Falls Schist) are known as Critical Water Areas (see map in Chapter II) as defined in the Baltimore County Code 34-2-103(f).

Coastal Plain Subarea

The Coastal Plain Subarea contains relatively large quantities of groundwater in artesian or semi-artesian and water-table conditions. Well yields vary from a few gallons per minute to as much as 1,000 GPM. The average yield is 200 GPM. Sand and gravel are the major aquifers that are separated by relatively impervious confining layers of clay.

Groundwater in the Coastal Plain Subarea is susceptible to salt water contamination. Groundwater contaminated by salt water is generally high in mineral content, high on the pH scale, and very hard. Detailed analyses can be obtained from the Geological Survey Water Supply Paper, 1499-F.

WATER QUALITY AND RELIABILITY

In general, residents of rural Baltimore County have little difficulty attaining an adequate and safe water supply from domestic wells use. The results of a County-wide 1998 study completed by the Maryland Geologic Survey entitled “Ground Water Quality in the Piedmont Region of Baltimore County” and a 2002 Supplemental Report indicate that there were no regional water quality concerns. However, subsequent water quality sampling has revealed a number of wells located in the Baltimore Gneiss Formation with elevated levels of naturally occurring radium in the ground water (see discussion below). The droughts of 1999 and 2002 raised concerns from many residents who rely on well water. Other localized ground water quality problems exist sporadically as a result of anthropogenic activities. Typically, areas of dense development and/or wells in close proximity to sources of contamination are more susceptible to groundwater quality problems. The discussion below details some of the more prevalent water quality issues that face rural Baltimore County property owners.

Radium

In 2005, a water quality survey of wells in the Baltimore Gneiss and Setters Gneiss formation revealed elevated levels of gross alpha particle emissions and radium (a human carcinogen) were present in roughly 10% of the wells. The areas of concern include Monkton, northern Phoenix, Sparks, Glencoe, Butler, and Woodstock. Radioactive elements such as uranium and radium are naturally occurring in the rock. Evaluation of the well construction data indicates no particular pattern in well depth, yield or age to wells with high gross alpha or radium concentrations. The occurrence of elevated concentrations of gross alpha and radium in ground water appears to be random within the gneiss formations and localized in various “hot spots.” The County recommends (and may require) that all potentially affected wells be tested for gross alpha and/or radium to minimize exposure. Water softeners have proven to be an effective removal technique for radium. In 2005, Baltimore County sent a mailing with information regarding radium to all Baltimore County residents located in areas of concern. Baltimore County Department of Environmental Protection and Sustainability continues to work with individual residents, and realtors to educate and assist in identifying those wells where treatment may be needed.

Drought

The drought of 2002 was marked by the lowest ground water levels on record in Baltimore County and an unprecedented number of replacement wells being drilled. Approximately 500 replacement wells were drilled which equates to nearly 1.5% of the total number of domestic wells estimated to be in service. Particularly hard hit were properties underlain by Loch Raven Schist and the Bradshaw Layered Amphibolite. These formations have long been known for their relatively low yielding wells and an increased likelihood of drilling “dry holes.” It was also noted that a large percentage of yield problems were experienced from hand dug wells or older shallow drilled wells that did not meet current construction and yield test standards.

MTBE

Methyl tert butyl ethylene (MTBE) has been used as a gasoline additive to help reduce toxic air emissions since the early 1990s. A growing number of ground water contamination cases involving MTBE in Maryland combined with increased public concern over its health implications prompted the Maryland Department of the Environment to issue new, more strict, regulations for petroleum storage facilities in January 2005. In May 2006, the petroleum industry ceased using MTBE as a gasoline additive for this region, and has since converted to ethanol to meet federal air emission regulations. Nevertheless, there continues to be a number of active ground water contamination cases in Baltimore County, most involving MTBE and other gasoline constituents. The current status of these investigations may be reviewed by accessing the Maryland Department of Environment's web page:

<http://www.mde.state.md.us/programs/Land/OilControl/Pages/remediationsites.aspx>

Road Salt

Once applied, road salt or sodium chloride (the predominant form of salt used in Baltimore County) is easily dissolved with precipitation and may enter the ground water system through the nearby surface soils or discharge directly into streams through storm water run-off. Studies have shown that the sodium typically becomes bound in subsurface soils, and gradually displaces calcium, magnesium and potassium from the soil into the ground water system (Kaushal *et. al.*)⁹. However, chlorides move through the subsurface and into groundwater relatively unaffected by chemical or biological interaction. The US EPA has set a secondary maximum contaminant level (SMCL) for chlorides at 250 mg/l (parts per million (ppm)) in drinking water. An SMCL is a non-enforceable water quality standard that is recommended for aesthetic qualities such as taste and odor. While chlorides are not considered a concern for human health, they can impart a bitter taste in drinking water and increase corrosion of metal pipes and fixtures. Chlorides can also inhibit plant growth and in high concentrations cause damage to root systems. The US EPA has set a Health Advisory for sodium of 20 mg/l.

In a study by the Maryland Geological Survey, "Ground Water Quality in the Piedmont Region of Baltimore County" (Bolton 1998), it was found that approximately 5% of the 106 wells sampled throughout rural Baltimore County had chloride levels above 100 ppm, but only one well was above the SMCL of 250 ppm. In addition, it was found that chloride concentrations were significantly higher in wells located within 200 feet of a paved roadway. Impacts to wells from chlorides are generally localized and dependent on where storm water run-off is directed. No wells in the 1998 study were found to have elevated levels of sodium in the water. However, over the last decade, there has been a marked increase in the number of complaints and many documents cases (dozens) of chloride and sodium levels exceeding SMCLs and Health Advisory levels.

⁹Kaushal, S.S., Groffman, P.M., Likens, G.E., Belt, K.T., Stack, W.P., Kelly, V.R., Band, L.E., & Fisher, G.T. (2005) *Proc. Natl. Acad. Sci. USA* 102, 13517 – 13520.

Baltimore County and the City of Baltimore have monitored salt concentrations from the drinking water reservoirs and streams leading to the reservoirs during base flow conditions (i.e. during dry weather). The data show a trend of increasing chloride levels that has more than doubled over the last 30 years. Sodium levels have increased 3 fold. Of most concern is that while chloride (and sodium) levels in streams are observed to peak during the winter months (as expected), the streams are not returning to baseline levels during the summer. The sodium and chlorides levels appear to be slowly building up in the groundwater system. Even if salt application were ceased today, it would take decades to the salt to be flushed out of the freshwater system.

While sodium chloride is not found naturally in this region, there are a number of anthropogenic sources of chlorides that are contributing to the observed trends. These include road salt, sanitary wastewater, fertilizers, and industrial discharges. The largest contribution of chlorides into Baltimore County watersheds by far is road salt. However, the other contributions should also be considered for proper management of this growing problem. For example, thousands of homeowners in Baltimore County use water softeners to treat their private water supplies. The spent brine from these systems solutions is usually discharged into the ground through their septic systems. While we are not seeing direct impacts to domestic wells from the use of water softeners (wells are intentionally sited to be upgradient and at least 100 feet from septic systems), chlorides from the brine are likely loading the ground water system and contributing to elevated chloride levels in downgradient streams. For further information related to chlorides and their environmental and health impacts, please see the Maryland Department of the Environment webpage:

<http://www.mde.state.md.us/programs/Marylander/Pages/roadSalt.aspx>

Regarding private water treatment systems, it is recommended that homeowners maintain an on-going service contract with a qualified professional to regularly monitor their well water quality and have their system upgraded or adjusted as needed to optimize the system efficiency.

SMALL COMMUNITY WATER SUPPLIES

There are currently nine small community water supply systems located in Baltimore County, together serving approximately 1985 people. With the exception of Phoenix and Sunnybrook, these systems are privately owned and operated.

Small Community Public Water Supply Systems in Baltimore County

Name	Location	Population Served
Glen Meadows Retirement Community	11630 Glen Arm Rd., Glen Arm	400
The Gramercy Mansion Bed & Breakfast	1400 Greenspring Valley Rd., Stevenson	40
Granite Trailer Court	10600 Davis Ave Woodstock	100
Oldfields School	1500 Glencoe Rd. Glencoe	200
Phoenix Community Water Supply ¹	Sweet Air Rd. Phoenix	50
Chapel Hill Nursing Center	4511 Robosson Rd. Randallstown	125 ²
Sunnybrook Community Water Supply ¹	Club View La. Phoenix	416 ²
Woodstock Job Corp	10900 Old Court Rd., Woodstock	675
Villa Julie Infirmary	1531 Greenspring Valley Rd., Stevenson	50
Total Population Served		2056

¹ Maintained by Baltimore County Department of Public Works

² Figure provided by MDE in Dec. 28, 2017 Correspondence, Safe Drinking Water Information System.

WATER PROGRAM COST SUMMARY

ESTIMATED 5-YEAR (2019-2023)

(Source: Capital Budget FY 2018, Capital Improvement Program FY 2019 – FY 2023)

Neighborhood Water Extensions (Petitions)	\$1,500,000
Construction at Highway Sites.....	\$1,500,000
Rehabilitation & Replacement of Water Mains.....	\$75,000,000
TOTAL NEIGHBORHOOD FACILITIES	\$78,000,000
 Major County Projects	 \$109,165,000
Joint City-County Projects (Baltimore County's Share Only)	\$462,820,000
GRAND TOTAL ALL WATER FACILITIES	\$649,985,000

Table No. 3
Projected Water Supply Demands and Planned Capacity

SERVICE AREA	2020								2025								2030							
	Population (Thousands)	GPCD* (Gallons)	Total Gallons* (GPCD)	Residential Demand (MGD)	Commercial Industrial Demand (MGD)	Unaccounted Water* (MGD)	Total Demand (MGD)	Planned Capacity (MGD)	Population (Thousands)	GPCD (Gallons)	Total Gallons (GPCD)	Residential Demand (MGD)	Commercial Industrial Demand (MGD)	Unaccounted Water (MGD)	Total Demand (MGD)	Planned Capacity (MGD)	Population (Thousands)	GPCD (Gallons)	Total Gallons (GPCD)	Residential Demand (MGD)	Commercial Industrial Demand (MGD)	Unaccounted Water (MGD)	Total Demand (MGD)	Planned Capacity (MGD)
FIRST	157.1	76	175	11.94	11.43	4.12	27.49	34.0	161	78	179	12.53	12.00	4.33	28.86	34.0	165	80	184	13.16	12.59	4.54	30.29	34.0
SECOND	98.5	74	108	7.29	0.69	2.66	10.64	13.5	102	77	112	7.81	0.74	2.85	11.39	13.5	104	78	114	8.11	0.77	2.96	11.84	13.5
CATONSVILLE FOURTH	57.4	98	149	5.63	1.64	1.28	8.55	10.0	58	99	151	5.74	1.68	1.31	8.73	10.0	59	101	153	5.94	1.74	1.35	9.03	10.0
COLGATE SECOND	6	63	74	0.38	0.00	0.07	0.44	0.7	6	63	74	0.38	0.00	0.07	0.44	0.7	6	63	74	0.38	0.00	0.07	0.44	0.7
EASTERN THIRD	90.5	78	102	7.06	0.33	1.85	9.23	13.0	92	79	104	7.29	0.34	1.91	9.54	13.0	93	80	105	7.45	0.34	1.95	9.74	13.0
FALLS FIFTH	7.7	64	107	0.49	0.13	0.21	0.82	1.8	8	66	111	0.53	0.13	0.22	0.89	1.8	8	66	111	0.53	0.13	0.22	0.89	1.8
PIKESVILLE FOURTH	104.6	80	128	8.37	3.01	2.01	13.39	16.0	107	82	131	8.75	3.15	2.10	14.00	16.0	109	83	133	9.08	3.27	2.18	14.53	16.0
POT SPRINGS FIFTH	12.3	77	127	0.95	0.38	0.23	1.56	1.9	12	75	124	0.90	0.36	0.22	1.49	1.9	12	75	124	0.90	0.36	0.22	1.49	1.9
REISTERSTOWN FIFTH	40	78	115	3.12	0.56	0.92	4.60	5.7	40	78	115	3.12	0.56	0.92	4.60	5.7	41	80	118	3.28	0.59	0.97	4.83	5.7
SHERWOOD FIFTH	0.5	111	127	0.06	0.00	0.01	0.06	0.2	1	167	191	0.17	0.00	0.03	0.19	0.2	1	167	191	0.17	0.00	0.03	0.19	0.2
SPARKS FIFTH	1.8	71	156	0.13	0.11	0.04	0.28	0.6	2	78	172	0.16	0.14	0.05	0.34	0.6	2	78	172	0.16	0.14	0.05	0.34	0.6
TOWSON FOURTH	94.1	87	147	8.19	2.88	2.77	13.83	15.5	95	88	148	8.34	2.93	2.82	14.10	15.5	96	89	150	8.52	3.00	2.88	14.39	15.5
WESTERN THIRD	71.6	72	111	5.16	1.20	1.59	7.95	9.6	72	72	112	5.21	1.22	1.61	8.04	9.6	73	73	113	5.36	1.25	1.65	8.26	9.6
TOTAL	742			58.74	22.36	17.76	98.86	122.5	756			60.94	23.24	18.43	102.61	122.5	769			63.03	24.17	19.07	106.27	122.5

SERVICE AREA	2035								2040							
	Population (Thousands)	GPCD (Gallons)	Total Gallons (GPCD)	Residential Demand (MGD)	Commercial Industrial Demand (MGD)	Unaccounted Water (MGD)	Total Demand (MGD)	Planned Capacity (MGD)	Population (Thousands)	GPCD (Gallons)	Total Gallons (GPCD)	Residential Demand (MGD)	Commercial Industrial Demand (MGD)	Unaccounted Water (MGD)	Total Demand (MGD)	Planned Capacity (MGD)
FIRST	169	82	188	13.79	13.20	4.76	31.76	34.0	172	83	191	14.28	13.67	4.93	32.89	34.0
SECOND	107	80	117	8.58	0.81	3.13	12.52	13.5	109	82	119	8.90	0.84	3.25	12.99	13.5
CATONSVILLE FOURTH	60	102	156	6.14	1.80	1.40	9.34	10.0	61	104	158	6.35	1.86	1.45	9.65	10.0
COLGATE SECOND	6	63	74	0.38	0.00	0.07	0.44	0.7	6	63	74	0.38	0.00	0.07	0.44	0.7
EASTERN THIRD	94	81	106	7.61	0.35	1.99	9.95	13.0	95	82	107	7.77	0.36	2.03	10.17	13.0
FALLS FIFTH	8	66	111	0.53	0.13	0.22	0.89	1.8	8	66	111	0.53	0.13	0.22	0.89	1.8
PIKESVILLE FOURTH	111	85	136	9.41	3.39	2.26	15.06	16.0	112	86	137	9.58	3.45	2.30	15.33	16.0
POT SPRINGS FIFTH	12	75	124	0.90	0.36	0.22	1.49	1.9	12	75	124	0.90	0.36	0.22	1.49	1.9
REISTERSTOWN FIFTH	41	80	118	3.28	0.59	0.97	4.83	5.7	41	80	118	3.28	0.59	0.97	4.83	5.7
SHERWOOD FIFTH	1	167	191	0.17	0.00	0.03	0.19	0.2	1	167	191	0.17	0.00	0.03	0.19	0.2
SPARKS FIFTH	2	78	172	0.16	0.14	0.05	0.34	0.6	2	78	172	0.16	0.14	0.05	0.34	0.6
TOWSON FOURTH	97	90	151	8.70	3.06	2.94	14.69	15.5	98	91	153	8.88	3.12	3.00	15.00	15.5
WESTERN THIRD	74	74	115	5.50	1.28	1.70	8.49	9.6	74	74	115	5.50	1.28	1.70	8.49	9.6
TOTAL	782			65.15	25.11	19.74	110.00	122.5	791			66.68	25.80	20.22	112.69	122.5

Notes:

1) Water projections are determined as a function of changes in population.

2) Water projections assume the percentage of unaccounted for water remains constant per zone.

* Data provided from Baltimore City Project 658, Comprehensive Plan for Water Facilities, Central System Report, Table II-13, Filtered Water Supplied by Zone, 2015 projections (March, 2003)

Table No. 4
Inventory of Existing Community / Multi-use Wells

Water Supply	Well ID	Public Water Supply ID	Aquifer	Coordinates (NAD 27 in thousands of feet)	Map No.	Depth (feet)	Well Diameter (Inches)	Maximum Safe Yield (gpd)	Pumping Capacity (gpd)	Comments
Municipal (Publicly Owned)										
Glen Arm Maintenance Facility (fka Grumman Aircraft) (MU)	BA-81-1777 BA-81-2071 Well #3	103-0052	Cockeysville Marble	942-591	W-17 A	200 100 ?	6	11,000	15,000	Added*
Oregon Ridge Park (MU)	BA-81-5810 BA-81-5811 BA-81-5812 BA-81-5898	103-1121	Cockeysville Marble	890-603	W-10 B	250 300 275 300	6	6,000	22,000	Added*
Phoenix Water Supply (CS)	BA-81-6482 BA-81-6524 BA-81-6525	003-0017	Baltimore Gneiss	918-610	W-11 A	200 200 200	6	5,000	7,000	
Sunnybrook Water Supply (CS)	Well #1 Well #2 Well #3	003-0011	Loch Raven Schist	923-606	W-11 A		6	31,000	60,000	
Manor Water Supply (MU)	BA-94-3562 BA-94-3633	103-1103	Baltimore Gneiss	920-628	W-11 A	400 400	6	5,000	15,000	Serves Manor Tavern Restaurant
Private Community/Institutional										
Bais Yaakov School for Girls (MU)	BA-73-3724	103-0002	Loch Raven Schist	877-581	W-16 A	200	6	10,300	15,500	
Baptist Home (MU)	BA-81-2904 BA-81-4577 BA-88-1436 BA-88-1437	003-0201	Baltimore Gneiss	877-577	W-16 A	300 300 200 250	6			Inactive
Camp Fretterd (fka Montrose School) (MU)	BA-81-6687 BA-88-1731	103-0055	Piney Run Formation	843-607	W-9 B	305 300	6	10,000	25,000	
Camp Milldale (aka, Pearlstone Retreat) (MU)	BA-92-0995 BA-94-3778	103-1331	Pleasant Grove Schist	841-640	W-9 B	205 250	6	12,000	32,000	
Caves Valley Golf Club (MU)	BA-88-1831 BA-88-1828	103-0065	Cockeysville Marble	874-587	W-16 A	140 400	6	3,000	5,000	

Table No. 4 (Continued)
Inventory of Existing Community / Multi-use Wells

Water Supply	Well ID	Public Water Supply ID	Aquifer	Coordinates (NAD 27 in thousands of feet)	Map No.	Depth (feet)	Well Diameter (Inches)	Maximum Safe Yield (gpd)	Pumping Capacity (gpd)	Comments
Chapel Hill Nursing Center (MU)	BA-94-3881; BA-81-7250, Well #3	003-0202	Serpentine	840-569	W-15 B	500 300 ?	6	6,500	10,000	
Glen Arm LLC (fka Marquip Ward United, fka Koppers) (MU)	BA-73-2480 BA-81-0481	103-0040	Cockeysville Marble	941-591		202 525	6	10,000	35,000	Added*
Glen Meadows Retirement Community (aka Notchcliff Lifecare Community) (MU)	BA-73-5149 BA-81-2562	003-0208	Cockeysville Marble	936-589	W-17 A	150 100	6		(50,000)	
Gramercy Mansion Bed & Breakfast (CS)	2 Wells	003-0023	Cockeysville Marble		W16B	?				Multiple OSDS
Granite Trailer Court (MU)	BA-81-0968 Spring	003-0204	Baltimore Gneiss	838-544	W-15 B	185	6	9,700	16,200	
Greystone Country Club (MU)	BA-94-1645	103-0074	Loch Raven Schist	911-655	W-4 B	300	6	4,000	5,500	
Hayfields County Club (MU)	BA-94-3289 BA-94-0329 BA-94-0328	103-0071	Cockeysville Marble	892-608	W-10 B	256 156 200	6			
Hereford High School (MU) (See Cycle 30 Issue 12-01)	BA-94-3100 BA-94-3101 BA-93-0492 BA-94-4235	103-0017	Loch Raven Schist	895-644	W-4 B	300 400 300 250	6	7,300	12,900	Added*
Hereford Middle School (MU)	BA-81-0033 BA-73-8284	103-0018	Setters Formation	898-635	W-10 B	275 273	6	6,100	9,200	Added*
Hillendale Country Club (MU)	BA-94-0008 BA-94-0268 BA-94-1239 BA-94-2698 BA-94-2697	103-0061	Loch Raven Schist	925-607	W-11 A	350 400 300 300 300	6	10,000	17,000	Added*
Hunt Valley Golf Club	BA-71-0081	102-1071	Cockeysville Marble	910-610	W-10 B	200	6	8,200	12,300	Added*
Life Point Church (fka Carroll Community Church) (MU)	BA-94-7313 BA-95-0730	103-0093	Pleasant Grove Schist	841-616	W-9B	180 130	6	3,900	10,800	

Table No. 4 (Continued)
Inventory of Existing Community / Multi-use Wells

Water Supply	Well ID	Public Water Supply ID	Aquifer	Coordinates (NAD 27 in thousands of feet)	Map No.	Depth (feet)	Well Diameter (Inches)	Maximum Safe Yield (gpd)	Pumping Capacity (gpd)	Comments
Manor Shopping Center (MU)	BA-73-2251 BA-73-2423 BA-81-7734 BA-73-5311 Well #5	103-0054	Loch Raven Schist	924-613	W-11 A	200 300 400 110 ?	6	9,000	15,000	Owner is reportedly hauling in water due to poor well yield
Maryvale Trinity Prep School	BA-81-0767 BA-94-6047	103-0025	Loch Raven Schist	888-582		200 700	6	7,500	11,000	Added*
Oldfields School (MU)	BA-81-7175 BA-81-5475 BA-88-1108 BA-81-1180 BA-94-1075	003-0210	Baltimore Gneiss	905-630	W-10 B	450 300 700 450 500	6	22,000	30,000	
Paper Mill Village (MU)	BA-81-6233; Well #2	103-0060	Loch Raven Schist	924-614	W-11 A	298	6	5,000	7,500	
Stevenson University (fka, Villa Julie College (CS))	BA-81-0564 BA-81-5471 BA-94-3047	103-0042	Cockeysville Marble	883-579	W-16 B	200 200 200	6	60,000	100,000	
Woodstock Job Corps Center (MU)	BA-94-2124 BA-81-0222 BA-81-0223 BA-81-0224 BA-92-0449	103-0012	Baltimore Gneiss	837-547	W-15 B	460 400 400 300 300	6	45,000	50,000	

* Existing facilities that use greater than 5,000 gpd, but were not included in the plan prior to the 2007 Triennial Review

Table No. 5
Inventory of Existing Impounded Supplies

Owner	Crest Elevation Above Sea Level (Feet)	Spillway Length (Feet)	Total Length of Dam (Feet)	Height of Crest Above Stream Bed (Feet)	Flooded Area of Crest Elevation (Acres)	Length of Shore Line at Crest Elevation (Miles)	Area of Land Owned (Acres)	Water Over Flowed Crest For First Time (Date)	Capacity of Reservoir (BIL/GALS)	Safe Yield (MGD)	Average Flow (MGD)
Municipal	520.0'	448.0'	692.5'	130.0'	1,500	46	7,380	9/23/33	20	48	
Prettyboy Dam (1)	(158.5 m)	(136.5 m)	(210.9 m)	(39.6 m)	(607 ha)	(74 km)	(2987 ha)		(76 MCM)	(182 TCMD)	
Municipal	240.0'	288.0'	650.0'	82.0'	2,400	50	8,000	5/20/23	23	100	264
Loch Raven Dam (1)	(73.2 m)	(87.8 m)	(198.1 m)	(25 m)	(971 ha)	(80 km)	(3237 ha)		(87 MCM)	(379 TCMD)	(999 TCMD)
Municipal	420.0'	480.0'	704.0'	160.0'	3,100	82	9,200	2/6/56	43	95	122
Liberty Dam (2)	(128 m)	(146.3 m)	(214.6 m)	(48.8 m)	(1254 km)	(132 km)	(3723 ha)		(163 MCM)	(360 TCMD)	(462 TCMD)

PUMPED SUPPLIES
Conowingo Dam (3)

Intake (Initial)	250 MGD	(946 TCMD)
Intake (Ultimate)	500 MGD	(1893 TCMD)
Deer Creek Pumping Station (Maximum)	4 Pumps @ 62.5 MGD each	(237 TCMD each)

- (1) Gunpowder River
- (2) Patapsco River
- (3) Susquehanna River

Table No. 6
Inventory of Existing Water Treatment Facilities

	OWNER				
	Municipal: Montebello Plant No. 1	Municipal: Montebello Plant No. 2	Municipal: Ashburton	BALTIMORE COUNTY Community Water Systems	
				Sunnybrook	Phoenix
WATER SOURCE	Gunpowder & Susquehanna Rivers		Patapsco River	Aquifer (2 wells)	Aquifer (2 wells)
TYPE OF TREATMENT	Chlorination, Chemical Treatment, Coagulation Sedimentation, Filtration, Fluoridation			Chlorination Chemical Treatment	Chlorination Chemical Treatment Filtration
PLANT COORDINATE LOCATION - NAD 27	917,124E 547,464N	915,923E 547,759N	895,645E 542,673N	923,200E 606,800N	918,500E 614,500N
PLANT COORDINATE LOCATION - NAD 83	1,429,542E 608,214N	1,428,341E 608,509N	1,408,063E 603,423N	1,435,617E 667,551N	1,430,917E 675,251N
RATED PLANT CAPACITY	128 MGD (485 TCMD)	112 MGD (424 TCMD)	120 MGD (454 TCMD)	70,000 GPD	36,000 GPD
AVERAGE PRODUCTION	Total of Plants 1 & 2 160.62 MGD (607.95 TCMD)		103.96 MGD (393.49 TCMD)	32,500 GPD	3,000 GPD
MAXIMUM PEAK FLOW	Total of Plants 1 & 2 237.24 MGD (897.65 TCMD)		158.65 MGD (600.49 TCMD)	52,000 GPD	7,000 GPD
STORAGE CAPACITY	Total of Plants 1 & 2 15.1 MG (57.2 TCM)	Druid Lake 193 MG (730.6 TCM)	Lake Ashburton 220 MG (832.8 TCM)	70,000 GAL	8,000 GAL
PLANNED EXPANSION	None	None	None	None	None
METHOD OF SLUDGE (*) REMOVAL	Sedimentation Lagoon	Sedimentation Lagoon	Sedimentation Lagoon	None	Pump Out
OPERATING AGENCY	Baltimore City	Baltimore City	Baltimore City	Baltimore County	Baltimore County

* Ultimate Disposal of Sludge: Co-disposal with BRWWTP Sludge

Table No. 7
Problem Areas

-
1. Susquehanna River: Red Water and hardness. Potential taste and odor problems.
 2. Loch Raven Reservoir: Algae Growth.

Table No. 8
Baltimore County Water Facilities
Capital Improvement Program

Project Job Order	Construction Start Date Fiscal Year	Priority	Maryland State Plane Coordinates NAD 83		Map	Project Description	Estimated Costs		Project Construction Capital Budget Program Number	Status Start (Design) Fiscal Year
							Total \$	Baltimore County \$		
First Zone										
3-36-007	2014	W-3	610750.6 611750.6	1479418.5 1484418.6	W17B	5,500 LF of 20” water main from Bengies Rd. to Eastern Ave. to Earles Rd.	4,000,000	4,000,000	0036	2016
3-67-278	2018	W-1	585750.1	1467418.8	W23B	Replacement of 6,000 LF of cast iron water main for Beechwood.	3,000,000	3,000,000	0067	2017
3-36-017	2020	W-3	610750.6	1479418.5	W17B	Rehabilitation of 37,000 LF of 36” water main Pulaski-Orem-Leland from Golden Ring Rd. to Bengies Rd.	6,000,000	6,000,000	0036	2018
3-36-028	2020	W-3	617750.6 624750.7	1469418.4 1474418.4	W17B	9,000 LF of 24” water main in Pulaski Hwy from Mohrs La. to Ebenezer Rd.	4,500,000	4,500,000	0036	2018
3-35-308	2018	W-6	617750.8	1487418.5	W17B	9,500 LF of 16” water main in Ebenezer Rd. from Stumpfs Rd. to Harewood Rd.	2,000,000	2,000,000	0035	2011
3-36-021	2017	W-3	620750.5	1456418.3	W17A	Fullerton Reservoir	72,000,000	32,800,000	0036	2008
Eastern Third Zone										
3-67-	2022	W-1	626750.3 628750.3	1431417.9 1427417.8	W17A	27,000 LF of water main. Hillen Rd. & Goucher Blvd. Rehabilitation	4,000,000	4,000,000	0067	2020
3-11-	2020	W-1	619559.2 615038.9	1449239.0 1444910.5	W17A	5,500 LF of 24” water main in Belair Rd. between Northern Pkwy and I-695	5,000,000	5,000,000	0011	2016
3-35-	2022	W-1	640750.3	1407417.4	W16B	8,000 LF of 16” main in Timonium Rd. and Mays Chapel Rd. between Thornton Rd. and Falls Rd. to improve fire flow and system reliability	2,000,000	2,000,000	0035	2020

Table No. 8 (continued)
Baltimore County Water Facilities
Capital Improvement Program

Project Job Order	Construction Start Date Fiscal Year	Priority	Maryland State Plane Coordinates NAD 83		Map	Project Description	Estimated Costs		Project Construction Capital Budget Program Number	Status Start (Design) Fiscal Year
							Total \$	Baltimore County \$		
Pikesville Fourth										
3-35-	2022	W-1	625749.5 620749.5	1361417.4 1367417.4	W16A	7,700 LF of 20” main Liberty & Deer Park Rds. from Chapman Rd. to Deer Park Tank	3,000,000	3,000,000	0035	2020
3-67-304	2018	W-1	625749.9	1388417.4	W16A	7,000 LF of 36” main between Painters Mill Rd. and Pleasant Hill Rd. in Reisterstown Rd.	10,000,000	10,000,000	0067	2016
3-12-489	2019	W-1			W16A	Pikesville PS Discharge Main-42”	10,000,000	10,000,000	0012	2016
Towson Fourth Zone										
3-35-445	2018	W-1			W16B	Towson PS Rehab	6,500,000	6,500,000	0035	2014
3-50-466	2015	W-1			W16B	24” water main in York Rd. from Cockeysville Rd. to Shawan Rd.	7,000,000	7,000,000	0050	2013
3-6-288	2018	W-2	651750.5	1416417.4	W10B	15,000 LF of 24” water main in York Rd. from Padonia Rd. to Cockeysville Rd.	9,600,000	9,600,000	0006	2009
Catonsville Fourth Zone										
3-35-332	2018	W-1			W22A	Catonsville PS Rehab-New 36” Suction and Discharge Main	8,000,000	8,000,000	0035	2012
Sparks Fifth Zone										
3-35-151	2018	W-3	670750.8	1412417.1	W10B	Improvements at the Sparks Pumping Station and Elevated Tank	4,000,000	4,000,000	0035	2015
Reisterstown Fifth Zone										
3-78	2018	W-1	641749.9	1372417.1	W16A	Replace 20,000 LF of 16” Main in Reisterstown Rd. from Pleasant Hill PS to Butler Rd.	15,000,000	15,000,000	0078	2016
3-78-0002	2020	W-3	655804.6	1371593.7	W16A	2.0 MG Bond Avenue Tank	5,500,000	5,500,000	0078	2008

Table No. 8 (continued)
Baltimore County Water Facilities
Capital Improvement Program

Project Job Order	Construction Start Date Fiscal Year	Priority	Maryland State Plane Coordinates NAD 83		Map	Project Description	Estimated Costs		Project Construction Capital Budget Program Number	Status Start (Design) Fiscal Year
							Total \$	Baltimore County \$		
Central System										
3-71-147	2015		608682.8	1429227.4		Montebello Plant Rehabilitation	112,125,000	41,487,000		2018
3-71-202	2020	W-3	619338.9	1456415.9	W17A	Fullerton Treatment Plant	530,782,000	232,412,000		2013
3-71-239	2017		611199.9	1421278.1		Guilford Reservoir Replacement	67,000,000	44,000,000		2011
3-71-474	2017					Druid Lake Storage Replacement	120,000,000	53,000,000		2013
3-71-475	2017					Ashburton Storage Replacement	110,000,000	48,000,000		2013

CAPITAL BUDGET 2018

**CAPITAL IMPROVEMENT PROGRAM FY 2019 - 2023
STAGE 7 - DEPT. 203 WATER SYSTEM**

Project No.	Title	Total Estimated Cost	Prior Authorizations	Total for 6-year Program	FY 2018*	FY 2020*	FY 2022*
0002	Neighborhood Petitions Water Ext.	5,194,484	3,694,484	1,500,000	500,000	500,000	500,000
0006	Towson Fourth Zone	52,489,140	48,489,140	4,000,000	4,000,000	0	0
0011	Eastern Third Zone	32,536,660	8,536,660	24,000,000	10,000,000	14,000,000	0
0012	Pikesville Fourth Zone	42,543,918	20,543,918	22,000,000	5,000,000	17,000,000	0
0035	Misc. Distribution System Improvements	75,423,146	46,923,146	28,500,000	8,500,000	10,000,000	10,000,000
0036	First Zone	137,301,432	125,711,432	11,590,000	11,590,000	0	0
0050	Construction at Highway Sites	5,800,888	4,300,888	1,500,000	500,000	500,000	500,000
0067	Main Replacement and Rehabilitation	202,287,582	127,287,582	75,000,000	20,000,000	25,000,000	30,000,000
0068	Special Water House Connections	735,000	720,000	15,000	5,000	5,000	5,000
0070	Fire Hydrants	790,778	730,778	60,000	20,000	20,000	20,000
0071	City/County Joint Use Facilities	1,001,544,774	538,724,774	462,820,000	140,320,000	152,000,000	170,500,000
0078	Reisterstown Fifth Zone	25,222,000	6,222,000	19,000,000	19,000,000	0	0
	TOTAL	1,581,869,802	931,884,802	649,985,000	219,435,000	219,025,000	211,525,000

* Baltimore County employs a Biennial Capital Budget.

CHAPTER IV - SEWERAGE PLAN

GENERAL BACKGROUND

Baltimore County constructs, operates and maintains all sewage collection and pumping facilities within the County. There are twenty-three (23) sewersheds which contain 2,060 miles of gravity sewer and 163 miles of pressure sewer. Baltimore County operates one hundred sixteen (116) pumping stations and one (1) 90-thousand gallon per day treatment plant at Richlyn Manor, east of Belair Road, adjacent to the Gunpowder River.

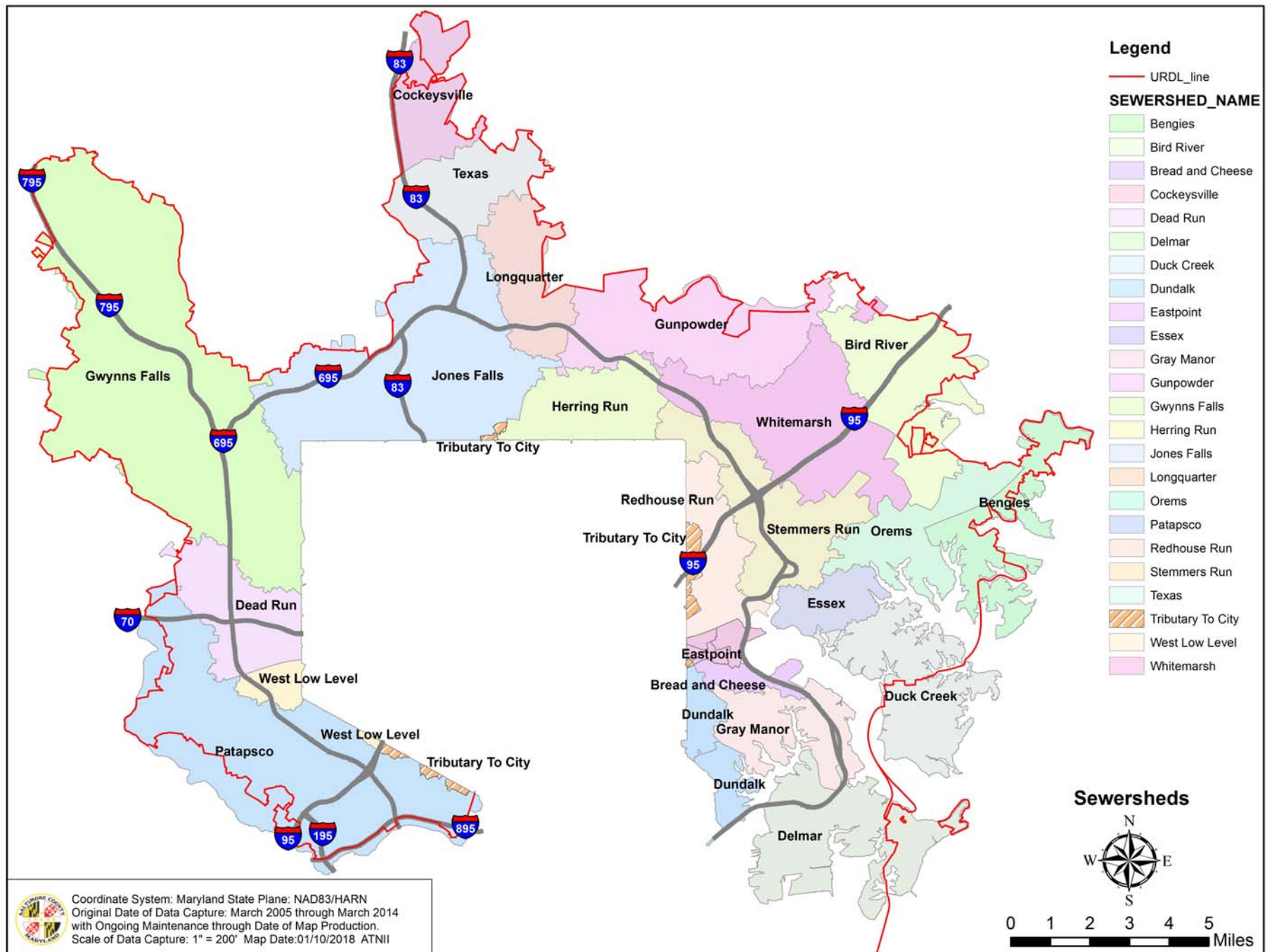
County generated sewage is treated and disposed of at the City-owned and operated treatment plants, Back River and Patapsco. The City and County agree to pay for new capital projects and for the repair to, and enlargement of, additions or improvements to sewerage facilities. The total flow conveyed from the County to the treatment plants determines the County's portion of capital improvement and/or operation and maintenance cost.

Baltimore County receives flow from Anne Arundel and Howard Counties. By agreement, these counties pay their portion of operating and capital costs. Copies of the sewer agreements with Baltimore City, Anne Arundel County and Howard County are included in the Appendices.

On September 20, 2005, Baltimore County entered into a Consent Decree with the U.S. Department of Justice, the U.S. Environmental Protection Agency and the Maryland Department of the Environment. This document requires Baltimore County to completely evaluate its sewer system and make corrections over a 14.5-year period in order to eliminate sanitary overflows in the collection system. This massive effort will involve field investigations, studies, reports, designs and construction projects. As of September 29, 2016 MDE and the EPA approved all Sewershed Repair, Replacement and Rehabilitation (SRRR) Plans. The County is in the process of implementing the corrective actions from these plans.

System Overview

The following is a description of each of the twenty-three (23) sewersheds with a discussion of their location, major system components, pumped flow, existing conditions and proposed projects:



STEMMERS RUN

Location

This area includes Parkville, Fullerton, Rossville, and Victory Villa and is located between Parkville and Essex in Eastern Baltimore County. The area encompassed by the drainage basin is approximately 3,950 acres serving a population of 31,230 people.

System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
Brien Run	2.57	30" to 54"
Montross Farms	0.45	10" to 16"
Northeast Creek	1.40	12" to 24"
Stemmers Run	4.90	18" to 27"
Parkville	0.77	10" to 18"
Carney Heights	0.85	15" to 18"
Orems Road	1.05	30" to 36"

Pumped Flow

Stemmers Run receives flow from the Orems Road and White Marsh Pumping Stations via the Brien Run Interceptor. Flow is then split between the 42.0 MGD Stemmers Run and the 71.7 MGD New Stemmers Run Pumping Stations. The sewage is then transported through 48" and 54" force mains discharging into the outfall sewer at Back River Treatment Plant, approximately three (3) miles south of the Stemmers Run Pumping Station.

Existing Conditions

The SRRR Plan was accepted by the EPA on September 9, 2013, and needs to be implemented by September 6, 2024.

Proposed Projects

There are multiple projects under design in Stemmers Run, below is a list of the proposed projects.

Project	Description	Estimated Cost
Brien Run Rehabilitation	20,800 LF of sewer rehabilitation	\$15,000,000
SR02B & 03 Rehabilitation	32,527 LF of sewer rehabilitation	\$4,197,690
SR05 Rehabilitation	26,692 LF of sewer rehabilitation	\$2,818,085
SR06 Rehabilitation	50,784 LF of sewer rehabilitation	\$6,232,490
SR08 Relief Sewer	500 LF of relief sewer	\$230,300
Flow Monitoring	Monitoring Orems Pump Station	\$144,000
Philadelphia Road Pressure Sewer & Grinder Replacement	300 LF of pressure sewer and one (1) grinder pump	\$103,720
Total		\$28,726,285

BIRD RIVER

Location

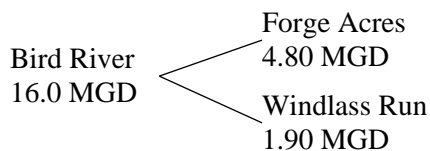
This area is in eastern Baltimore County includes Perry Hall and White Marsh and is boarded on the east by the Big Gunpowder Falls. The area encompassed by the drainage basin is approximately 5,710 acres serving a population of 14,222 people.

System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
Honeygo Run Interceptor	3.34	24" to 27"
Bird River Interceptor	4.58	16" to 42"

Pumped Flow

The 16.0 MGD Bird River Pumping Station receives flow from two (2) pumping stations, Forge Acres and Windless Run.



Existing Conditions

In accordance with the requirements of the Consent Decree, Baltimore County has developed a Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) for Bird River. This SRRR Plan was accepted by the EPA on September 29, 2016. The SRRR plan concluded there was no corrective action needed in Bird River.

Proposed Projects

Currently there is one (1) project in design in Bird River, Chapel Road Sewer Extension. This project is classified as a health project and is estimated to cost \$800,000.

OREMS

Location

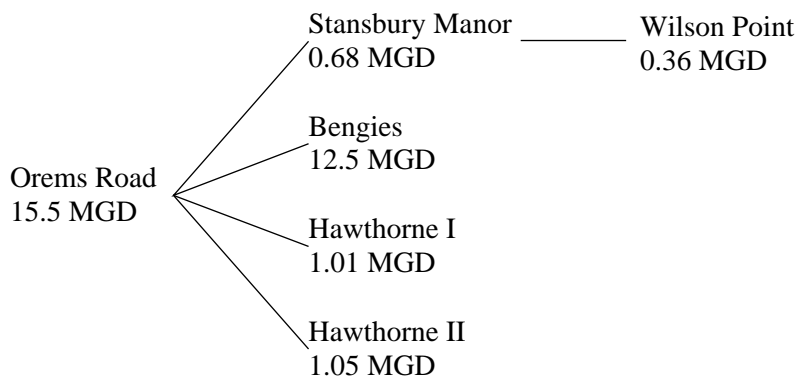
This area is in eastern Baltimore County, between Essex and Bengies, and encompasses the areas around Aero Acres, Martin Plaza, Ballard Gardens, Hawthorn, and Wilson Point including the Chesapeake Industrial Park and the Glen L. Martin State Airport. It serves approximately 1,600 acres with a population of 16,652 people.

System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
Middle River Diversion	1.27	15" to 36"
Middlesex Outfall	0.62	12" to 30"
Leland Avenue Interceptor	2.34	42" to 48"
Aero Acres Outfall	0.45	12" to 18"

Pumped Flow

The 15.5 MGD Orem's Road Pumping station receives flows from five (5) pumping stations as shown below:



The sewage is then transported from Orem's Road Pumping Station through a 30" force main to the Brien Run Interceptor in the Stemmers Run System

Existing Conditions

In accordance with the requirements of the Consent Decree, Baltimore County has developed a Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) for Orem's.

This SRRR Plan was accepted by the EPA on September 29, 2016, and needs to be implemented by September 29, 2020.

Proposed Projects

There are multiple projects under design in Orem, below is a list of the proposed projects.

Project	Description	Estimated Cost
Orem Flow Monitoring	Flow monitoring in OR01 & 08	\$288,000
Hawthorne 2 Force Main Repairs	Clean and inspection force main	\$235,195
Stansbury Manor Force Main Repairs	Replace force main	\$282,995
Orem 03 Relief Sewer	930 LF of relief sewer	\$330,500
Orem structural repair	20,586 LF of sewer rehabilitation	\$3,976,891
Stansbury Manor Pump Station	Station upgrade	\$2,700,000
Total		\$7,813,581

BENGIES

Location

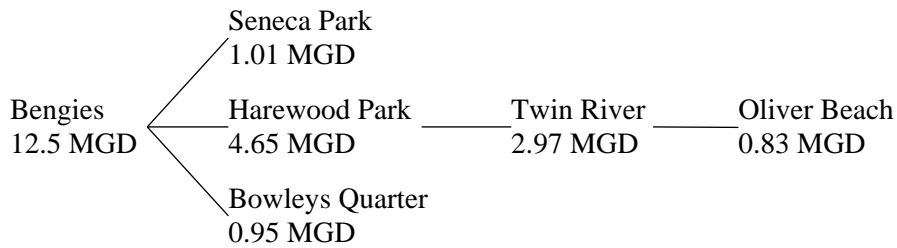
The Bengies Sewershed is in eastern Baltimore County and includes the Bowleys Quarters Peninsula and the area along Eastern Avenue northeast of Carroll Island Road. The area serves approximately 1,450 acres with a population of 13,863 people.

System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
Eastern Avenue Int. West	0.93	18" to 42"
Bowleys Quarters Interceptor	1.19	18" to 24"
Eastern Avenue Int. East	3.31	24" to 48"
Oliver Beach PS Outfall Sewer	0.63	15" to 18"
Middle River Neck Interceptor	1.44	20"
Twin River Beach PS Outfall Sewer	0.51	18" to 24"
Middle River Neck Interceptor	1.44	20"

Pumped Flow

The 12.5 MGD Bengies Pumping Station receives flow from five (5) pumping stations. The Bowleys Quarters Pumping Station pumps to the Middle River Neck Interceptor.



Existing Conditions

In accordance with the requirements of the Consent Decree, Baltimore County has developed a Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) for Bengies. This SRRR Plan was accepted by the EPA on September 29, 2016, and needs to be implemented by September 29, 2020.

Proposed Projects

There are multiple projects under design in Bengies, below is a list of the proposed projects.

Project	Description	Estimated Cost
Bengies Force Main Repairs	Clean, inspection and repair force main	\$219,050
Oliver Beach Force Main Repairs	Clean and inspection force main	\$78,950
Bengies Structural Repairs	11,857 LF of sewer rehabilitation	\$1,566,369
Harewood Park Pump Station	Station upgrade	\$2,500,000
Oliver Beach Pump Station	Station upgrade	\$2,500,000
Total		\$6,864,369

WHITE MARSH

Location

This area includes Perry Hall, Carney and the White Marsh Town Center and is located in eastern Baltimore County. The area encompassed by the drainage basin is approximately 4,025 acres serving a population of 51,152 people.

System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
North Branch White Marsh	4.75	30" to 54"
White Marsh South Interceptor	0.82	12" to 18"
South Branch White Marsh	2.29	12" to 24"
Barrington Outfall	0.59	10" to 20"
West Branch White Marsh	4.41	10" to 27"
Belmont Outfall Sewer	0.58	12" to 18"
Bird River Interceptor	2.50	24" to 48"

Pumped Flow

The 72.8 MGD White Marsh Pumping Station receives flows from the Gunpowder and Bird River Pumping stations. The sewage is then transported through dual 42" force mains extending southerly to Compass Road and the recently reinforced Brien Run Interceptor.

Existing Conditions

In accordance with the requirements of the Consent Decree, Baltimore County has developed a Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) for White Marsh. This SRRR Plan was accepted by the EPA on April 18, 2016, and needs to be implemented by April 18, 2024.

Proposed Projects

There are multiple projects under design in White Marsh, below is a list of the proposed projects.

Project	Description	Estimated Cost
White Marsh Flow monitoring	Flow monitoring in WM04 & WM37	\$432,000
White Marsh Force Main Repairs	Force main rehabilitation	\$13,200
White Marsh Relief Interceptor	Relief sewer	\$16,108,114
White Marsh Rehabilitation - East	10,864 LF of sewer rehabilitation	\$2,543,980
White Marsh Rehabilitation - West	42,719 LF of sewer rehabilitation	\$3,483,978
Total		\$22,581,272

GUNPOWDER

Location

The Gunpowder Sewershed is located in northeast Baltimore County, generally north of Joppa Road and south of the Gunpowder River. The area served by this Sewershed is approximately 4,100 acres with a population of 35,615 people.

System Components

<u>Main Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
Gunpowder Interceptor	6.60	27" to 42"
Perry Hall Interceptor	1.94	12" to 24"
Jenifer Run Interceptor	1.85	12" to 18"
Satyr Hill Interceptor	1.84	12" to 16"
Perry Hall Estates Outfall	0.23	18"

Pumped Flow

There are two (2) pumping stations tributary to Gunpowder Pumping Station, the Campus Hills and Longquarter Pumping Stations. The 37.0 MGD Gunpowder Pumping Station pumps flow through a 36" force main to the northern end of the White Marsh Sewershed.

Existing Conditions

In accordance with the requirements of the Consent Decree, Baltimore County has developed a Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) for Gunpowder. This SRRR Plan was accepted by the EPA on April 18, 2016, and needs to be implemented by April 18, 2026.

Proposed Projects

There are multiple projects under design in Gunpowder, below is a list of the proposed projects.

Project	Description	Estimated Cost
Campus Hills Pump Station	Station upgrade	\$2,000,000
Gunpowder Flow Monitoring	Flow monitoring in GN06 & GN18	\$288,000
Campus Hills Force Main Repairs	Force main rehabilitation	\$22,600
Jennifer Branch Relief	Relief sewer	\$2,465,400
Gunpowder Interceptor Relief Sewer	Relief sewer	\$22,376,124
Gunpowder Structural Repair	71,460 LF of sewer rehabilitation	\$10,309,548
Gunpowder Supplemental Force Main	Relief sewer	\$10,000,000
Minebank Interceptor Relocation	1300' of 8" & 20" relocation	\$800,000
Total		\$48,261,672

TEXAS

Location

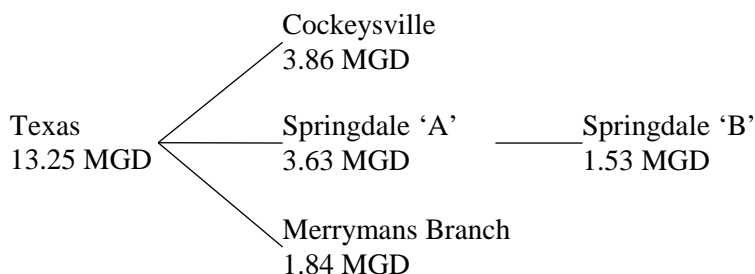
The Texas Sewershed is located between Cockeysville and Timonium in north-central Baltimore County. The Texas System serves approximately 2,100 acres with a population of 25,370 people.

System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Sizes</u>
Texas East Interceptor	1.86	12" to 24"
Texas South Interceptor	1.77	15" to 24"
Padonia Road West	1.38	10" to 16"
Gateridge Road Sewer	0.66	10" to 16"
Mays Chapel Outfall	0.83	12" to 16"

Pumped Flow

There are four (4) pumping stations tributary to the Texas Pump Station as shown below:



The Texas Pumping Station pumps through a 30" force main to the Longquarter Sewershed.

Existing Conditions

In accordance with the requirements of the Consent Decree, Baltimore County has developed a Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) for Texas. This SRRR Plan was accepted by the EPA on April 18, 2016, and needs to be implemented by April 18, 2022.

Proposed Projects

There are multiple projects under design in Texas, below is a list of the proposed projects.

Project	Description	Estimated Cost
Texas Flow Monitoring	Flow monitoring in TX08, TX10, TX12 & TX15	\$432,000
Texas Force Main repairs	Force main inspection	\$779,300
Texas Structural Repair	3,006 LF of sewer rehabilitation	\$619,394
Texas Force Main Inspection	Force main inspection	\$3,000,000
Total		\$4,830,694

LONGQUARTER

Location

The Longquarter Sewershed is located in north-central Baltimore County, between Towson and the Loch Raven Reservoir. The area served by this Sewershed is approximately 4,150 acres with a population of 19,737 people.

System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
Greenridge (Fairmount Avenue)	2.30	10" to 24"
Spring Branch Outfall	1.12	16" to 66"
Timonium Interceptor	1.54	33" to 42"
Seminary Avenue Sewer	0.46	15" to 21"

Pumped Flow

The Longquarter System receives flows from the Texas Pumping Station. The sewage from Longquarter Pumping Station is pumped through dual force mains to the top of the Gunpowder System. The present capacity at Longquarter Pumping Station is 36.0 MGD.

Existing Conditions

In accordance with the requirements of the Consent Decree, Baltimore County has developed a Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) for Longquarter. This SRRR Plan was accepted by the EPA on April 18, 2016, and needs to be implemented by April 18, 2024.

Proposed Projects

There are multiple projects under design in Longquarter, below is a list of the proposed projects.

Project	Description	Estimated Cost
Longquarter Flow Monitoring	Flow monitoring for LQ03, LQ05 & LQ13-15	\$504,000
Longquarter Structural Repair LQ1-7 & 20	48,052 LF of sewer rehabilitation	\$5,518,290
Longquarter Structural Repair LQ8-19	51,534 LF of sewer rehabilitation	\$8,112,915
Longquarter Force Main Replacement	Force main rehabilitation	\$5,260,000
Gunpowder Supplemental Force Main	Relief sewer	\$10,000,000
Minebank Interceptor Relocation	1300' of 8" & 20" relocation	\$800,000
Total		\$30,195,205

COCKEYSVILLE

Location

The Cockeysville Sewershed is located in north-central Baltimore County. The area served by this system is approximately 1,400 acres with a population of 5,523 persons.

System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
Oregon Branch Interceptor	1.14	21" to 36"
Beaver Dam Run Interceptor	1.02	27" to 30"
Western Run Interceptor	3.67	12" to 36"
Ashland Sub-Interceptor	0.39	18"

Pumped Flow

There is one (1) pumping station tributary to the Cockeysville Pump Station, Loveton Estates. The sewage is pumped from the 3.86 MGD Cockeysville Pumping Station

through a 24-inch force main southerly along the Pennsylvania Railroad to the Texas Pumping Station.

Existing Conditions

In accordance with the requirements of the Consent Decree, Baltimore County has developed a Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) for Cockeysville. This SRRR Plan was accepted by the EPA on September 29, 2016, and needs to be implemented by September 29, 2020.

Proposed Projects

There are two (2) projects under design in Cockeysville, below is a list of the proposed projects.

Project	Description	Estimated Cost
Cockeysville Structural Repair	2,346 LF of sewer rehabilitation	\$766,607
Cockeysville Force Main Repair - Phase I	Force main rehabilitation	\$194,358
Total		\$960,965

ESSEX

Location

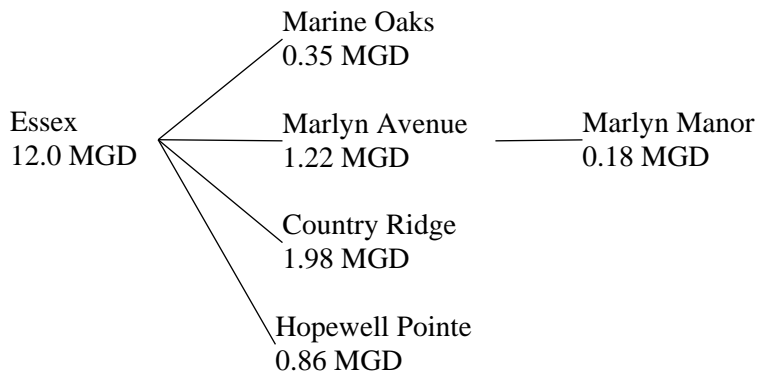
The Essex Sewershed consists of the Essex area in eastern Baltimore County. The area served is approximately 1,900 acres with a population of 17,138 people.

System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
Essex Outfall Sewer	1.94	12" to 18"
Cedar-Taylor Avenue Outfall	1.33	12" to 30"
Cedar Avenue Outfall	2.77	18" to 30"

Pumped Flow

The 12.0 MGD Essex Pumping Station receives flows from five (5) pumping stations as shown below:



The sewage is then pumped through a 20" force main, either under Back River or along Eastern Avenue and outfalls, to the Back River Wastewater Treatment Plant.

Existing Conditions

In accordance with the requirements of the Consent Decree, Baltimore County has developed a Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) for Essex. This SRRR Plan was accepted by the EPA on April 18, 2016, and needs to be implemented by April 18, 2022.

Proposed Projects

There are multiple projects under design in Essex, below is a list of the proposed projects.

Project	Description	Estimated Cost
Country Ridge Force Main	Force main cleaning	\$10,933
Marlyn Ave. and Marlyn Manor Force Main	Force main cleaning	\$10,511
Essex Flow Monitoring	Flow monitoring in SX07	\$144,000
Essex Structural Repairs	18,491 LF of sewer rehabilitation	\$7,185,565
Essex Sewer Upsizing	7,310 LF of sewer rehabilitation	\$3,882,508
Essex Pump Station	Pump station upgrade	\$26,381,614
Marlyn-Old Eastern Sewer Rehabilitation	12,700 LF of sewer rehabilitation	\$4,000,000
Marine Oak Pump Station	Wet pit submersible station	\$1,500,000
Essex Bridge Force Main Repairs	Force main rehabilitation	\$288,900
Essex Force Main Replacement	Force main replacement	\$5,811,855
Total		\$49,215,886

DUCK CREEK

Location

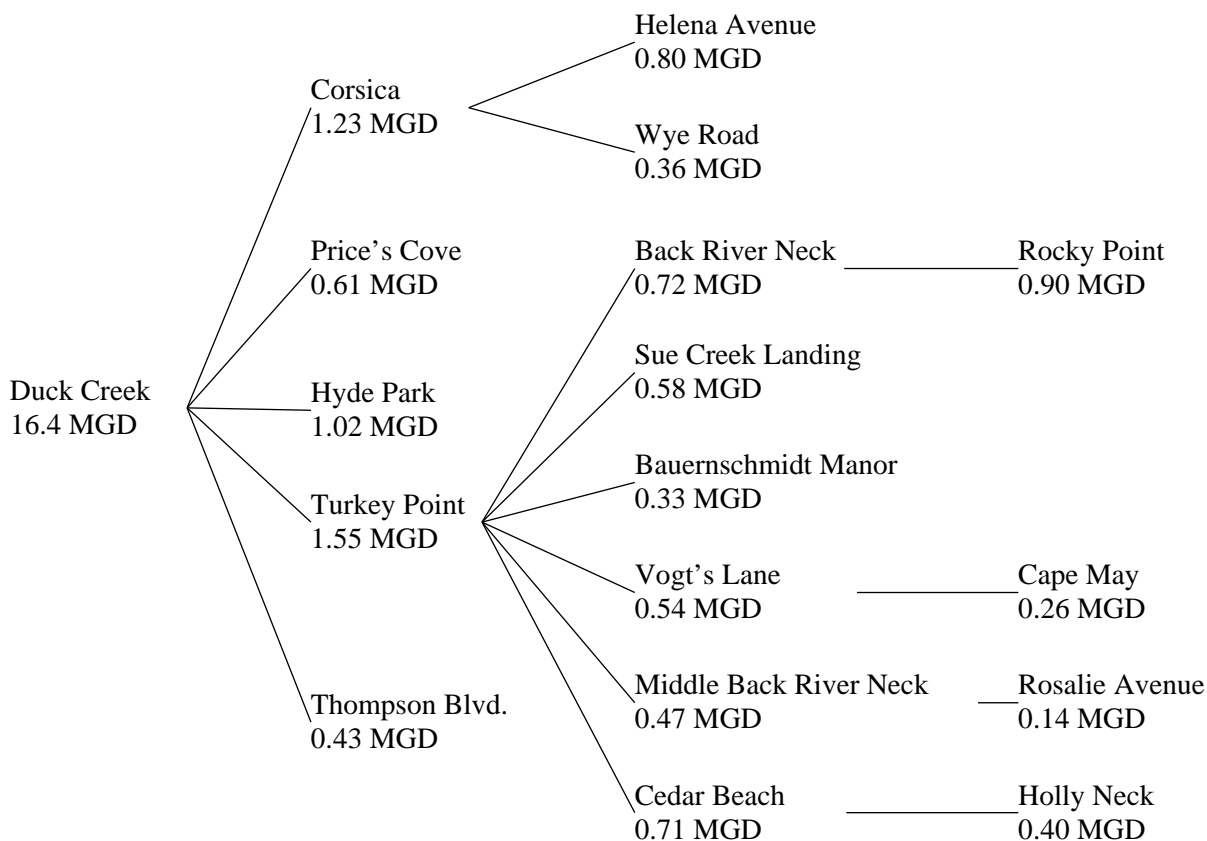
The Duck Creek Sewershed is located south of Essex in eastern Baltimore County and includes Cape May, Turkey Point and the Back River Neck Peninsula. The area encompassed by the drainage basin is approximately 1,475 acres serving a population of 18,047 people.

System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
Marlyn Avenue Hyde Park	1.41	12" to 42"
Middleborough Interceptor	1.54	12" to 24"
Turkey Point Interceptor	0.99	8" to 24"
Back River Neck Sewer	0.52	18"
Cape May PS Outfall	0.30	12"

Pumped Flow

The existing capacity of the Duck Creek Pumping Station is 16.4. The sewage is then transported through a 30" force main along Eastern Avenue and outfalls to the Back River Treatment Plant. The pumping station receives flows from seventeen (17) pumping stations as shown below:



The sewage is then transported through a 30” force main along Eastern Avenue and outfalls to the Back River Treatment Plant.

Existing Conditions

In accordance with the requirements of the Consent Decree, Baltimore County has developed a Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) for Duck Creek. This SRRR Plan was accepted by the EPA on April 18, 2016, and needs to be implemented by April 18, 2022.

Proposed Projects

There are multiple projects under design in Duck Creek, below is a list of the proposed projects.

Project	Description	Estimated Cost
Bauernschmidt Force Main repairs	Force main cleaning & rehabilitation	\$11,293
Cedar Beach-Back River Neck Force Main repairs	Force main cleaning & rehabilitation	\$65,659
Sue Creek Force Main	Force main cleaning & rehabilitation	\$11,142
Duck Creek Flow Monitoring	Corsica pump station & DC 07 flow monitoring	\$72,000
Duck Creek Force Main repairs	Force main cleaning & rehabilitation	\$59,110
Turkey Point Force Main repairs	Force main cleaning & rehabilitation	\$60,478
Duck Creek structural	4,184 LF of sewer rehabilitation	\$1,885,141
Tickwood Road Sewer Extension	1800 LF pressure sewer & 4 grinders pumps	\$250,000
Corsica Pump Station Capacity	Pump station upgrade	\$2,879,494
Middle Back River Neck Pump Station	Pump station upgrade	\$575,489
Thompson Blvd. Pump Station	Wet pit submersible station upgrade	\$1,700,000
Corsica Pump Station Force Main	Force main replacement	\$1,947,050
Total		\$9,516,856

BREAD & CHEESE

Location

The Bread and Cheese Sewershed is located in the south eastern portion of Baltimore County, generally southeast of Eastern Avenue, along the south side of North Point Boulevard to a point where it intersects Bread and Cheese Creek and then both sides of North Point Boulevard to Coves Road. The area encompassed by the drainage basin is approximately 700 acres serving a population of 5,946 people.

System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
North Point Blvd. Interceptor	1.02	18" to 24"
Bread and Cheese Creek Interceptor	1.13	12" to 24"
Gray Manor FM Outfall	0.64	30" to 36"

Pumped Flow

The 16.7 MGD Bread and Cheese Pumping Station normally has no other pump stations tributary to it. However, the Gray Manor Pumping Station has the option of pumping a small percentage of its flow to Bread and Cheese. The Bread and Cheese Pumping Station transports the sewage through a force main that outfalls to the Back River Treatment Plant.

Existing Conditions

In accordance with the requirements of the Consent Decree, Baltimore County has developed a Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) for Bread & Cheese. This SRRR Plan was accepted by the EPA on September 29, 2016, and needs to be implemented by September 29, 2020.

Proposed Projects

There are two (2) projects under design in Bread & Cheese, below is a list of the proposed projects.

Project	Description	Estimated Cost
Bread & Cheese Structural	13,612 LF of sewer rehabilitation	\$3,630,000
Bread & Cheese Force Main	Force main rehabilitation	\$25,930
Total		\$3,655,930

GREY MANOR

Location

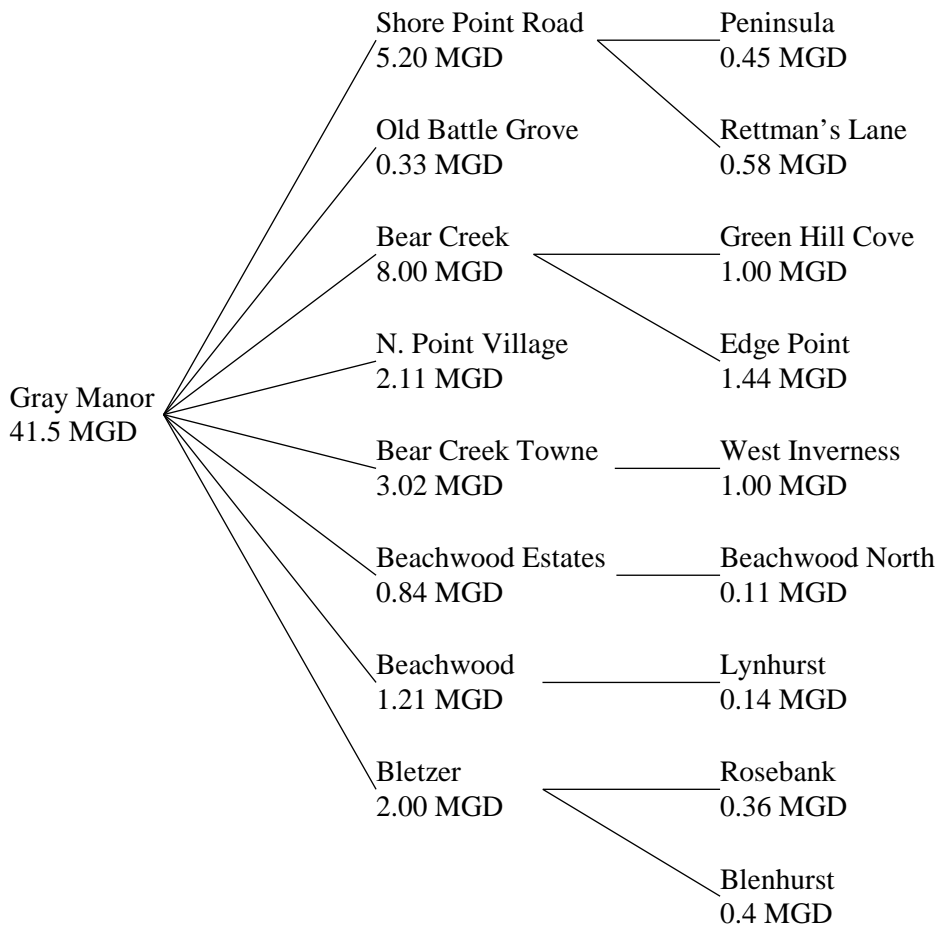
The Gray Manor Sewershed is in the south eastern portion of Baltimore County, generally bounded by Back River on the east, German Hill Road and North Point Road on the north, Sollers Point Road and Merrit Boulevard on the west, and Patapsco Freeway and North Point Boulevard on the south. The area encompassed by the drainage basin is approximately 2,225 acres serving a population of 29,368 people.

System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
Lynch Road - Wise Avenue Sewer	0.78	30" to 48"
Patapsco Neck Outfall	2.03	33" to 48"
Shore Road PS Collector Sewer	0.94	12" to 18"
Wise Avenue (Bea Creek PS Outfall)	1.20	24" to 30"
North Point Village PS Outfall	0.42	10" to 24"
Beachwood Road PS Outfall	0.58	12" to 21"
Bletzer Road Outfall	0.34	10" to 16"
Bearcreek Towne PS Outfall	0.26	18"
Beach-Bayside Drive Collector Sewer	1.02	10" to 16"

Pumped Flow

There is a total of seventeen (17) pumping stations that are tributary to the Gray Manor Pump Station as shown below:



The 41.5 MGD Gray Manor Pumping Station has the option of pumping a small percentage of its flow to the Bread and Cheese Sewershed but normally pumps directly to the main outfall sewer at Back River Wastewater Treatment Plant.

Existing Conditions

In accordance with the requirements of the Consent Decree, Baltimore County has developed a Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) for Grey Manor. This SRRR Plan was accepted by the EPA on April 18, 2016, and needs to be implemented by April 18, 2022.

Proposed Projects

There are multiple projects under design in Grey Manor, below is a list of the proposed projects.

Project	Description	Estimated Cost
Grey Manor Flow Monitoring	North Point Village pump station	\$72,000
Bear Creek Force Main	Force main cleaning	\$19,720
North Pt. Village Force Main repair	Force main cleaning	\$10,974
Bear Creek Towne Force Main	Force main inspection	\$3,000
Gray Manor Force Main repairs - Phase I	Force main inspection & repair	\$43,200
Old Battle Grove Force Main repair	Force main inspection & repair	\$18,806
Rosebank Force Main replacement	Force main replacement	\$262,920
Beachwood Pump Station	Station upgrade	\$2,200,000
Bear Creek Towne Pump Station	Station upgrade	\$545,200
Blenhurst Pump Station	Station upgrade	\$2,000,000
Peninsula Blvd Pump Station	Station upgrade	\$1,700,000
Rettman's Land Pump Station	Station upgrade	\$2,000,000
Rosebank Pump Station	Station upgrade	\$2,000,000
West Inverness Pump Station	Station upgrade	\$3,907,266
Grey Manor Basin 11 Upsize	2,585 LF of sewer rehabilitation	\$1,085,742
Grey Manor Basin 20 Upsize	535 LF of sewer rehabilitation	\$187,250
Grey Manor Basin 01 Upsize	4,367 LF of sewer rehabilitation	\$1,755,845
Gray Manor Structural	9,182 LF of sewer rehabilitation	\$5,543,189
Grey Manor Basin 16 Relief	Relief sewer	\$1,010,055
Total		\$24,365,167

DELMAR

Location

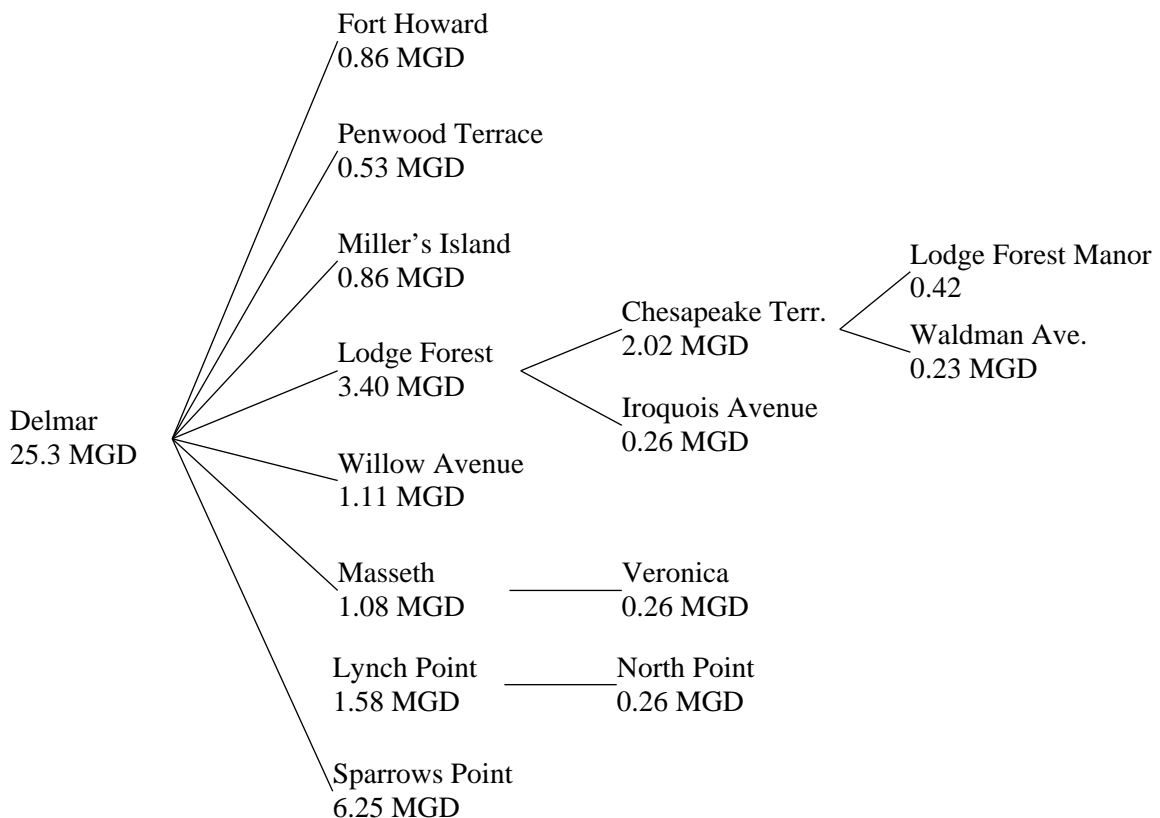
The Delmar Sewershed is located in the extreme southeastern end of Baltimore County, south and east of North Point Boulevard and Patapsco Freeway. The area encompassed by the drainage basin is approximately 1,600 acres serving a population of 8,458 people.

System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
Glen Echo Interceptor	1.38	15" to 36"
Sparrows Point Force Main Outfall	0.47	24"
Chesapeake Terrace Collector Sewer	0.89	10" to 24"
Chesapeake Terrace FM Outfall	0.35	12" to 16"

Pumped Flows

The 25.3 MGD Delmar Pumping Station receives flows from fourteen (14) pumping stations as shown below:



The sewage is then pumped through a 30" force main to the Patapsco Neck Outfall Sewer at the upper end of the Gray Manor System.

Existing Conditions

In accordance with the requirements of the Consent Decree, Baltimore County has developed a Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) for Delmar. This SRRR Plan was accepted by the EPA on April 18, 2016, and needs to be implemented by April 18, 2022.

Proposed Projects

There are multiple projects under design in Delmar, below is a list of the proposed projects.

Project	Description	Estimated Cost
Delmar Flow Monitoring	Flow monitoring in DM03 & DM09	\$216,000
Delmar structural repair	18,583 LF of sewer rehabilitation	\$3,360,702
Glen Echo Interceptor Upsize	4,035 LF of sewer rehabilitation	\$2,261,756
Lynch Point Outfall	Relief sewer	\$4,000,953
Lodge Forest Manor Pump Station	Wet pit submersible station	\$1,500,000
Millers Island Pump Station	Pump station upgrade	\$1,181,266
Pennwood Terrace Pump Station	Pump station upgrade	\$2,635,133
Delmar Force Main	Force main inspection & repair	\$466,000
Ft. Howard Force Main	Force main inspection & repair	\$226,670
Lodge Forest Force Main	Force main inspection & repair	\$1,649,670
Lodge Forest Manor Force Main	Force main inspection & repair	\$256,668
Millers Island Force Main	Force main inspection & repair	\$3,616,742
Willow Ave Force Main	Force main rehabilitation	\$5,000
Total		\$21,376,560

EASTPOINT

Location

The Eastpoint Sewershed is a small area in eastern Baltimore County. The system is along Eastern Boulevard in the area of North Point Boulevard. The system has one (1) pumping station and a small gravity system all tributary to the Back River Treatment Plant. The system serves 226 acres with a population of 5,523 people.

System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
Eastpoint Outfall Sewer	0.58	8" to 12"

Pumped Flow

The Eastpoint Pumping Station has a capacity of 2.7 MGD and pumps to the Back River Wastewater Treatment Plant.

Existing Conditions

In accordance with the requirements of the Consent Decree, Baltimore County has developed a Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) for Eastpoint. This SRRR Plan was accepted by the EPA on April 18, 2016, and needs to be implemented by April 18, 2022.

Proposed Projects

There are multiple projects under design in Eastpoint, below is a list of the proposed projects.

Project	Description	Estimated Cost
Eastpoint Flow Monitoring	Flow monitoring in EP02 & EP06	\$288,000
Eastpoint structural	8,524 LF of sewer rehabilitation	\$1,563,426
Eastpoint Basin 04 relief & upsize	Relief sewer	\$1,314,600
Eastpoint Force Main Improvements	Force main rehabilitation	\$146,000
Total		\$3,312,026

REDHOUSE RUN

Location

The Redhouse Run Sewershed is on the east side of Baltimore County along the eastern boundary of Baltimore City, north of the Back River Treatment Plant. The system serves 2,500 acres and 17,552 people.

System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
Redhouse Run Interceptor	4.35	18" to 30"
Chesaco Park Outfall	0.64	15" to 24"
Chesaco Park Collector Sewer	0.35	12" to 18"

Pumped Flow

There are two (2) pumping stations tributary to the Redhouse Run Pump Station. The 3.44 MGD Chesaco Park Pumping Station pumps to the Chesaco Park Outfall Sewer and 1.15 MGD Quad Avenue Pumping Station pumps directly to Red House Run Pumping

Station. The 15.0 MGD Red House Run Pumping Station pumps directly to the Back River Wastewater Treatment Plant.

Existing Conditions

In accordance with the requirements of the Consent Decree, Baltimore County has developed a Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) for Redhouse Run. This SRRR Plan was accepted by the EPA on April 18, 2016, and needs to be implemented by April 18, 2024.

Proposed Projects

There are multiple projects under design in Redhouse Run, below is a list of the proposed projects.

Project	Description	Estimated Cost
Quad Ave. Force Main	Force main inspection	\$5,584
Chesaco Park Force Main	Force main inspection & repair	\$5,100
Redhouse Run Force Main	Force main inspection & repair	\$15,000
Redhouse Run Structural Repairs	59,686 LF of sewer rehabilitation	\$21,391,423
Redhouse Run Relief Sewer	7,716 LF of relief sewer and upsizing	\$6,370,364
Storage Tank	Storage tank in basin RR13	\$2,573,220
Total		\$30,360,691

DUNDALK

Location

The Dundalk Sewershed is located in southeastern Baltimore County west of Baltimore City. The area served is approximately 1,500 acres with a population of 23,458 people.

System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
Woodland Avenue	0.31	20" to 24"
Cameron Drive Outfall	0.76	10" to 24"
Liberty Parkway (Dundalk)	0.70	12" to 24"
Keyway Road OF Sewer	0.24	12" to 18"

Pumped Flow

The 7.5 MGD Dundalk Pumping Station receives flows from the Day Village and Lyons Homes Pumping Stations. The sewage is then transported through a force main into Baltimore City where it is re-pumped to the Back River Wastewater Treatment Plant.

Existing Conditions

In accordance with the requirements of the Consent Decree, Baltimore County has developed a Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) for Dundalk. This SRRR Plan was accepted by the EPA on April 18, 2016, and needs to be implemented by April 18, 2022.

Proposed Projects

There are multiple projects under design in Dundalk, below is a list of the proposed projects.

Project	Description	Estimated Cost
Dundalk Force Main	Force main inspection	\$7,000
Dundalk Sewer Upsizing	469 LF of sewer rehabilitation in DUN06	\$164,211
Dundalk Structural Repairs	68,013 LF of sewer rehabilitation	\$6,119,752
Lyons Home Force Main	Force main rehabilitation & repairs	\$64,480
Total		\$6,355,443

HERRING RUN

Location

The Herring Run Sewershed is located at the north boundary of Baltimore City south of the Baltimore Beltway, between Harford Road and York Road. The system serves an area of approximately 3,200 acres with a population of 43,544 people.

System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
East Branch Herring Run	2.32	12" to 24"
West Branch Herring Run	2.17	12" to 24"
E. Fork W. Branch Herring Run	1.30	12" to 18"
W. Fork E. Branch Herring Run	1.55	12" to 15"

Pumped Flow

There are no pumping stations located in the Herring Run Sewershed.

Existing Conditions

The Herring Run SRRR Plan was accepted by the EPA on September 9, 2013, and needs to be implemented by September 6, 2018.

Proposed Projects

There are multiple projects under design in Herring Run, below is a list of the proposed projects.

Project	Description	Estimated Cost
East Branch Herring Run Relief Sewer	Interceptor relief sewer	\$9,287,646
Herring Run Structural Repairs	104,021 LF of sewer rehabilitation	\$7,700,000
Herring Run Basin 06 Rehabilitation	Basin wide rehabilitation	\$1,146,138
Herring Run Basin 33 Relief Sewer	1890 LF of 12" relief sewer	\$661,150
Herring Run Basin 31 Rehabilitation	Basin wide rehabilitation	\$2,000,033
Herring Run Basin 17 Relief Sewer	1414 LF of 15" and 18" relief sewer	\$635,670
Herring Run Basin 22 Relief Sewer	896 LF of 24" relief sewer	\$439,040
Total		\$21,869,677

JONES FALLS

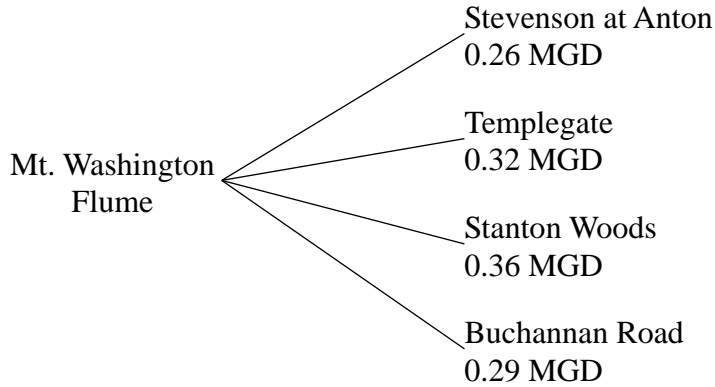
System Components

The Jones Falls Wastewater Drainage Area is located in central Baltimore County from the north boundary of Baltimore City to Green Spring Valley and from York Road on the east to Reisterstown on the west. The system serves approximately 7,100 acres and 63,756 people.

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
Jones Falls Interceptor	5.23	8" to 42"
Towson Run Interceptor	3.83	8" to 24"
Roland Run Interceptor	5.60	15" to 42"
Moore's Branch	3.11	12" to 18"
Worleys Run Interceptor	1.81	15" to 24"
Deepdale Drive Outfall	1.31	8" to 16"
Slaughterhouse Branch	2.86	12" to 18"

Pumped Flow

There are four (4) pumping stations in the Jones Falls System, Stevenson at Anton, Templegate, Stanton Woods and Buchanan Road as shown below:



The sewage from these stations flow to the Jones Falls Interceptor and then to the Mt. Washington Flume at the Baltimore City Line.

Existing Conditions

The Jones Falls SRRR Plan was accepted by the EPA on December 9, 2013, and needs to be implemented by September 6, 2019.

Proposed Projects

There are multiple projects under design in Jones Falls, below is a list of the proposed projects.

Project	Description	Estimated Cost
Blair Hill Road Improvements	335 LF of sewer rehabilitation	\$400,000
Large Diameter Rehabilitation	Interceptor sewer rehabilitation	\$6,200,000
Jones Falls Structural Repairs	91,769 LF of sewer rehabilitation	\$9,376,960
Towson Run Relief Sewer	1,600 LF of 24" relief sewer	\$1,300,000
Total		\$17,276,960

WEST LOW LEVEL

Location

The West Low Level Sewershed is located in the southwest part of Baltimore County. The area is south of Baltimore National Pike to south of Frederick Road and from an area west of the Baltimore Beltway (I-695) easterly to the boundary of Baltimore City. The area served by this system is approximately 880 acres with a population of 10,531 people.

System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
West Low Level Interceptor	1.51	10" to 21"

Pumped Flow

There are no pump stations within the West Low Level Sewershed.

Existing Conditions

The West Low Level SRRR Plan was accepted by the EPA on December 9, 2013, and needs to be implemented by September 6, 2019.

Proposed Projects

There are two (2) projects under design in West Low Level, below is a list of the proposed projects.

Project	Description	Estimated Cost
West Low Level 6" Sewer Replacement	Replace 9185' of 6" sewers with 8"	\$3,036,147
Academy Heights Relief Sewer	2,300 LF of 15" relief sewer	\$1,900,000
Total		\$4,936,147

DEAD RUN

Location

The Dead Run Sewershed is located on the west side of Baltimore County from an area south of Windsor Mill Road southerly to Baltimore National Pike and from west of Rolling Road easterly to the west boundary of Baltimore City. The area served is approximately 3,250 acres with a population of 31,046 people.

System Components

<u>Major Sewer</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
Dead Run Interceptor	3.25	15" to 30"
Ingleside Avenue Outfall	1.63	12" to 16"
Catonsville Manor Outfall	0.65	12" to 15"
Dead Run Branch	1.85	16" to 24"

Pumped Flow

There are one (1) County owned pump station in Dead Run, Putnam Green Pumping Station.

Existing Conditions

The Dead Run SRRR Plan was accepted by the EPA on December 9, 2013, and needs to be implemented by September 6, 2017.

Proposed Projects

There is one (1) project under design in Dead Run, it is a rehabilitation project estimated at \$200,000.

GWYNNS FALLS

Location

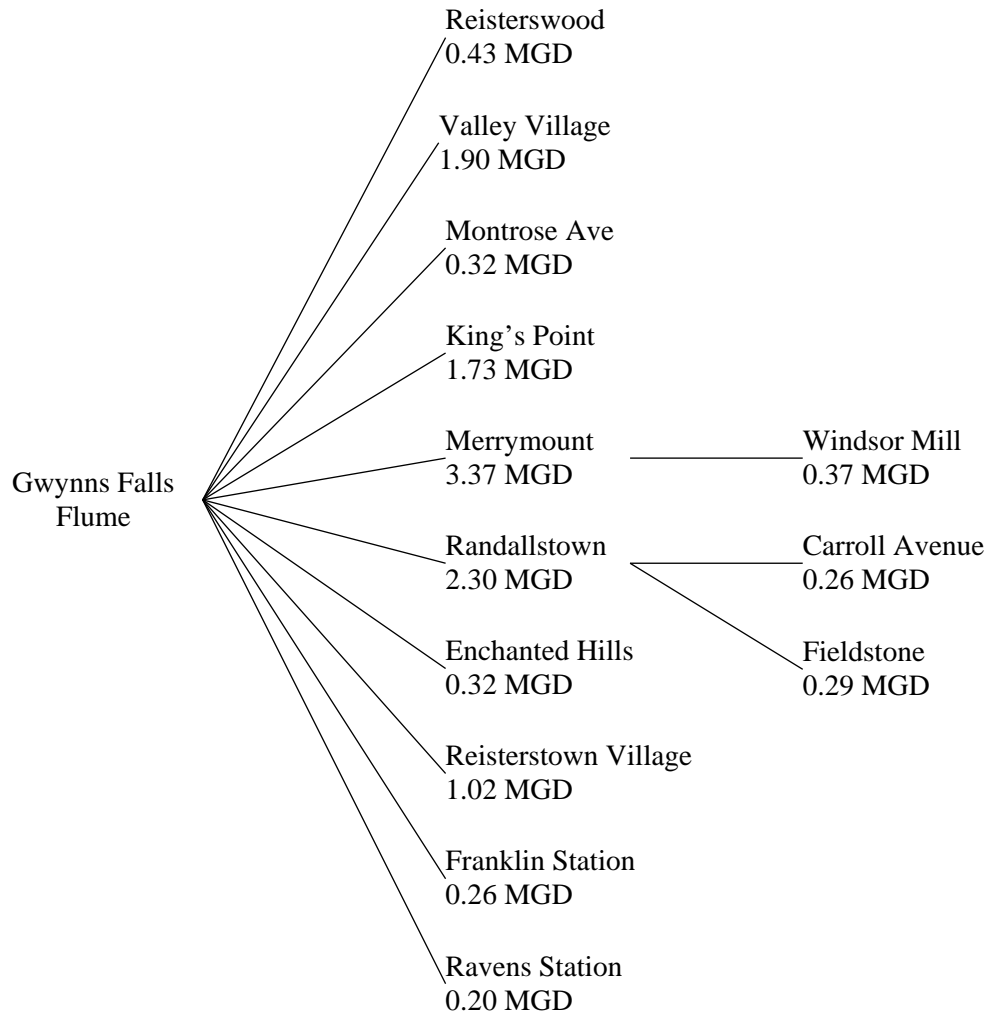
The Gwynns Falls sewershed covers a large portion of the northwest part of Baltimore County, from the northwest corner of Baltimore City, generally northwest along Garrison Forest Road, and out to the area of Hanover Pike north of Butler Road then southerly along Berrymans Lane and Deer Park Road to the area of Lyons Mill and Liberty Roads then southeasterly along Windsor Mill Road to the Baltimore City Line. The area served is approximately 13,600 acres with a population of 165,653 people.

System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
Gwynns Falls Interceptor	30.39	10" to 60"
Powder Mill Interceptor	3.17	12" to 31"
Scotts Level Interceptor	9.81	10" to 24"
Horse Head Branch Interceptor	1.14	18" to 21"
Red Run Interceptor	4.71	16" to 36"
Lyons Mill Road North Interceptor	1.32	12" to 16"
Roaches Run Interceptor	2.62	10" to 18"
Beltway Crossing	0.34	15" to 16"
Liberty Gardens Outfall	0.34	8" to 16"
Randallstown PS Collector Sewer	1.24	8" to 16"
Sudbrook Park Outfall	0.67	10" to 16"
McHenry Road Outfall	0.13	15" to 16"
Ner Israel Rabb. College Outfall	0.31	8" to 16"
McDonogh Crossroads Outfall	0.83	8" to 16"
Owings Mills Towne Center	0.21	12" to 16"

Pumped Flow

There are thirteen (13) pump stations in the Gwynns Falls area as shown below. Flow from the Gwynns Falls Flume has the option of diverting a portion of flow to the Back River Treatment Plant but normal operation directs flow to the Patapsco Treatment Plant.



Existing Conditions

The Gwynns Falls SRRR Plan was accepted by the EPA on December 9, 2013, and needs to be implemented by September 6, 2018.

Proposed Projects

There are multiple projects under design in Gwynns Falls, below is a list of the proposed projects.

Project	Description	Estimated Cost
Delight Road Sewer Extension	Petition project, 268' of 8" sewer	\$267,320
Pleasant Hill Road at I-795	Completing a dead sewer, 203' of 8"	\$67,620
Montbel Pipe Burst & Relief	1,600 of pipe bursting & relief sewer	\$640,000
Powder Mill Relief Sewer	12,000 LF relief sewer	\$9,963,833
Environmentally Sensitive Areas	Miscellaneous rehabilitation	\$700,000
Total		\$11,638,773

PATAPSCO

Location

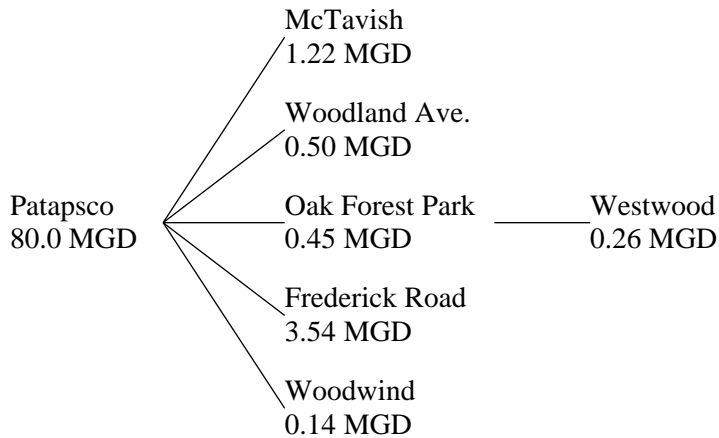
The Patapsco River Basin is located in the southwest end of Baltimore County. The area covers everything south and west of the southwest corner of Baltimore City, along Frederick Road to the Baltimore Beltway, and then Baltimore National Pike west to Rolling Road north to Route 70 then west to the Patapsco River and then along the River south and east back to the Baltimore City Line. The area served is approximately 8,775 acres with a population of 75,995 people.

System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
Patapsco (Top to MH34848)	9.40	42" to 54"
Old Patapsco, 85-15 to 85-10	0.84	54"
Old Patapsco, 85-10 to 85-01	2.72	42" to 54"
Patapsco Supplemental Interceptor	3.64	48" to 72"
Baltimore Highlands	2.08	12" to 24"
Herbert Run	4.10	12" to 30"
Herbert Run West	2.88	12" to 30"
UMBC Outfall Sewer	0.84	12" to 18"
Lansdowne Outfall	1.51	12" to 20"
Bull Branch Interceptor	3.53	18" to 24"
Halethorpe Terrace Outfall	1.11	12" to 18"
Rolling Road-Valley Road Sewer	0.58	18"
Newburg Avenue Sewer	0.40	15" to 18"
Hilton Avenue Outfall	1.08	15" to 16"

Pumped Flow

The 80.0 MGD Patapsco Pump Station receives flow from six (6) pumping stations as shown below.



Existing Conditions

The Patapsco SRRR Plan was accepted by the EPA on December 9, 2013, and needs to be implemented by September 6, 2021.

Proposed Projects

There are multiple projects under design in Patapsco, below is a list of the proposed projects.

Project	Description	Estimated Cost
Patapsco Basin 07	68,405 LF of sewer rehabilitation	\$4,838,802
Patapsco Basin 33	10,344 LF of 8" to 18" relief sewer	\$1,259,710
Patapsco Basin 10	61,101 LF of sewer rehabilitation	\$3,954,902
Patapsco Structural Repairs	107,431 lf of sewer rehabilitation	\$2,200,000
Interceptor Relocation at Bloede Dam	1,600 LF of interceptor relocation	\$3,800,000
Total		\$16,053,414

RURAL BALTIMORE COUNTY

Areas of Septic System Failures

Since the 1960s, the largest concentration of known septic system failures in Baltimore County occurred in the Bowleys Quarters and Back River Neck peninsulas. However, beginning in the mid-1980s Baltimore County began to address these problems comprehensively by extending public sewerage to these “non-service” areas as part of a “Health Project.” To date, over 95% of the estimated 3,000 failing septic systems in those areas have been connected to the public sewerage system.

Due in part to the recent efforts being given to eliminate nitrogen discharges to the Chesapeake Bay (Bay Restoration Fund), Baltimore County is systematically evaluating all existing septic systems located within the Chesapeake Bay Critical Area (CBCA) to determine whether public sewerage or on-site sewage disposal upgrades will most effectively alleviate nitrogen from these sources. These efforts will entail establishing a database of all existing systems in the CBCA, performing sanitary surveys by area or community, and then evaluating the best technical solutions to address observed conditions.

In northern Baltimore County, several older communities continue to experience septic system failures due to limited areas for repair (small lot sizes), poor soils, and high water tables. These areas were developed prior to zoning and environmental protection regulations (i.e., prior to 1970) that were designed to protect against building on poor soils and on undersized lots. These areas include the following: the old town of Phoenix, Hereford, Monkton, Butler, Baldwin, Freeland, Trenton and Kingsville. Because these problems involve a relatively small number of privately owned properties that are far removed from the metropolitan district, there is no straightforward mechanism or procedure to accomplish community-wide septic system corrections. Efforts to organize a Rural Sanitary District to resolve these types of problems were initiated in the early 1990s, but were ultimately put on hold due to complexity of establishing such a district, and the concerns for increased development as a result.

Since 2015, Baltimore County has been focusing on efforts to identify where septic systems are located within the metropolitan district and assess the feasibility of getting these facilities connected to public sewerage through the Bay Restoration Fund Grant Program. The grant program assists residents as well as businesses and non-profit organization with the dual purpose of resolving septic system problems and reducing nitrogen loading to the Chesapeake Bay and its tributaries.

TABLES

Table 9A
Projected Sewerage Demands and Planned Capacity
Back River Waste Water Treatment Plant

JURISDICTION	POPULATION			PER CAPITA	TREATMENT CAPACITY	
	TOTAL	SERVED	UNSERVED	DEMAND (GPCD) NOTE 1.	DEMAND (MGD)	PLANNED (MGD)
2020						
City (note 3)					61.64	
Baltimore County	547,387	455,049	92,338	150.23	68.36	
Total					130.00	180.00
2025						
City (note 3)						
Baltimore County	557,774	464,111	93,663			
Total						
2030						
City (note 3)						
Baltimore County	567,094	472,636	94,458	150.23	71.00	
Total						180.00
2035						
City (note 3)						
Baltimore County	575,146	480,190	94,956	150.23	72.14	
Total						
2040						
City (note 3)						
Baltimore County	582,823	487,395	95,428	150.23	73.22	
Total						180.00

NOTES:

1. GPCD (gallons per capita per day) includes residential commercial industrial and infiltration/inflow.
2. Population and flows from the Gwynns Falls service area have been allocated to the Back River and Patapsco Waste Water Treatment Plants reflecting the partial diversion of the Gwynns Falls service area through the Southwest Diversion pressure sewer to the Patapsco Waste Water Treatment Plant.
3. Baltimore County is currently in contact with Baltimore City to exchange population and demand data but it is not yet available.

Table 9B
Projected Sewerage Demands and Planned Capacity
Patapsco Waste Water Treatment Plant

JURISDICTION	POPULATION			PER CAPITA	TREATMENT CAPACITY	
	TOTAL	SERVED	UNSERVED	DEMAND (GPCD) NOTE 1.	DEMAND (MGD)	PLANNED (MGD)
2020 (note 2)						
City (note 5)					13.66	
Baltimore County	286,829	284,225	2,604	155.67	44.25	
Howard County ³	83,970	83,970	0	71.45	6.00	12.40
A. Arundel Co. ⁴	40,330	40,330	0	137.12	5.53	6.39
Total	459,565	456,961	2,604		69.44	73.00
2025						
City (note 5)						
Baltimore County	291,566	288,881	2,685	155.67	44.97	
Howard County ³	88,534	88,534	0	72.06	6.38	12.40
A. Arundel Co. ⁴	41,491	41,491	0	144.37	5.99	6.39
Total						81.00
2030						
City (note 5)						
Baltimore County	295,816	293,078	2,786	155.67	45.62	
Howard County ³	91,158	91,158	0	72.29	6.59	12.40
A. Arundel Co. ⁴	42,164	42,164	0	148.47	6.26	6.39
Total						81.00
2035						
City (note 5)						
Baltimore County	299,770	296,983	2,786	155.67	46.23	
Howard County ³	92,320	92,320	0	72.36	6.68	12.40
A. Arundel Co. ⁴	42,586	42,586	0	150.72	6.42	6.39
Total						81.00
2040						
City (note 5)						
Baltimore County	302,841	300,005	2,835	155.67	46.70	
Howard County ³	92,399	92,399	0	72.84	6.73	12.40
A. Arundel Co. ⁴						
Total						81.00

NOTES:

1. GPCD (gallons per capita per day) includes residential commercial industrial and infiltration/inflow.
2. Population and flows from the Gwynns Falls service area have been allocated to the Back River and Patapsco Waste Water Treatment Plants reflecting the partial diversion of the Gwynns Falls service area through the Southwest Diversion pressure sewer to the Patapsco Waste Water Treatment Plant.
3. Howard County data based on "Howard County Maryland Master Plan for Water and Sewerage, 2015 Amendment".
4. Anne Arundel County data based on "Master Plan for Water Supply & Sewerage Systems, 2013". Figures for 2040 not yet available.
5. Baltimore County is currently in contact with Baltimore City to exchange population and demand data but it is not yet available.

Table 10
Inventory of Small Sewage Treatment Facilities

Owner	NPDES Permit Number	Treatment Type*	Location (NAD 27)	Map No.	Population Equivalent	Point of Discharge	Design Flow (MGD)	Operating Agency	Comments
Municipal (Publicly Owned)									
Richlyn Manor	MD0022713	f, k, l, q, w	959-579	S-17B	500	Gunpowder Falls	0.090	Baltimore County	Scheduled to be taken out of service
Private / Community / Institutional									
Bais Yaakov School For Girls		h	877-581	S-16A	940	North Branch	0.010	Private	
Camp Milldale (Pearlstone Retreat)	99-DP-3305	h,a	841-640	S-9B	200	Sycamore Creek	0.012	Private	
Camp Fretterd (fka, Montrose School)	01-DP-318	e, f, k, l, q, u, v	847-608	S-10A	310	Patapsco River	0.0105	State	3 separate septic systems
Cargill Salt		h, b, k	962-568	S-17B	47	Bird River Trib.	0.002	Private	Public Water Res. 49-92
Caves Valley Golf Club		h	872-588	S-16A			0.012	Private	
Glen Arm LLC (fka Marquip Ward United, fka Koppers)	MD0024635	b, g, k, l, v, w	943-592	S-17A	250	Long Green Creek	0.014	Private	
Glen Arm Maintenance Facility (fka Grumman Aircraft)	MD0067903	b, g, k, l, v, w	942-591	S-17A	50	Long Green Creek	0.010	Baltimore County	
Glen Meadows Retirement Community (aka Notch Cliff Life Care Comm.)	MD0022951	h, p	937-587	S-17A	150	Minebank Run	0.050	Private	
Granite Trailer Court		h	842-545	S-15B	100	Patapsco River	0.007	Private	3 separate septic systems;
Greystone Golf Course		h	911-655	S-4B	25	First Mine Branch	0.005	Baltimore County	
Hayfields Country Club		h	892-608	S-10B	200	Oregon Branch	0.005	Private	
Hereford High School (See Cycle 30 Issue 12-01)		h	895-644	S-4B	1100	Panther Branch	0.007	Baltimore County	New OSDS under construction
Hereford Middle School		h	898-635	S-10B	1100	Gunpowder Falls	0.006	Baltimore County	

Table 10 (*continued from previous page*)
Inventory of Small Sewage Treatment Facilities

Owner	NPDES Permit Number	Treatment Type*	Location (NAD 27)	Map No.	Population Equivalent	Point of Discharge	Design Flow (MGD)	Operating Agency	Comments
Private / Community / Institutional									
Hunt Valley Golf Club		h	910-610	S-10B	250	Greene Branch	0.010	Private	
Hillendale Country Club		h, a	925-607	S-11A	200	Overshot Run	0.015	Private	
Life Point Church (fka, Carroll Community Church)		h	841-616	S-9B	25	Broad Run	0.005	Private	
Manor Shopping Center		h	924-613	S-11A	75	Overshot Run	0.010	Private	
Manor Tavern Restaurant		h	620-628	S-11A	25	Nelson Branch	0.005	Private	
Maryvale Trinity Prep School		h,	888-582	S-16B	380	Dipping Pond Run	0.005	Private	
Oldfields School		h, a	905-630	S-10B	200	Gunpowder Falls	0.022	Private	
Oregon Ridge Park		h	890-603	S-10B	25	Baisman Run	0.005	Baltimore County	
Paper Mill Village		h	924-614	S-11A	25	Greene Branch	0.007	Private	
State Aviation Admin.		d, g, k, l, u	968-540	S-23B	450	Frog Mortar Creek	0.015	State	Public Water
Stevenson Univ (fka Villa Julie College)	MD0066001		885-579	S-16B	1300	Jones Falls	0.025	Private	Zoning Case No. 92-285 - SPHXA
Woodstock Job Corp Center	MD0023906	a, k, l, t, w	836-546	S-15B	500	Patapsco River	0.050	State	

Treatment Types
(Footnotes from Table 10)

(a) Aeration Activated Sludge, Difused Air	(h) Septic Tank	(q) Filters, High Capacity
(b) Extended Aeration	(i) Digester (Separate Sludge Stirring Mechanism)	(r) Filters, Fixed Nozzle, Standard Capacity
(c) Open Sludge Beds	(j) Digester (Separate Sludge Open Top)	(s) Filters, Rotary Distributors, Standard Capacity
(d) Two Story (Imhoff Settling Tanks)	(k) Chlorination with Contact Tank	(t) Sludge Storage Tanks, Covered
(e) Clarigester Settling Tanks	(l) Chlorination by Chlorine Gas	(u) Sludge Tanks, Open
(f) Mechanically Equipped Settling Tanks	(m) Chlorination by Hypochlorite	(v) Screens, Comminutor
(g) Plain Hopper Bottom Settling Tanks	(o) Filters, Rapid Sand	(w) Screens, Bar
	(p) Filters, Intermittent Sand	

Table 11
Inventory of Problem Septic Areas
Individual and Community - Active

Service Area	Location	Number of Properties	Date of DEPRM Memo	Status
White Marsh	4832, 4838, 4842, 4900, 4902, and 4904 Joppa Rd	6	9-12-07	Designed but on Hold
	4323 – 4364 Chapel Road	14	6-21-07	Designed but on Hold
	Babikow Rd and Shirleybrook Rd	30	11-14-05	No Current Plans to Correct
Duck Creek	Tickwood Road	5	1-27-97	Sewer health project approved by County Council Resolution 7-18 Jan. 16, 2018
Jones Falls	Powers Ave and Sherwood Rd	15	3-20-90	Some properties have been connected
	Baldwin	10		Outside URDL; No Current Plans to Correct
	Monkton	22		Outside URDL; No Current Plans to Correct
	Freeland	16		Outside URDL; No Current Plans to Correct
	Old Town of Phoenix	43		Outside URDL; No Current Plans to Correct
	Kingsville	53		Outside URDL; No Current Plans to Correct
	Trenton	16		Outside URDL; No Current Plans to Correct

Table 12
Water Quality Problems due to Storm Drainage
Outfalls and to Non-Point Sources

Baltimore County has no combined sanitary sewer and storm drain systems that would be tabulated under this item. Please refer to the Water Resources Element of *Master Plan 2020* for a detailed discussion of water quality issues throughout the County.

Table 13**Sewer Capital Program**

(Additional information on individual projects is available on the Baltimore County Web

Site at <http://www.baltimorecountymd.gov/Agencies/budfin/budget/index.html>)

Job Order	Project Name	Construction Funding	Budget Program
201-0002	Neighborhood Petition/Health Extensions	\$5,000,000	FY18 thru 23
201-0052	Construction at Highway Sites	\$200,000	FY18 thru 23
201-0072	City/County Joint Use Facilities	\$200,000,000	FY18 thru 23
201-0073	Special Sewer House Connections	\$2,000,000	FY18 thru 23
201-0077	Main Relining, Rehab & Replacement	\$524,200,000	FY18 thru 23
201-0090	Miscellaneous System Improvements	\$50,000,000	FY18 thru 23

CAPITAL BUDGET 2018

Capital Improvement Program FY 2019 – 2023 Department 201: Sewer System

Project No.	Title	Total Estimated Cost	Prior Authorizations	Total for 6-Year Program	Budget Year FY 2018	FY 2019	FY 2020	FY2021	FY 2022	FY 2023
0002	Neighborhood Petition / Health Ext	24,046,672	19,046,672	5,000,000	0	0	2,500,000	0	2,500,000	0
0052	Construction at Highway Sites	2,055,636	1,855,636	200,000	0	0	100,000	0	100,000	0
0072	City/County Joint Use Facilities	782,513,304	582,513,304	200,000,000	100,000,000	0	50,000,000	0	50,000,000	0
0073	Special Sewer House Connections	11,944,628	9,944,628	2,000,000	0	0	1,000,000	0	1,000,000	0
0077	Main Relining, Rehab & Replacement	1,012,296,780	488,096,780	524,200,000	141,400,000	0	191,400,000	0	191,400,000	0
0090	Miscellaneous System Replacements	368,701,143	318,701,143	50,000,000	10,000,000	0	20,000,000	0	20,000,000	0
TOTAL		2,201,558,163	1,420,158,163	781,400,000	251,400,000	0	265,000,000	0	265,000,000	0

MAPS

MAP MAINTENANCE POLICY (From 1993 Triennial Review)

WHEREAS, it is a benefit to the general public, the Baltimore County Council, the Baltimore County Executive, and appropriate agencies of both local and state government to have access to the WATER SUPPLY AND SEWERAGE PLAN which is as current as possible; and

WHEREAS, each capital improvement program adopted by the County Council may introduce water or sewer facilities, 12 inch in diameter or larger, which may not appear on the plan; and

WHEREAS, each capital improvement contract which is completed in the field automatically changes the map designation of a project from a proposed to an existing facility; and

WHEREAS, any capital facilities area (W-3 or S-3) in which a capital, development, or neighborhood improvement project has been completed and put in service becomes legally and automatically an existing service area (W-1 or S-1);

NOW THEREFORE, the Department of Public Works is directed by the County Council of Baltimore County to maintain the original water and sewer maps in as current a condition as possible with regard to the capital improvement program, as adopted by the County Council, and with regard to construction completed in the field, and to any changes from a W-3 or S-3 designation to a W-1 or S-1 designation, without recourse to further public hearings or Council action; and

Further, it is directed that copies of such maps which are as current as possible be available to members of the County Council, the Baltimore County Executive, agencies of local and state government, and the general public through the Engineering Records Section, Bureau of Engineering, Room 206 Baltimore County Office Building, 111 West Chesapeake Avenue, Towson, Maryland, and that they be available under the same conditions as apply to the production of any other record from that unit.

February, 1993

Water Supply& Sewerage Plan Designations

Areal designations noted on each page of analysis and on the petition exhibits:

W-1 or S-1 EXISTING SERVICE AREAS Areas in which Metropolitan water and sewerage facilities are presently available to 90 % of the properties.

W-3 or S-3 CAPITAL FACILITIES AREAS Areas in which water and sewerage facilities are required, and are possible, within the framework of the six-year capital program, subject to annual budgeting, neighborhood petitions, determination of health hazards and the negotiation of Public Works Agreements.

W-4 or S-4 STUDY AREAS Areas, rural centers, outside the Metropolitan District which shall be studied to determine the feasibility of future community water supply and sewer service.

W-5 or S-5 MASTER PLAN AREAS Areas in which water and sewerage facilities are required and are intended within the framework of the Baltimore County Master Plan.

W-5 X or S-5 X MASTER PLAN AREAS Areas to become CAPITAL FACILITIES AREAS upon annexation into the Baltimore County Metropolitan District.

W-6 or S-6 AREAS OF FUTURE CONSIDERATION Areas which are to be considered in the design of major facilities for growth and development beyond the Land Use Master Plan.

W-7 or S-7 NO PLANNED COMMUNITY OR MULTI-USE SERVICE (NPS) Areas of planned, low-density growth (also known as "Resource Conservation Zoning") for which Metropolitan water and sewerage facilities are neither planned nor intended.

The following definitions have been derived from Maryland State Law and the Baltimore County Code and are set forth here as they relate specifically to Water Supply and Sewerage Planning in Baltimore County:

INDIVIDUAL WATER SUPPLY A water supply well and plumbing system within a single property, intended for domestic use of less than 5,000 gallons of ground water per day.

INDIVIDUAL SEWERAGE SYSTEM A sewerage system, within a single property, comprising a treatment system (septic tank) which receives waste water from a plumbing system and has a ground water recharge system of less than 5,000 gallons per day.

MULTI-USE SYSTEM A water supply or sewerage system which is identical to an individual system, as defined above, except that use and recharge of ground water is equal to or greater than 5,000 gallons per day.

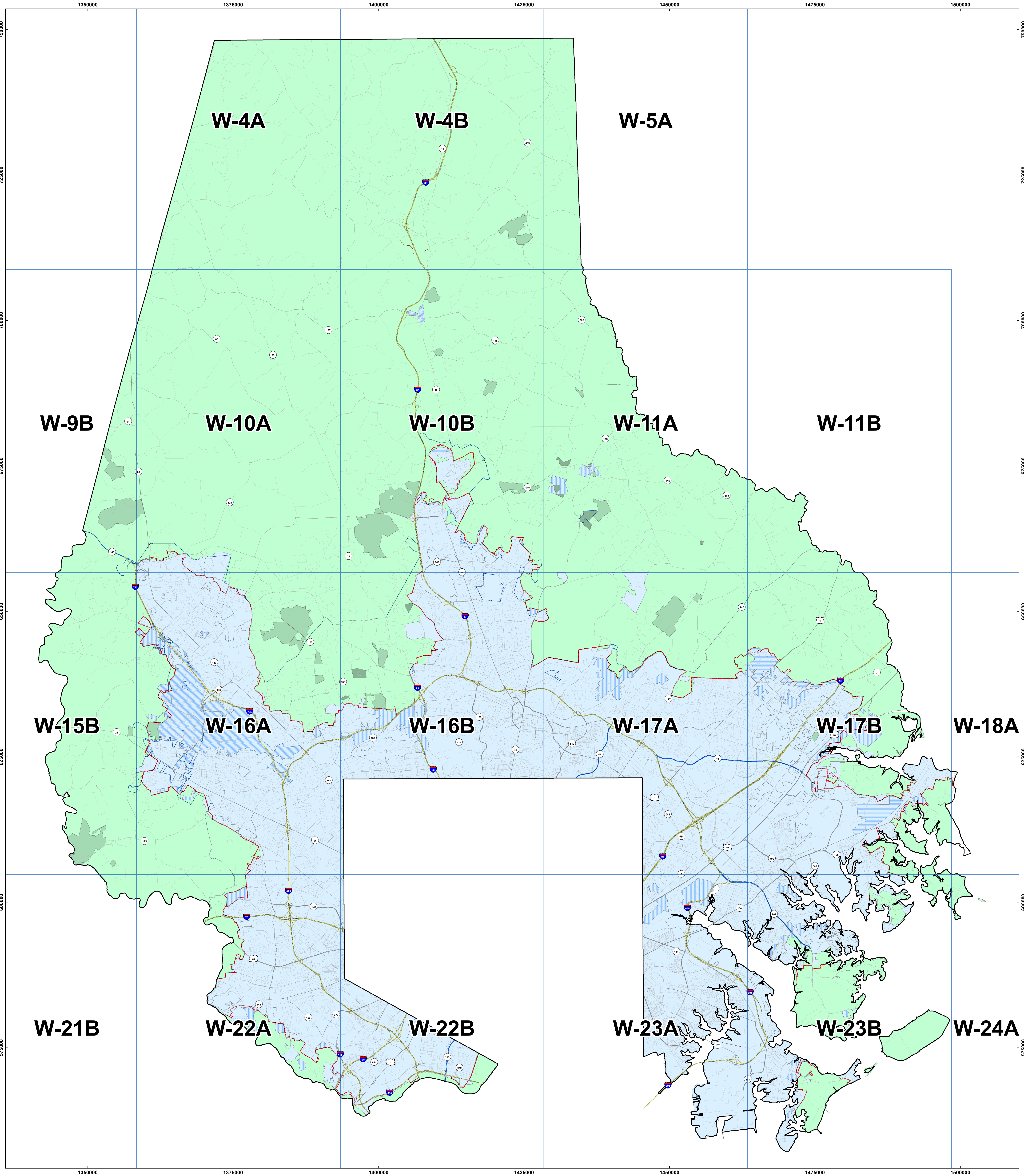
COMMUNITY SYSTEM (Public or Private)

A system of water supply or sewerage disposal involving two or more property owners, regardless of the quantity or point of disposal.

Note: Any of the above may be a community system under the Clean Water Act of the Federal Government relative to the required water quality and frequency of testing.

Disclaimer

Information shown on the maps in this document **does not guarantee** that public water or sewerage service is available in any given area.



Baltimore County Water Supply Plan 2017 Triennial Review

Water Supply Plan Area Designations

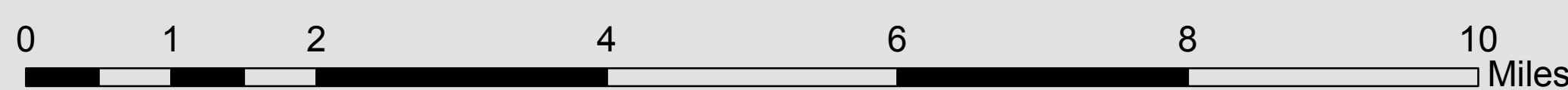
W-1 Existing Service Area	W-5 Master Plan Area	W-7 CS No Planned Service: Community System
W-3 Capital Facilities Area	W-5 X Master Plan Area	W-7 MU No Planned Service: Multi-Use System
W-4 Study Area	W-6 Area of Future Consideration	W-7 No Planned Community or Multi-Use Service (NPS)

Boundaries

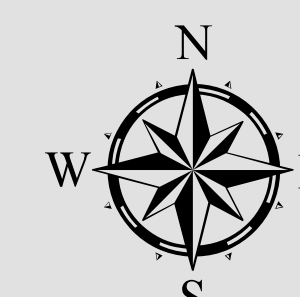
Triennial Master Plan Grid
Urban Rural Demarcation Line
Metropolitan District

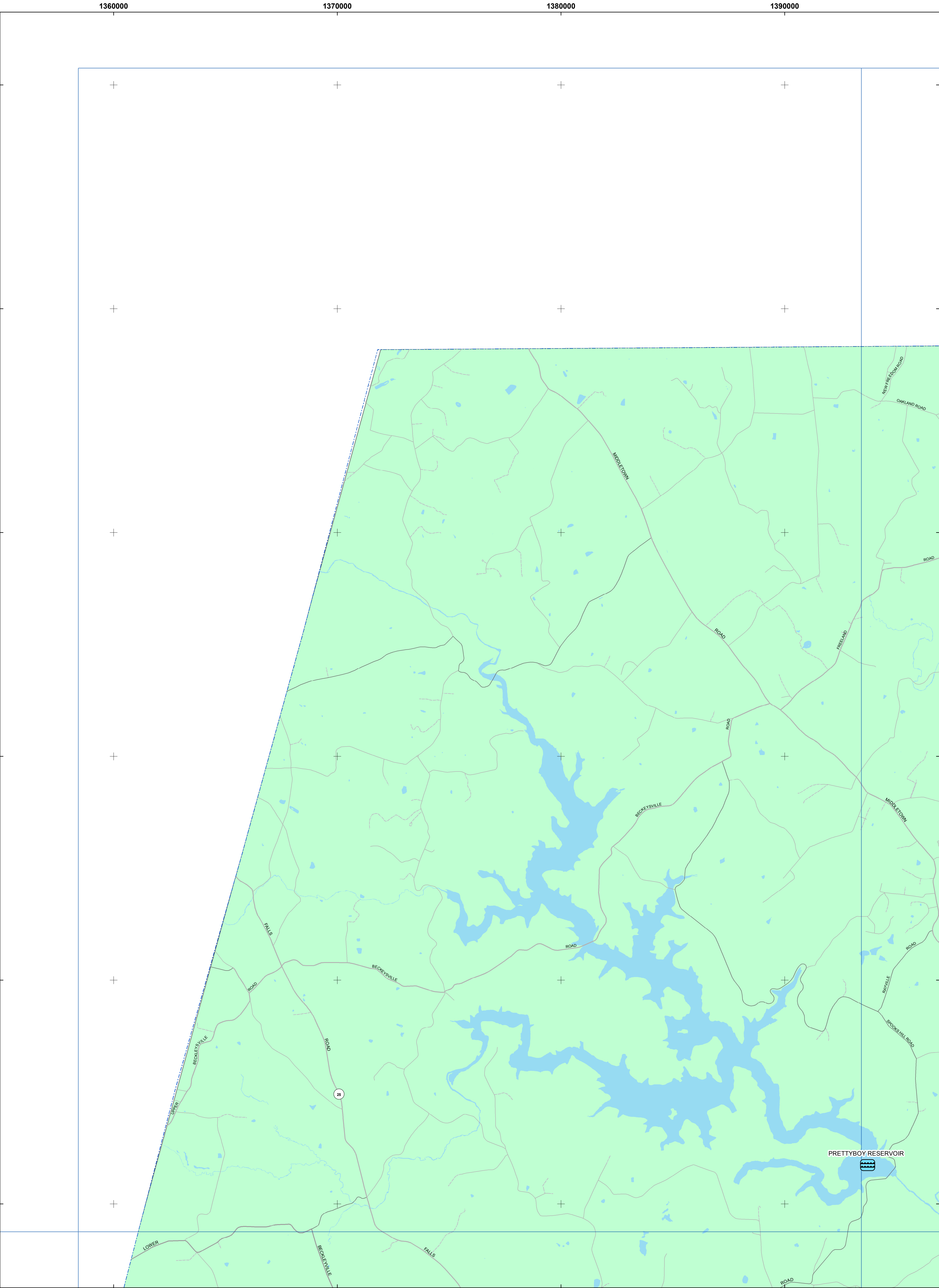


1:63,360



1 in = 1 mile





Baltimore County Water Supply Plan



2017 Triennial Review Map W-4A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
Draft Published Tuesday, January 30, 2018

System Facilities

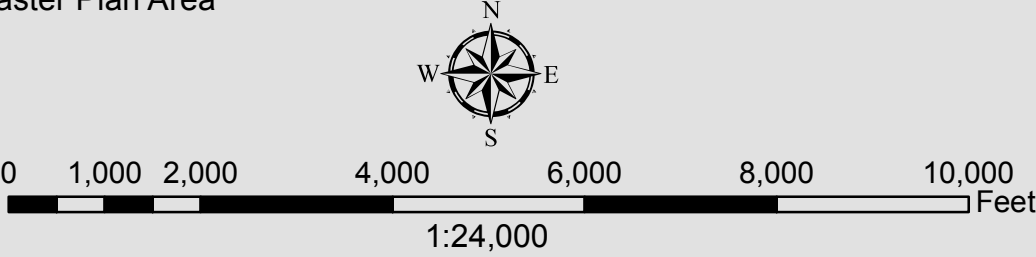
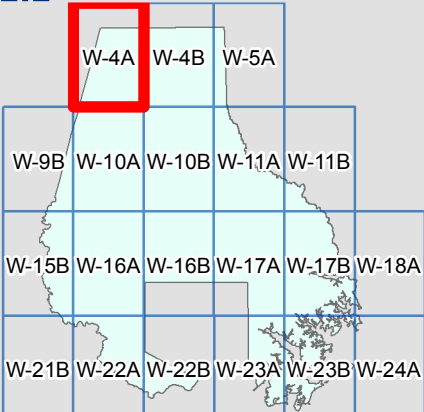
- PS Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Mains 12" and Greater

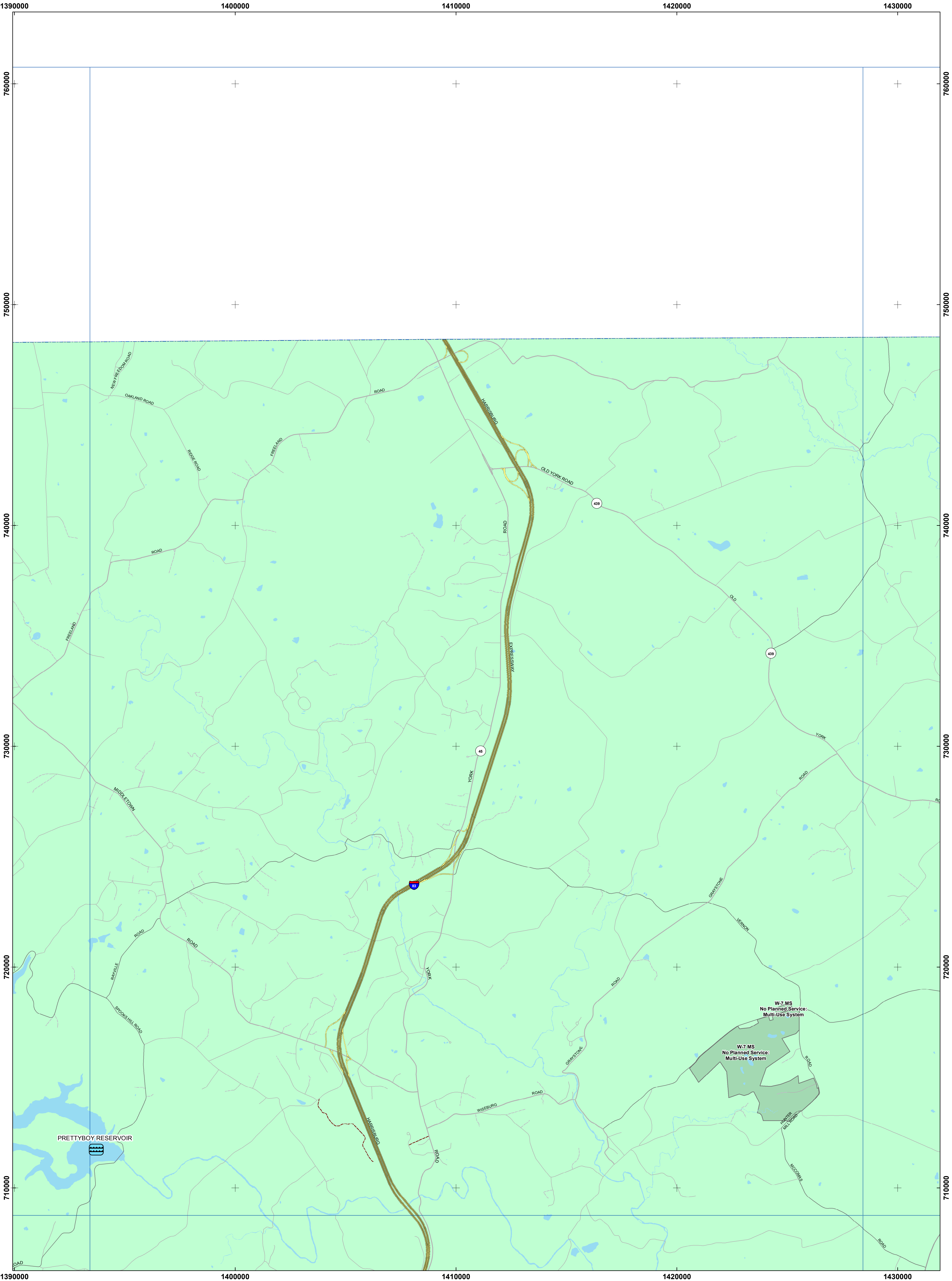
Water Supply Plan Areal Designations

- W-1 Existing Service Area
- W-3 Capital Facilities Area
- W-4 Study Area
- W-5 Master Plan Area
- W-5 X Master Plan Area
- W-6 Area of Future Consideration
- W-7 CS No Planned Service: Community System
- W-7 MU No Planned Service: Multi-Use System
- W-7 No Planned Community or Multi-Use Service (NPS)

Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District





Baltimore County Water Supply Plan



2017 Triennial Review Map W-4B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
Draft Published Tuesday, January 30, 2018

System Facilities

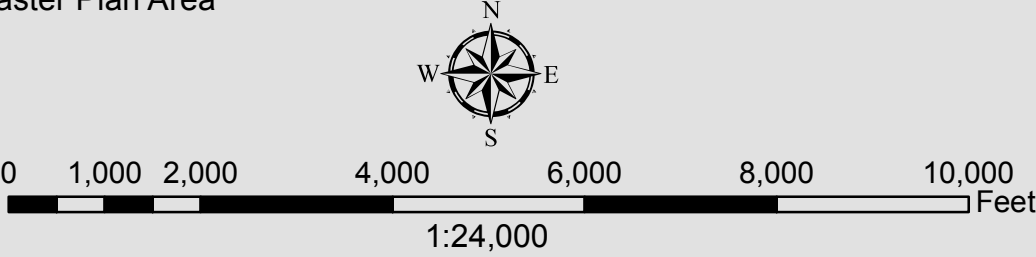
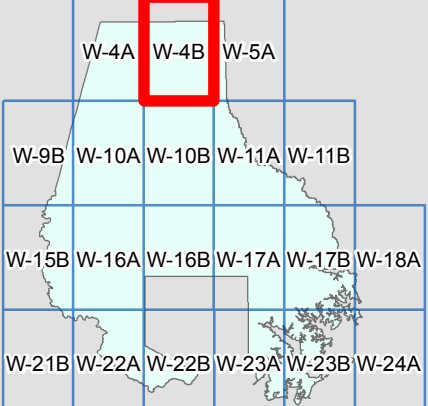
- PS Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Mains 12" and Greater

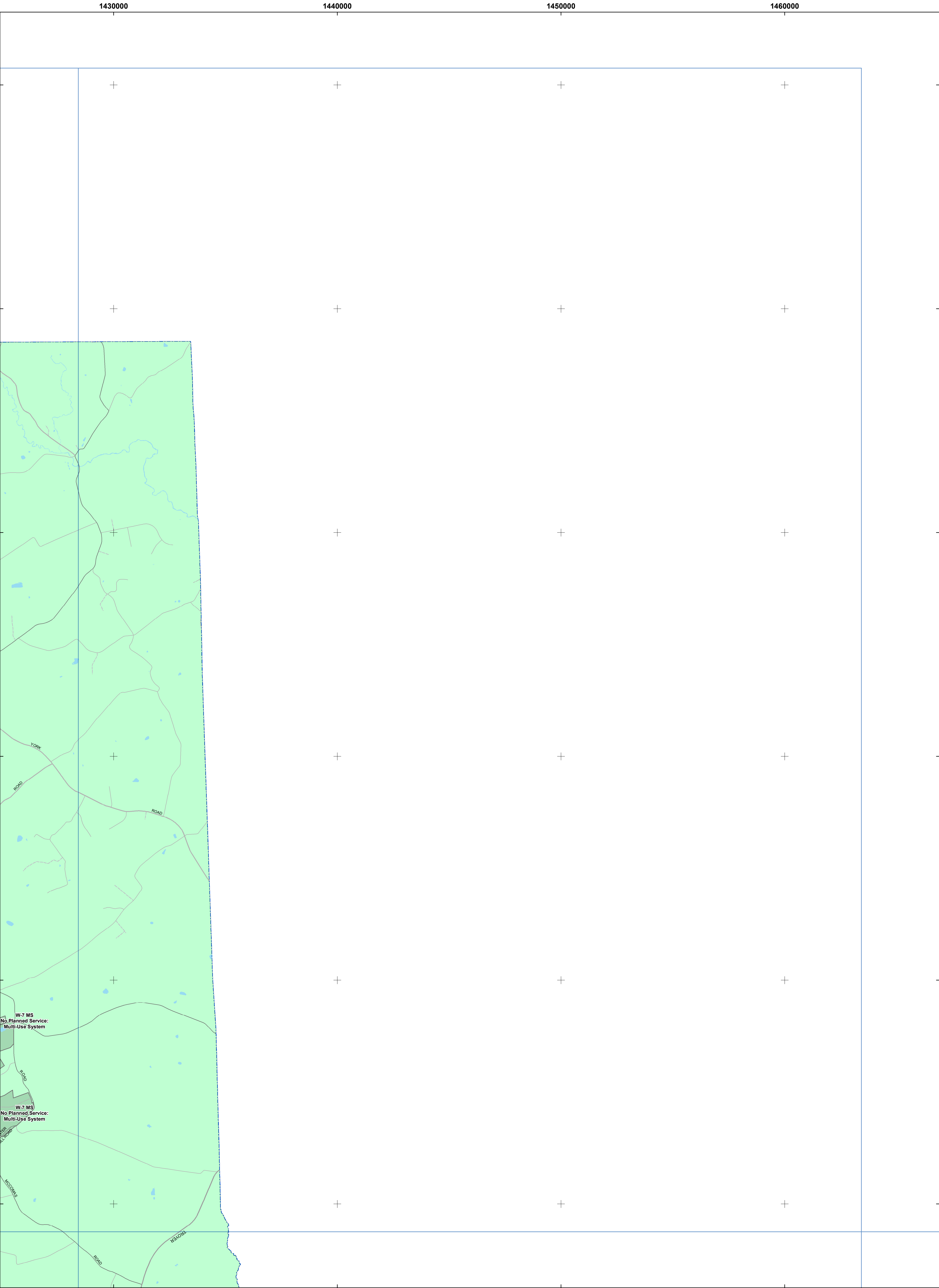
Water Supply Plan Areal Designations

- W-1 Existing Service Area
- W-3 Capital Facilities Area
- W-4 Study Area
- W-5 Master Plan Area
- W-5 X Master Plan Area
- W-6 Area of Future Consideration
- W-7 CS No Planned Service: Community System
- W-7 MU No Planned Service: Multi-Use System
- W-7 No Planned Community or Multi-Use Service (NPS)

Boundaries


- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District





Baltimore County

Water Supply Plan



2017 Triennial Review

Map W-5A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
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System Facilities

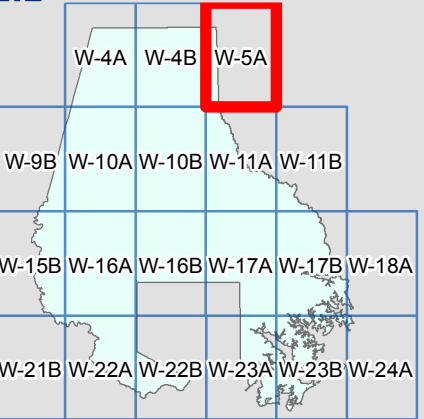
- Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Mains 12" and Greater

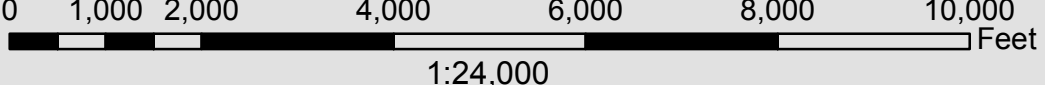

Water Supply Plan Areal Designations

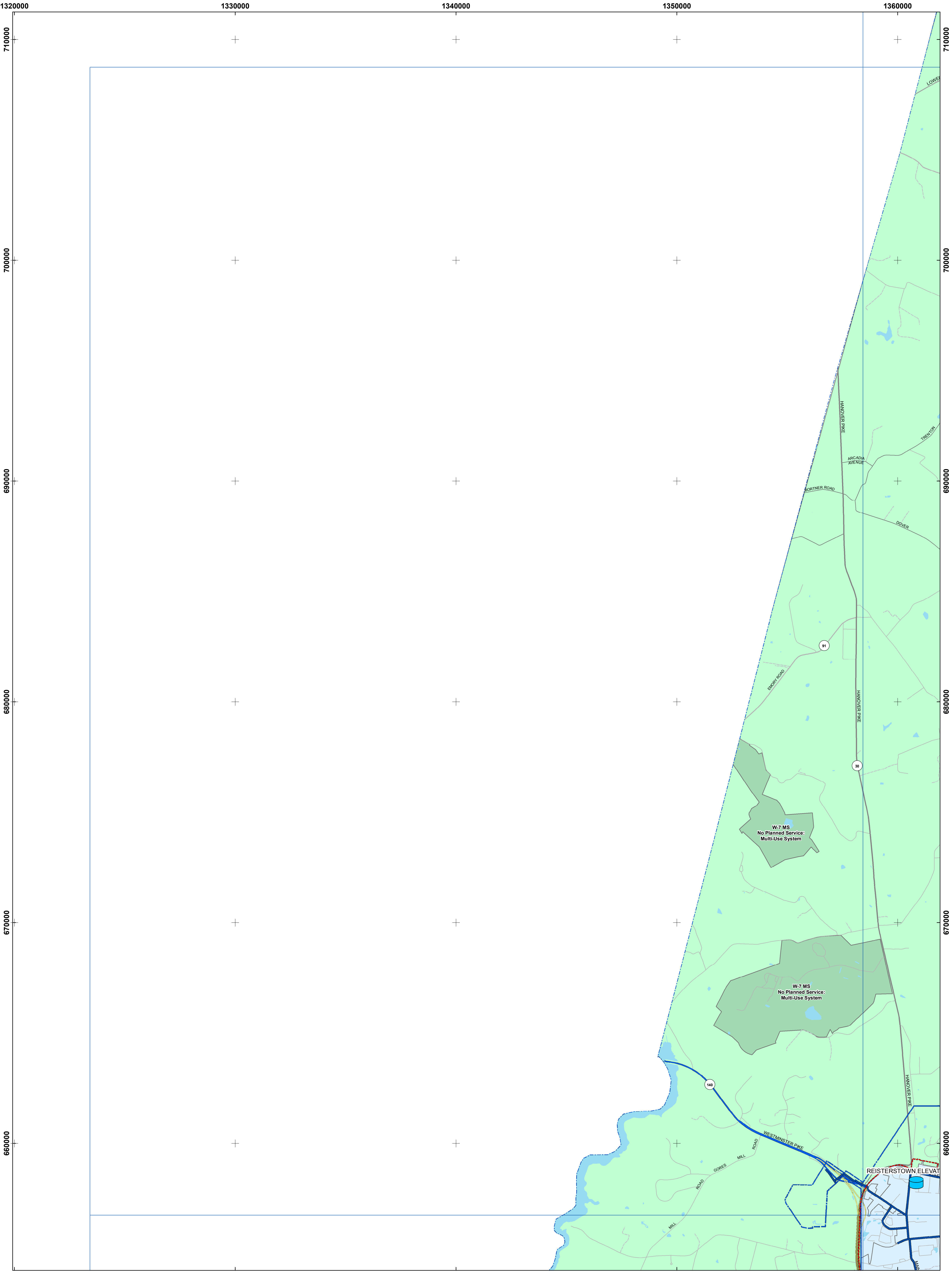
W-1 Existing Service Area	W-6 Area of Future Consideration
W-3 Capital Facilities Area	W-7 CS No Planned Service: Community System
W-4 Study Area	W-7 MU No Planned Service: Multi-Use System
W-5 Master Plan Area	W-7 No Planned Community or Multi-Use Service (NPS)
W-5 X Master Plan Area	

Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District







Baltimore County Water Supply Plan



2017 Triennial Review Map W-9B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
Draft Published Tuesday, January 30, 2018

System Facilities

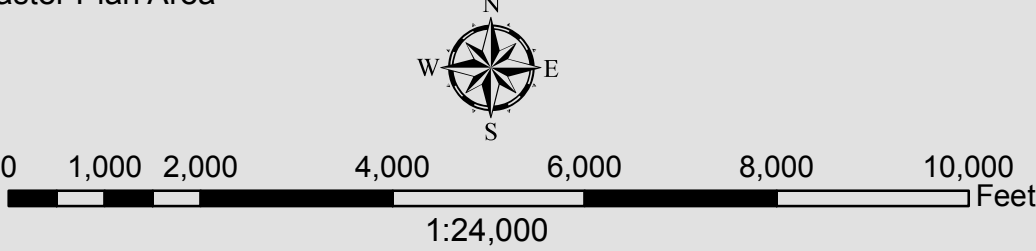
- PS Pumping Station
- Reservoir
- Tank
- WTP Treatment Plant
- Mains 12" and Greater

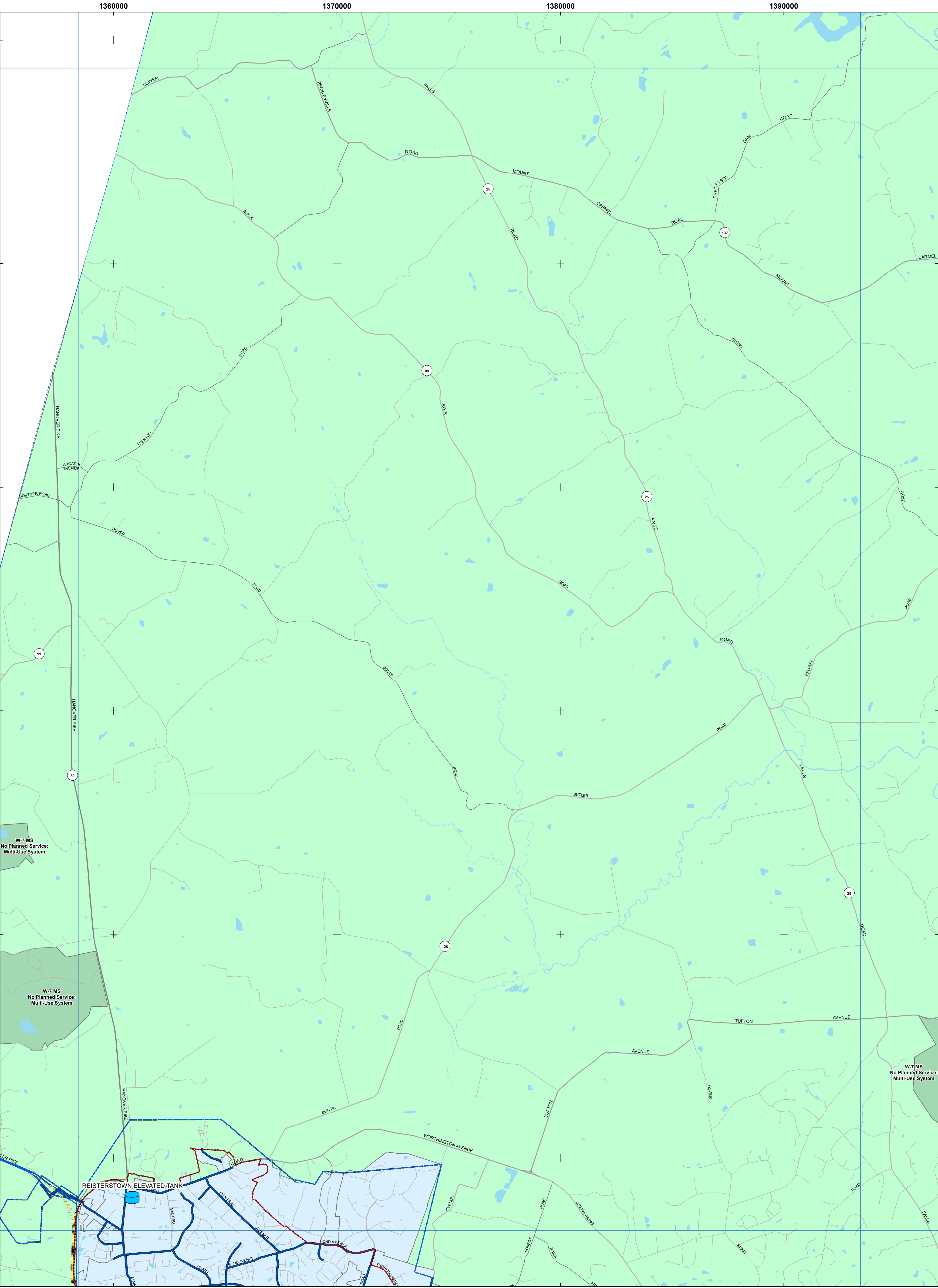
Water Supply Plan Areal Designations

- W-1 Existing Service Area
- W-3 Capital Facilities Area
- W-4 Study Area
- W-5 Master Plan Area
- W-5 X Master Plan Area
- W-6 Area of Future Consideration
- W-7 CS No Planned Service: Community System
- W-7 MU No Planned Service: Multi-Use System
- W-7 No Planned Community or Multi-Use Service (NPS)

Boundaries


- Triennial Master Plan Grid
 - Urban Rural Demarcation Line
 - Metropolitan District
- Inset map showing the location of Map W-9B within the larger context of the Baltimore County Water Supply Plan. The inset map displays a grid of maps labeled W-4A through W-24A, with W-9B highlighted in red.





Baltimore County

Water Supply Plan



2017 Triennial Review

Map W-10A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
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System Facilities

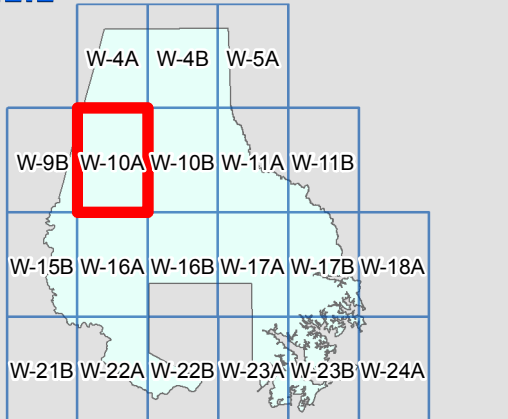
- Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Mains 12" and Greater

Water Supply Plan Areal Designations

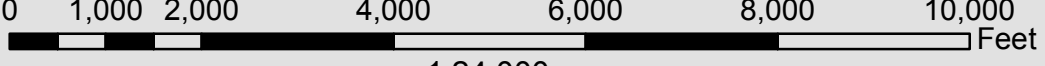

W-1 Existing Service Area	W-6 Area of Future Consideration
W-3 Capital Facilities Area	W-7 CS No Planned Service: Community System
W-4 Study Area	W-7 MU No Planned Service: Multi-Use System
W-5 Master Plan Area	W-7 No Planned Community or Multi-Use Service (NPS)
W-5 X Master Plan Area	

Boundaries

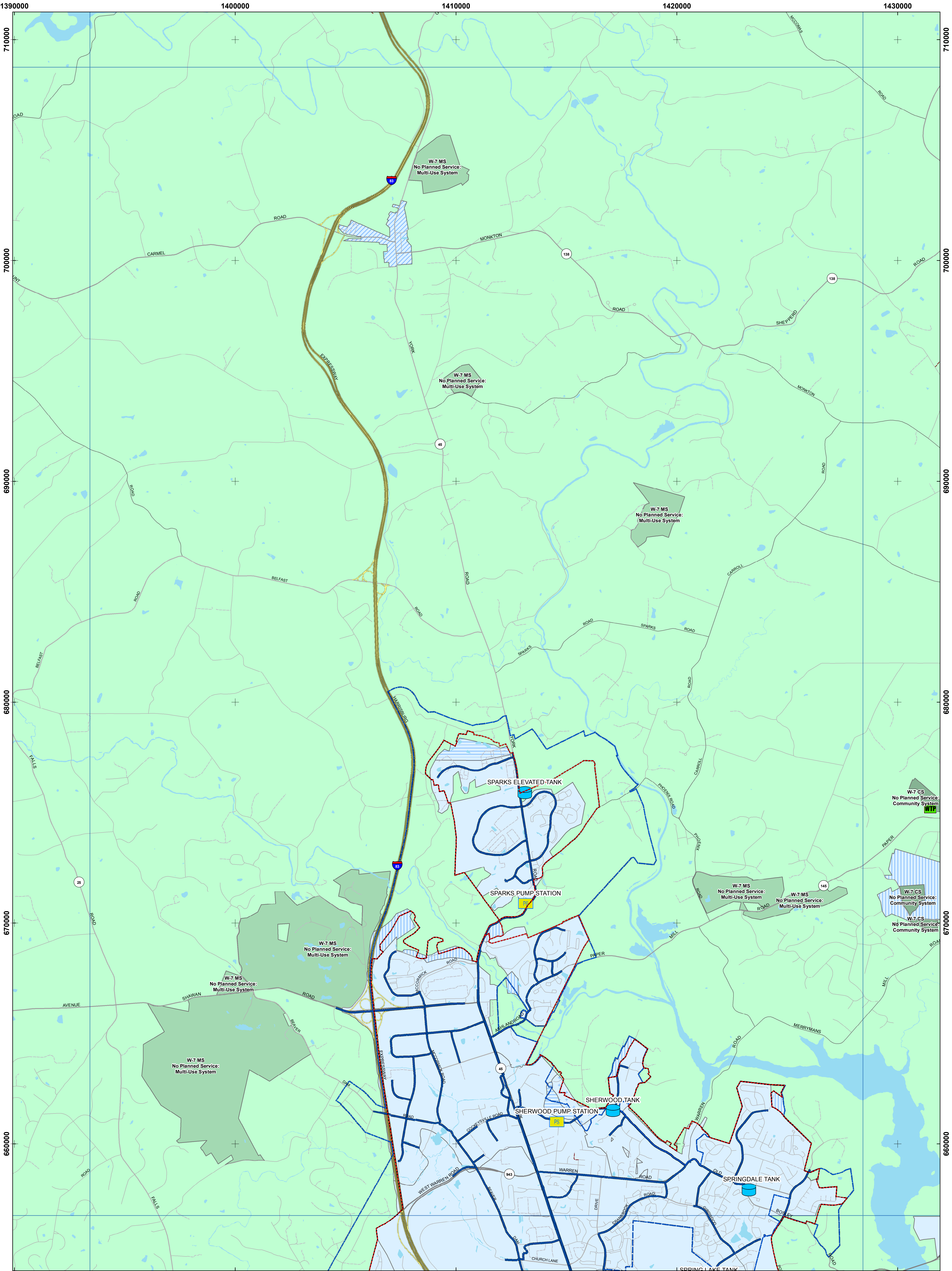
- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District



Inset map labels: W-4A, W-4B, W-5A, W-9B, W-10A, W-10B, W-11A, W-11B, W-15B, W-16A, W-16B, W-17A, W-17B, W-18A, W-21B, W-22A, W-22B, W-23A, W-23B, W-24A



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Baltimore County Water Supply Plan



2017 Triennial Review Map W-10B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

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System Facilities

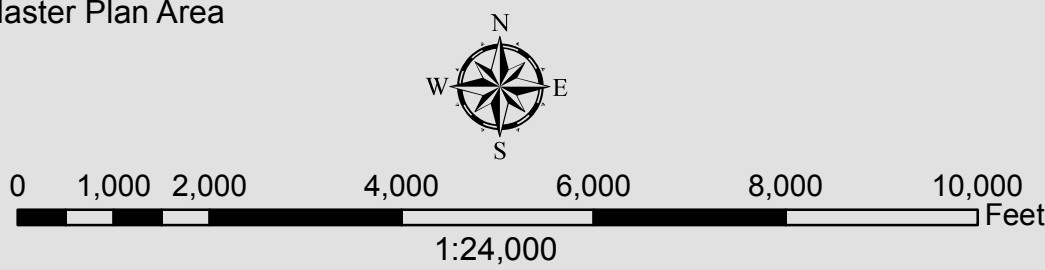
- PS Pumping Station
- Reservoir
- Tank
- WTP Treatment Plant
- Mains 12" and Greater

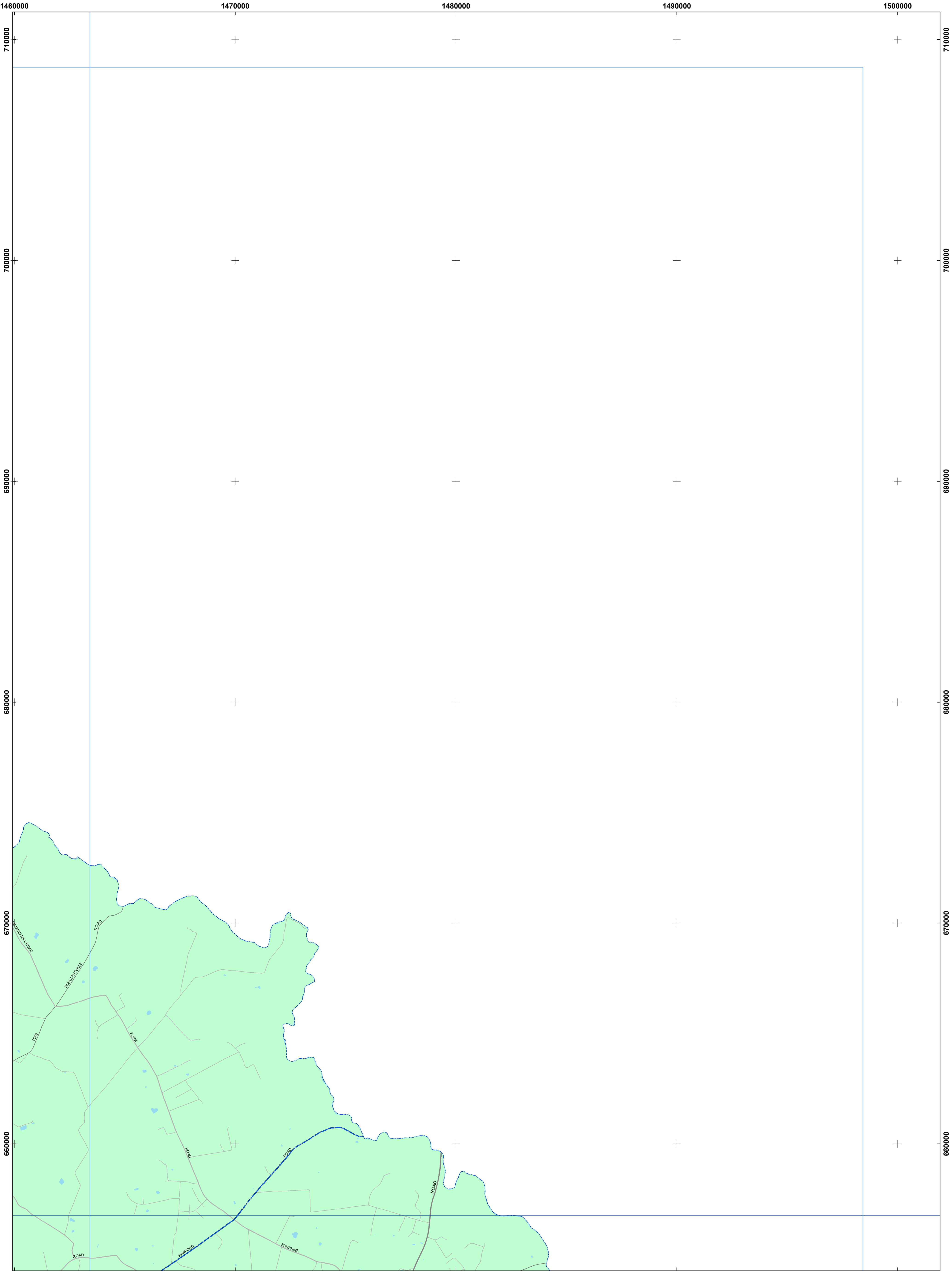
Water Supply Plan Areal Designations

- W-1 Existing Service Area
- W-3 Capital Facilities Area
- W-4 Study Area
- W-5 Master Plan Area
- W-5 X Master Plan Area
- W-6 Area of Future Consideration
- W-7 CS No Planned Service: Community System
- W-7 MU No Planned Service: Multi-Use System
- W-7 No Planned Community or Multi-Use Service (NPS)

Boundaries

- Triennial Master Plan Grid
 - Urban Rural Demarcation Line
 - Metropolitan District
-





Baltimore County Water Supply Plan



2017 Triennial Review Map W-11B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
Draft Published Tuesday, January 30, 2018

System Facilities

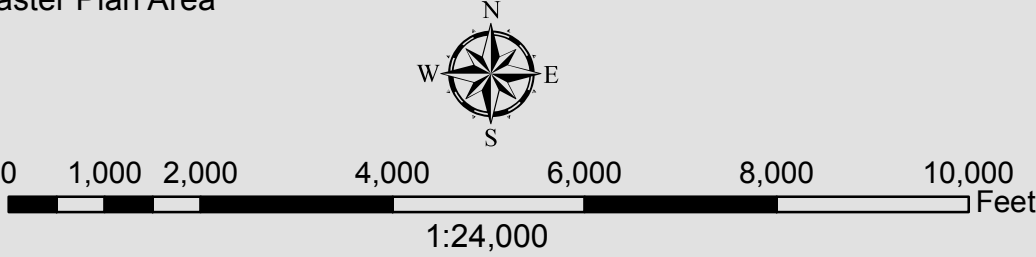
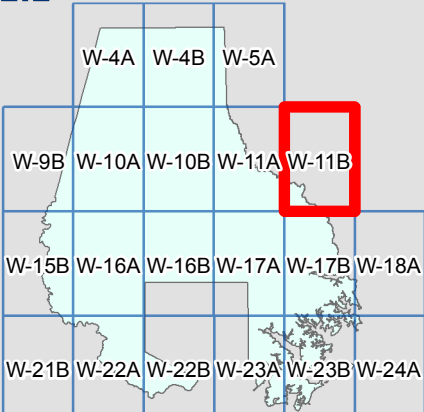
- Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Mains 12" and Greater

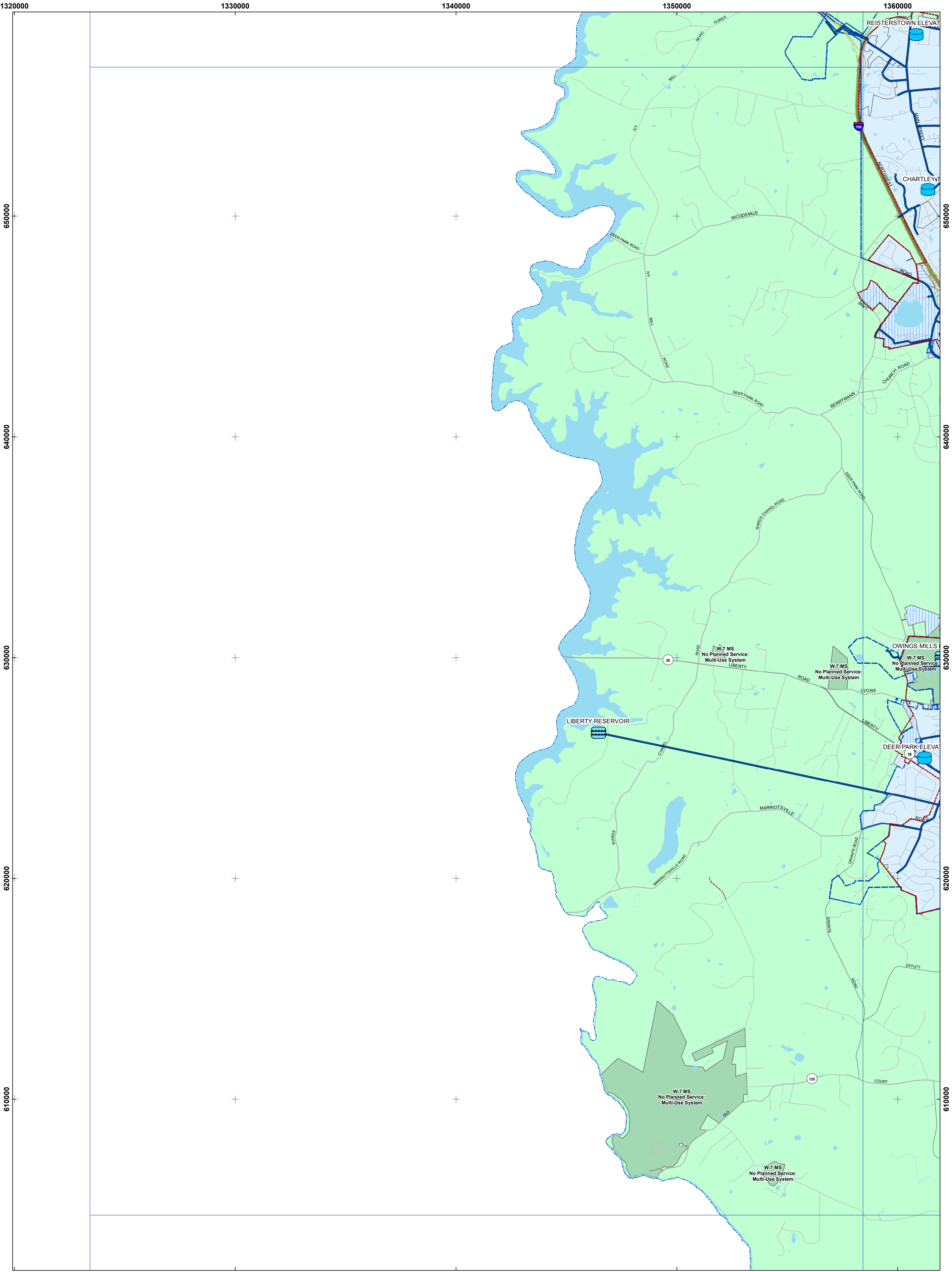
Water Supply Plan Areal Designations

- W-1 Existing Service Area
- W-3 Capital Facilities Area
- W-4 Study Area
- W-5 Master Plan Area
- W-5 X Master Plan Area
- W-6 Area of Future Consideration
- W-7 CS No Planned Service: Community System
- W-7 MU No Planned Service: Multi-Use System
- W-7 No Planned Community or Multi-Use Service (NPS)

Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District





Baltimore County Water Supply Plan



2017 Triennial Review Map W-15B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
Draft Published Tuesday, January 30, 2018

System Facilities

- Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Mains 12" and Greater

Water Supply Plan Areal Designations

- W-1 Existing Service Area
- W-3 Capital Facilities Area
- W-4 Study Area
- W-5 Master Plan Area
- W-5 X Master Plan Area
- W-6 Area of Future Consideration
- W-7 CS No Planned Service: Community System
- W-7 MU No Planned Service: Multi-Use System
- W-7 No Planned Community or Multi-Use Service (NPS)

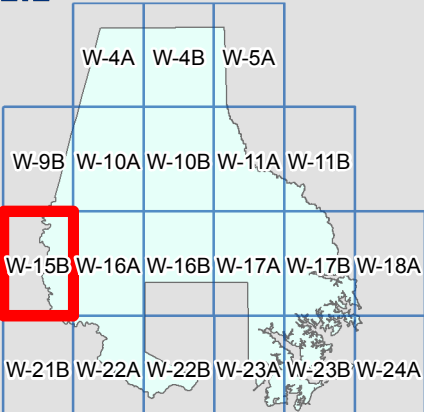
Boundaries

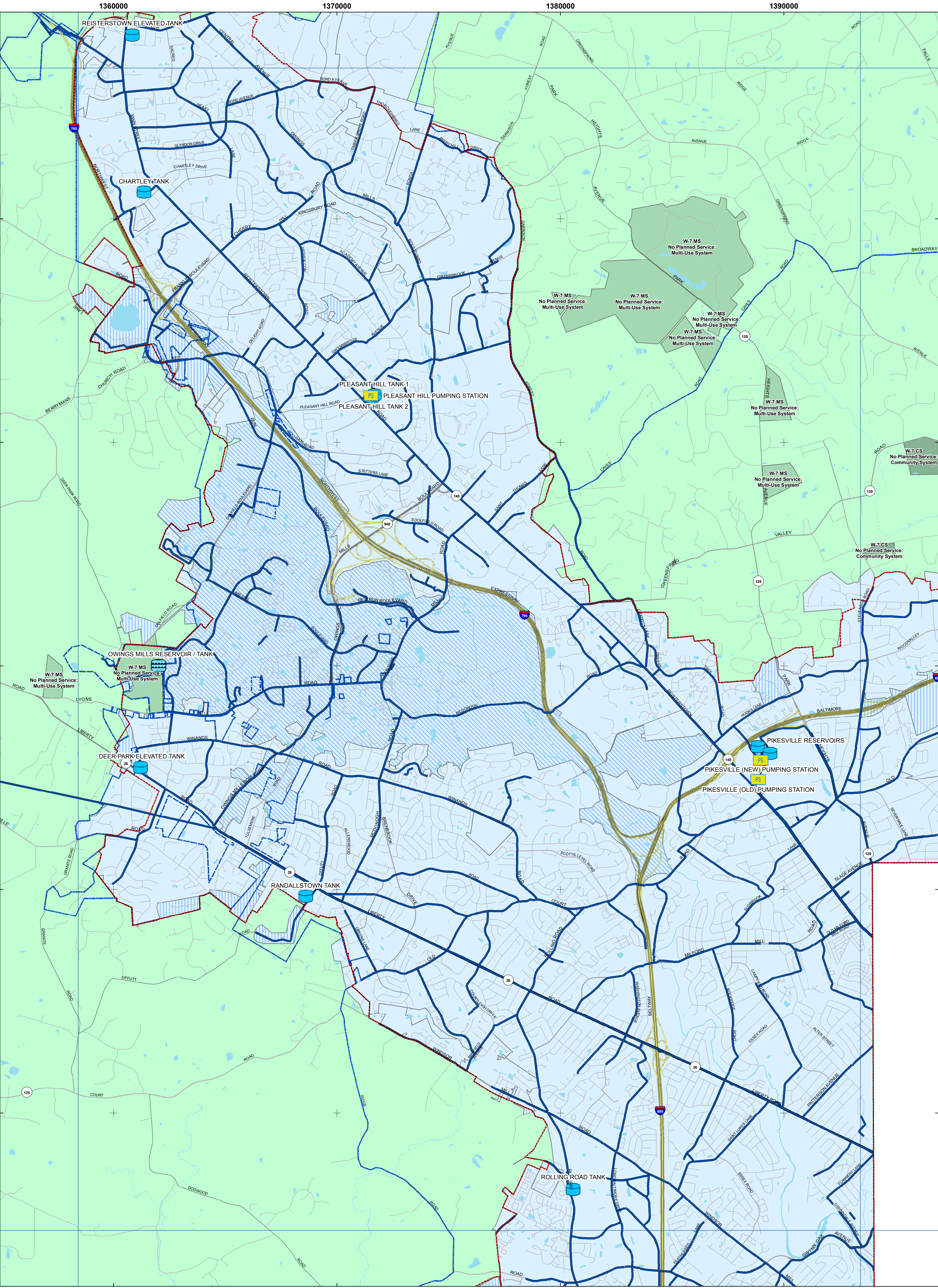
- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District



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1:24,000





Baltimore County

Water Supply Plan








2017 Triennial Review

Map W-16A

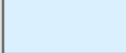

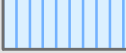



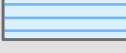

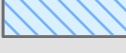
Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
Draft Published Tuesday, January 30, 2018

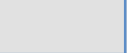


System Facilities

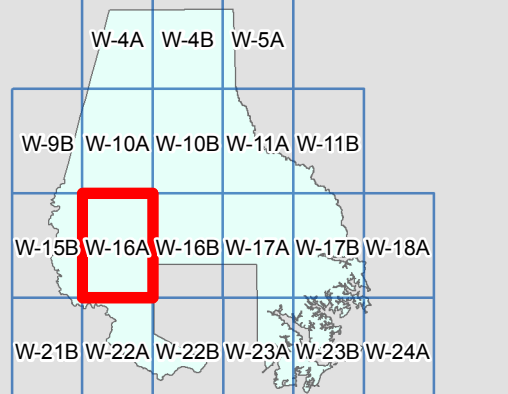
-  Pumping Station
-  Reservoir
-  Tank
-  Treatment Plant
-  Mains 12" and Greater

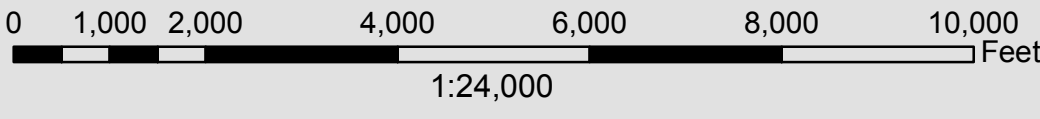

Water Supply Plan Area Designations

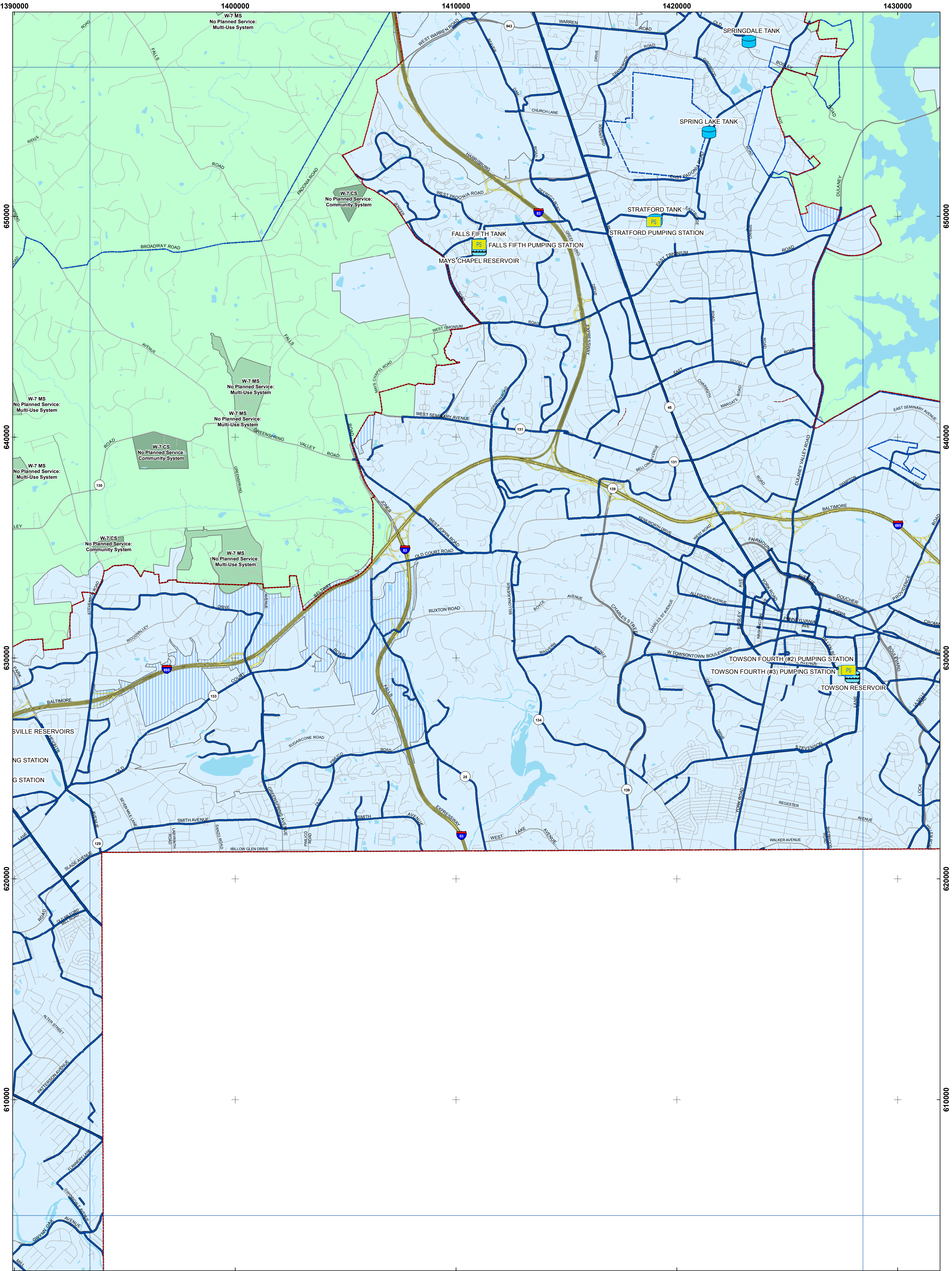
 W-1 Existing Service Area	 W-6 Area of Future Consideration
 W-3 Capital Facilities Area	 W-7 CS No Planned Service: Community System
 W-4 Study Area	 W-7 MU No Planned Service: Multi-Use System
 W-5 Master Plan Area	 W-7 No Planned Community or Multi-Use Service (NPS)
 W-5 X Master Plan Area	

Boundaries

-  Triennial Master Plan Grid
-  Urban Rural Demarcation Line
-  Metropolitan District







Baltimore County Water Supply Plan



2017 Triennial Review Map W-16B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot
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Draft Published Tuesday, January 30, 2018

System Facilities

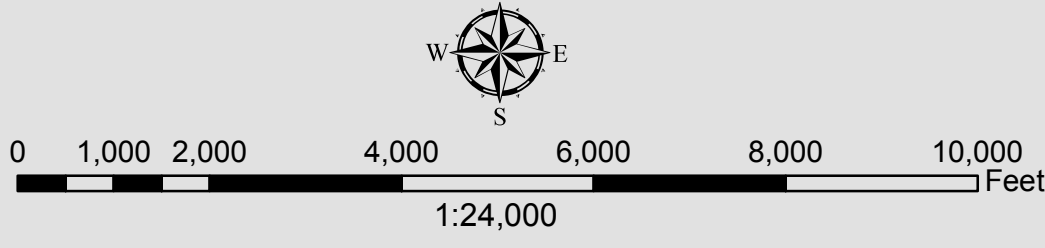
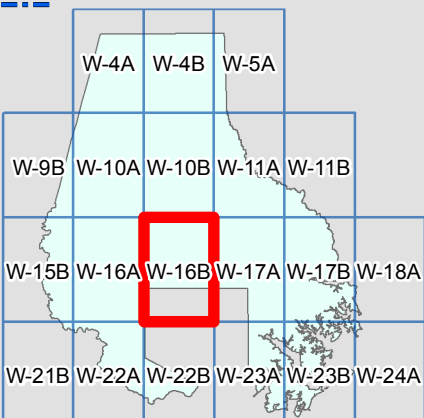
- Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Mains 12" and Greater

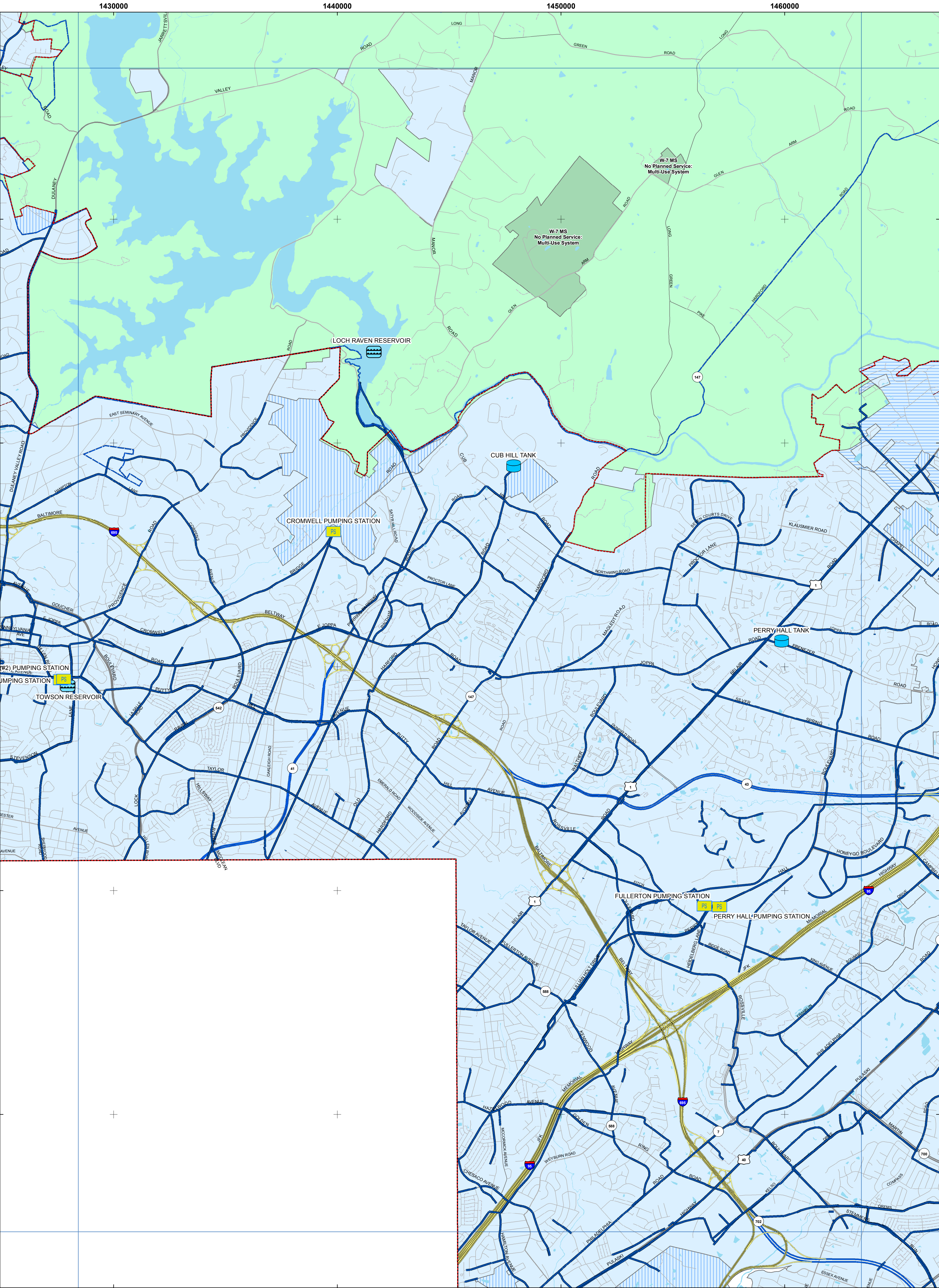
Water Supply Plan Areal Designations

- W-1 Existing Service Area
- W-3 Capital Facilities Area
- W-4 Study Area
- W-5 Master Plan Area
- W-5 X Master Plan Area
- W-6 Area of Future Consideration
- W-7 CS No Planned Service: Community System
- W-7 MU No Planned Service: Multi-Use System
- W-7 No Planned Community or Multi-Use Service (NPS)


Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District





Baltimore County Water Supply Plan



2017 Triennial Review Map W-17A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
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System Facilities

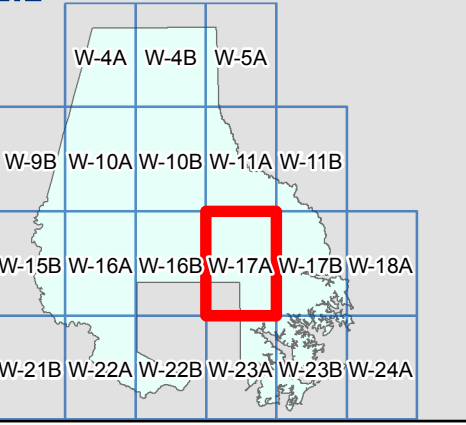
	Pumping Station
	Reservoir
	Tank
	Treatment Plant
	Mains 12" and Greater

Water Supply Plan Area Designations


	W-1 Existing Service Area		W-6 Area of Future Consideration
	W-3 Capital Facilities Area		W-7 CS No Planned Service: Community System
	W-4 Study Area		W-7 MU No Planned Service: Multi-Use System
	W-5 Master Plan Area		W-7 No Planned Community or Multi-Use Service (NPS)
	W-5 X Master Plan Area		

Boundaries

	Triennial Master Plan Grid
	Urban Rural Demarcation Line
	Metropolitan District

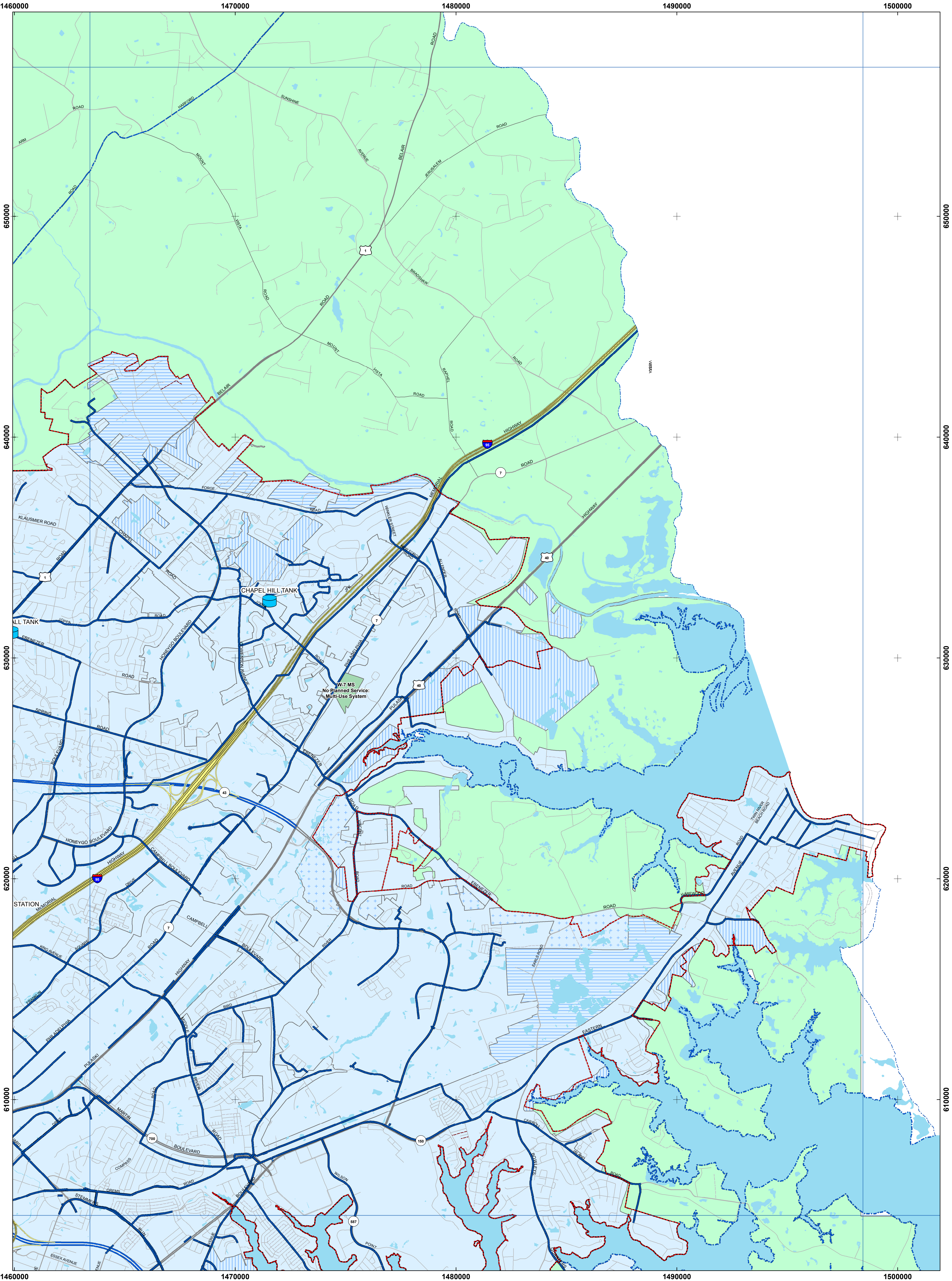


Inset map showing the location of Map W-17A within the larger Baltimore County context.



0 1,000 2,000 4,000 6,000 8,000 10,000 Feet

1:24,000



Baltimore County Water Supply Plan



2017 Triennial Review Map W-17B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
Draft Published Tuesday, January 30, 2018

System Facilities

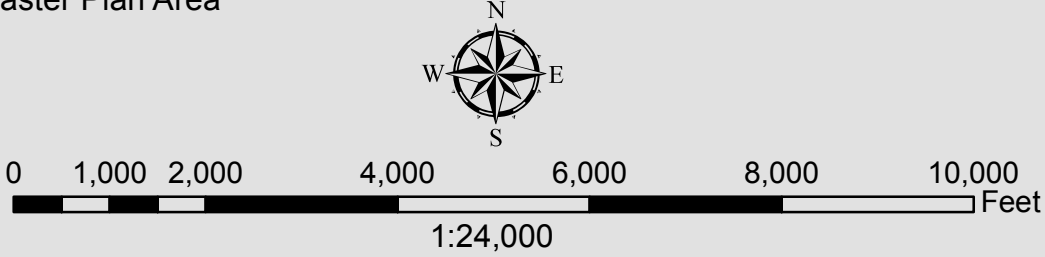
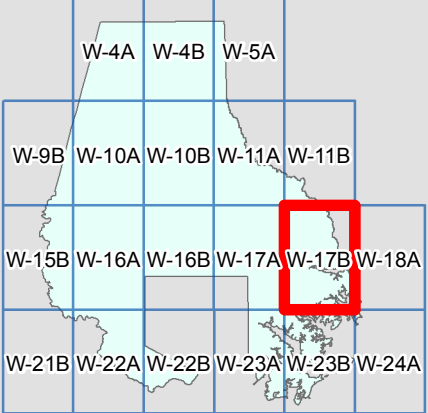
- Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Mains 12" and Greater

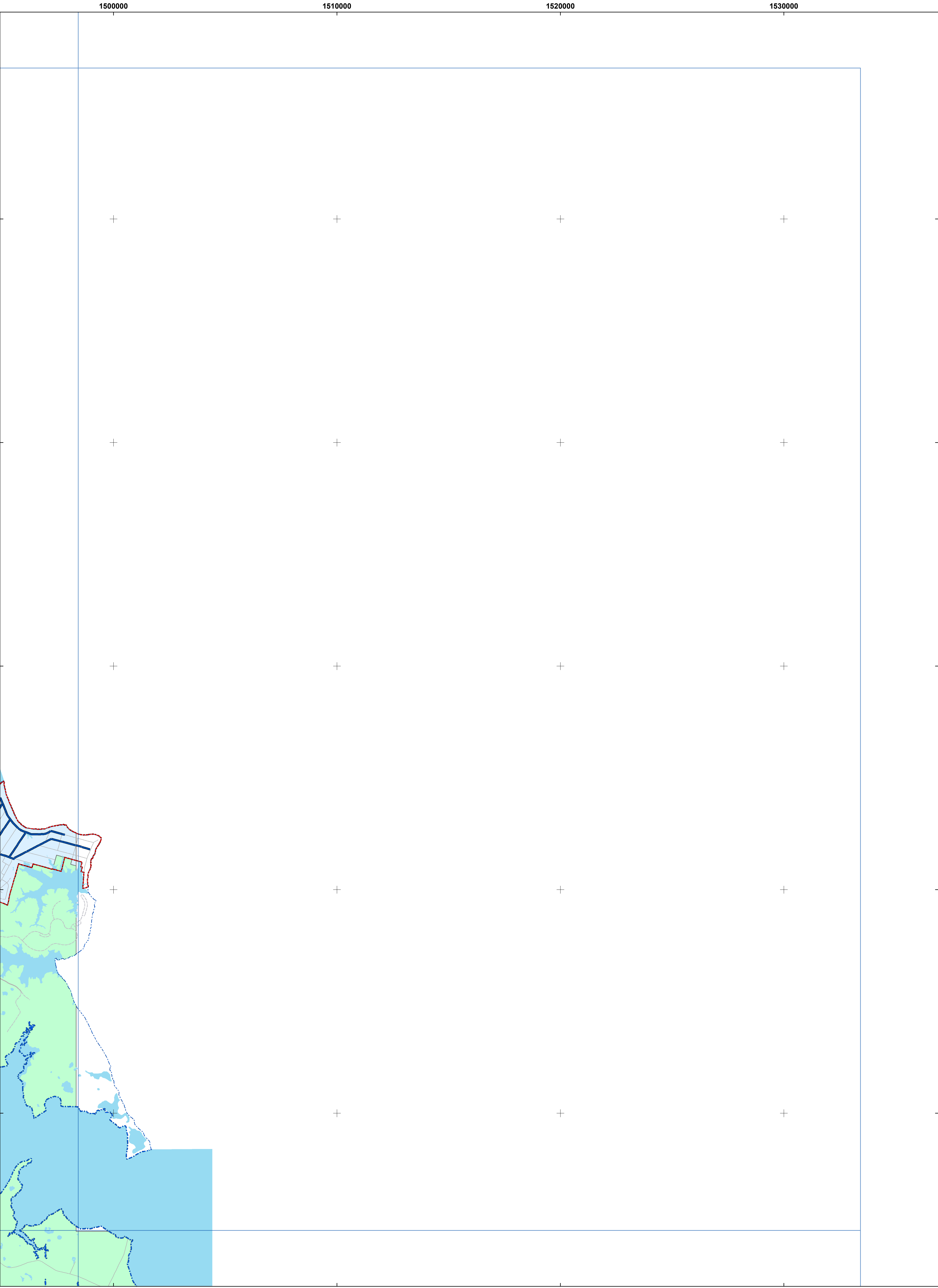
Water Supply Plan Area Designations

- W-1 Existing Service Area
- W-3 Capital Facilities Area
- W-4 Study Area
- W-5 Master Plan Area
- W-5 X Master Plan Area
- W-6 Area of Future Consideration
- W-7 CS No Planned Service: Community System
- W-7 MU No Planned Service: Multi-Use System
- W-7 No Planned Community or Multi-Use Service (NPS)


Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District





Baltimore County Water Supply Plan



2017 Triennial Review Map W-18A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
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System Facilities

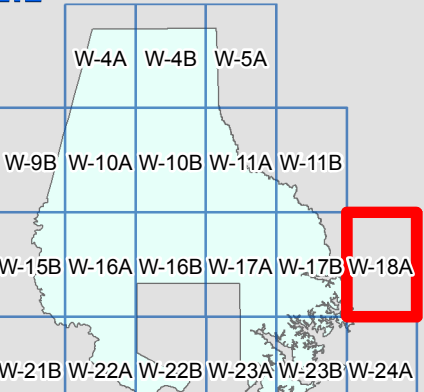
- Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Mains 12" and Greater

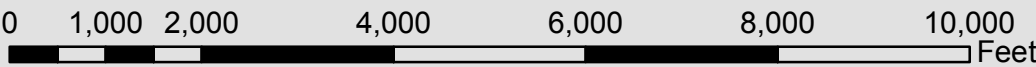

Water Supply Plan Areal Designations

W-1 Existing Service Area	W-6 Area of Future Consideration
W-3 Capital Facilities Area	W-7 CS No Planned Service: Community System
W-4 Study Area	W-7 MU No Planned Service: Multi-Use System
W-5 Master Plan Area	W-7 No Planned Community or Multi-Use Service (NPS)
W-5 X Master Plan Area	

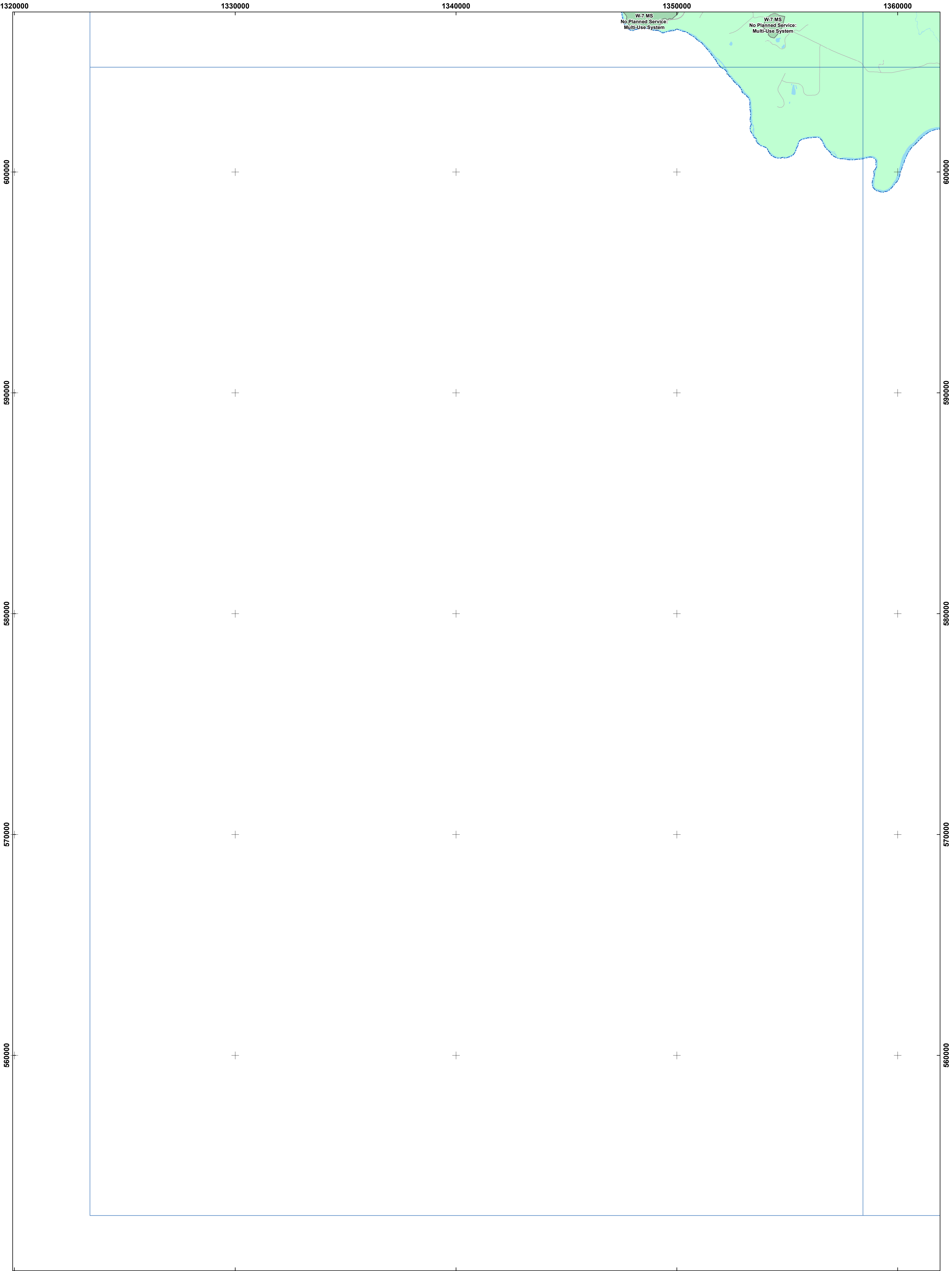
Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District





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Baltimore County Water Supply Plan



2017 Triennial Review Map W-21B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

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System Facilities

- Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Mains 12" and Greater

Water Supply Plan Areal Designations

- W-1 Existing Service Area
- W-3 Capital Facilities Area
- W-4 Study Area
- W-5 Master Plan Area
- W-5 X Master Plan Area
- W-6 Area of Future Consideration
- W-7 CS No Planned Service: Community System
- W-7 MU No Planned Service: Multi-Use System
- W-7 No Planned Community or Multi-Use Service (NPS)

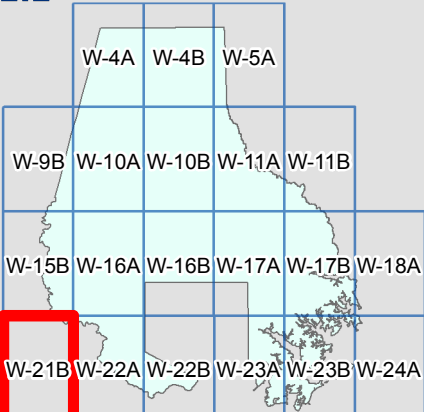
Boundaries

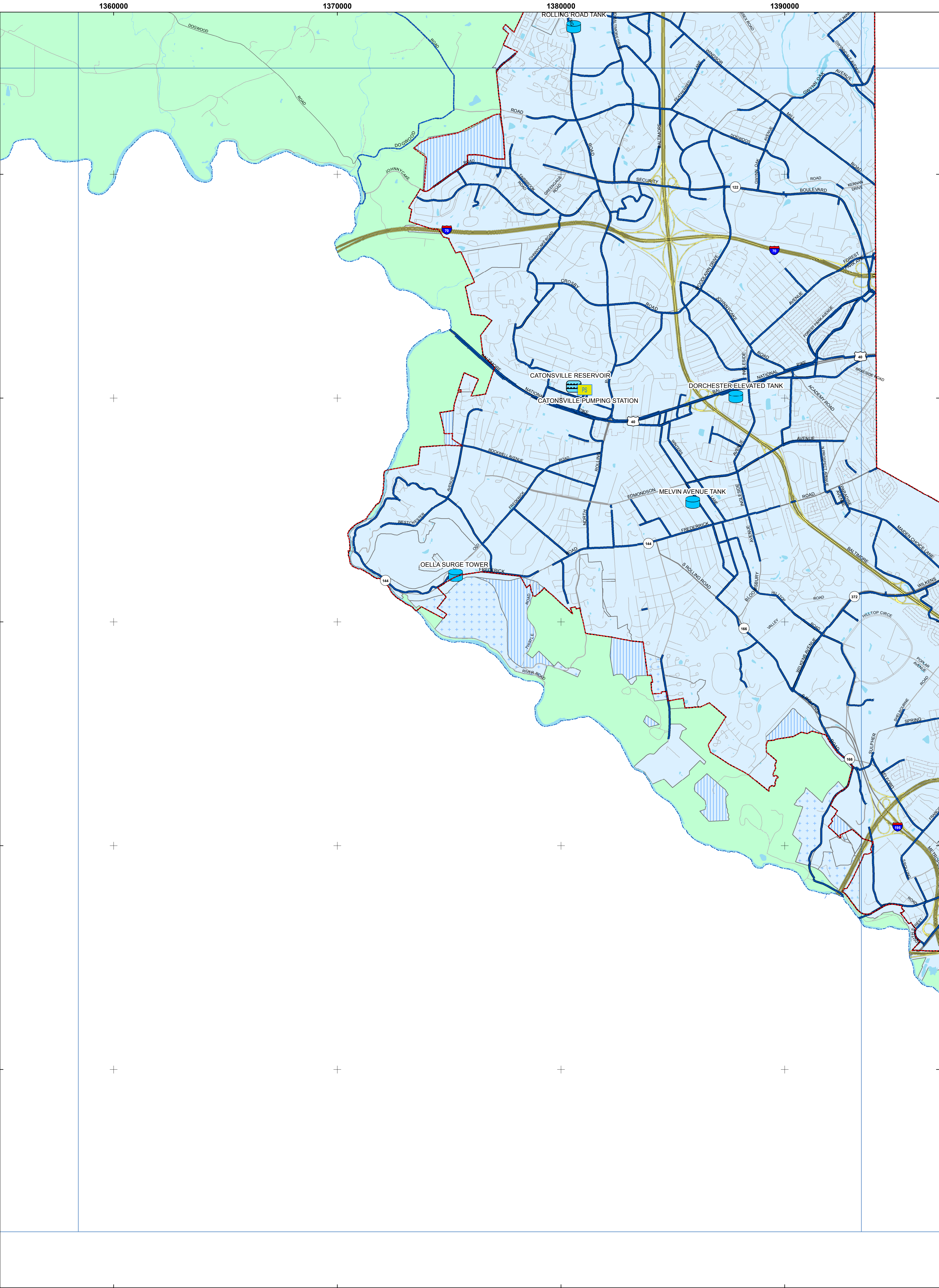
- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District




0 1,000 2,000 4,000 6,000 8,000 10,000 Feet

1:24,000





Baltimore County Water Supply Plan



2017 Triennial Review Map W-22A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot
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Draft Published Tuesday, January 30, 2018

System Facilities

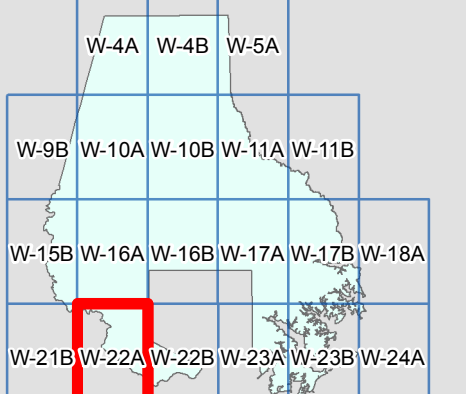
- Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Mains 12" and Greater

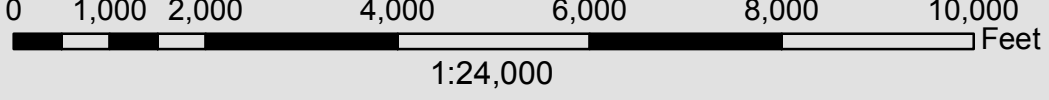

Water Supply Plan Area Designations

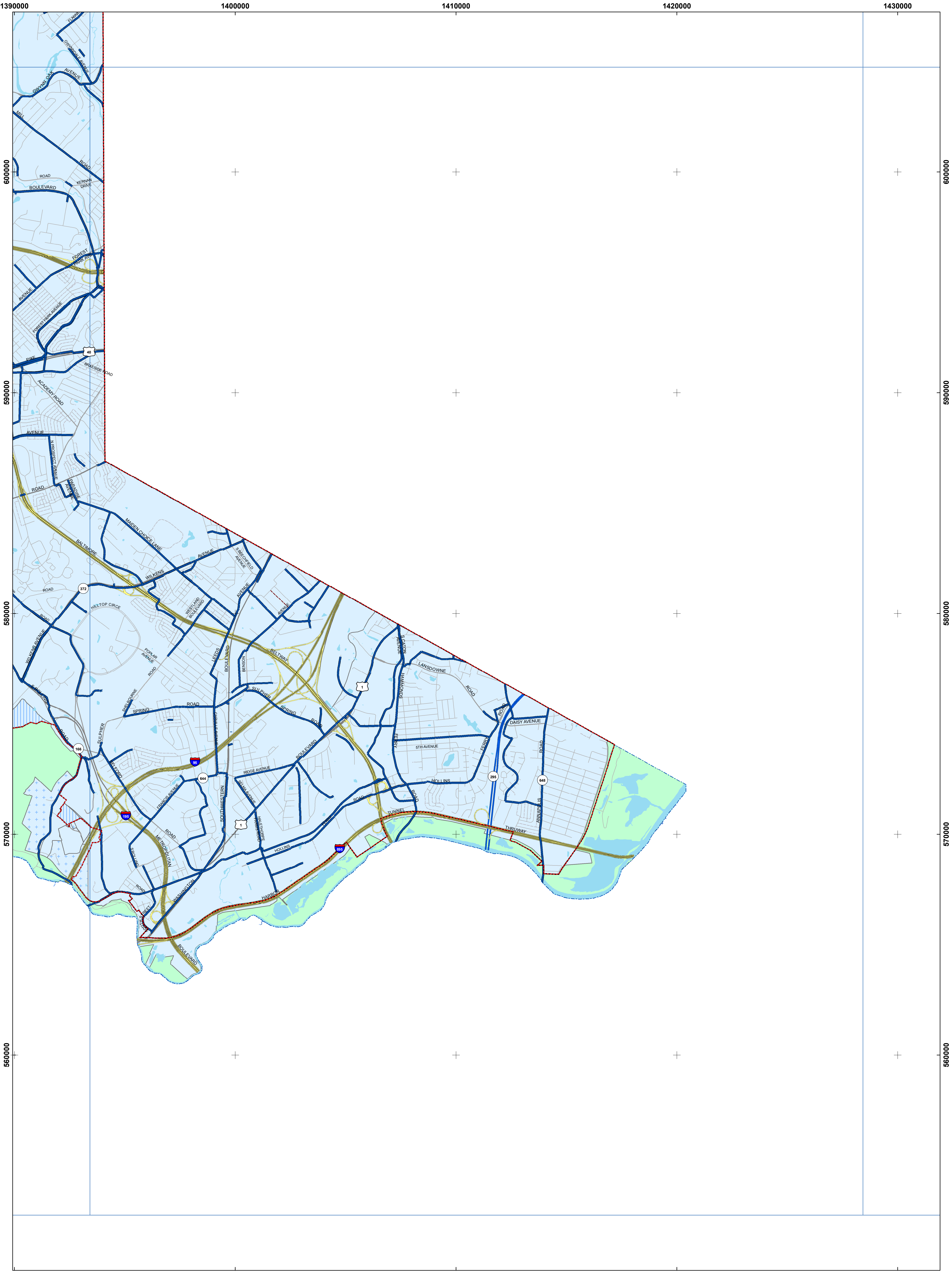
W-1 Existing Service Area	W-3 Capital Facilities Area	W-4 Study Area	W-5 Master Plan Area	W-5 X Master Plan Area
W-6 Area of Future Consideration	W-7 CS No Planned Service: Community System	W-7 MU No Planned Service: Multi-Use System	W-7 No Planned Community or Multi-Use Service (NPS)	

Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District








Baltimore County

Water Supply Plan




2017 Triennial Review


Map W-22B


Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot


Produced by Baltimore County, Department of Public Works
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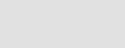
System Facilities

 Pumping Station

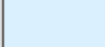
 Reservoir

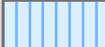
 Tank


 Treatment Plant

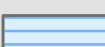
 Mains 12" and Greater

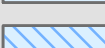
Water Supply Plan Areal Designations


 W-1 Existing Service Area

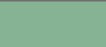
 W-3 Capital Facilities Area


 W-4 Study Area

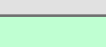
 W-5 Master Plan Area

 W-5 X Master Plan Area

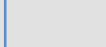
 W-6 Area of Future Consideration


 W-7 CS No Planned Service: Community System

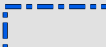
 W-7 MU No Planned Service: Multi-Use System

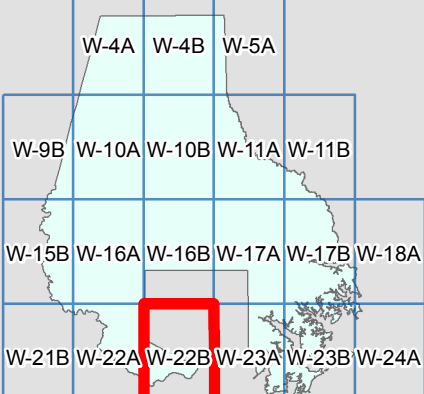
 W-7 No Planned Community or Multi-Use Service (NPS)

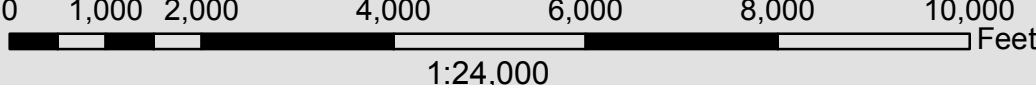

Boundaries

 Triennial Master Plan Grid

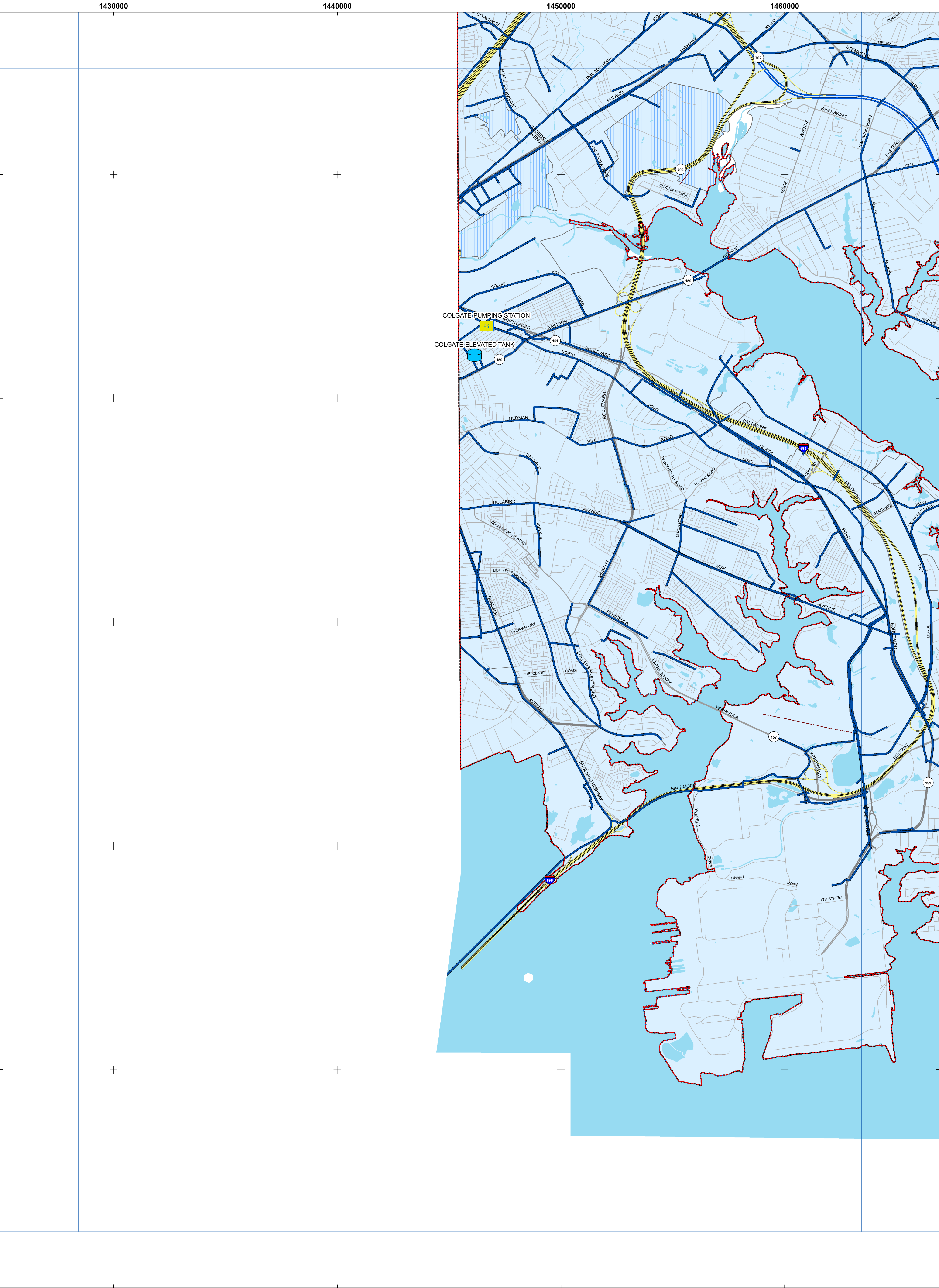
 Urban Rural Demarcation Line

 Metropolitan District






Map 17 of 20



Baltimore County Water Supply Plan



2017 Triennial Review Map W-23A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot
Produced by Baltimore County, Department of Public Works
Draft Published Tuesday, January 30, 2018

System Facilities

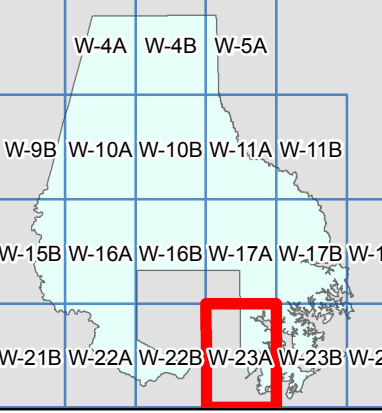
	Pumping Station
	Reservoir
	Tank
	Treatment Plant
	Mains 12" and Greater

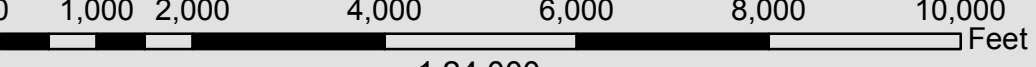

Water Supply Plan Areal Designations

	W-1 Existing Service Area		W-6 Area of Future Consideration
	W-3 Capital Facilities Area		W-7 CS No Planned Service: Community System
	W-4 Study Area		W-7 MU No Planned Service: Multi-Use System
	W-5 Master Plan Area		W-7 No Planned Community or Multi-Use Service (NPS)
	W-5 X Master Plan Area		

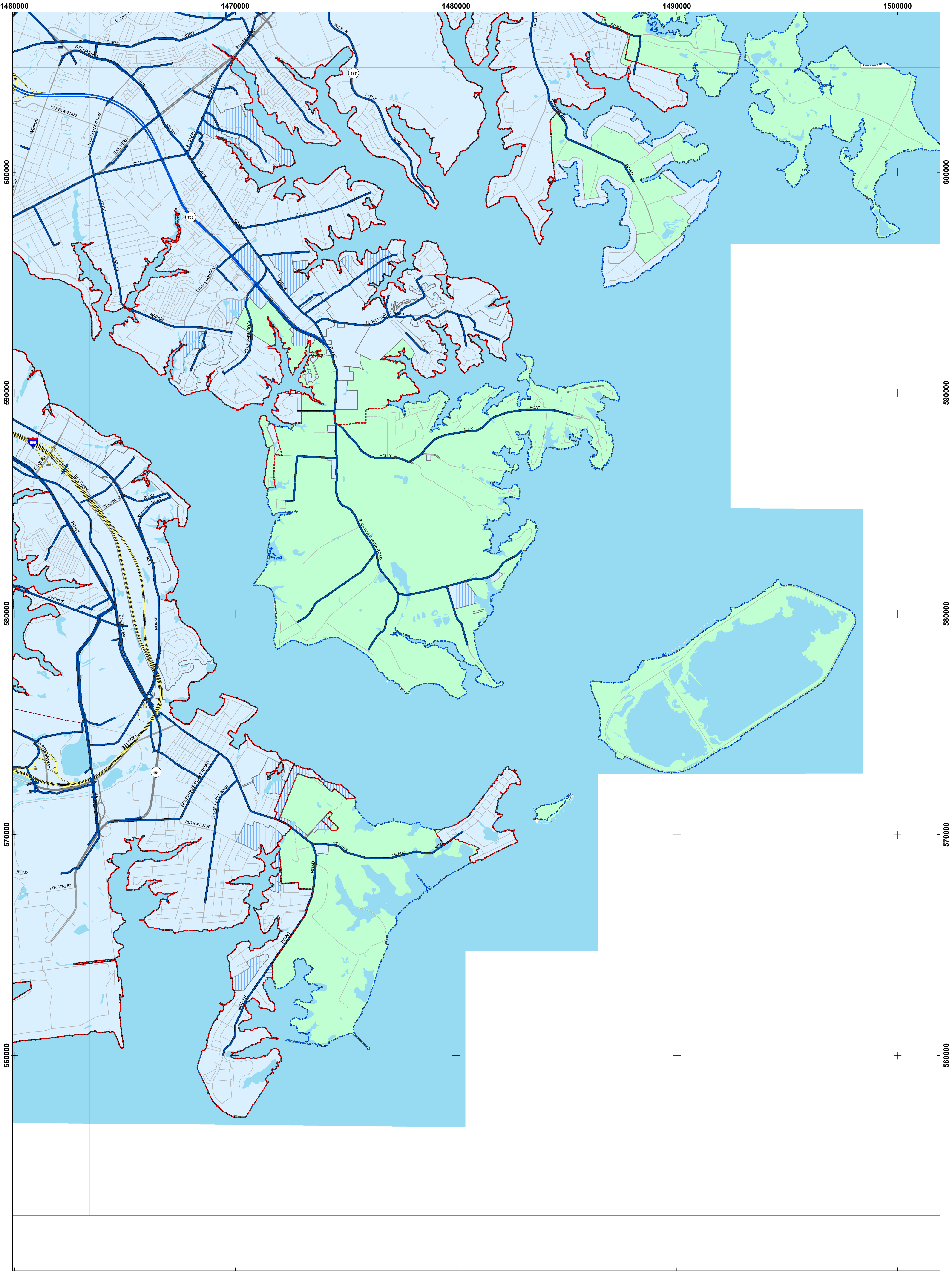
Boundaries

	Triennial Master Plan Grid
	Urban Rural Demarcation Line
	Metropolitan District






1:24,000



Baltimore County Water Supply Plan



2017 Triennial Review Map W-23B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
Draft Published Tuesday, January 30, 2018

System Facilities

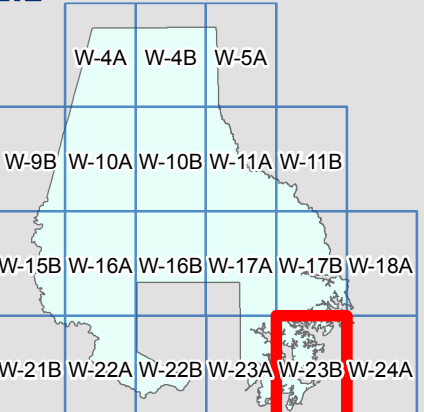
- Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Mains 12" and Greater

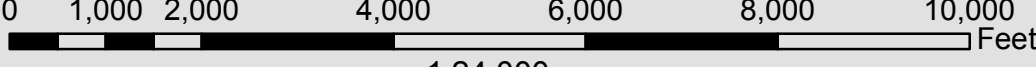

Water Supply Plan Areal Designations

W-1 Existing Service Area	W-6 Area of Future Consideration
W-3 Capital Facilities Area	W-7 CS No Planned Service: Community System
W-4 Study Area	W-7 MU No Planned Service: Multi-Use System
W-5 Master Plan Area	W-7 No Planned Community or Multi-Use Service (NPS)
W-5 X Master Plan Area	

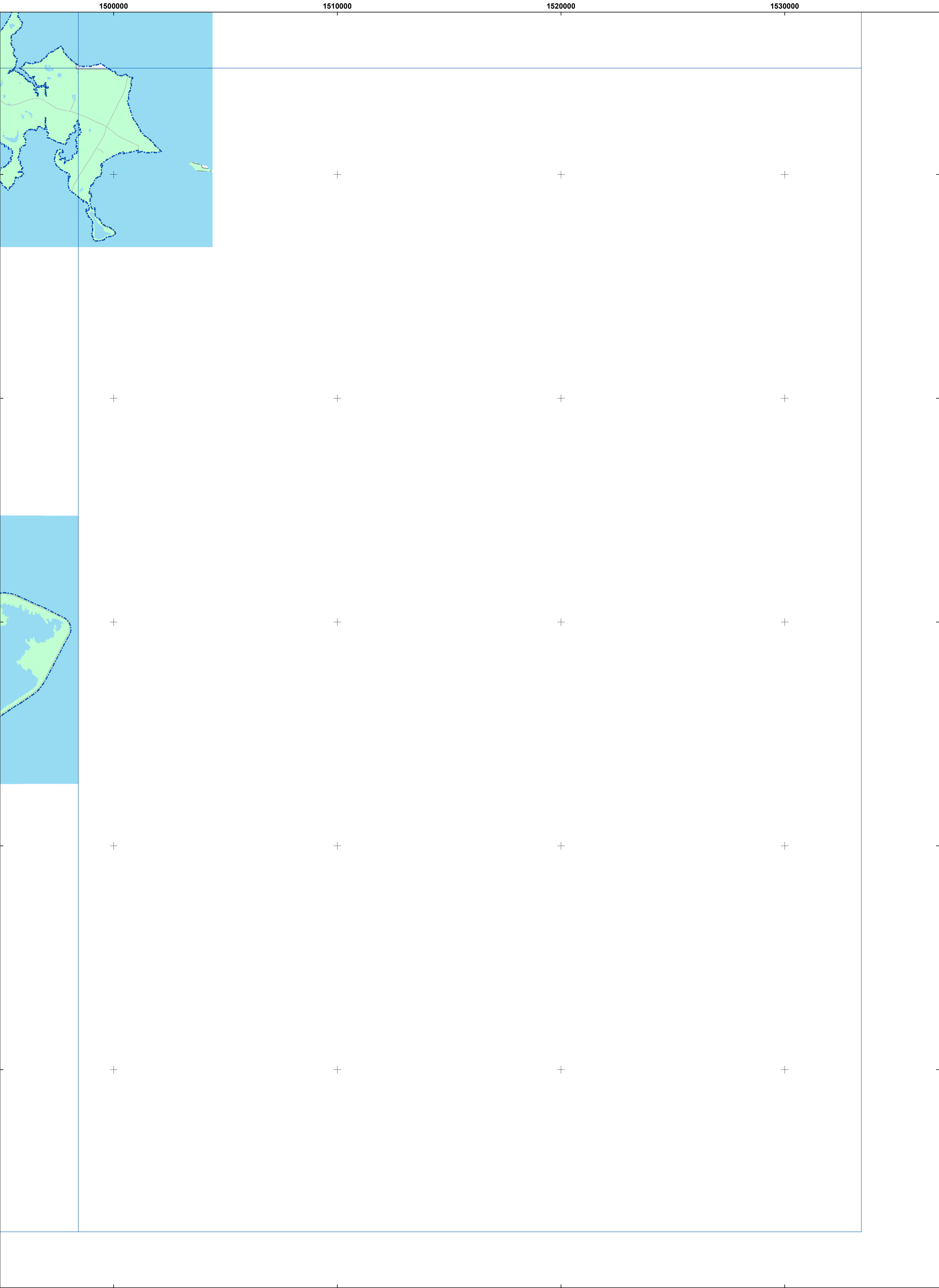
Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District






1:24,000



Baltimore County Water Supply Plan





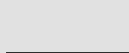


2017 Triennial Review Map W-24A

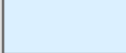





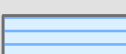
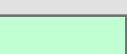

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
Draft Published Tuesday, January 30, 2018

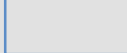
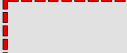
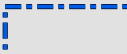
System Facilities

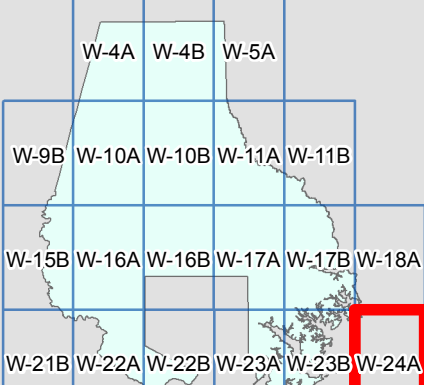
	Pumping Station
	Reservoir
	Tank
	Treatment Plant
	Mains 12" and Greater

Water Supply Plan Areal Designations



	W-1 Existing Service Area		W-6 Area of Future Consideration
	W-3 Capital Facilities Area		W-7 CS No Planned Service: Community System
	W-4 Study Area		W-7 MU No Planned Service: Multi-Use System
	W-5 Master Plan Area		W-7 No Planned Community or Multi-Use Service (NPS)
	W-5 X Master Plan Area		

Boundaries

	Triennial Master Plan Grid
	Urban Rural Demarcation Line
	Metropolitan District

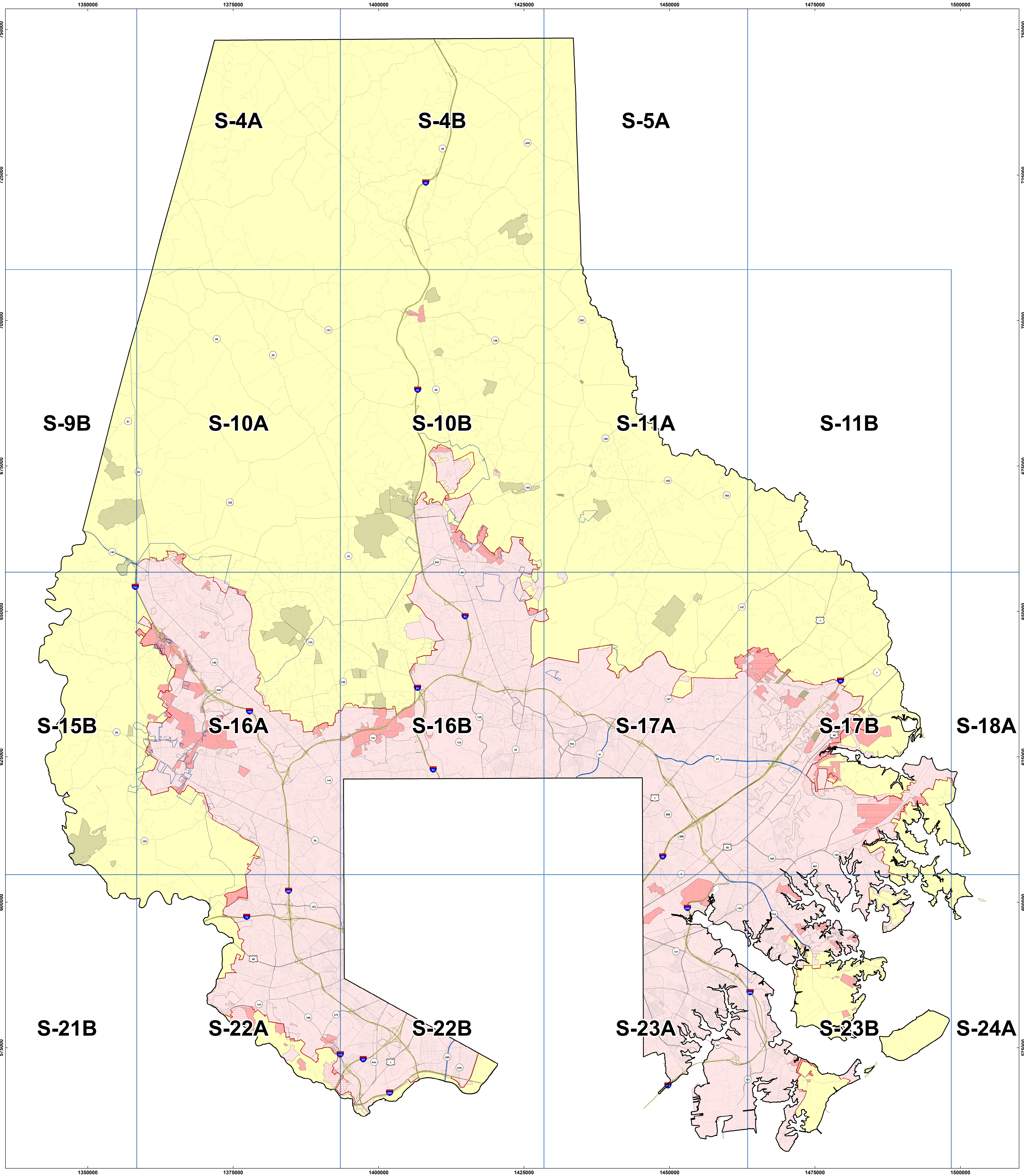


Inset map showing the location of Map W-24A within Baltimore County. The map is divided into a grid of 24 sub-areas, labeled W-1A through W-24A. Map W-24A is highlighted in red in the bottom right corner.



0 1,000 2,000 4,000 6,000 8,000 10,000 Feet

1:24,000



Baltimore County Sewerage Plan 2017 Triennial Review

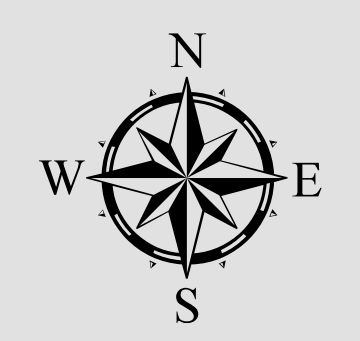


Sewerage Plan Area Designations

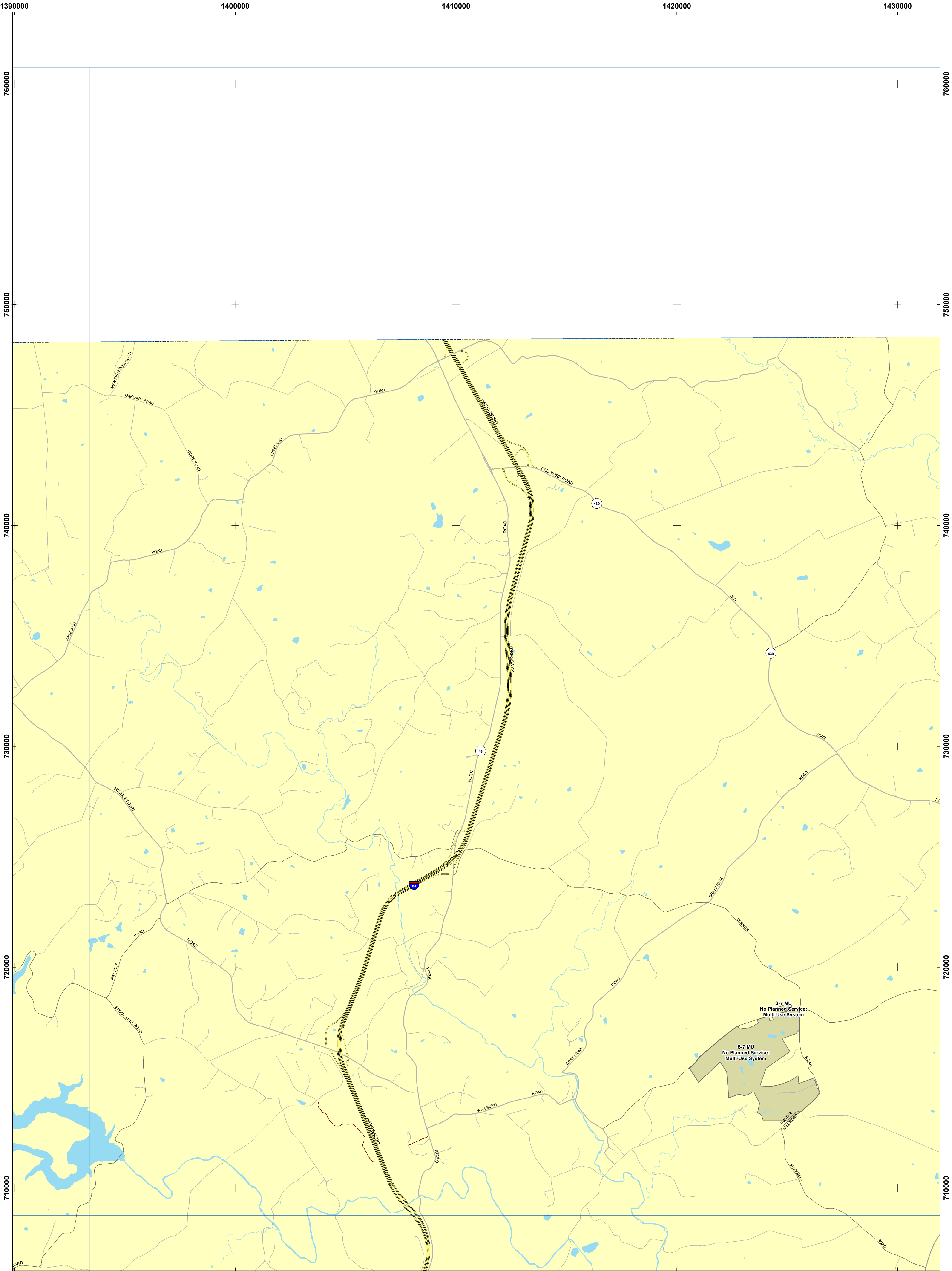
- | | | |
|-----------------------------|----------------------------------|---|
| S-1 Existing Service Area | S-5 Master Plan Area | S-7 CS No Planned Service: Community System |
| S-3 Capital Facilities Area | S-5 X Master Plan Area | S-7 MU No Planned Service: Multi-Use System |
| S-4 Study Area | S-6 Area of Future Consideration | S-7 No Planned Community or Multi-Use Service (NPS) |

Boundaries

- | |
|------------------------------|
| Triennial Master Plan Grid |
| Urban Rural Demarcation Line |
| Metropolitan District |



1:63,360
0 1 2 4 6 8 10 Miles
1 in = 1 mile



Baltimore County Sewerage Plan



2017 Triennial Review Map S-4B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
Draft Published Tuesday, January 30, 2018

System Facilities

- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains

Sewerage Plan Area Designations

- S-1 Existing Service Area
- S-3 Capital Facilities Area
- S-4 Study Area
- S-5 Master Plan Area
- S-5 X Master Plan Area
- S-6 Area of Future Consideration
- S-7 CS No Planned Service: Community System
- S-7 MU No Planned Service: Multi-Use System
- S-7 No Planned Community or Multi-Use Service (NPS)

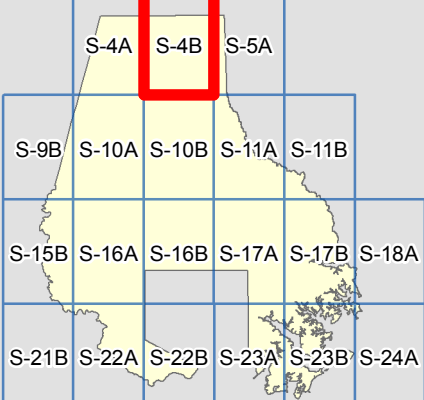


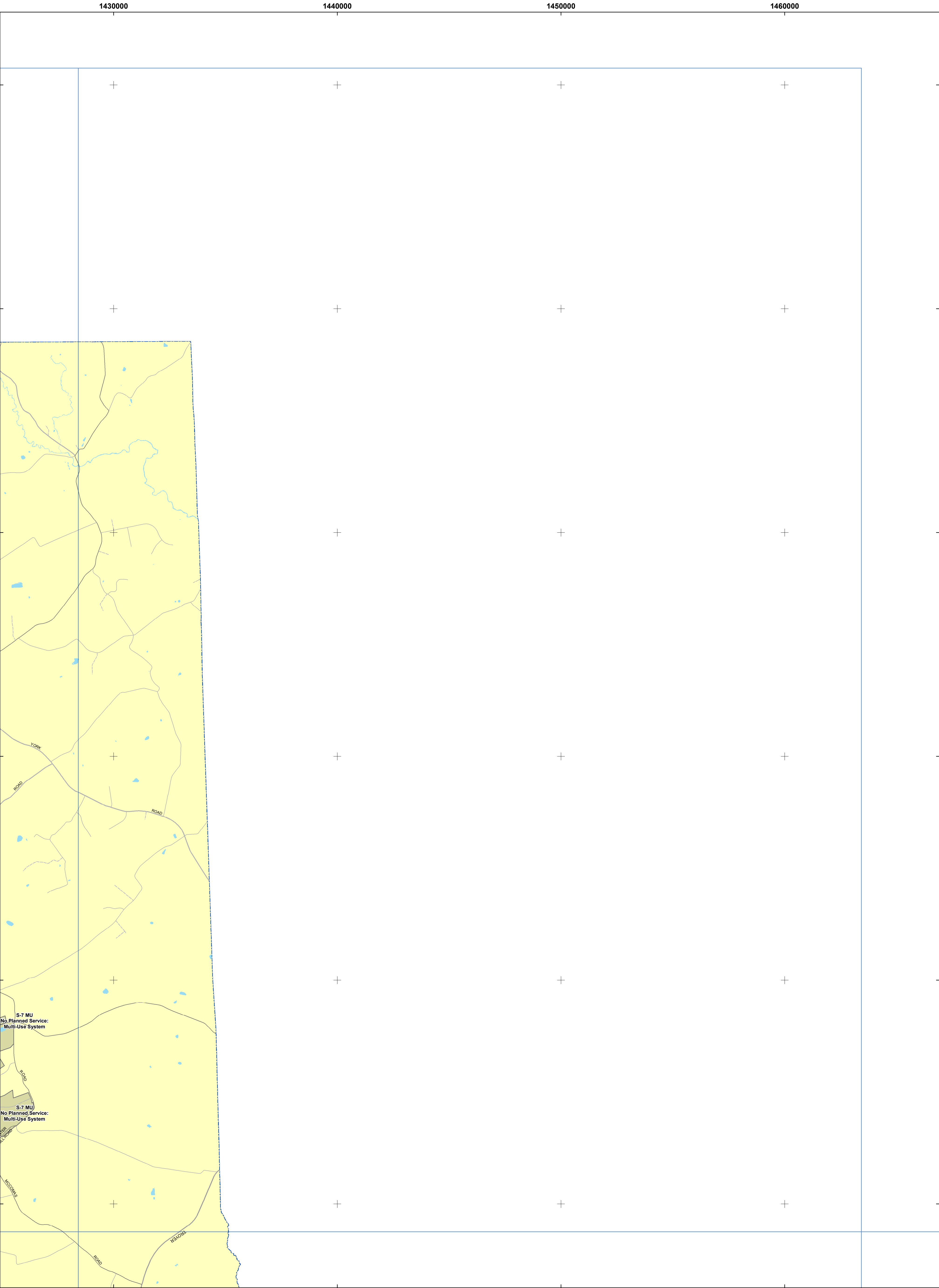
0 1,000 2,000 4,000 6,000 8,000 10,000 Feet

1:24,000


Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District





Baltimore County Sewerage Plan



2017 Triennial Review Map S-5A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
Draft Published Tuesday, January 30, 2018

System Facilities

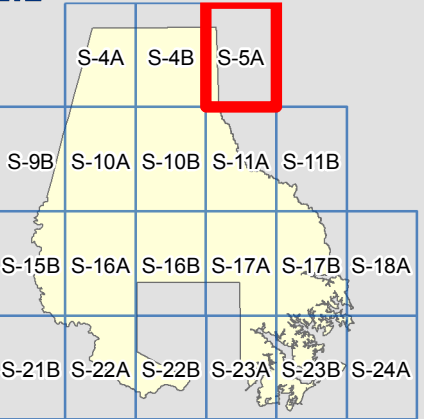
- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains

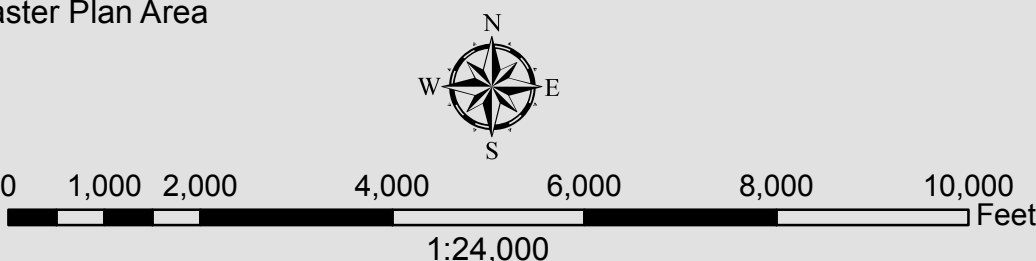
Sewerage Plan Area Designations

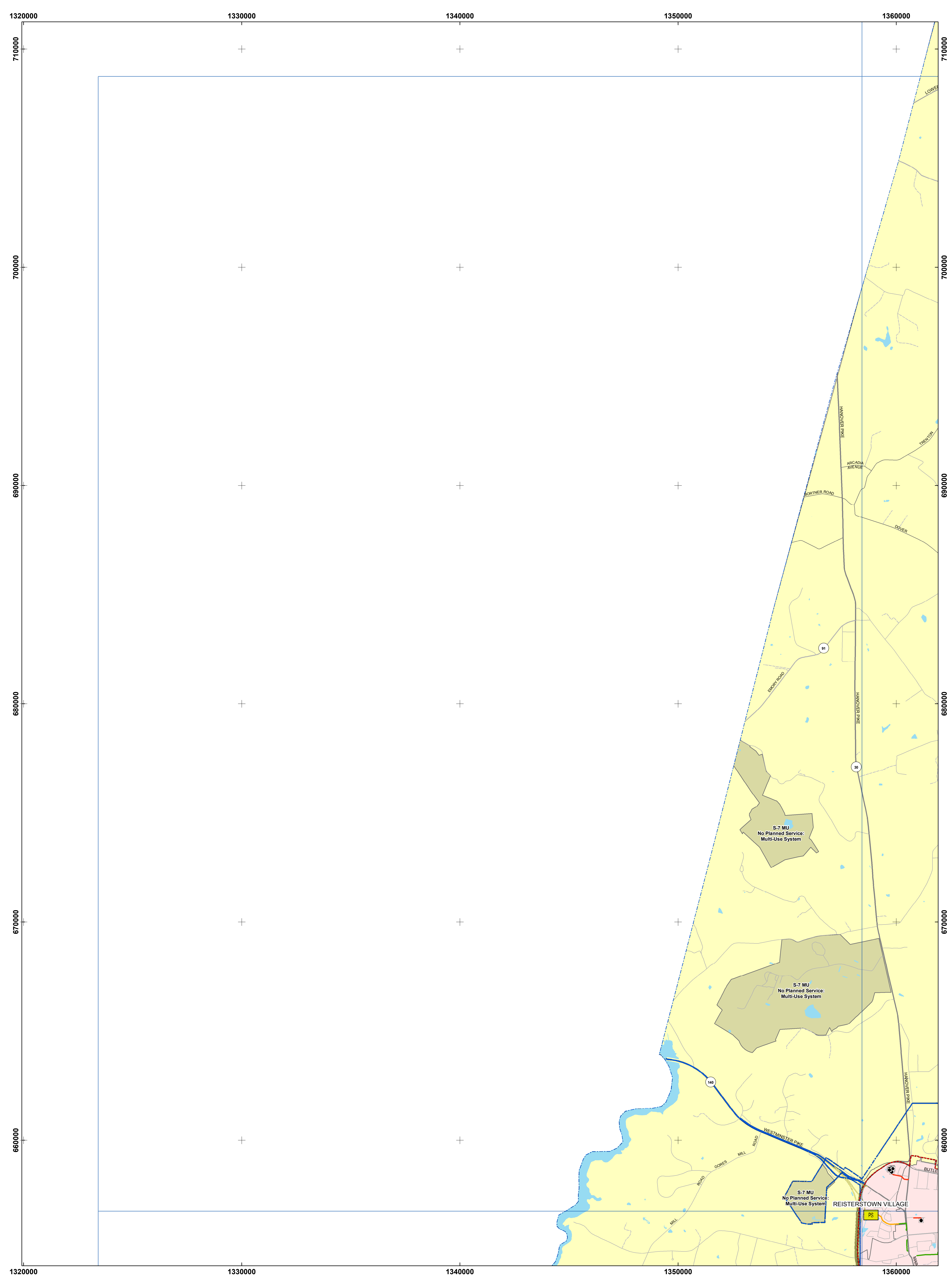
- S-1 Existing Service Area
- S-3 Capital Facilities Area
- S-4 Study Area
- S-5 Master Plan Area
- S-5 X Master Plan Area
- S-6 Area of Future Consideration
- S-7 CS No Planned Service: Community System
- S-7 MU No Planned Service: Multi-Use System
- S-7 No Planned Community or Multi-Use Service (NPS)

Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District







Baltimore County Sewerage Plan







2017 Triennial Review

Map S-9B


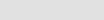





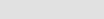

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
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


System Facilities

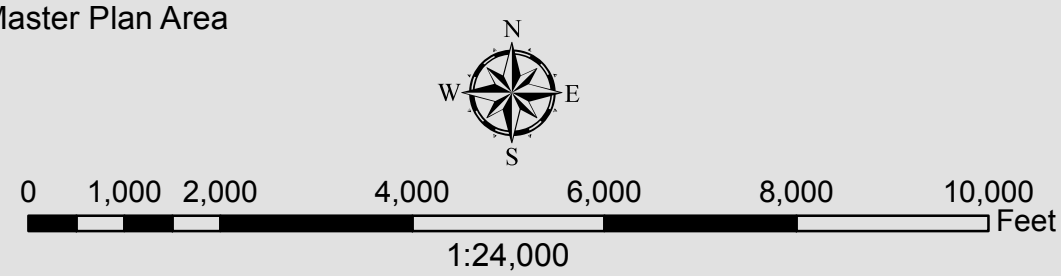
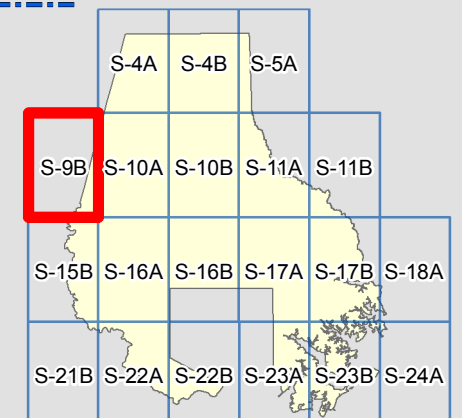
-  Grinder Pump
-  PS Pump Station
-  Force Mains
-  Gravity Mains 12" and Greater
- Low Pressure Mains

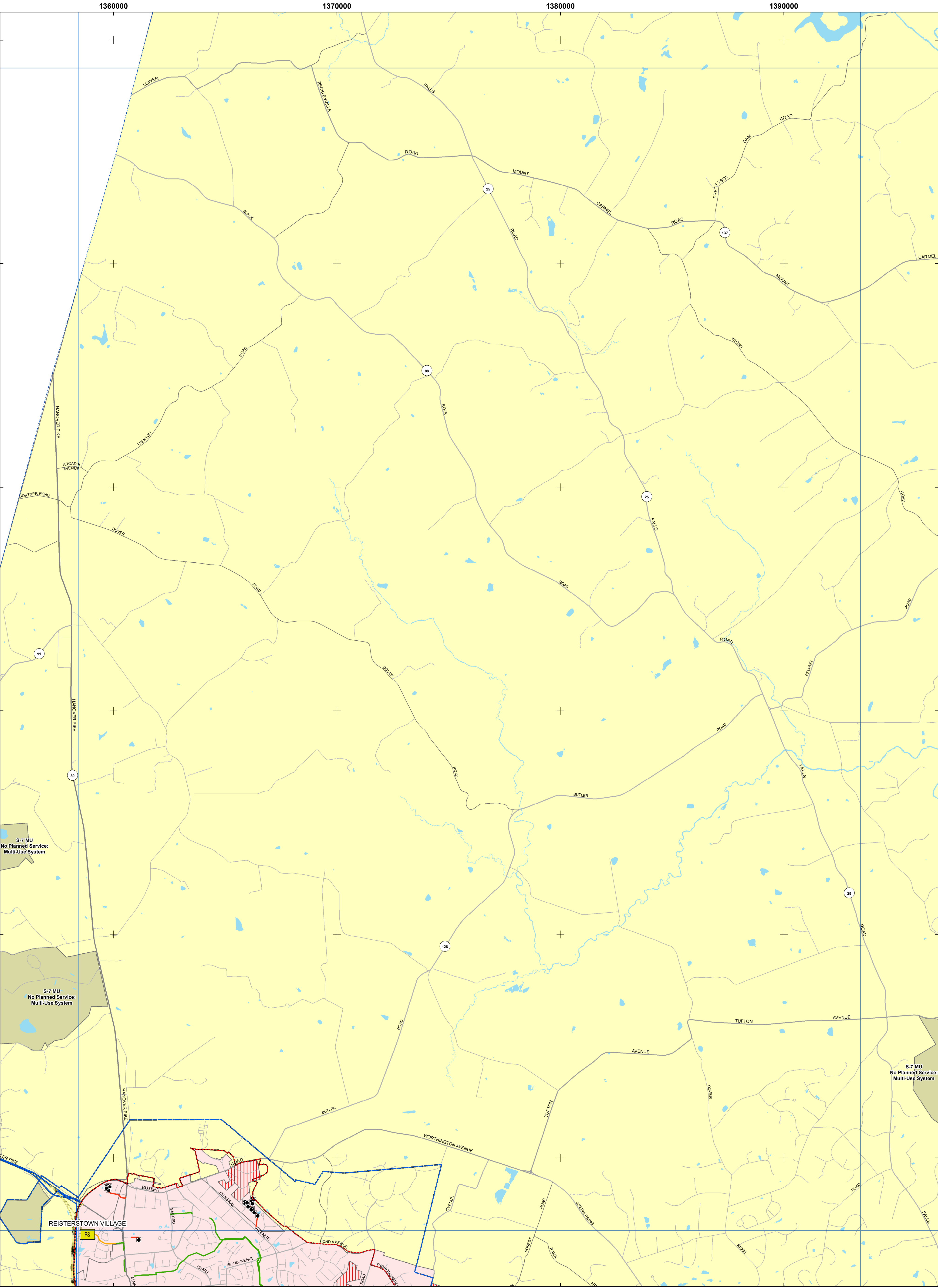
Sewerage Plan Areal Designations

- | | | | |
|---|-----------------------------|---|---|
|  | S-1 Existing Service Area |  | S-6 Area of Future Consideration |
|  | S-3 Capital Facilities Area |  | S-7 CS No Planned Service: Community System |
|  | S-4 Study Area |  | S-7 MU No Planned Service: Multi-Use System |
|  | S-5 Master Plan Area |  | S-7 No Planned Community or Multi-Use Service (NPS) |
|  | S-5 X Master Plan Area | | |

Boundaries

-  Triennial Master Plan Grid
 Urban Rural Demarcation
 Metropolitan District





Baltimore County Sewerage Plan



2017 Triennial Review Map S-10A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

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System Facilities

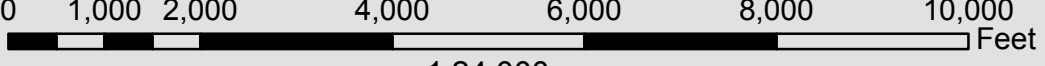

- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains

Sewerage Plan Area Designations

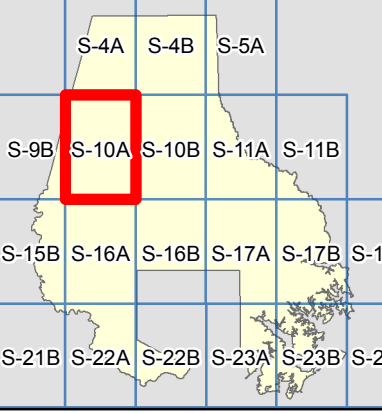
- S-1 Existing Service Area
- S-3 Capital Facilities Area
- S-4 Study Area
- S-5 Master Plan Area
- S-5 X Master Plan Area
- S-6 Area of Future Consideration
- S-7 CS No Planned Service: Community System
- S-7 MU No Planned Service: Multi-Use System
- S-7 No Planned Community or Multi-Use Service (NPS)

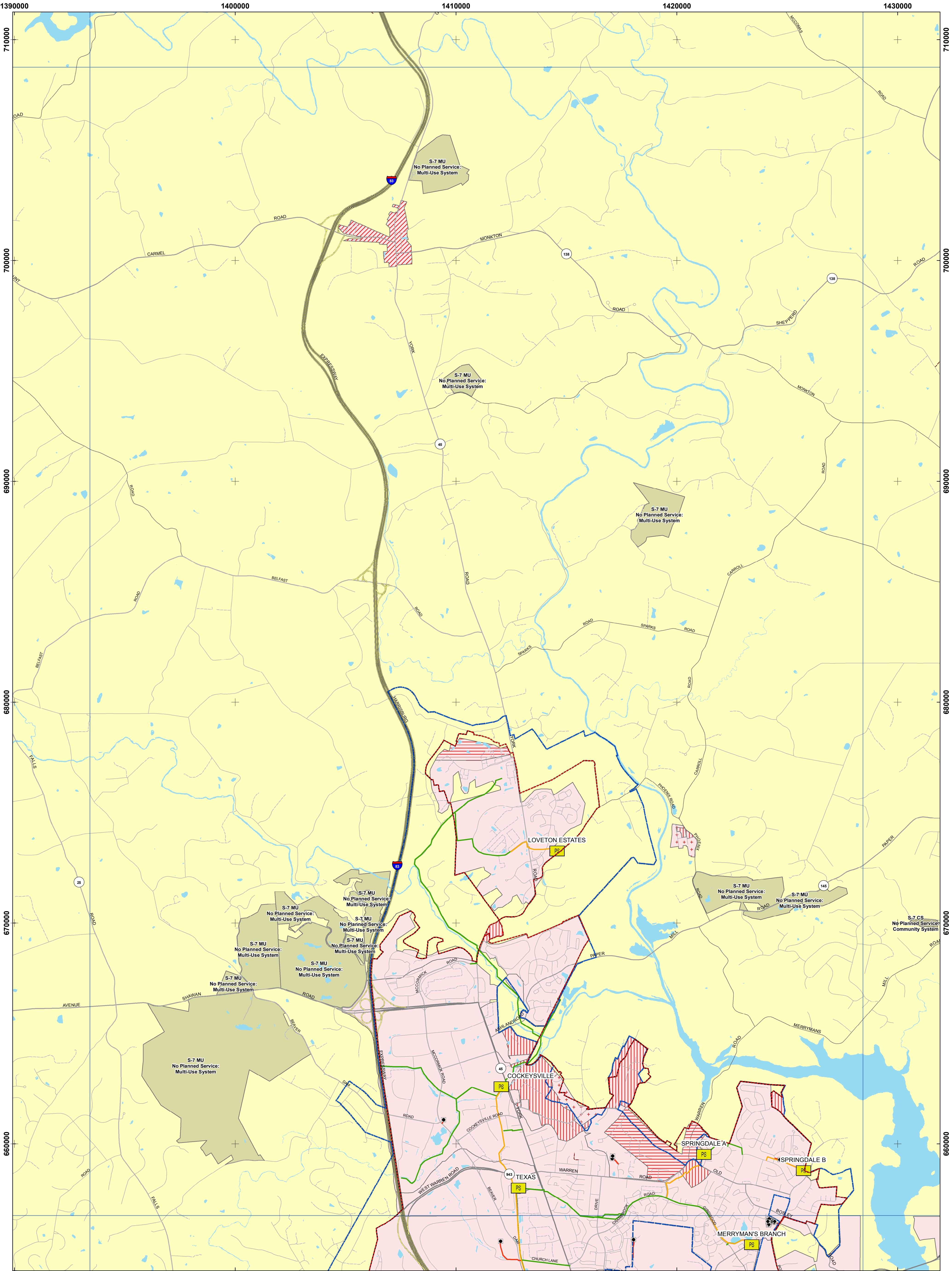
Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District



1:24,000





Baltimore County Sewerage Plan



2017 Triennial Review Map S-10B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot
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System Facilities

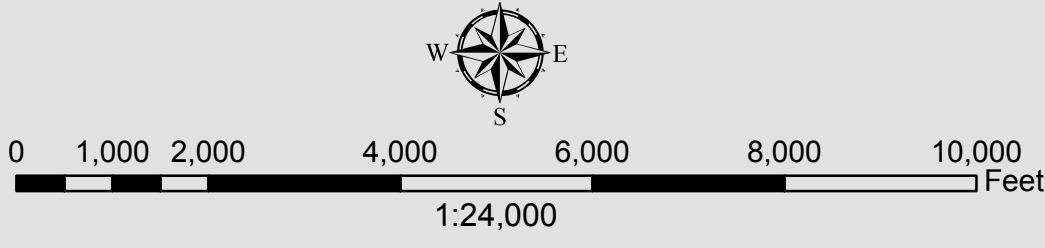
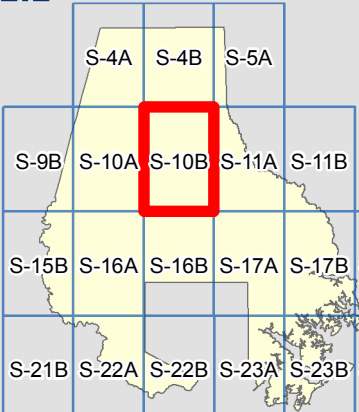
- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains

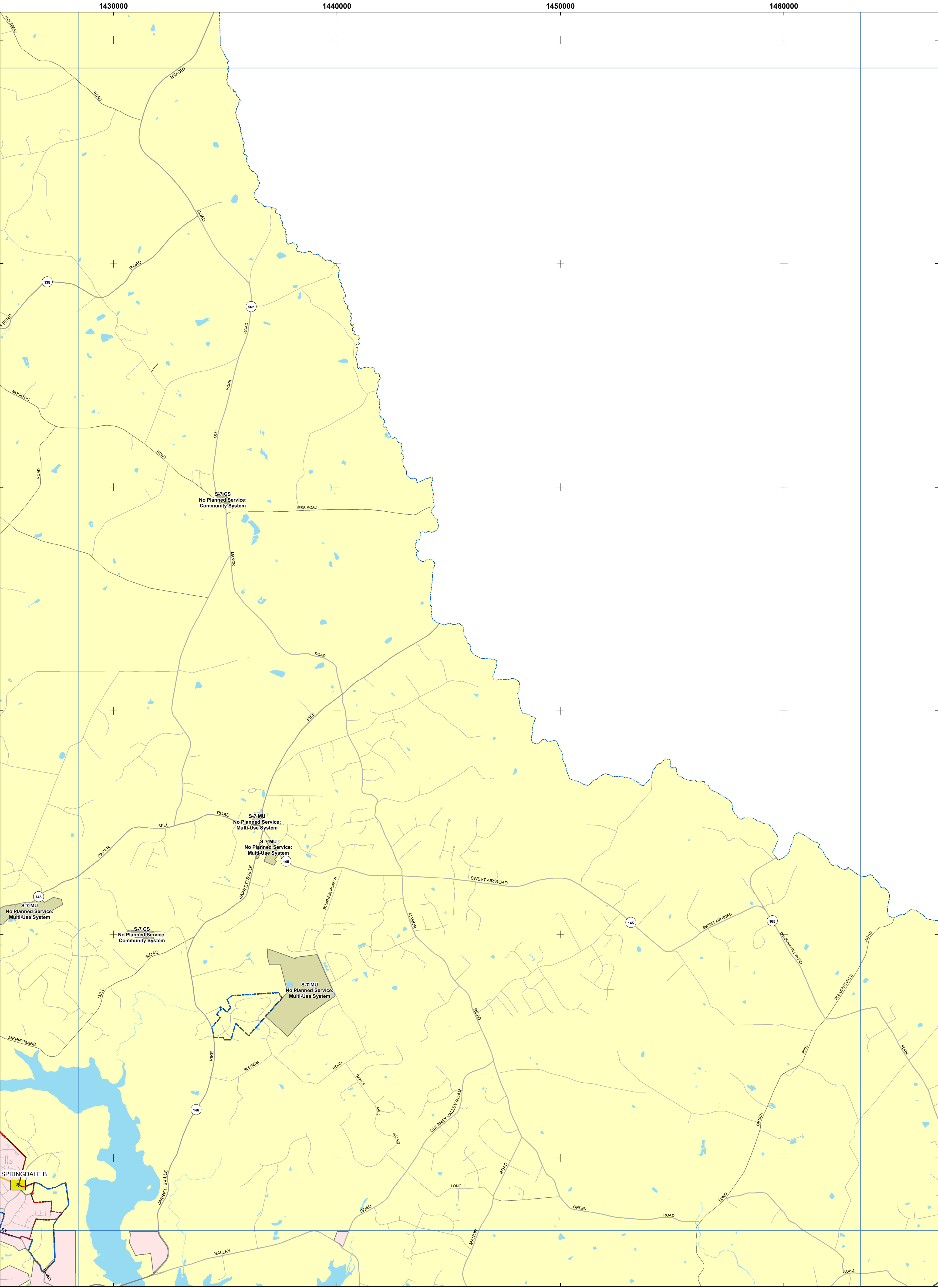
Sewerage Plan Area Designations

- S-1 Existing Service Area
- S-3 Capital Facilities Area
- S-4 Study Area
- S-5 Master Plan Area
- S-5 X Master Plan Area
- S-6 Area of Future Consideration
- S-7 CS No Planned Service: Community System
- S-7 MU No Planned Service: Multi-Use System
- S-7 No Planned Community or Multi-Use Service (NPS)

Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District





Baltimore County Sewerage Plan



2017 Triennial Review Map S-11A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

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System Facilities

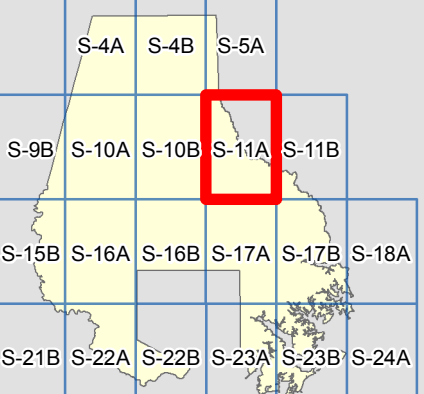
- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains

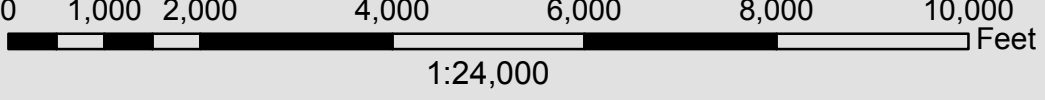

Sewerage Plan Area Designations

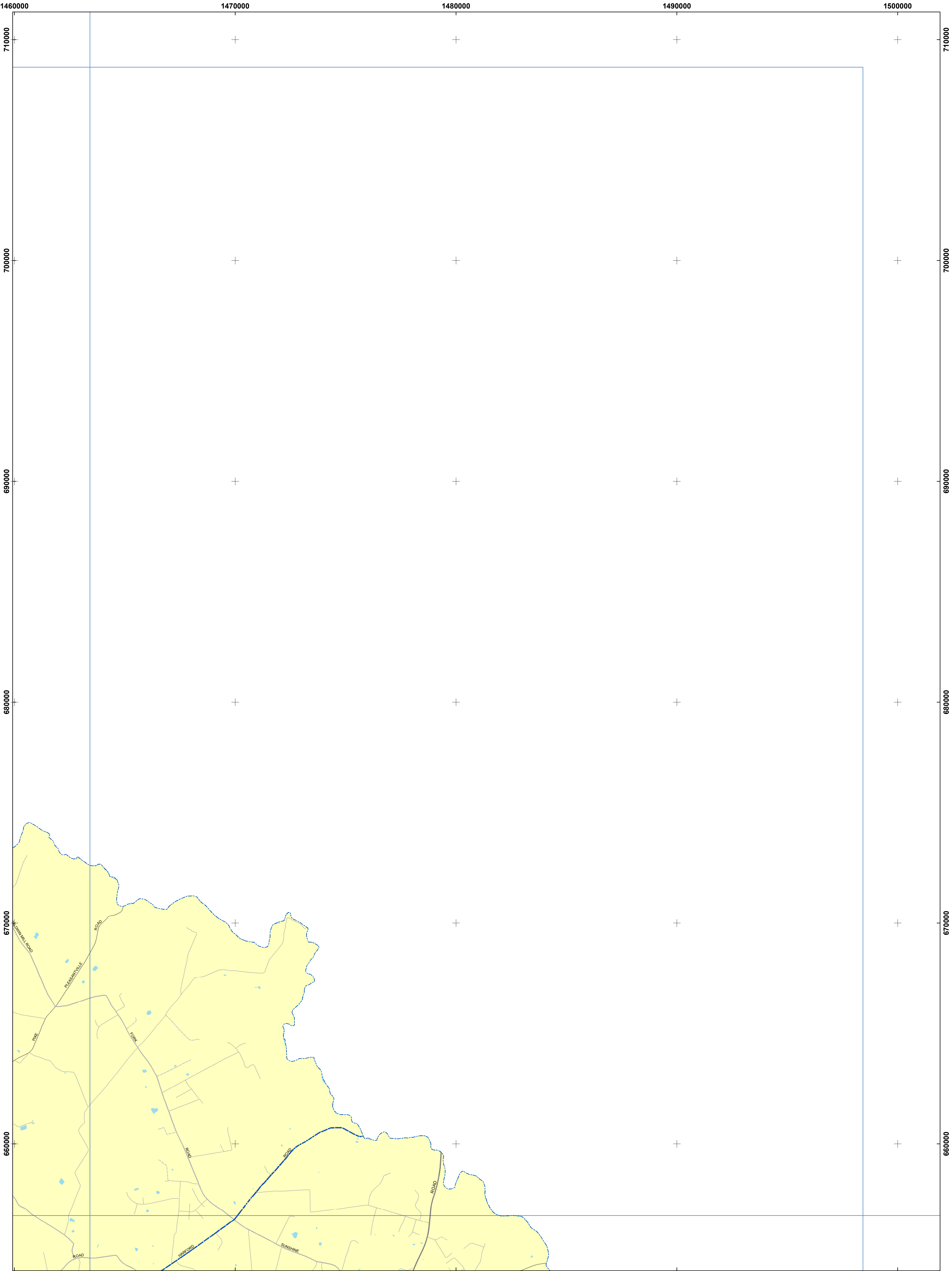
S-1 Existing Service Area	S-6 Area of Future Consideration
S-3 Capital Facilities Area	S-7 CS No Planned Service: Community System
S-4 Study Area	S-7 MU No Planned Service: Multi-Use System
S-5 Master Plan Area	S-7 No Planned Community or Multi-Use Service (NPS)
S-5 X Master Plan Area	

Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District







Baltimore County Sewerage Plan



2017 Triennial Review Map S-11B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot
Produced by Baltimore County, Department of Public Works
Draft Published Tuesday, January 30, 2018

System Facilities

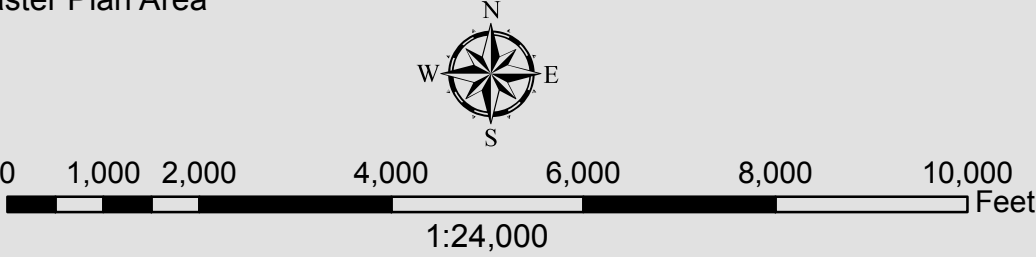
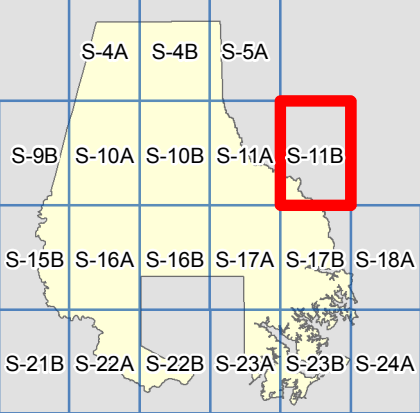
- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains

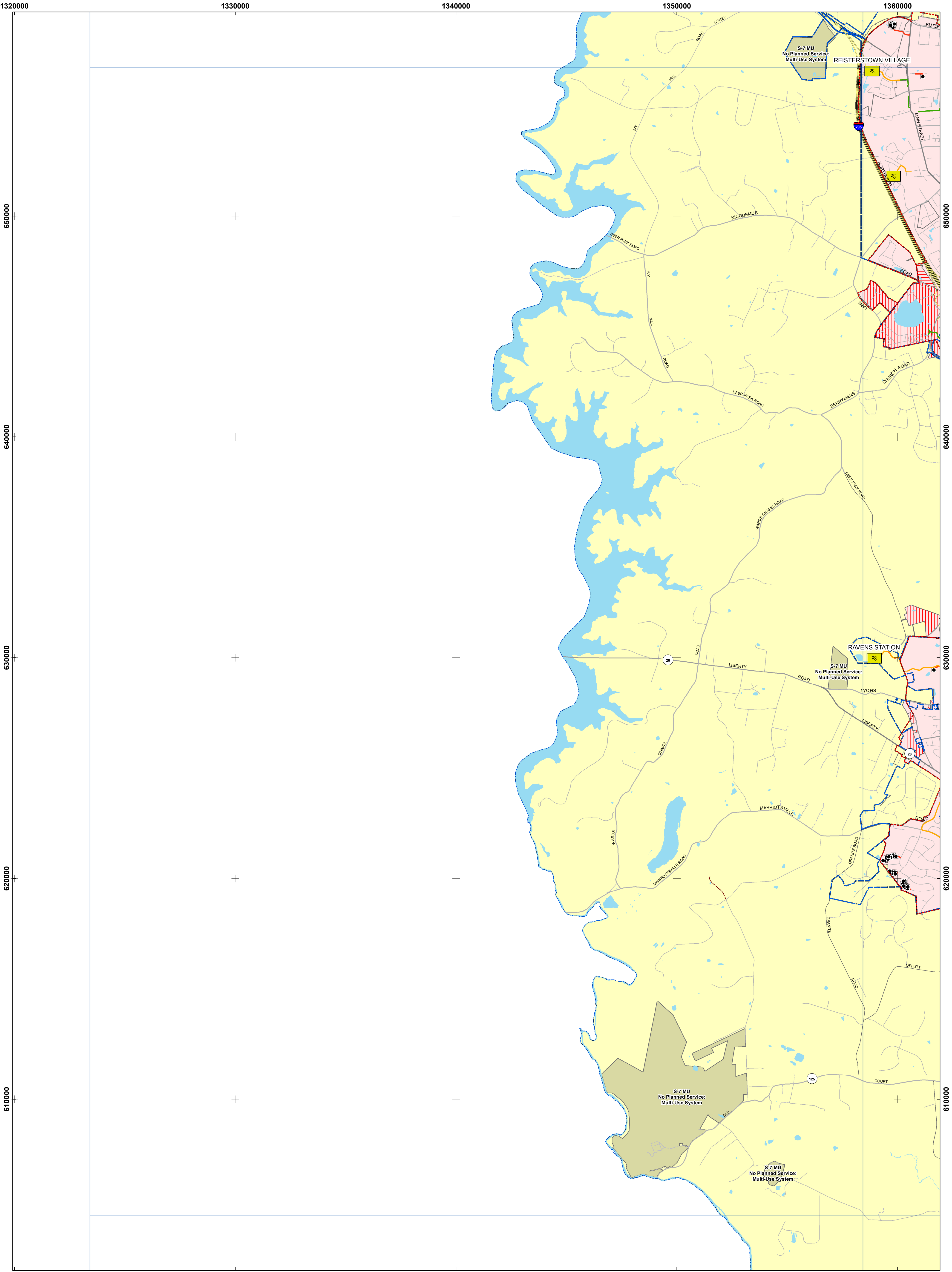
Sewerage Plan Area Designations

- S-1 Existing Service Area
- S-3 Capital Facilities Area
- S-4 Study Area
- S-5 Master Plan Area
- S-5 X Master Plan Area
- S-6 Area of Future Consideration
- S-7 CS No Planned Service: Community System
- S-7 MU No Planned Service: Multi-Use System
- S-7 No Planned Community or Multi-Use Service (NPS)

Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District





Baltimore County Sewerage Plan



2017 Triennial Review Map S-15B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot
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System Facilities

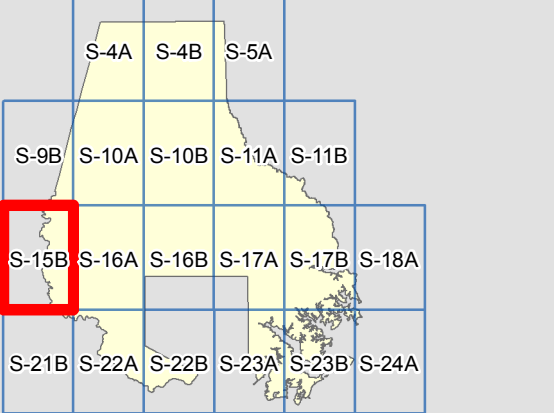
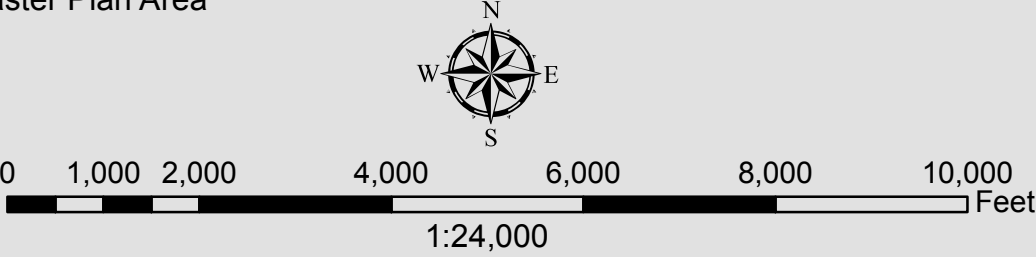
- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains

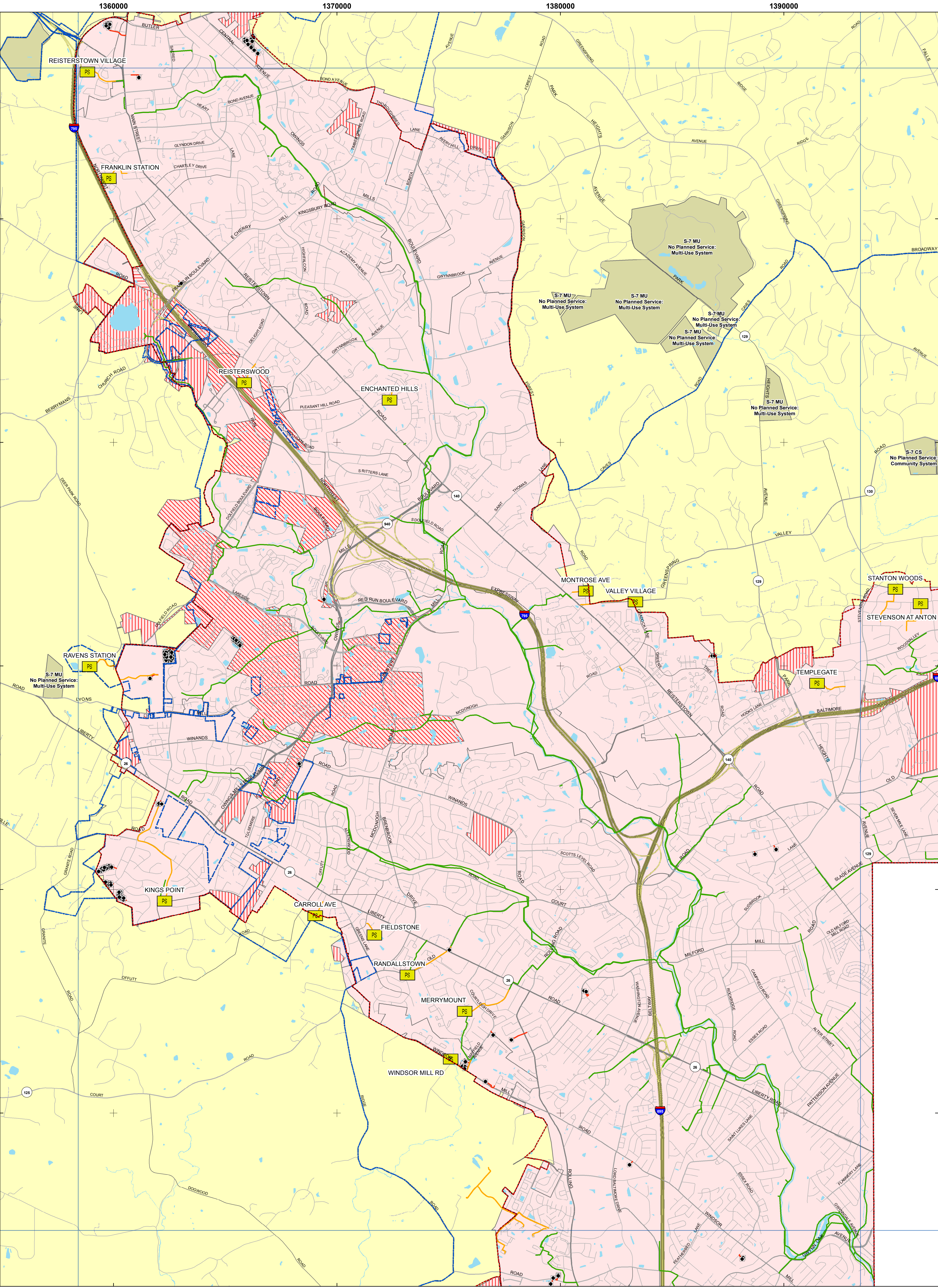
Sewerage Plan Area Designations

- S-1 Existing Service Area
- S-3 Capital Facilities Area
- S-4 Study Area
- S-5 Master Plan Area
- S-5 X Master Plan Area
- S-6 Area of Future Consideration
- S-7 CS No Planned Service: Community System
- S-7 MU No Planned Service: Multi-Use System
- S-7 No Planned Community or Multi-Use Service (NPS)

Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District





Baltimore County Sewerage Plan



2017 Triennial Review Map S-16A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
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System Facilities

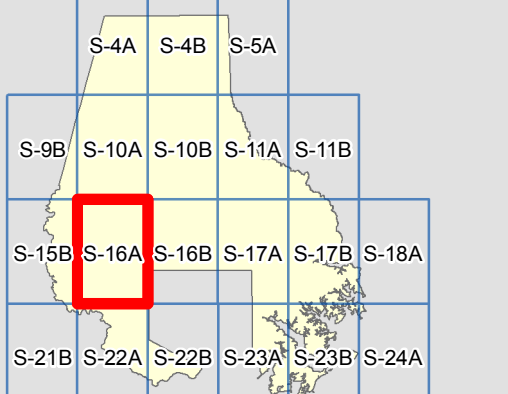
- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains

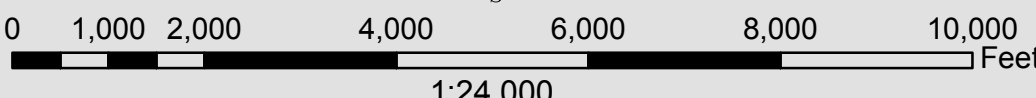

Sewerage Plan Area Designations

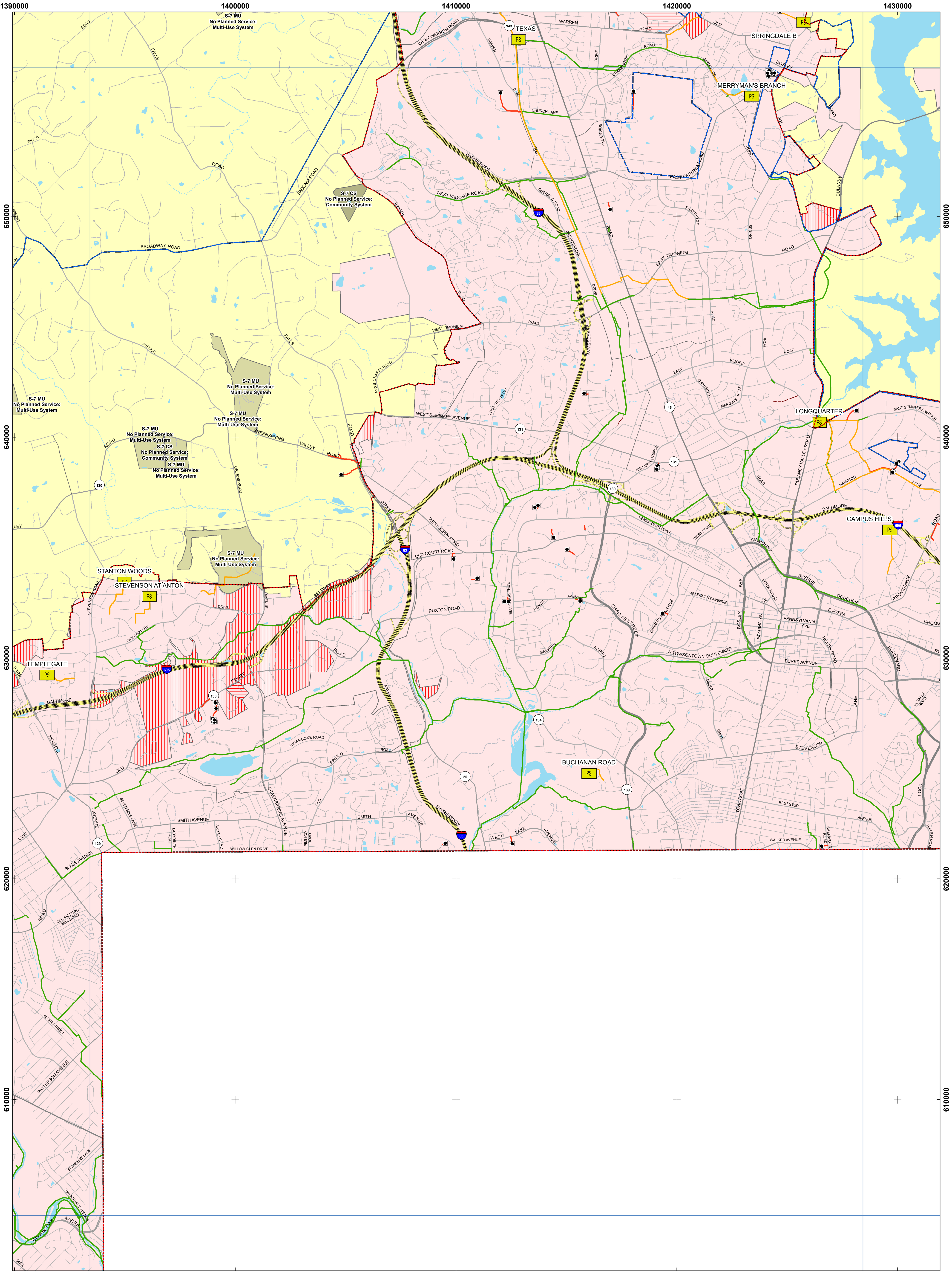
- S-1 Existing Service Area
- S-3 Capital Facilities Area
- S-4 Study Area
- S-5 Master Plan Area
- S-5 X Master Plan Area
- S-6 Area of Future Consideration
- S-7 CS No Planned Service: Community System
- S-7 MU No Planned Service: Multi-Use System
- S-7 No Planned Community or Multi-Use Service (NPS)

Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District







Baltimore County Sewerage Plan



2017 Triennial Review Map S-16B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
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System Facilities

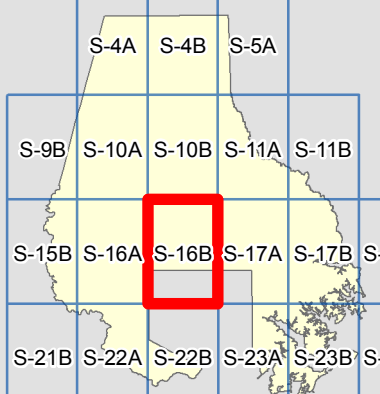
- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains

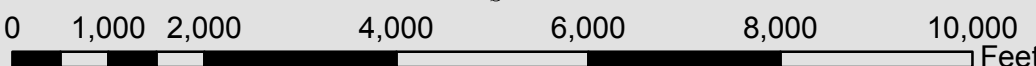

Sewerage Plan Area Designations

S-1 Existing Service Area	S-6 Area of Future Consideration
S-3 Capital Facilities Area	S-7 CS No Planned Service: Community System
S-4 Study Area	S-7 MU No Planned Service: Multi-Use System
S-5 Master Plan Area	S-7 No Planned Community or Multi-Use Service (NPS)
S-5 X Master Plan Area	

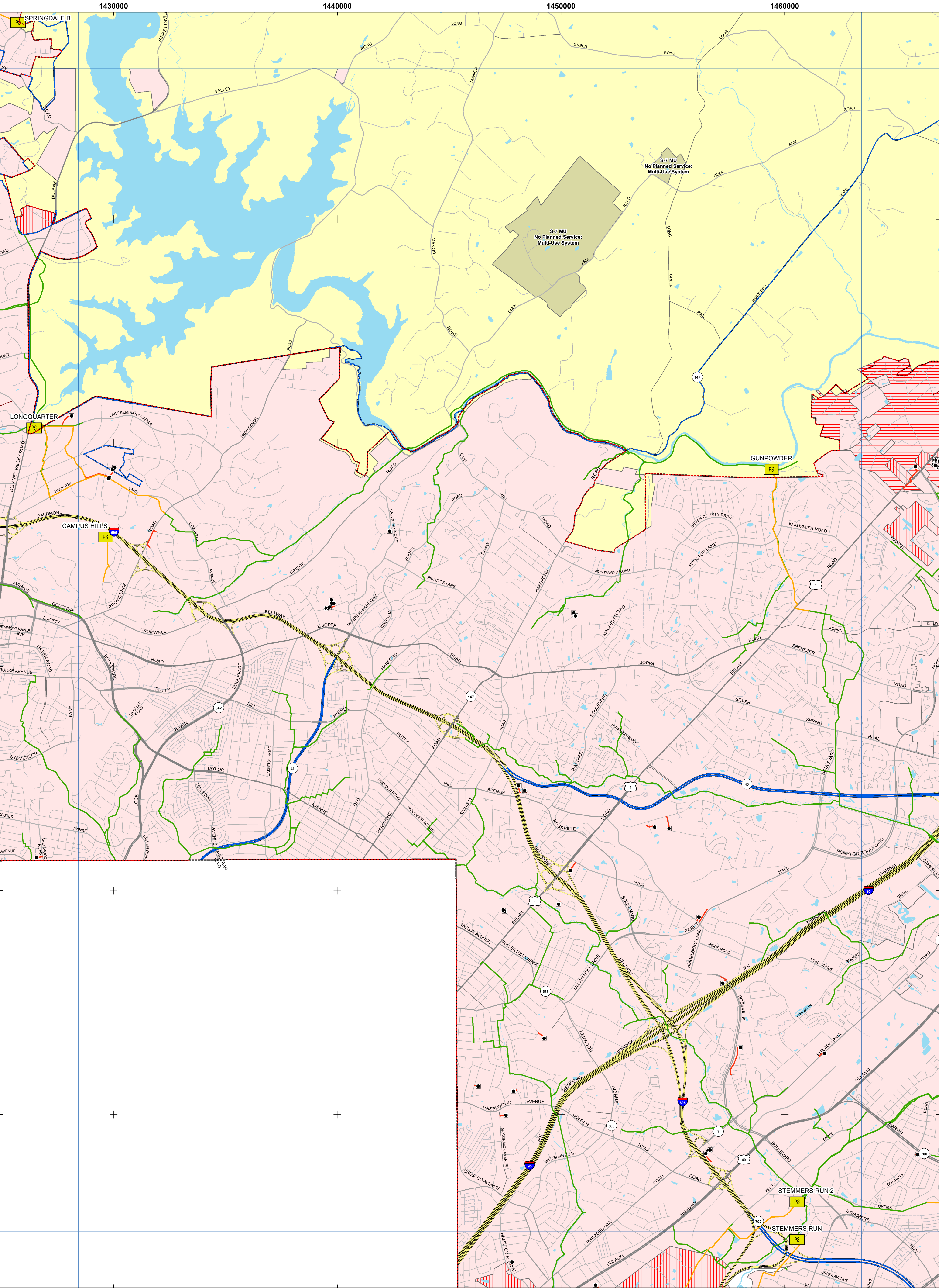
Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District





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Baltimore County Sewerage Plan



2017 Triennial Review Map S-17A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
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System Facilities

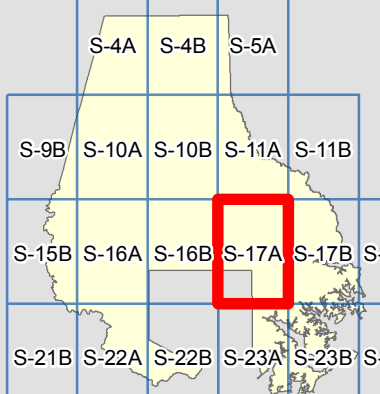
- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains

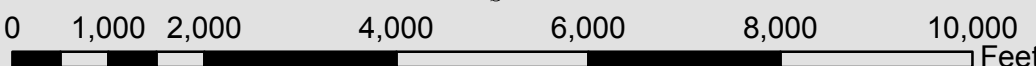

Sewerage Plan Area Designations

S-1 Existing Service Area	S-6 Area of Future Consideration
S-3 Capital Facilities Area	S-7 CS No Planned Service: Community System
S-4 Study Area	S-7 MU No Planned Service: Multi-Use System
S-5 Master Plan Area	S-7 No Planned Community or Multi-Use Service (NPS)
S-5 X Master Plan Area	

Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District






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Baltimore County Sewerage Plan



2017 Triennial Review Map S-18A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

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Draft Published Tuesday, January 30, 2018

System Facilities

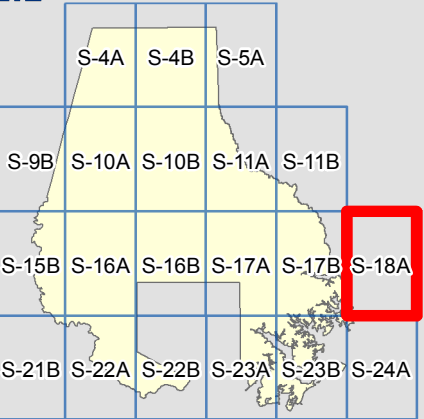
- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains

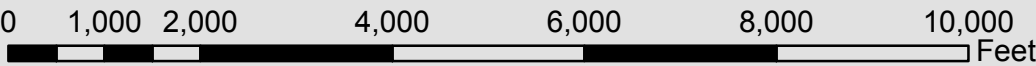
Sewerage Plan Area Designations

- S-1 Existing Service Area
- S-3 Capital Facilities Area
- S-4 Study Area
- S-5 Master Plan Area
- S-5 X Master Plan Area
- S-6 Area of Future Consideration
- S-7 CS No Planned Service: Community System
- S-7 MU No Planned Service: Multi-Use System
- S-7 No Planned Community or Multi-Use Service (NPS)

Boundaries


- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District

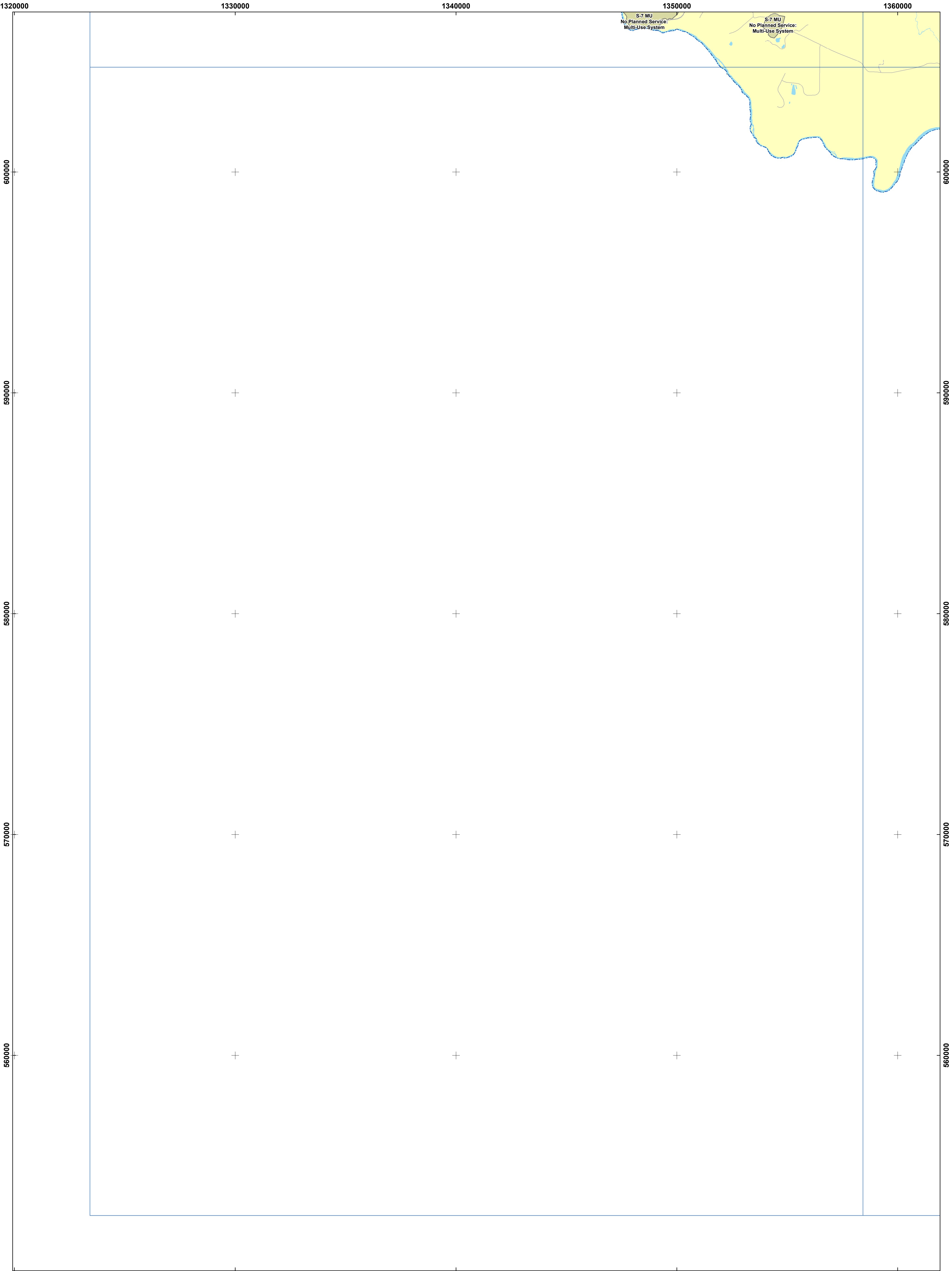




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Baltimore County Sewerage Plan



2017 Triennial Review Map S-21B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot
Produced by Baltimore County, Department of Public Works
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System Facilities

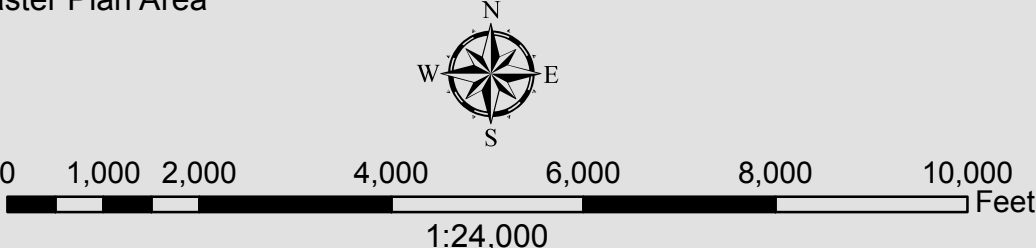
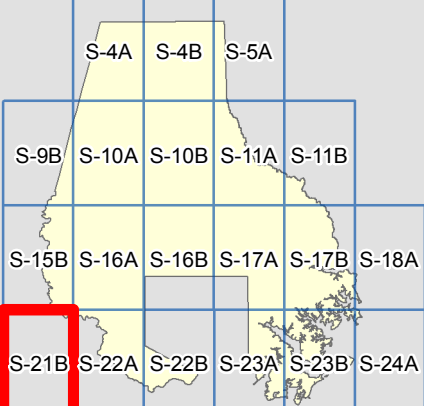
- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains

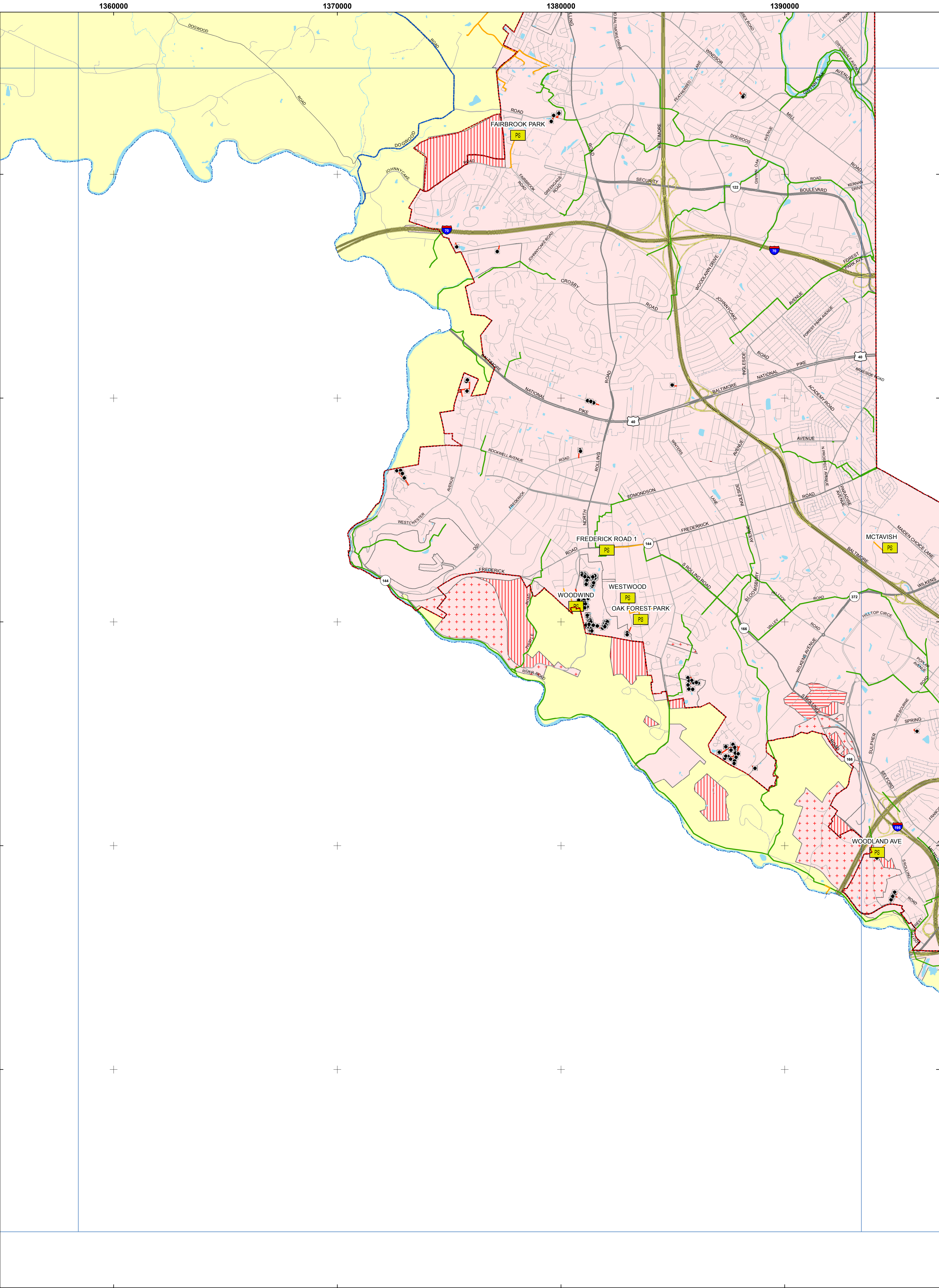
Sewerage Plan Area Designations

- S-1 Existing Service Area
- S-3 Capital Facilities Area
- S-4 Study Area
- S-5 Master Plan Area
- S-5 X Master Plan Area
- S-6 Area of Future Consideration
- S-7 CS No Planned Service: Community System
- S-7 MU No Planned Service: Multi-Use System
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Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District





Baltimore County Sewerage Plan



2017 Triennial Review Map S-22A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

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System Facilities

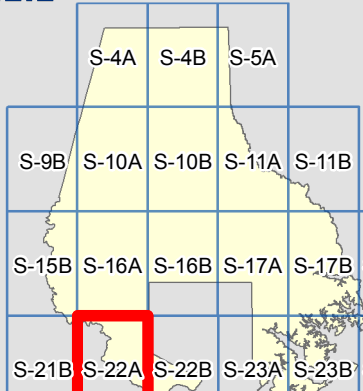
- Grinder Pump
- Pump Station
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- Low Pressure Mains

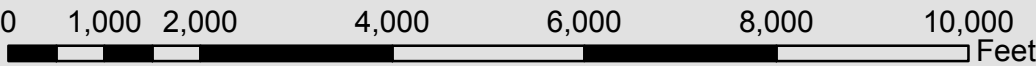

Sewerage Plan Area Designations

S-1 Existing Service Area	S-6 Area of Future Consideration
S-3 Capital Facilities Area	S-7 CS No Planned Service: Community System
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S-5 Master Plan Area	S-7 No Planned Community or Multi-Use Service (NPS)
S-5 X Master Plan Area	

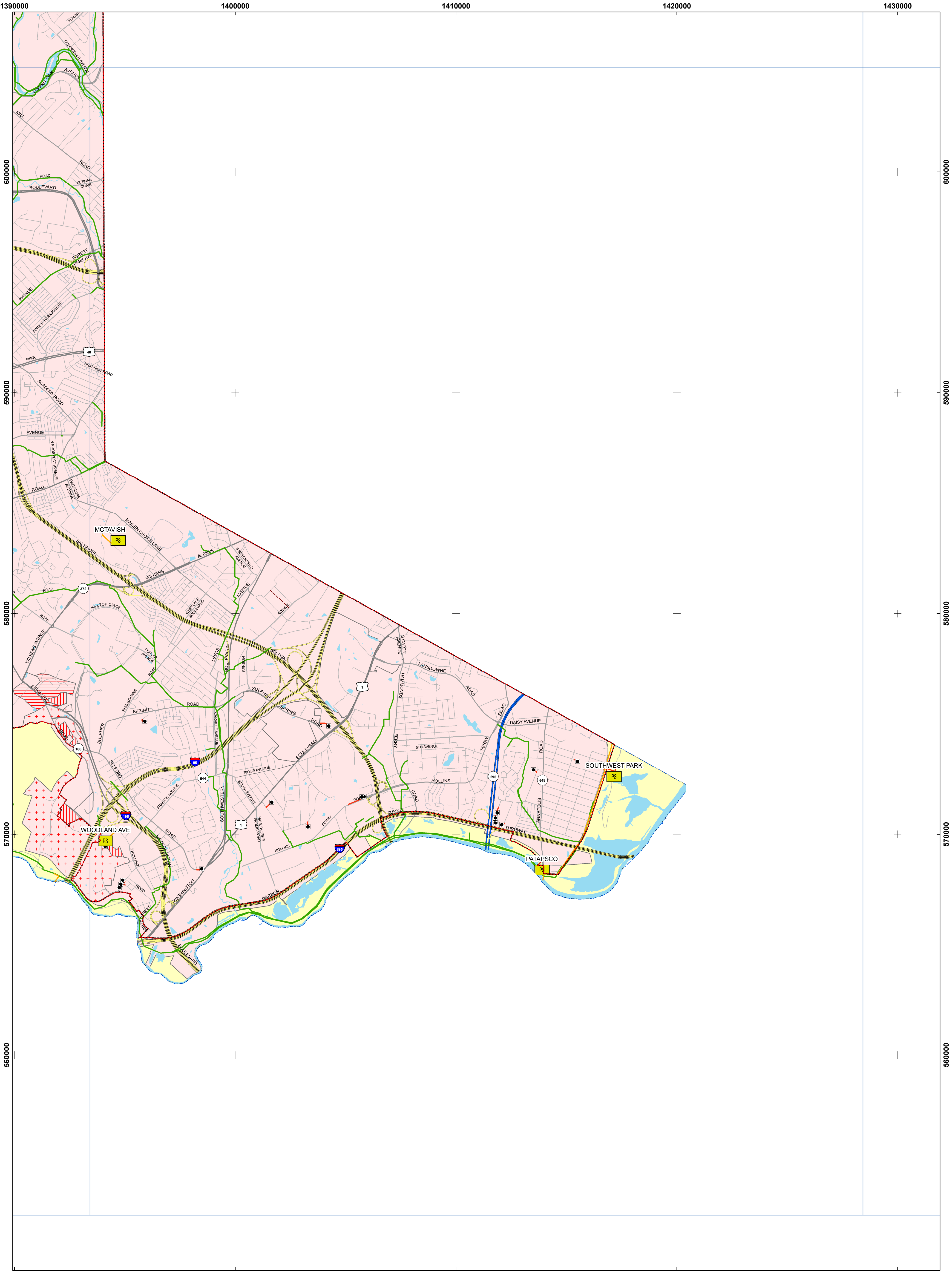
Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District





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Baltimore County Sewerage Plan



2017 Triennial Review Map S-22B

Maryland State Plane Coordinate System
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System Facilities

- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
- Low Pressure Mains

Sewerage Plan Area Designations

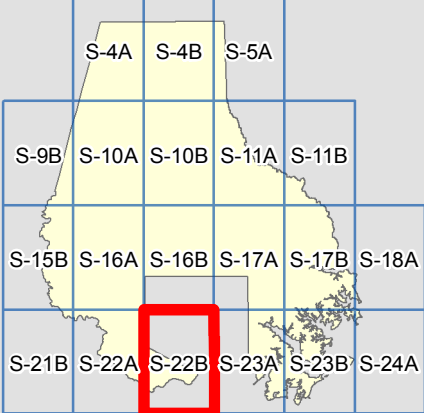
- S-1 Existing Service Area
- S-3 Capital Facilities Area
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- S-5 Master Plan Area
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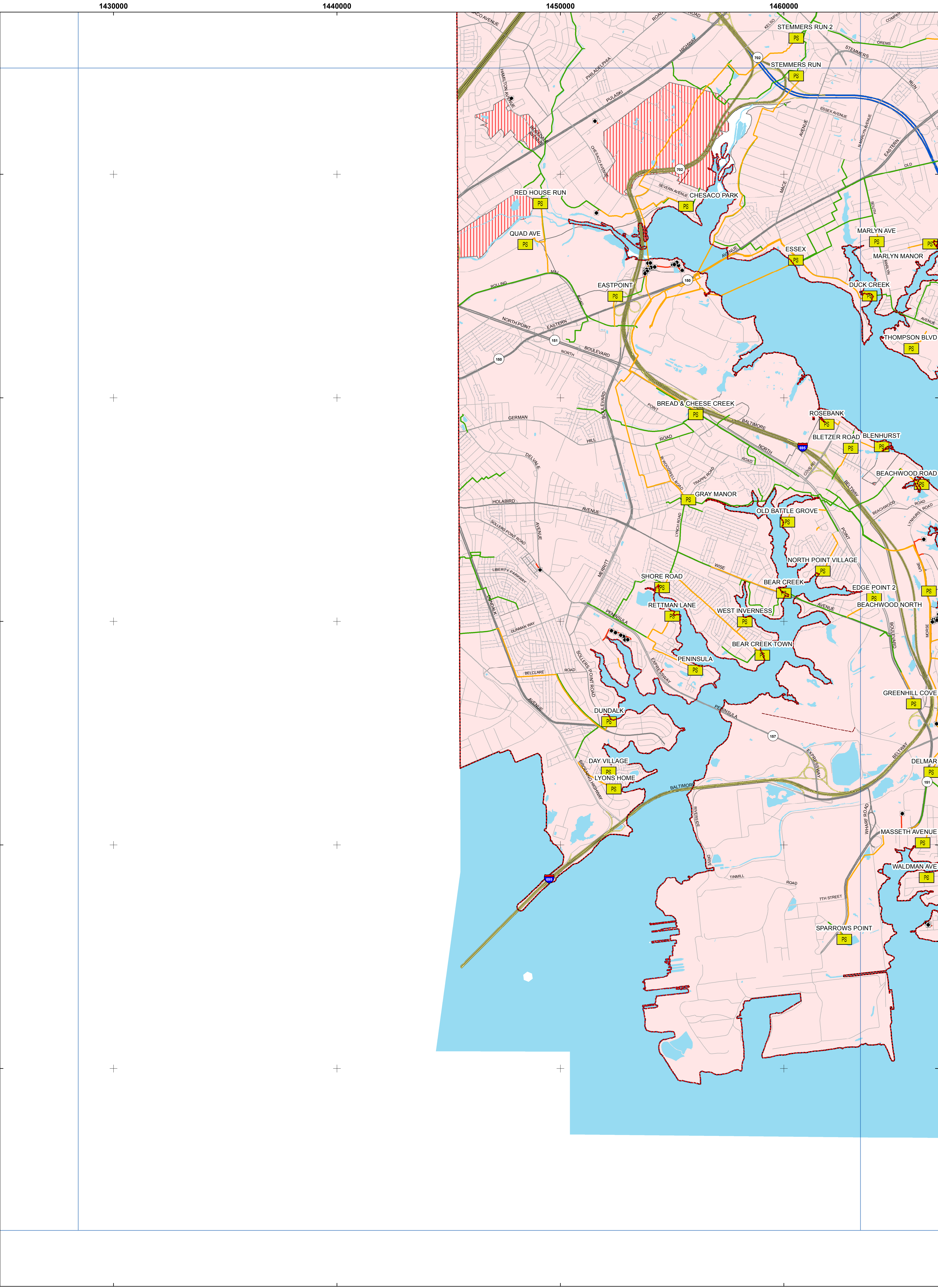


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Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District





Baltimore County Sewerage Plan



2017 Triennial Review Map S-23A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

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System Facilities

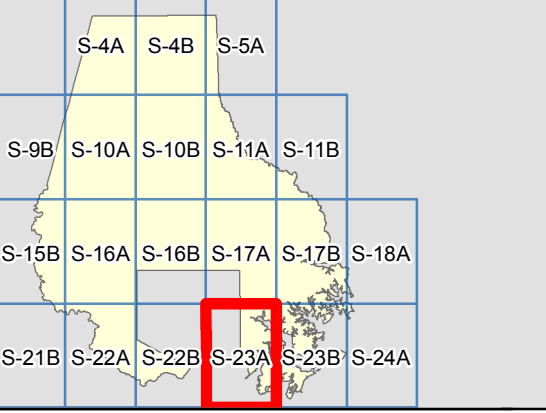
- Grinder Pump
- Pump Station
- Force Mains
- Gravity Mains 12" and Greater
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Sewerage Plan Area Designations

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- S-3 Capital Facilities Area
- S-4 Study Area
- S-5 Master Plan Area
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- S-6 Area of Future Consideration
- S-7 CS No Planned Service: Community System
- S-7 MU No Planned Service: Multi-Use System
- S-7 No Planned Community or Multi-Use Service (NPS)

Boundaries

- Triennial Master Plan Grid
- Urban Rural Demarcation Line
- Metropolitan District



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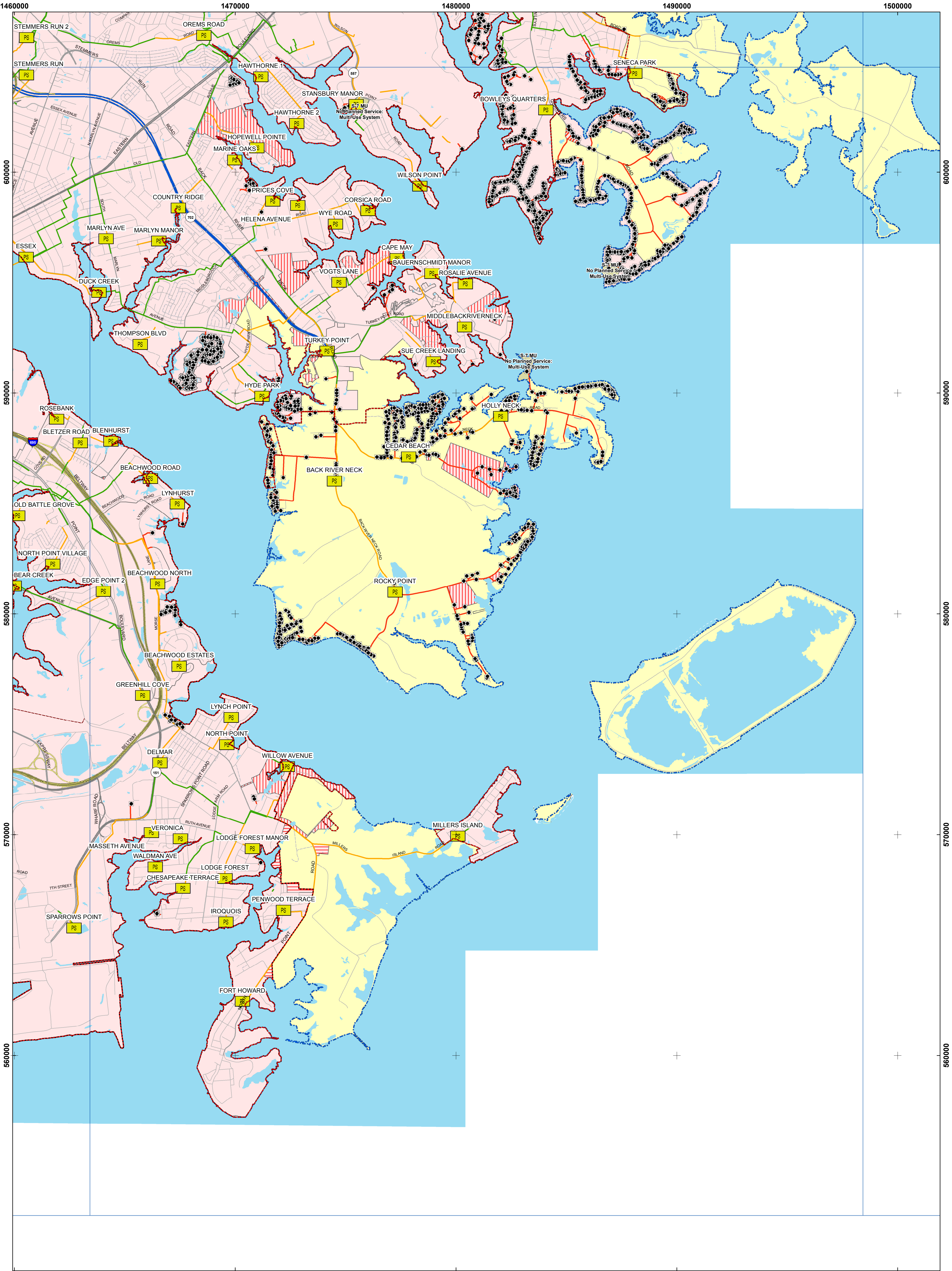
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Map 18 of 20



Baltimore County

Sewerage Plan



2017 Triennial Review

Map S-23B

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

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System Facilities

Grinder Pump

Pump Station

Force Mains

Gravity Mains 12" and Greater

Low Pressure Mains

S-1 Existing Service Area

S-3 Capital Facilities Area

S-4 Study Area

S-5 Master Plan Area

S-5 X Master Plan Area

S-6 Area of Future Consideration

S-7 CS No Planned Service: Community System

S-7 MU No Planned Service: Multi-Use System

S-7 No Planned Community or Multi-Use Service (NPS)

Boundaries

Triennial Master Plan Grid

Urban Rural Demarcation Line

Metropolitan District



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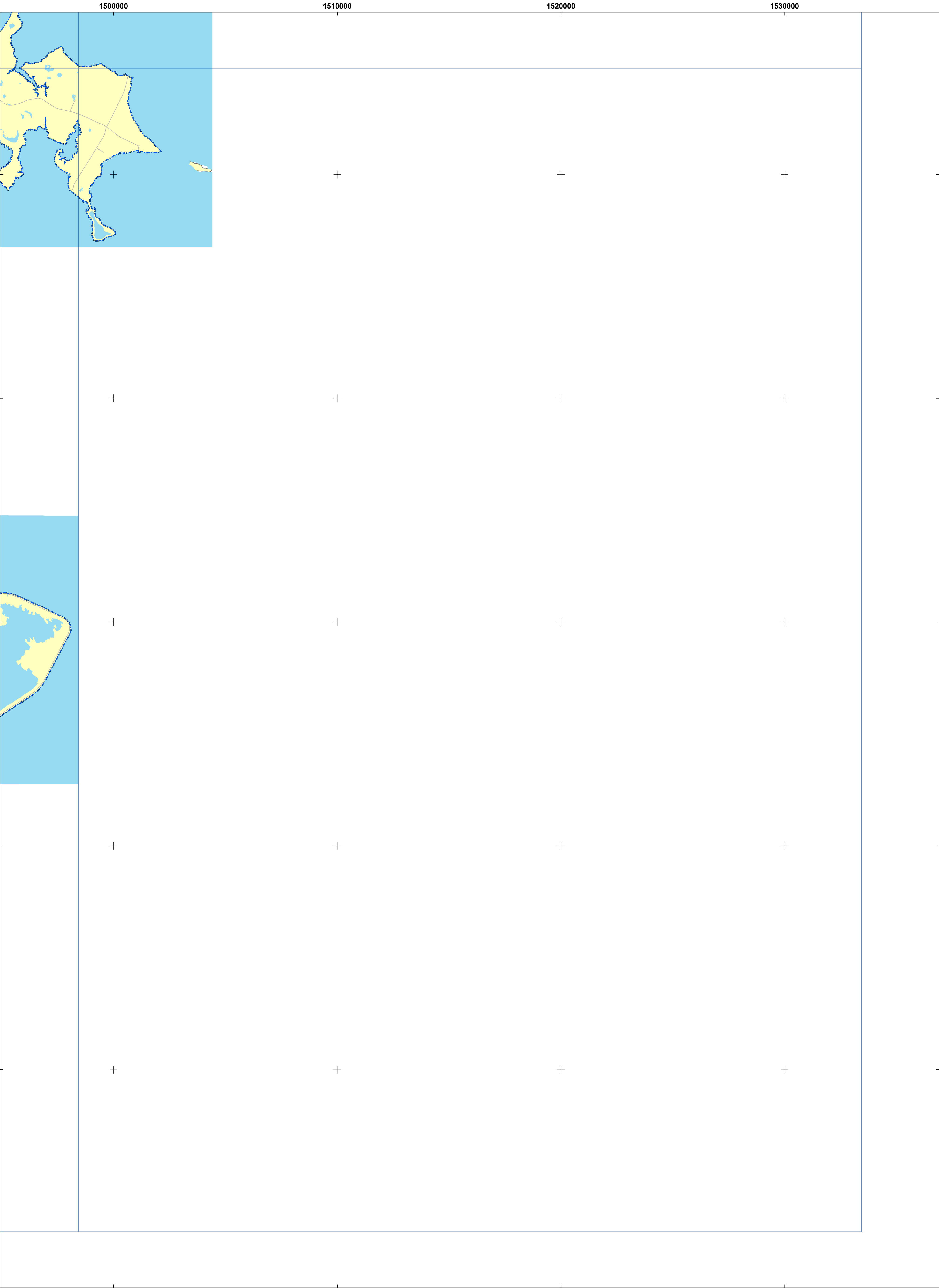
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Baltimore County Sewerage Plan



2017 Triennial Review Map S-24A

Maryland State Plane Coordinate System
North American Datum 1983 HARN, U.S. Survey Foot

Produced by Baltimore County, Department of Public Works
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System Facilities

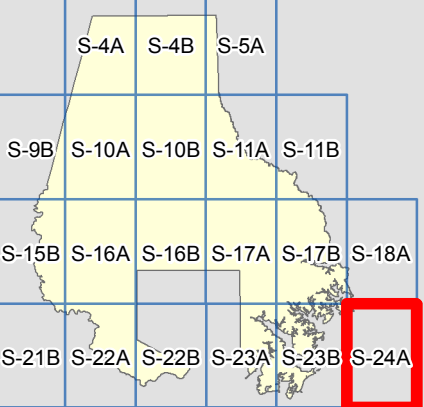
- Grinder Pump
- Pump Station
- Force Mains
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- Low Pressure Mains

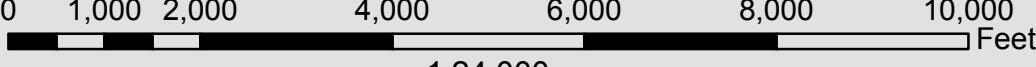
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Boundaries

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- Urban Rural Demarcation Line
- Metropolitan District





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