

# Baltimore County Water Supply and Sewerage Plan

## 2014 Triennial Review

*Draft Report of the Review  
as submitted to the  
Baltimore County Council  
December 15, 2014*

Errata & Addenda  
August 12, 2014

1. Correct Table of Contents
2. Insert EPS updates into Chapters III and IV

Errata & Addenda  
December 22, 2014

1. Insert County Council Resolution 116-14 adopting the 2014 Triennial Review
2. Insert Sewer Design additional information requested by MDE into Chapter IV

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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 2011 Triennial Review was adopted on May 2, 2011 by County Council Resolution No. 39-11.

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

The 2011 Triennial Review was approved by Maryland Department of the Environment (MDE) in the letter from MDE's Director of the Water Management Administration dated July 30, 2013.

The next Triennial Review is due for submission to MDE in 2014.

## Statements and Certifications

Upon approval of the *Water Supply and Sewerage Plan 2014 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.



**County Council  
of  
Baltimore County**

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Towson, Maryland 21204

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**Thomas J. Peddicord, Jr.**  
LEGISLATIVE COUNSEL  
SECRETARY

*10 Dec  
TJ Peddicord*

December 18, 2014

Ed Adams, Director  
Department of Public Works  
County Office Building  
111 W. Chesapeake Avenue  
Towson, Maryland 21204

Dear Mr. Adams:

Attached please find a copy of Resolution 116-14 adopting the report of the 2014 triennial review of the Baltimore County water supply and sewerage plan.

This Resolution was approved by the County Council at its December 15, 2014 meeting and is being forwarded to you for appropriate action.

Sincerely,

*Thomas J. Peddicord, Jr.*

Thomas J. Peddicord, Jr.  
Legislative Counsel/Secretary

TJP:jlh  
Enclosure

COUNTY COUNCIL OF BALTIMORE COUNTY, MARYLAND  
Legislative Session 2014, Legislative Day No. 20

Resolution No. 116-14

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Mrs. Cathy Bevins, Chair  
By Request of County Executive

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By the County Council, December 1, 2014

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A RESOLUTION adopting the report of the 2014 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 May 2, 2011 by Resolution 39-11; 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 State Department of the Environment; and

WHEREAS, the Planning Board did on September 4, 2014 hold an advertised public hearing on the 2014 Triennial Review; and

WHEREAS, the Planning Board did on October 2, 2014 vote to recommend that the 2014 Triennial Review be adopted;

NOW, THEREFORE, be it resolved by the County Council of Baltimore County, Maryland, that the 2014 Triennial Review of the Baltimore County Water Supply and Sewerage Plan, as amended, is hereby adopted; and

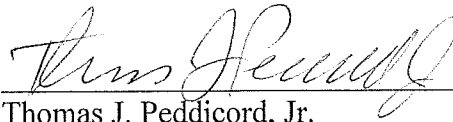
BE IT FURTHER RESOLVED, that this Resolution be submitted to the County Executive for his approval; and

BE IT FURTHER RESOLVED, that a copy of this Resolution together with the 2014 Triennial Review be submitted to the State Department of the Environment;

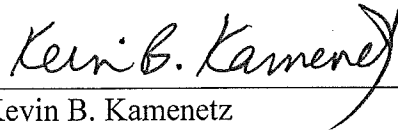
AND BE IT FURTHER RESOLVED, that this Resolution shall take effect from the date of its passage by the County Council.

READ AND PASSED this 15<sup>th</sup> day of DECEMBER, 2014.

BY ORDER



Thomas J. Peddicord, Jr.  
Secretary



Kevin B. Kamenetz  
County Executive

ITEM: RESOLUTION 116-14



# 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 Office 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.

## 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 include the following:

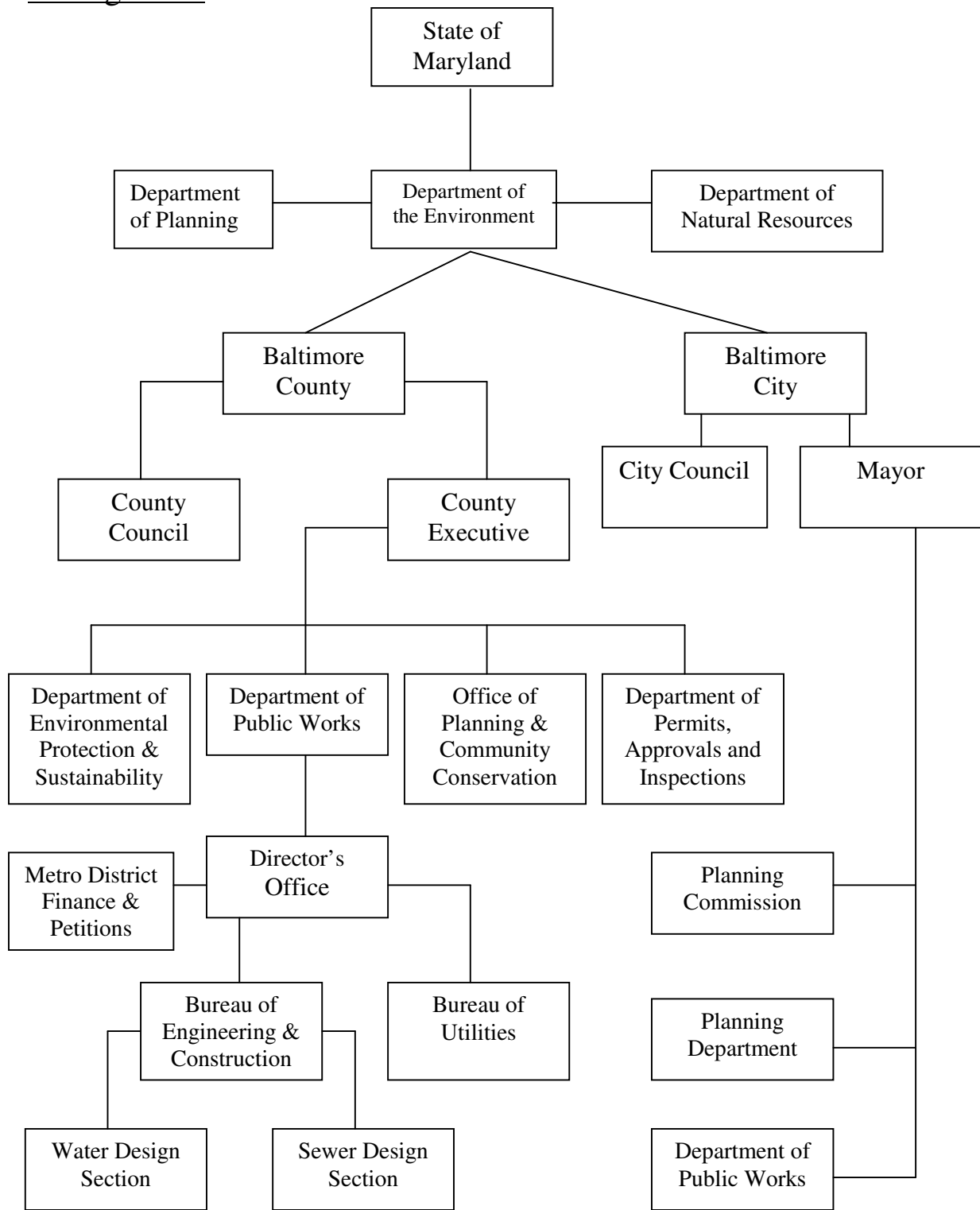
<b>Community Plans</b>	<b>Adoption</b>
Towson Manor Village Enhancement Study	11/06/06
Eastern Baltimore County Pedestrian and Bicycle Access Plan	11/06/06
Liberty West Community Plan	12/18/06
Middle river Community Plan	09/04/07
Overlea Fullerton Community Plan	12/07/09
Lower Back River Neck Community Action Plan	05/03/10
Greater Hillendale Community Plan	05/03/10
Rosewood Institutional Educational Center	05/27/10
Carney-Cub Hill-Parkville Area Community Plan	05/03/10

## Article 66B, Annotated Code of Maryland

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.

# 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.

## Metropolitan District Water & Sewer Enterprise Fund

The Metropolitan District Enterprise fund was established in FY 2002 as a result of Governmental Accounting Standard Board (GASB) Statement No. 34, as amended by GASB Statement No. 37, requiring new financial reporting standards for state and local government. The Metropolitan District enterprise fund combines the Metropolitan

District Operating and Metropolitan District Capital Project funds. Prior to FY 2006, the Metropolitan District was considered a special revenue governmental fund and therefore included as an appropriation in the Operating Fund. The Metropolitan District receives revenues from the net receipts on the sale of water, water service and sewer service. Such revenues are expended for the maintenance and operation of the water and sewerage system. All rates are reviewed annually on a funds-needs basis and revisions are recommended to the County Executive. The authority for setting water consumption rates rests with Baltimore City's Board of Estimates, based on recommendation submitted by the Baltimore County Director of Public Works. The County increased rates 5% in FY 2003, 10% in FY 2004, 15% in FY 2006, 15% in FY 2008, 6.9% in FY 2009 and 4.76% in FY 2010. The rate increases offset projected increases in the County's share of expenditures as estimated by Baltimore City. The authority for setting other Metropolitan District rates lies with the County's executive branch by Executive Order. The County has the right to appeal water and sewer rates to the Public Service Commission of Maryland. New rates take effect on July 1 in the years in which there are increases. The Metropolitan District also receives the annual front foot assessment charges for water and sewer mains installed that abut property within the Metropolitan District and charges for connection to the system. The majority of these charges are used to pay debt service on Metropolitan District Bonds outstanding. Representative rates in FY 2010 for the Metropolitan District are set out below:

**Front Foot Assessments  
(Assessed over 40 years)**

<b><u>Property Type</u></b>	<b><u>Water</u></b>	<b><u>Sewer</u></b>
Subdivision	@\$1.20	@\$2.00
Agricultural (150 ft. maximum)	@\$1.20	@\$2.00
Small Acreage (Up to 200 ft.)	@\$1.20	@\$2.00
(Next 200 ft.)	@\$0.80	@\$1.35
(Remainder)	@\$0.40	@\$0.65
Industrial or Commercial	@\$2.30	@\$3.10

**Sewer Service Charges for Individually Metered Domiciles:**

\$39.48 per 1,000 cu. Ft. of water consumption for FY 2011.

**Annual Water Distribution Charges:**

\$98.11 up to \$30,874.20 per unit, depending on size of meter for FY 2011.

## Comparison of Customer Billing between Baltimore City and Baltimore County.

A common question asked of staff and elected officials of both the City and the County is why is there such a large difference between the water rates charged to City customers as compared to County customers, both of whom are billed directly by the city. The following explanation addresses this issue:

Based on billing rates in effect at the time of this writing, the following table illustrates the comparative rates charged water and sewer customers in Baltimore City and in the Baltimore County Metropolitan District. The unit of consumption is 100 cubic feet of water. An average annual residential usage is estimated to be 97 units to 100 cubic feet each. A family of four is estimated to use 154.6 units annually.

Baltimore City bills its customers quarterly for water and sewer using a unit rate of \$5.788 each. Baltimore County customers are billed differently. County customers pay quarterly water bills directly to Baltimore City for units of water usage only. The remaining charges are billed annually with the property tax bill. These charges are for benefit assessments (to recover the cost of local water and sewer main construction; in newer subdivisions this may be a **private** charge established by the developer), water distribution charges (to cover costs of services to the water system not directly provided by Baltimore City such as the construction of new transmission mains) and sewer service charges (Baltimore County maintains the Metropolitan District sewer system). The sewer service charge is usually based on units as measured by the City water meter readings. There are exceptions for unmetered service, such as sewer customers with private well water supplies or for condominium regimes. In these unmetered cases, the sewer service charges is based on plumbing fixtures and is usually higher than if it were metered.

As the table on the following page illustrates, County Metropolitan District customers often pay higher total costs for their water and sewer service even though their water bills paid to the City are much lower. Many County customers who pay their property tax bills through their mortgage escrow account may not even be aware of this fact. This explains why many customers think the City charges more than the County when in fact it often charges less.

## Comparison Chart: Water & Sewer Billing Baltimore City and Baltimore County

Average Residential Property 97 units	Residential Family of Four 156.4 units
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### **Baltimore County Charges**

Water Benefit Assessment	\$40.50		\$40.50
Sewer Benefit Assessment	\$66.00		\$66.00
Water Distribution Charge	\$89.19		\$89.19
Sewer Service Charge	\$348.13		\$561.32
Total Charges billed with County Property Tax Bill	<b>\$543.82</b>		<b>\$757.01</b>
Water Bill paid by County customers directly to City	97 @ \$1.323 =	<b>\$128.33</b>	156.4 @ \$1.323 =
			<b>\$206.92</b>
Total of all charges to <b>County</b> customers		<b>\$672.15</b>	<b>\$963.93</b>

### **Baltimore City Charges**

Total charge to <b>City</b> customers	97 @ \$5.788 =	<b>\$561.44</b>	156.4 @ \$5.788 =	<b>\$905.24</b>
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## Water and Sewerage Plan Maps, Annual Amendment Cycle

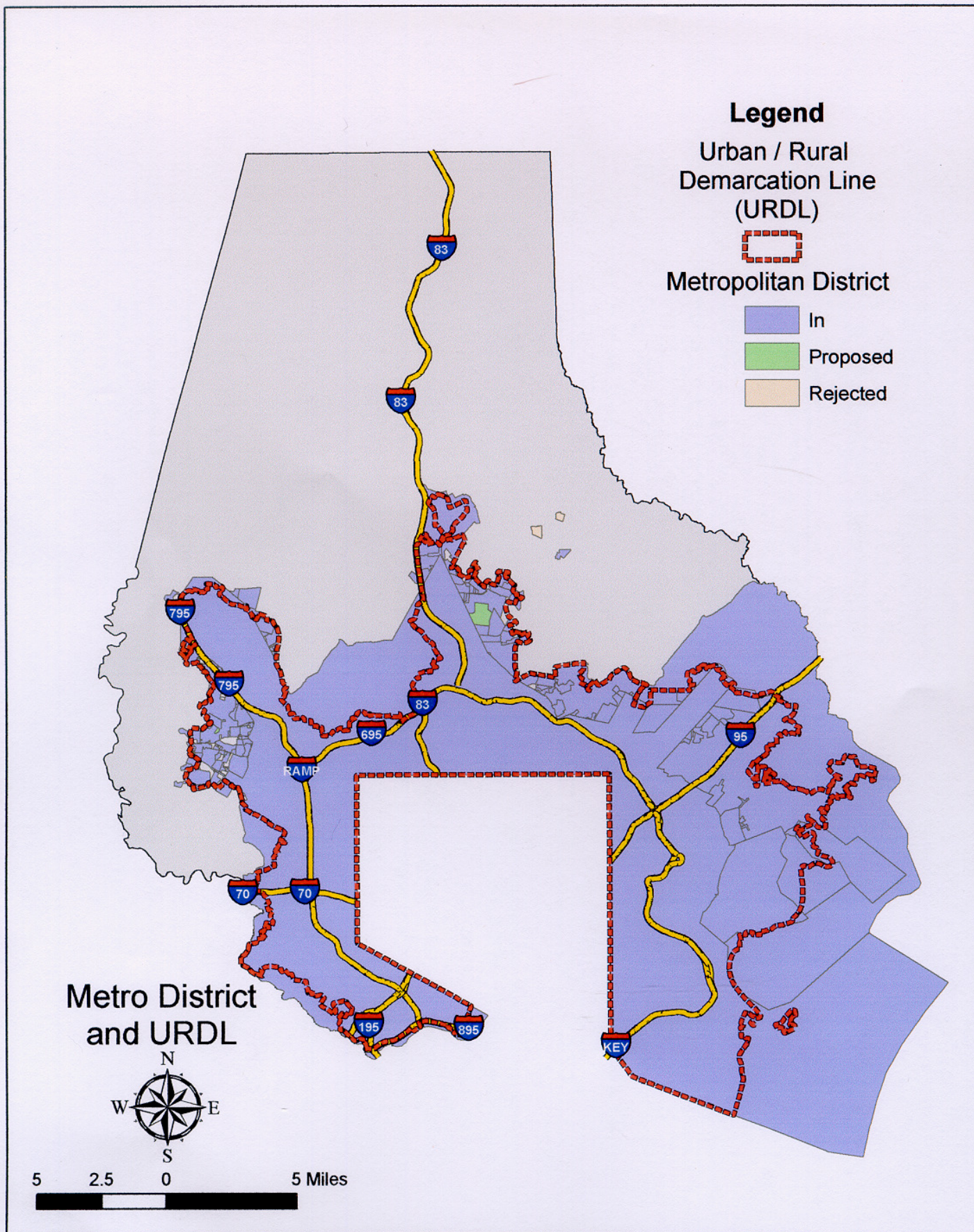
Owners of properties for which public water and sewer utility service is desired but are not within Capital Facilities or Existing Service areas must petition the County for a map amendment. The executive order of April 11, 1990, established an **annual amendment cycle** for this purpose. Petitions for 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

## LAND USE 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 adoption of Master Plan 2020, Baltimore County has made a series of amendments to the Plan to continue its progress on sustainable development. In December 2012 and January 2013, the County Council adopted the resolution committing the county's support to the regionally significant **Red Line** project (Resolution 106-12) and regarding the Bayview to Dundalk Red Line Extension Evaluation.

In December 2012, Andrea Van Arsdale, Director of Planning, administratively adopted the official Baltimore County **Growth Tier Map**. The Tier Map, developed as a requirement of the *Maryland Sustainable Growth and Agricultural Preservation Act of 2012*, classifies Baltimore County's land into different density levels of residential development and establishes growth tier designations for every residential property. In September 2013, Baltimore County refined and adopted the Growth Tiers with the resulting "Amended Baltimore County Growth Tier Map." The Maryland Department of Planning made no comments on the county's December 2012 growth tiers and September 2013 amendments. The Growth Tiers are a new tool to implement the Master Plan 2020, continuing to direct future development to where infrastructure has been in place or planned. Growth Tiers will be incorporated in Master Plan 2020 as an amendment.

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. The adoption of this legislation may help to enhance vibrancy of the communities along the dynamic Maryland Route 43 corridor.

Between May 2013 and May 2014, the Maryland Department of Housing and Community Development (DHCD) indicated to the Baltimore County Executive Kevin Kamenetz that the Maryland Smart Growth Subcabinet approved the applications for six county areas for the state **sustainable community designations**. The six areas are

Pulaski Highway Redevelopment Area, Catonsville/Patapsco, Greater Dundalk, Hillendale/Parkville/Overlea, Towson, and Reisterstown Main Street. Those six sustainable community designations are effective for five years and eligible to apply for the resources in order to strengthen reinvestment and revitalization in those communities within the URDL.

The following data tables and a series of maps depict the county's continued success on growth management and sensible development outlined in Master Plan 2020 for ensuring effervescent residential neighborhoods and vital business communities.

## TABLE No.1 - POPULATION PROJECTIONS

Forecast Year	Population Forecasts				
	Urban (Inside URDL)		Rural (outside URDL)		Total
	Total Urban	% County Total	Total Rural	% County Total	
Census 2010	714,054	88.70%	90,975	11.30%	805,029
2015	728,870	88.55%	94,258	11.45%	823,128
2020	737,000	88.54%	95,391	11.46%	832,391
2025	750,341	88.61%	96,432	11.39%	846,772
2030	761,063	88.68%	97,125	11.32%	858,188
2035	771,709	88.75%	97,808	11.25%	869,517
2040	782,235	88.82%	98,492	11.18%	880,727

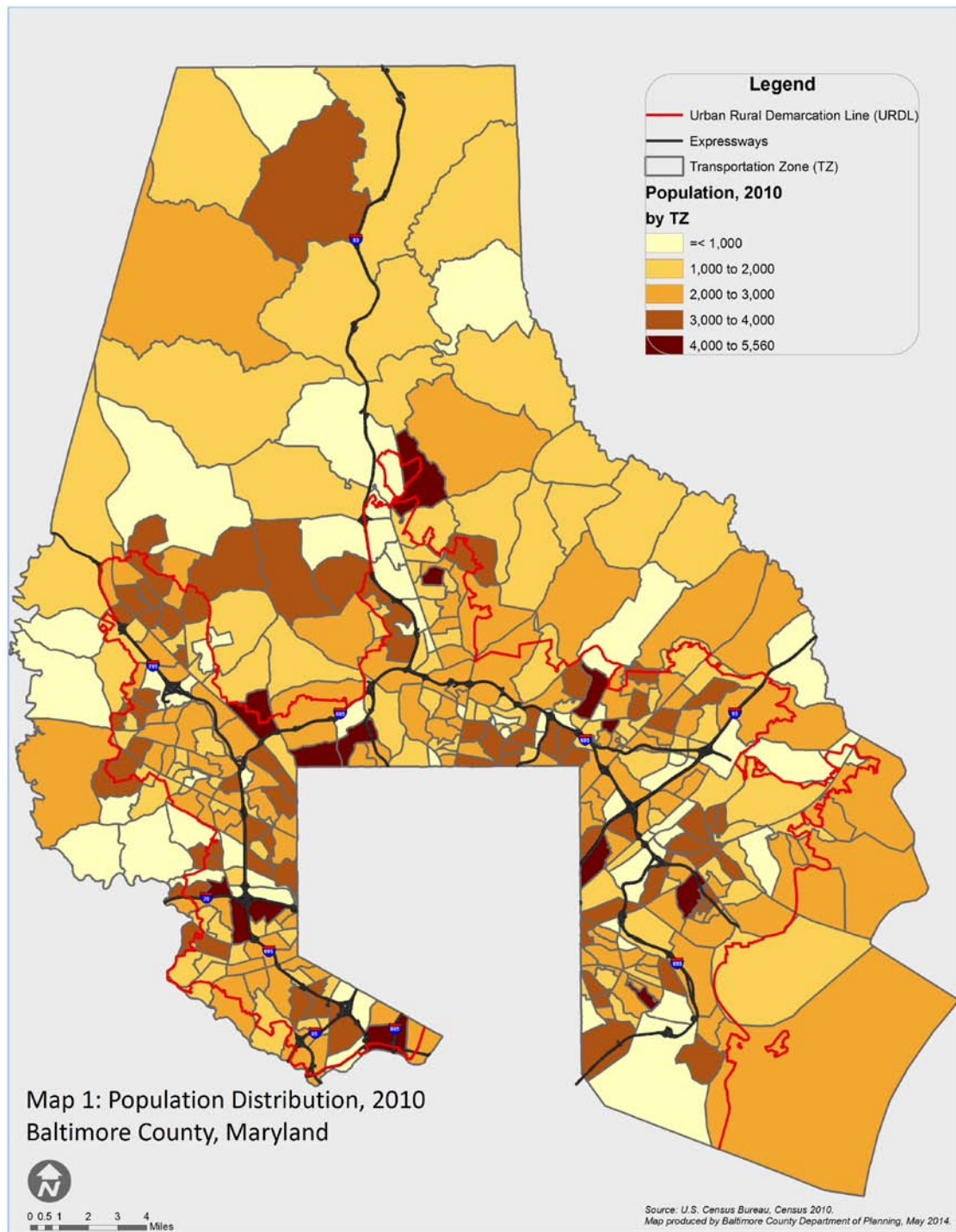
Source: Baltimore County Department of Planning, Round 8A Forecasts.

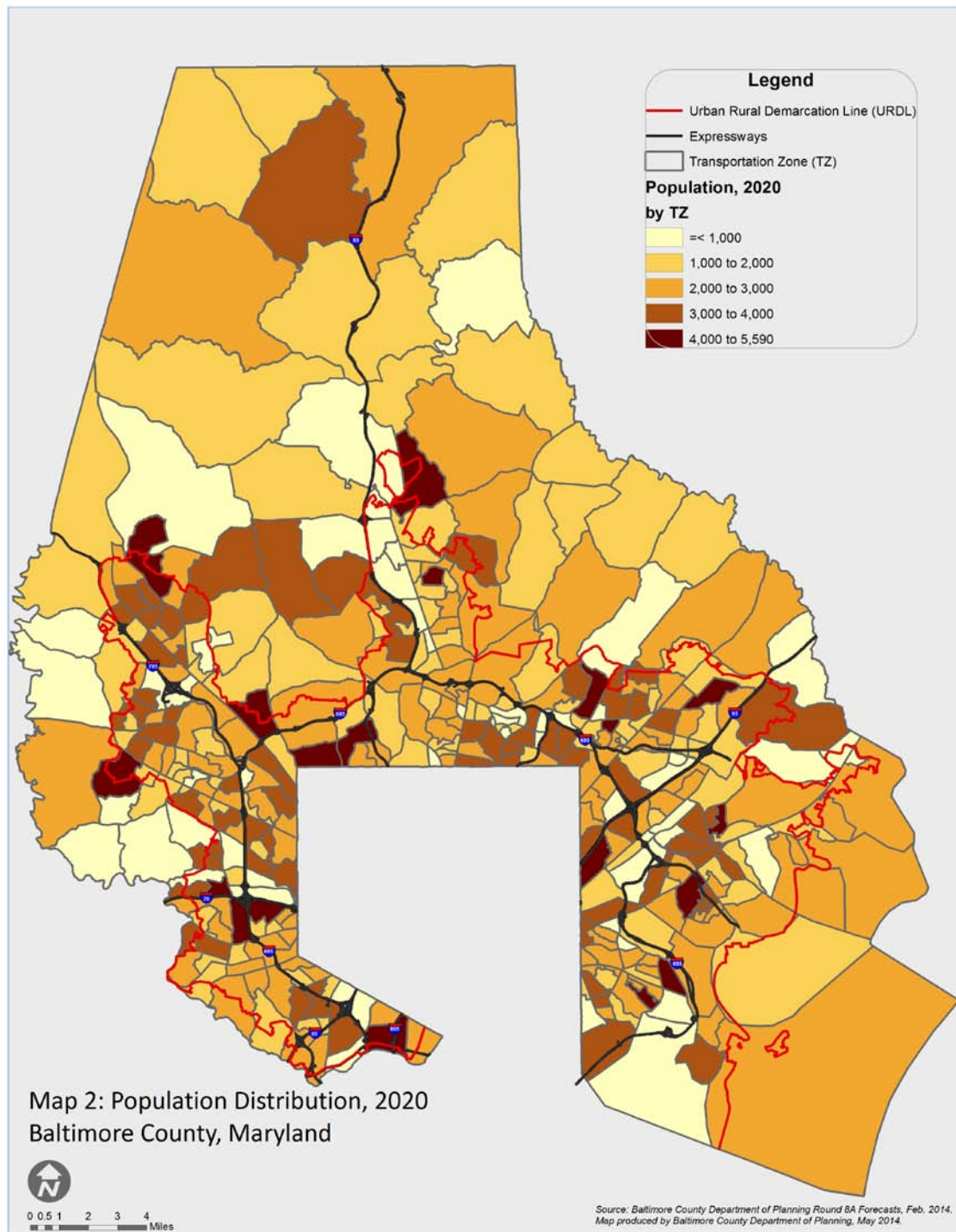
February 2014.

Data compiled by Baltimore County Department of Public Works, June 2014.

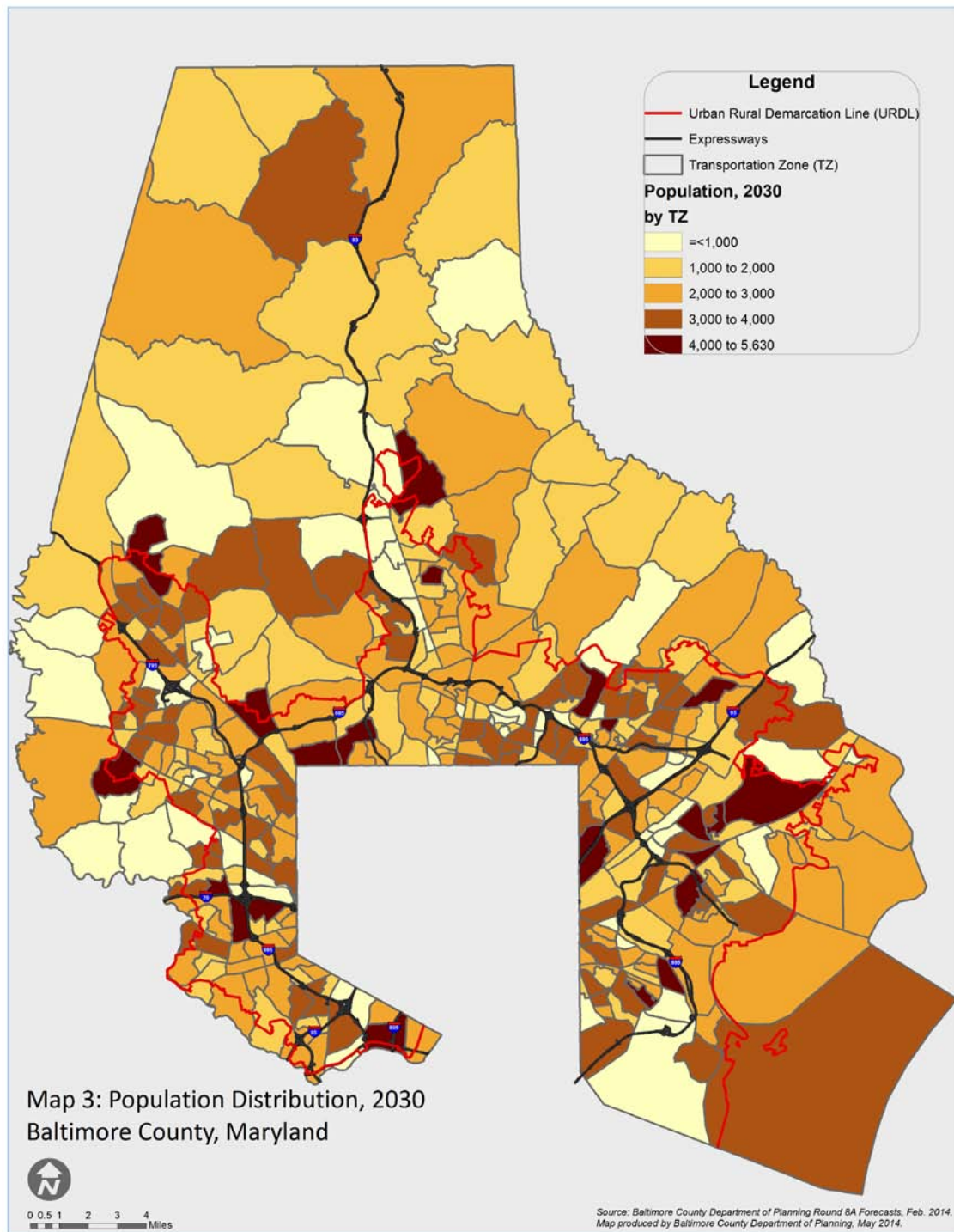
Information in Table No. 1 is computed on the basis of the Baltimore County's Round 8A population forecasts. The forecast data set is furnished by the transportation zone (TZ) for the regional transportation planning purposes. To correctly account for the URDL, the TZ's were divided into more than 15,000 component census blocks from Census 2010 using the urban and rural rates in the forecast data set.

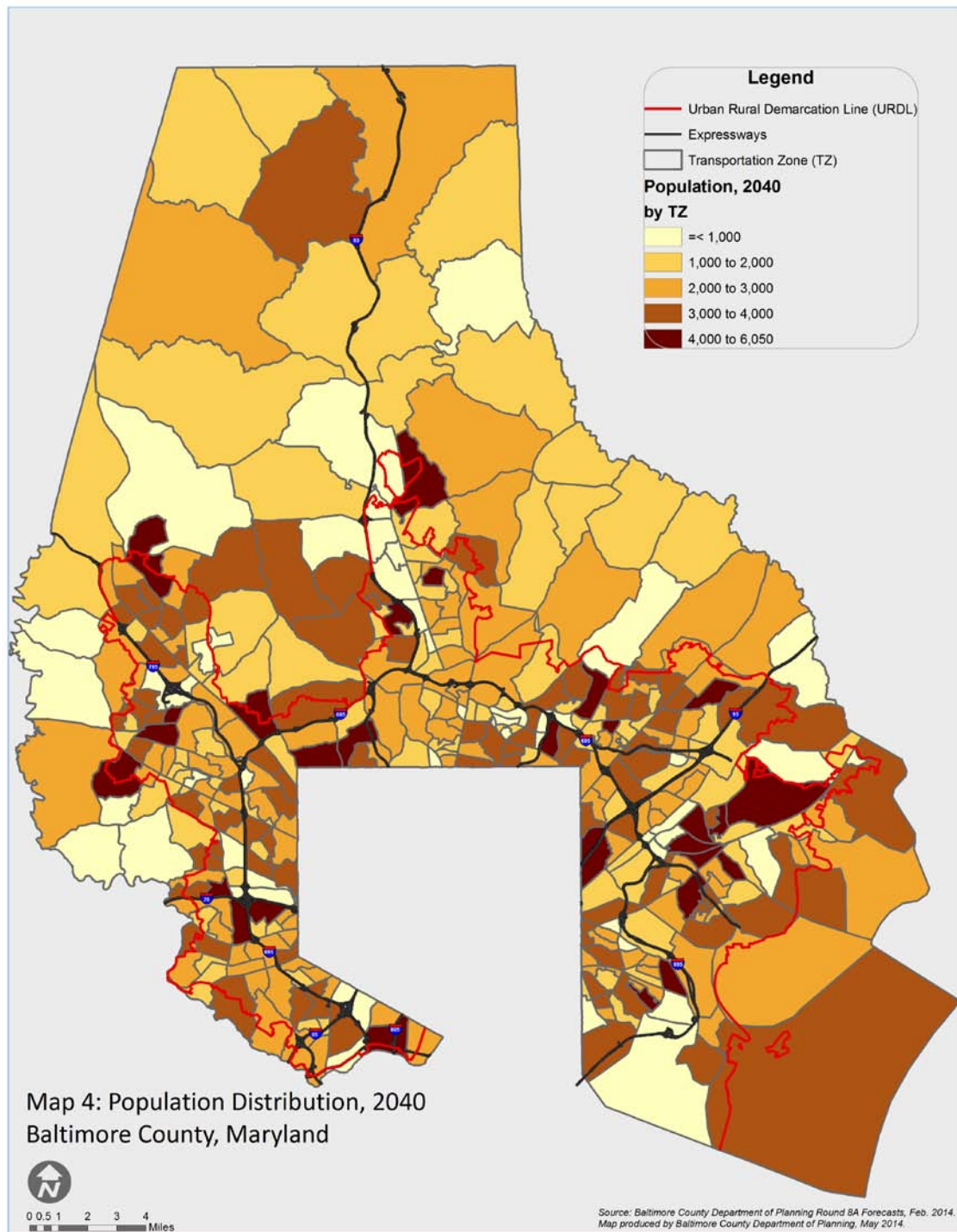
The figures in Table No.1 were adjusted to the census blocks according to the TZ structure. The results of this analysis tend to confirm that nearly 90% of the county's population resides within the URDL, amounting to one-third of the county's land area. Furthermore, even though the TZ structure may not flawlessly correspond to the county's iconic URDL, the following maps (one through eight) by TZ evidently help portray a meaningful picture about the county's residential distribution patterns trends inside or outside the URDL.



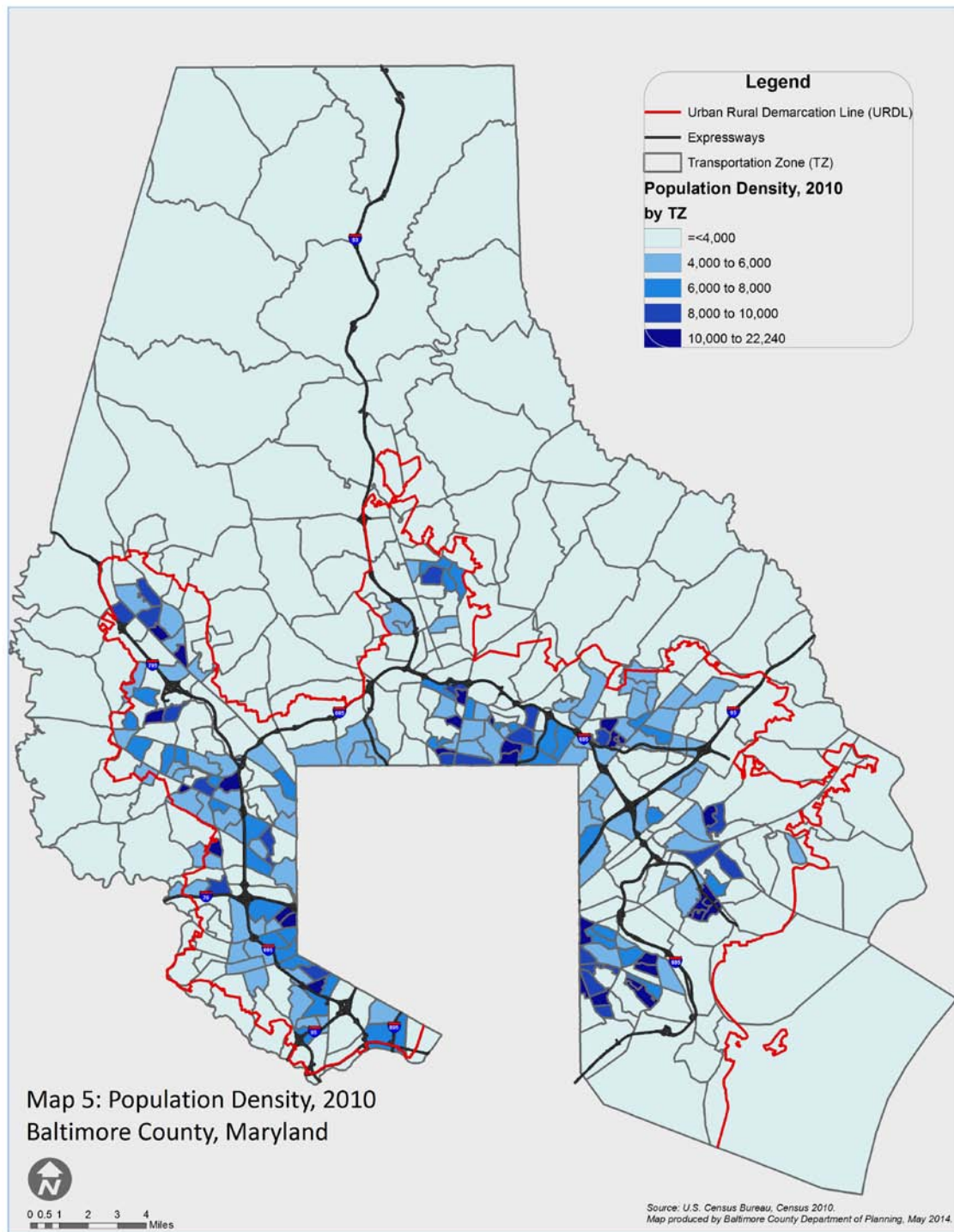


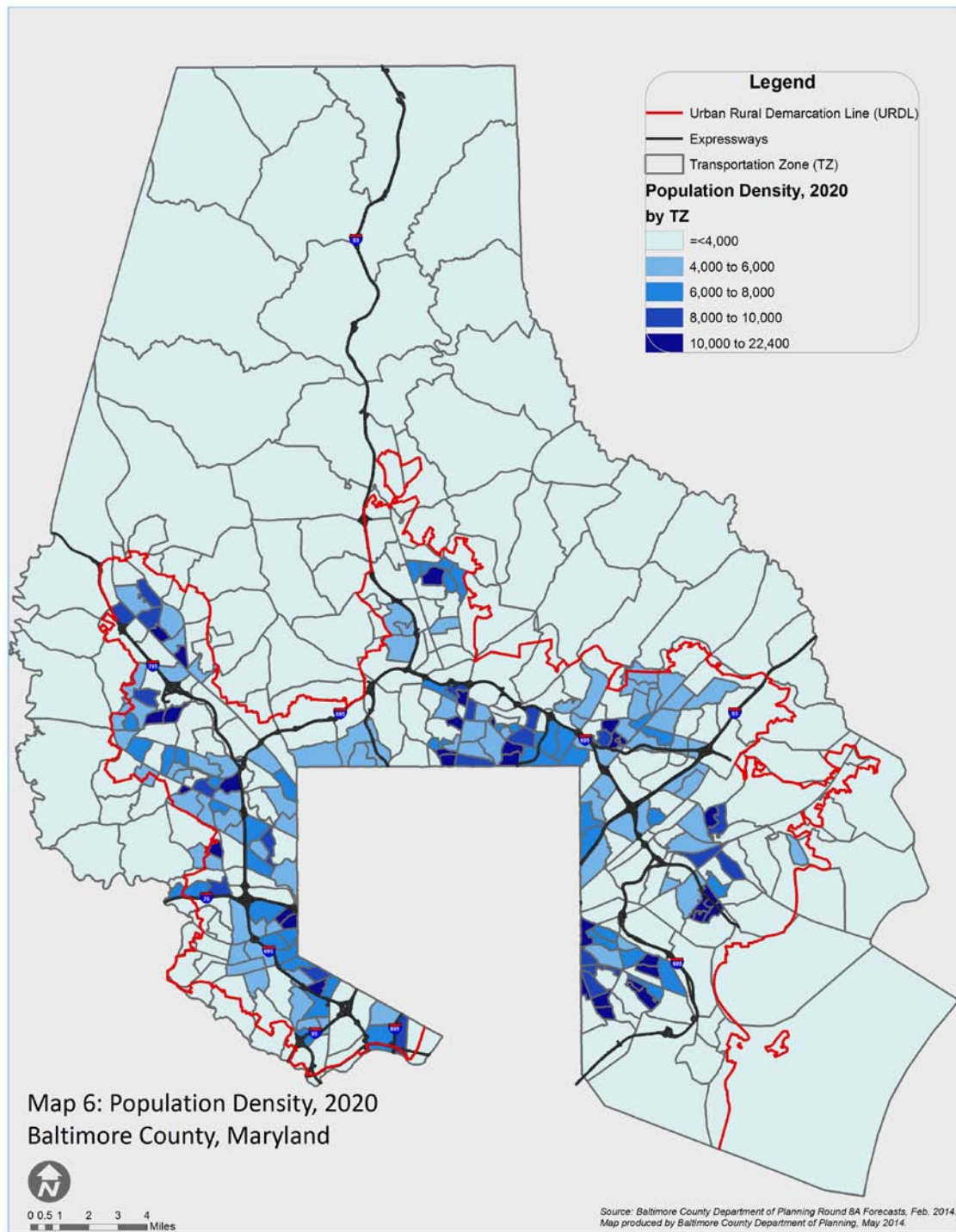


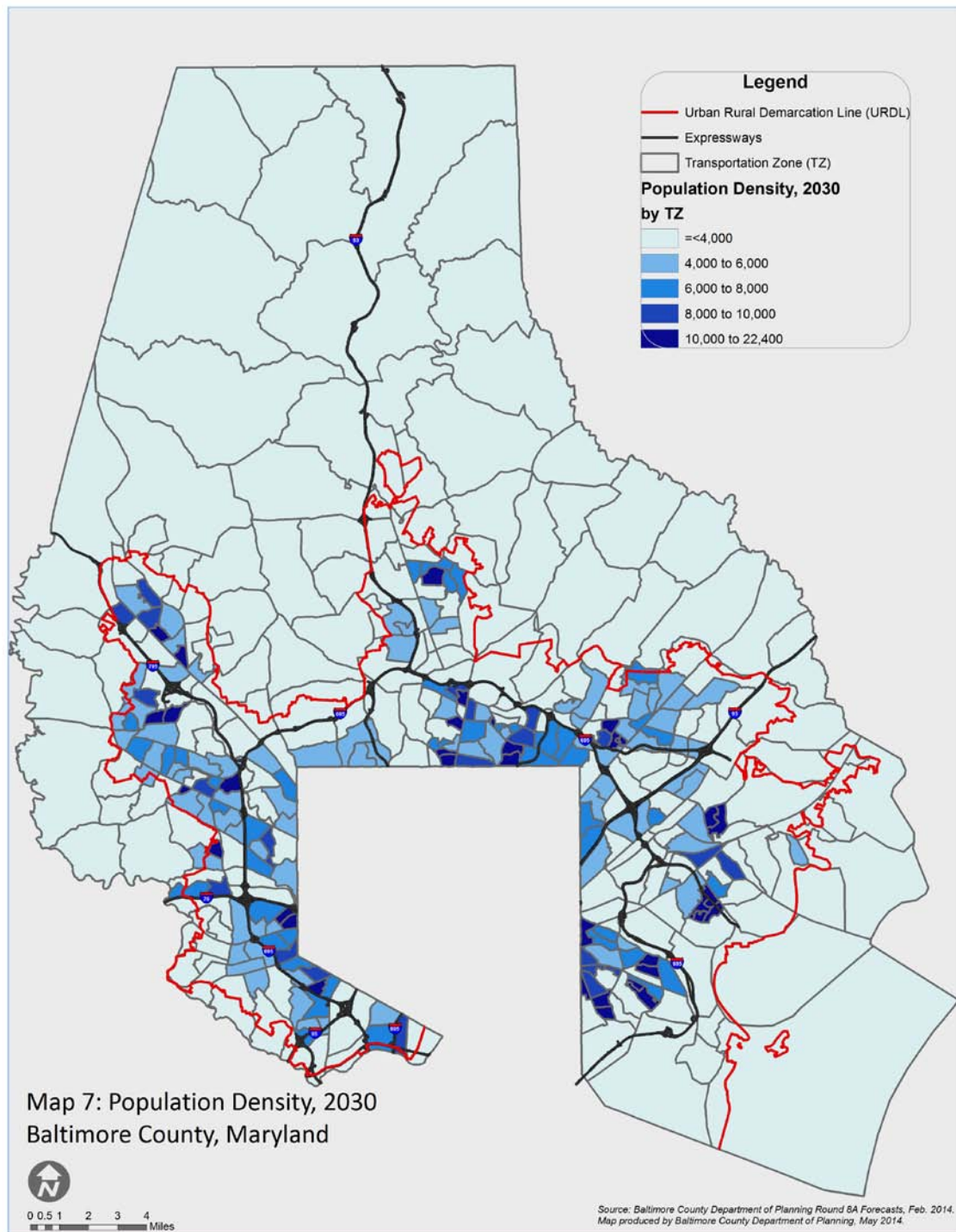




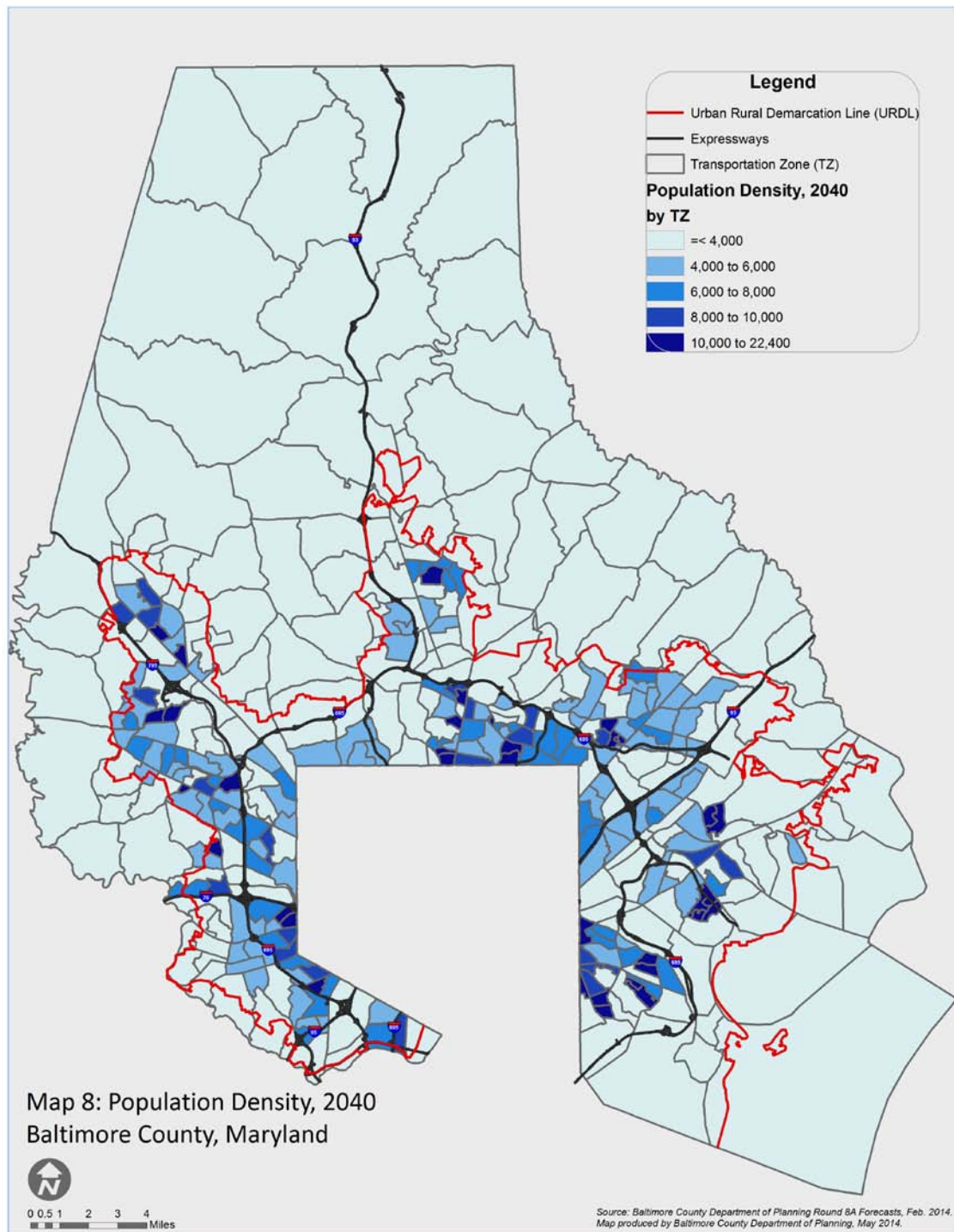












## Table No. 2 – LAND IN COUNTY

Baltimore County's land use plan is formulated and updated as an integral component of Master Plan 2020. 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 are the agricultural preservation, resource conservation, rural residential and open space. Those four types of the land use account to 63.23% of the total land acres of Baltimore County, demonstrating the county's objective and effort on sensible development and resource preservation. The residential land uses excluding rural residential represent 13.26% of the county's total land acres. The non-residential uses contribute to 10.10% of the total land area.

**Table 2a: Existing Land Use:**

Land Use Type	Acres	Percent Total
Single Family Detached	41,132.24	10.61%
Single Family Attached	5,056.37	1.30%
Multi Family	5,190.41	1.34%
Commercial	7,312.02	1.89%
Office	1,370.00	0.35%
Industrial	11,060.37	2.85%
Mixed Use	858.93	0.22%
Institution	17,403.05	4.49%
Open Space	59,025.75	15.23%
Agricultural Preservation	64,455.73	16.63%
Resource Conservation	61,334.93	15.83%
Rural Residential	60,198.38	15.53%
Transportation	27,327.72	7.05%
Utilities/Drainage	5,744.90	1.48%
Landfill	1,118.66	0.29%
Vacant	17,919.66	4.62%
Unbuildable	994.81	0.26%
Total	387,503.93	100.00%

Data compiled by Baltimore County Department of Planning,  
June 2014.

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 is set aside for agricultural preservation and resource conservation. The zoning for residential uses ranks second. Among it, the low-density residential classification occupies the highest acreages (12.23% of the total land area). The percent acres of the medium and high density combined amounts to 12.15% of the county's total land acres.

**Table 2b: Zoning Classification Areas:**

Zoning Classifications	Acres	Percent Total	Zone in Each Category
Low Density Residential	47,634.62	12.23%	DR 1, DR 2, DR 3.5
Medium Density Residential	35,104.85	9.01%	DR 5.5
High Density Residential	12,228.98	3.14%	DR 10.5, DR 16, RAE
Business	9,590.02	2.46%	B, CB
Manufacturing	20,888.28	5.36%	M
Office	2,909.67	0.75%	O, RO, ROA, SE
Agricultural Preservation	143,311.33	36.80%	RC 2, RC 50
Resource Conservation	117,751.98	30.24%	RC3, RC 4, RC 5, RC 6, RC7, RC 8, RC 20, RCC
Total	389,419.73	100.00%	-

Data compiled by Baltimore County Department of Planning, June 2014.

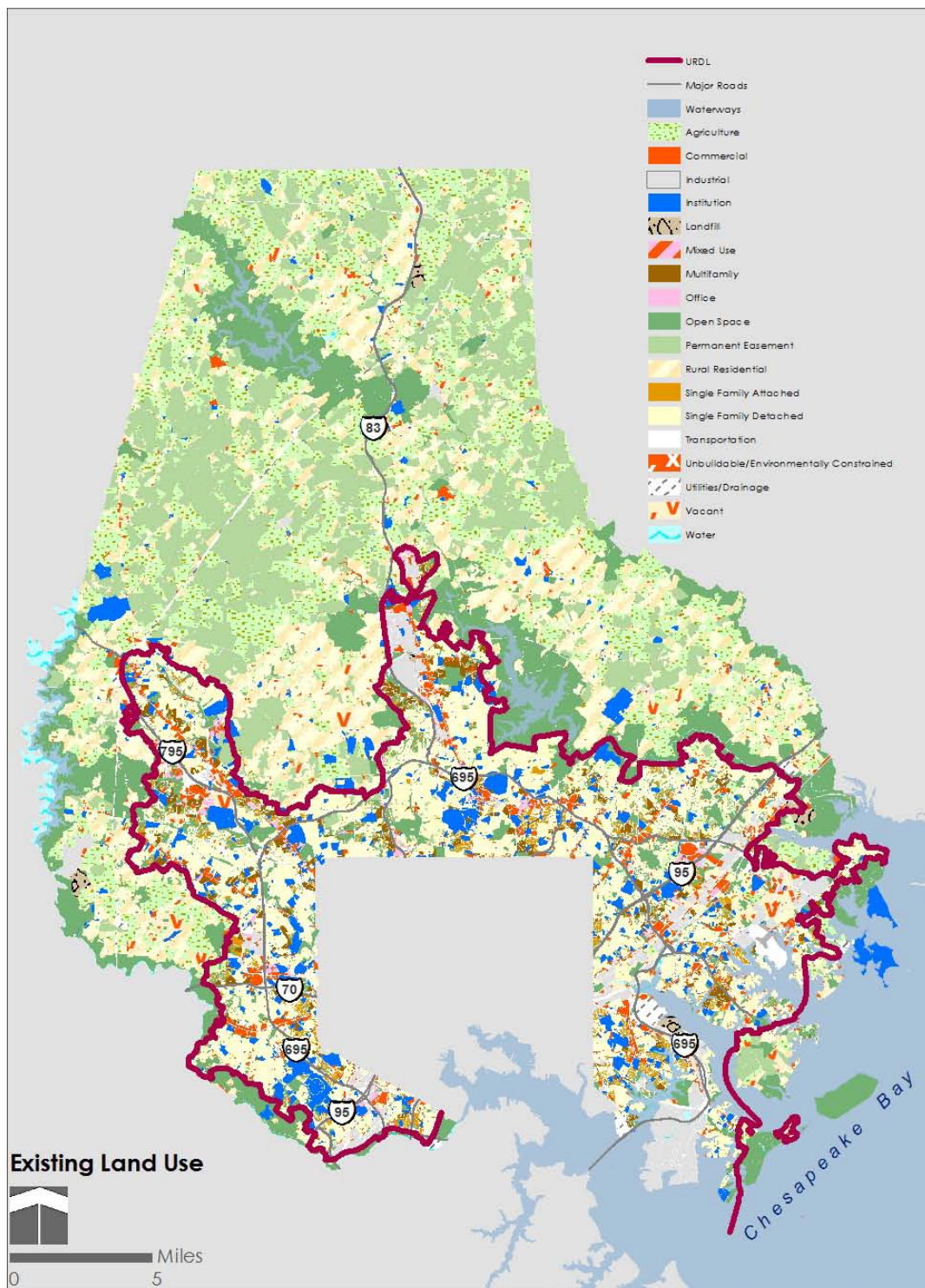
As indicated in Master Plan 2020 (p. 27 to 31), the "transect" is a framework, identifies a range of habitats from the most natural to the most urban. Its continuum, when subdivided, lends itself to the creation of zoning categories (Table 2c). The standards overlap, reflecting the sequential pattern of development and natural ecosystems. The "transect" integrates environmental and zoning methodologies, enabling the design of compact, mixed-use, walkable communities that support the viability of natural ones.

**Table 2c: Proposed Land Use Areas:**

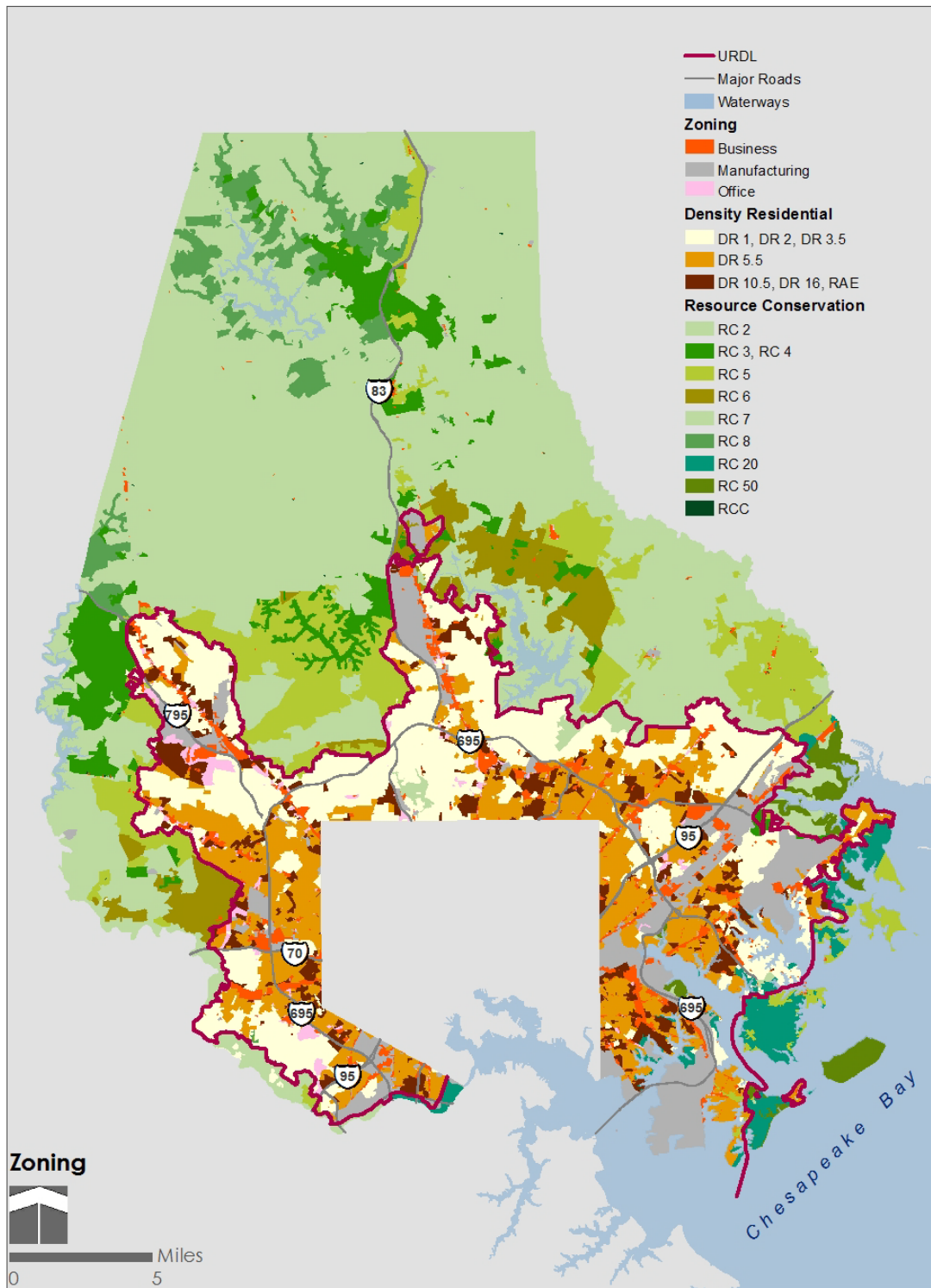
Smart Code	Acres	Percent Total
T1 - Natural	53,054.02	13.62%
T2 - Rural	172,482.65	44.29%
T2R - Rural Residential	35,056.54	9.00%
T2V - Rural Village	174.63	0.04%
T3 - Suburban	46,182.72	11.86%
T4 - General Urban	67,729.69	17.39%
T5 - Urban Center	14,419.77	3.70%
T6 - Urban Core	319.70	0.08%
Total	389,419.73	100.00%

Data compiled by Baltimore County Department of Planning, June 2014.

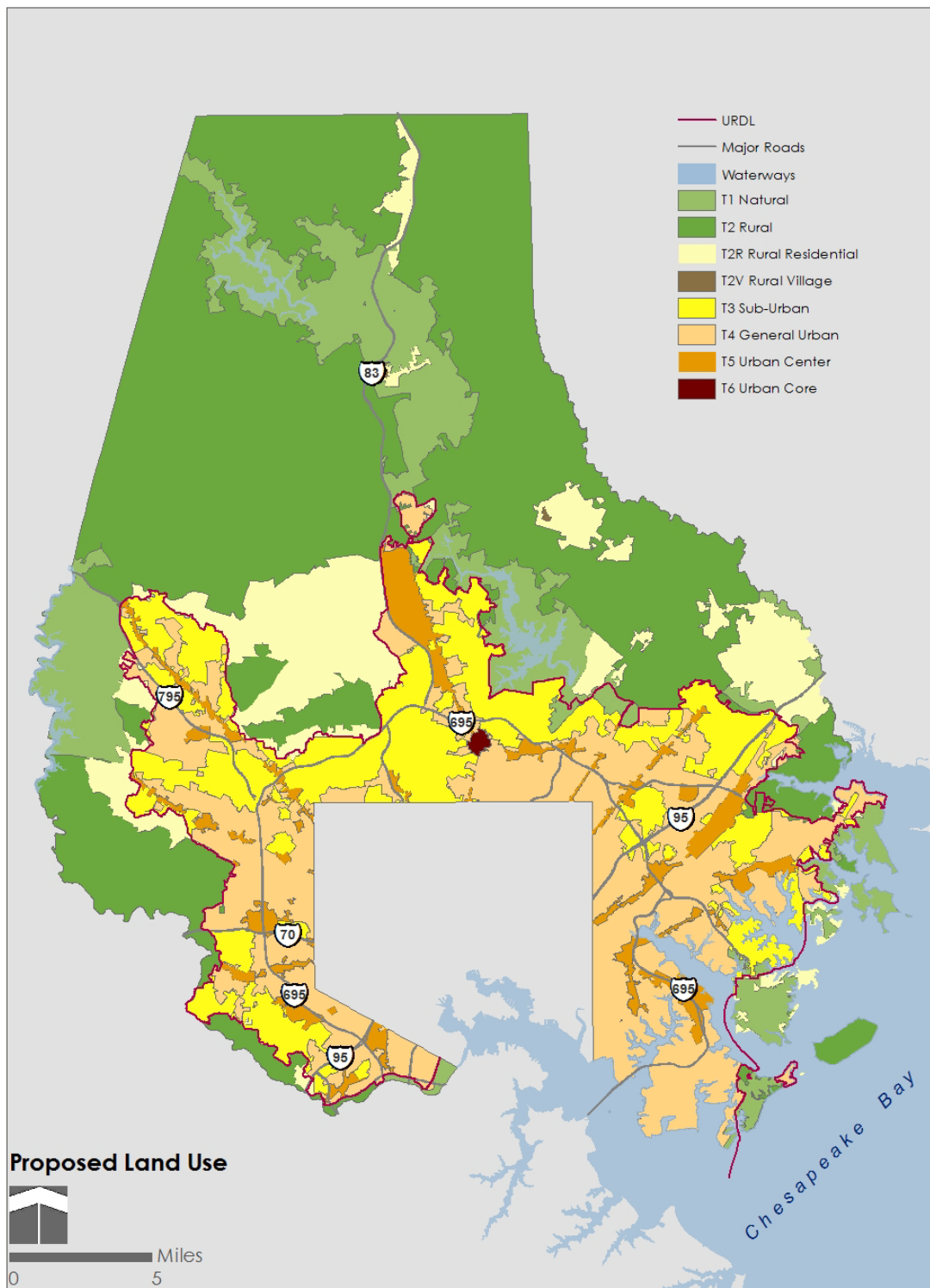
The existing land use map shows the land use in accordance with the current zoning classifications but does not identify land use of individual properties. The transect map illustrates "T-zones" designed for the intent to support compact mixed-use communities within the URDL and protect natural resources outside the URDL. The proposed land use map provides general direction for the county's future land use decisions that are subject to amendments to the Master Plan 2020.

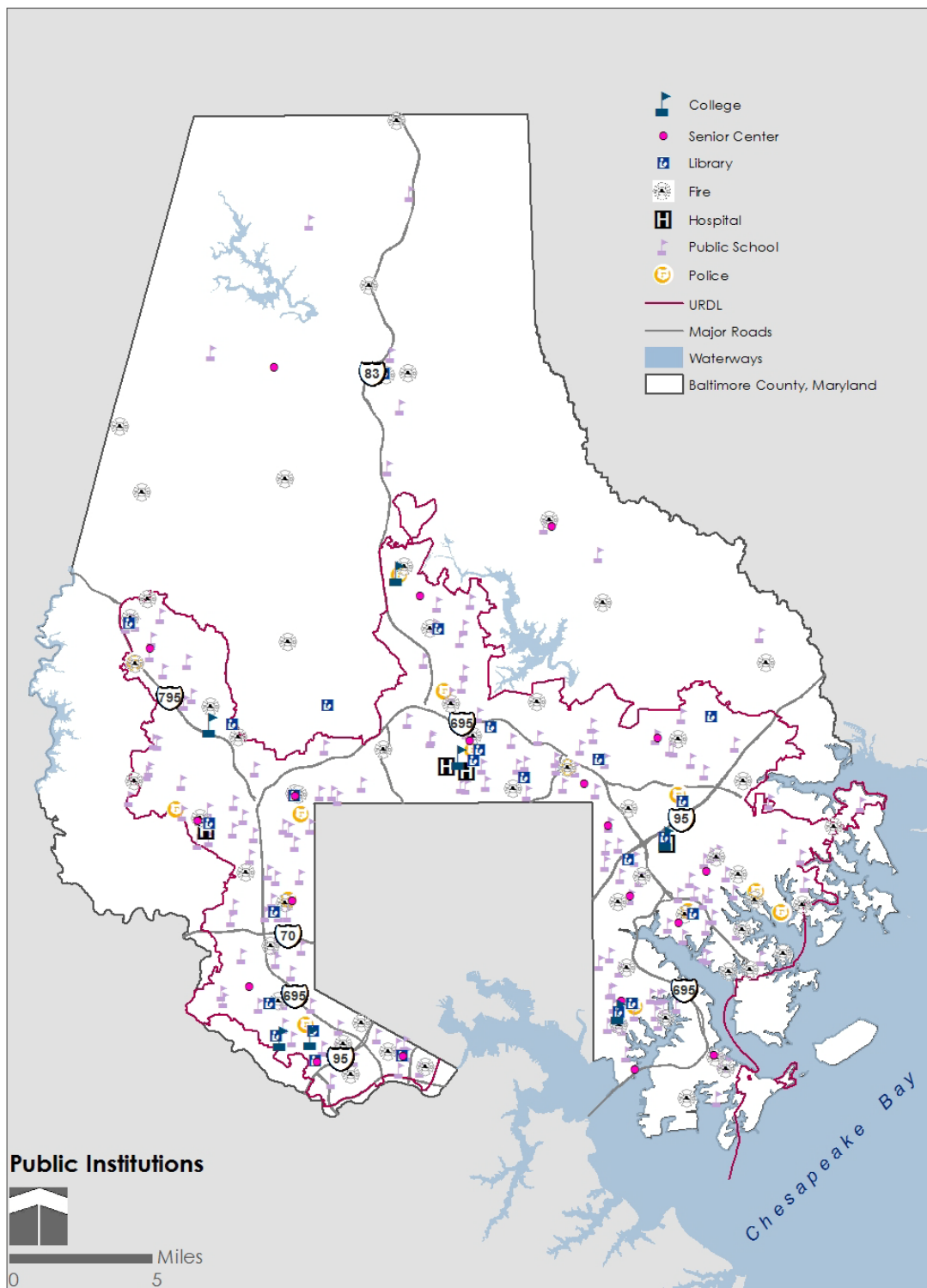














# Baltimore County Geology Reference



Department of Environmental  
Protection & Sustainability

## Geology

Age (Estimated)	Name
Cretaceous	Arundel Formation
Permian	Patuxent Formation
Devonian	Woodstock Granite
Ordovician	Ellicott 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




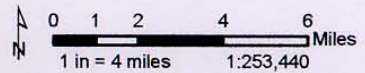
# Baltimore County Critical Well Yield Areas



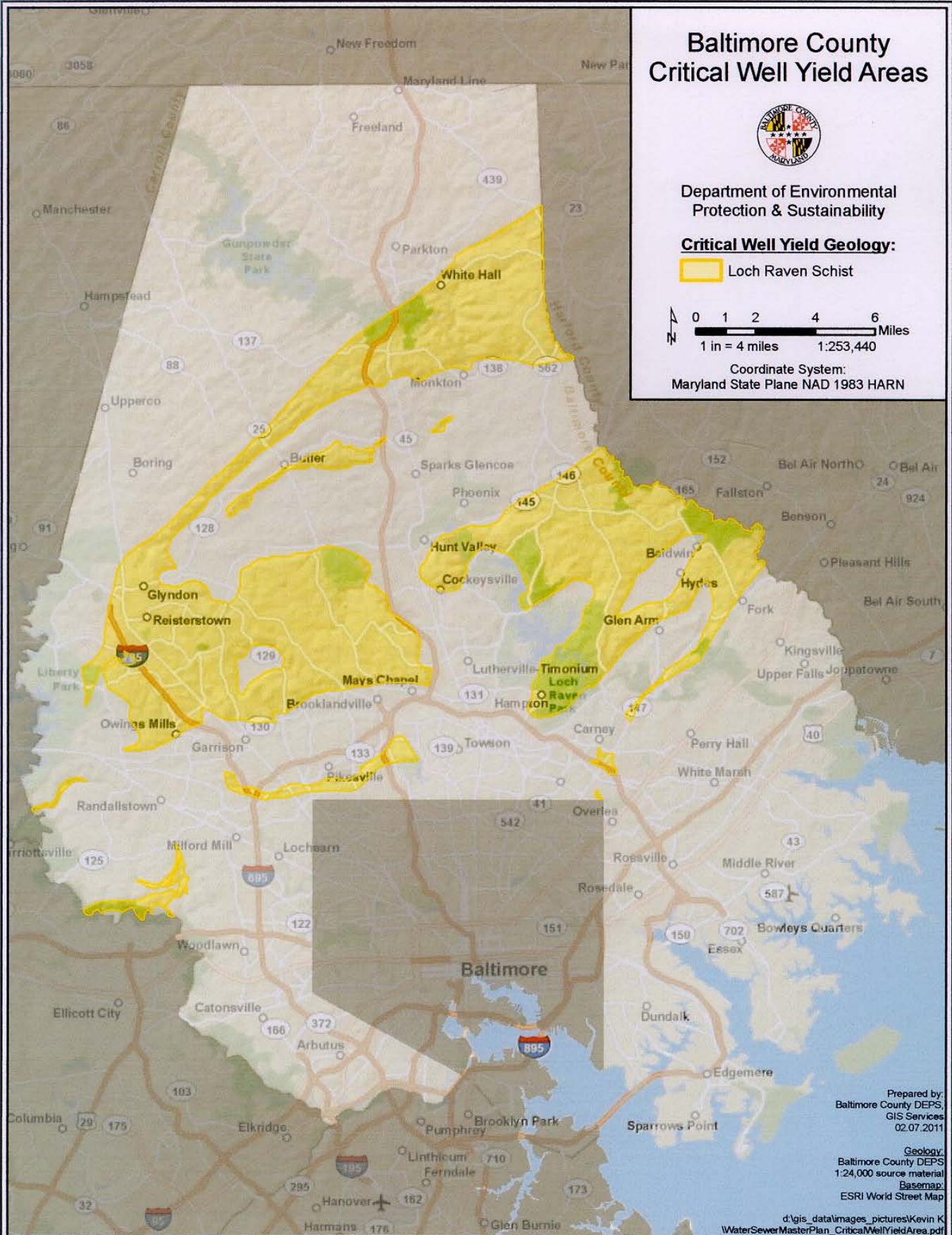
Department of Environmental  
Protection & Sustainability

## 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

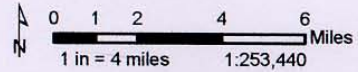


Department of Environmental  
Protection & Sustainability

## Soil Erosion Potential\*

0.001 - 0.10
0.10 - 0.30
0.30 - 0.60: mean** = 0.43
0.60 - 1.20
1.20 - 2.40

Not Available



Coordinate System:  
Maryland State Plane NAD 1983 HARN

\* Soil Erosion Potential (Ep) is defined as:

$Ep = K * S$ , 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



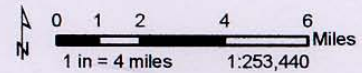
# Baltimore County Hydrologic Soil Groups



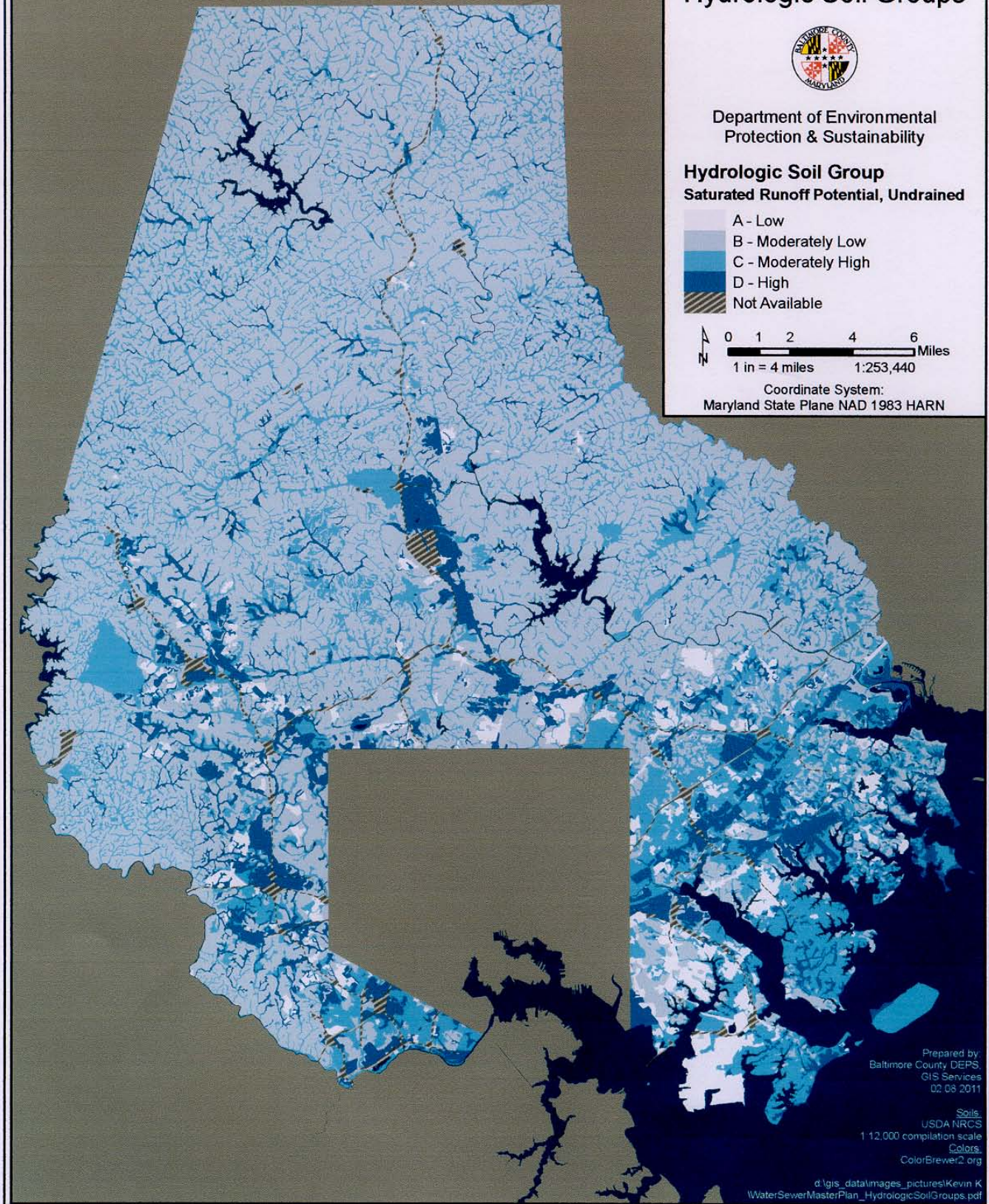
Department of Environmental  
Protection & Sustainability

## Hydrologic Soil Group Saturated Runoff Potential, Undrained

- A - Low
- B - Moderately Low
- C - Moderately High
- D - High
- Not Available



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



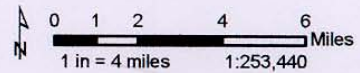
# Baltimore County Slope Evaluation



Department of Environmental  
Protection & Sustainability

## Slope Evaluation Percent Slope

	0% - 4% (flat)
	4% - 8% (gentle slope)
	8% - 15% (moderate slope)
	15% - 25% (strong slope)
	> 25% (steep 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

### WATER PROGRAM COST SUMMARY ESTIMATED 10-YEAR (2016-2026)

*(Source: Bureau of Engineering & Construction, Water Design Section)*

Neighborhood Extensions (Petitions):	2,500,000
Construction at Highway Sites:	2,500,000
Rehabilitation & Replacement of Water Mains:	<u>142,500,000</u>
<b>TOTAL NEIGHBORHOOD FACILITIES:</b>	<b>\$147,500,000</b>
Major County Projects:	90,000,000
Joint City-County Projects (Baltimore County's Share Only):	<u>866,400,000</u>
<b>GRAND TOTAL ALL WATER FACILITIES:</b>	<b>1,103,900,000</b>



## CAPITAL BUDGET 2015

### CAPITAL IMPROVEMENT PROGRAM FY 2016 - 2020 STAGE 7 – DEPT. 203 WATER SYSTEM

Proj. No.	Title	Total Estimated Cost	Prior Authorizations	Total for 6-year Program	FY2016*	FY 2018*	FY 2020*
0002	Neighborhood Petitions Water Ext	4,694,484	3,194,484	1,500,000	500,000	500,000	500,000
0005	Western Third Zone	14,503,010	13,503,010	1,000,000	0	0	0
0006	Towson Fourth Zone	52,489,140	37,989,140	14,500,000	10,500,000	4,000,000	0
0011	Eastern Third Zone	20,536,660	8,536,660	12,000,000	0	10,000,000	2,000,000
0012	Pikesville Fourth Zone	20,543,918	6,543,918	14,000,000	14,000,000	0	0
0035	Misc Distribution System Improvements	63,923,146	38,423,146	25,500,000	8,500,000	8,500,000	8,500,000
0036	First Zone	105,808,432	79,624,856	26,183,676	0	0	0
0050	Construction at Highway Sites	5,300,888	3,800,888	1,500,000	500,000	500,000	500,000
0067	Main Replacement and Rehabilitation	167,287,582	107,287,582	60,000,000	20,000,000	20,000,000	20,000,000
0068	Special Water House Connections	730,000	715,000	15,000	5,000	5,000	5,000
0070	Fire Hydrants	770,778	710,778	60,000	20,000	20,000	20,000
0071	City/County Joint Use Facilities	879,724,774	353,324,774	526,400,000	170,400,000	186,000,000	170,000,000
0078	Reisterstown Fifth Zone	25,222,000	6,222,000	19,000,000	0	1,500,000	17,500,000
	TOTAL	1,361,534,812	659,876,236	701,658,576	224,425,000	231,025,000	219,025,000

\* Baltimore County employs a Biennial Capital Budget.

## Water Supply System - 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 River<sup>1</sup> watershed above Loch Raven. It also granted the City the right to use the entire Patapsco River<sup>2</sup> watershed in 1931; and in 1931 and in 1955, the City received the legislature's approval to withdraw water from the Susquehanna River<sup>3</sup> above the Conowingo Dam.

The present Baltimore County water system is actually an extension of the City system. This resulted from the 1918 annexation<sup>4</sup> 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.

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<sup>1</sup> Acts of the Maryland General Assembly - 1908, Chapter 214, Sec. 1-16

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

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

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

## Description of Existing Water 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 three (3) 50 MGD pumps in the station capable of pumping 150 MGD. 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 2022, 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 District<sup>5</sup> 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.

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<sup>5</sup> See Title 35, Baltimore County Code.

### Water Consumption

In fiscal year 2013, Baltimore County used about 84 MGD from the Baltimore system. This amounts to about 41% of the average day water demand of 204 MGD. About 16% of the 84 MGD is used by commerce and industry. Residential consumption accounts for the remaining 84%.

### 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 2014 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 (24.5 MGD for Howard and 3 MGD for Anne Arundel), both counties must rely heavily on the Baltimore System for future water supply. Howard County recognized 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 10 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.<sup>6</sup> 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, 1972<sup>7</sup>.

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 a reservoir Watershed Management Agreement<sup>8</sup> 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

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<sup>6</sup> See Title 35, Baltimore County Code.

<sup>7</sup> See Water Agreement, Baltimore City and Baltimore County, dated September 20, 1972.

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

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 2017 and 2022 respectively.

Replacement covered reservoirs is scheduled to be built by 2018 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 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 (12,000 ft.), Oliver Beach (15,000 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 - 2017 to comply with the EPA LT2ESWTR mandate.

Replacement covered reservoirs is scheduled to be built by 2018 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.

#### Colgate Second Zone

The new 0.50 million gallon water storage tank was placed into service in 2014.

#### Eastern Third Zone

Towson Reservoir was replaced with a new covered reservoir in 2013. This new reservoir, which also supplies water to the Towson Fourth Zone, will improve hydraulics and water quality.

A new 12" water main is currently under construction in Harford Road, between Joppa Road and Cub Hill 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

A new 16" transmission main will be needed to meet future water demands for both Baltimore and Howard Counties. This main will run from Frederick Road south on Sanford Avenue, east on Magruder Avenue, south on Mellor Avenue, south on Hilltop Road, west on Wilkens Avenue to Rolling Road.

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 36" main from Pikesville Pumping Station is needed to provide redundancy.

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 42" Towson Bypass main is needed to replace an existing 50-year old 48" Prestressed Concrete Cylinder Pipe transmission main between Towson Pumping Station and Kenilworth Drive. This project will begin in 2014.

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 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 2015.

#### Falls Fifth Zone

Increasing demand in the Mays Chapel area will require the construction of a 0.3 Million Gallon elevated water storage tank by the year 2020.

#### Zones that Do Not Need Planned Improvements to their Distribution System

- Pot Springs Fifth Zone
- Sherwood 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

### Safe Yield

- Loch Raven - Prettyboy 148 MGD
  - Liberty 92 MGD
  - Susquehanna
    - 108-inch line 250 MGD
    - Future Additional Allowance 250 MGD
- Total Available Water: 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. The pipeline has not been built for the additional 250 MGD available from the Susquehanna.
3. Present agreements would allow up to 69 MGD average day for Howard and Anne Arundel Counties.
4. Harford County has State authority for 10 MGD from the Susquehanna.
5. 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 7C Population Forecasts by the Baltimore Metropolitan Council (see Chapter II) indicate over 730,000 persons in the urban area of Baltimore County within ten years. The provision of public water services to this many people will require capital expenditures in nearly every zone of water service (see the Ten-Year Water Program Summary Page).

### 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 2020.

Industrial use is expected to increase especially in the First Zone of service with smaller increases in other zones. 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 2035.

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.

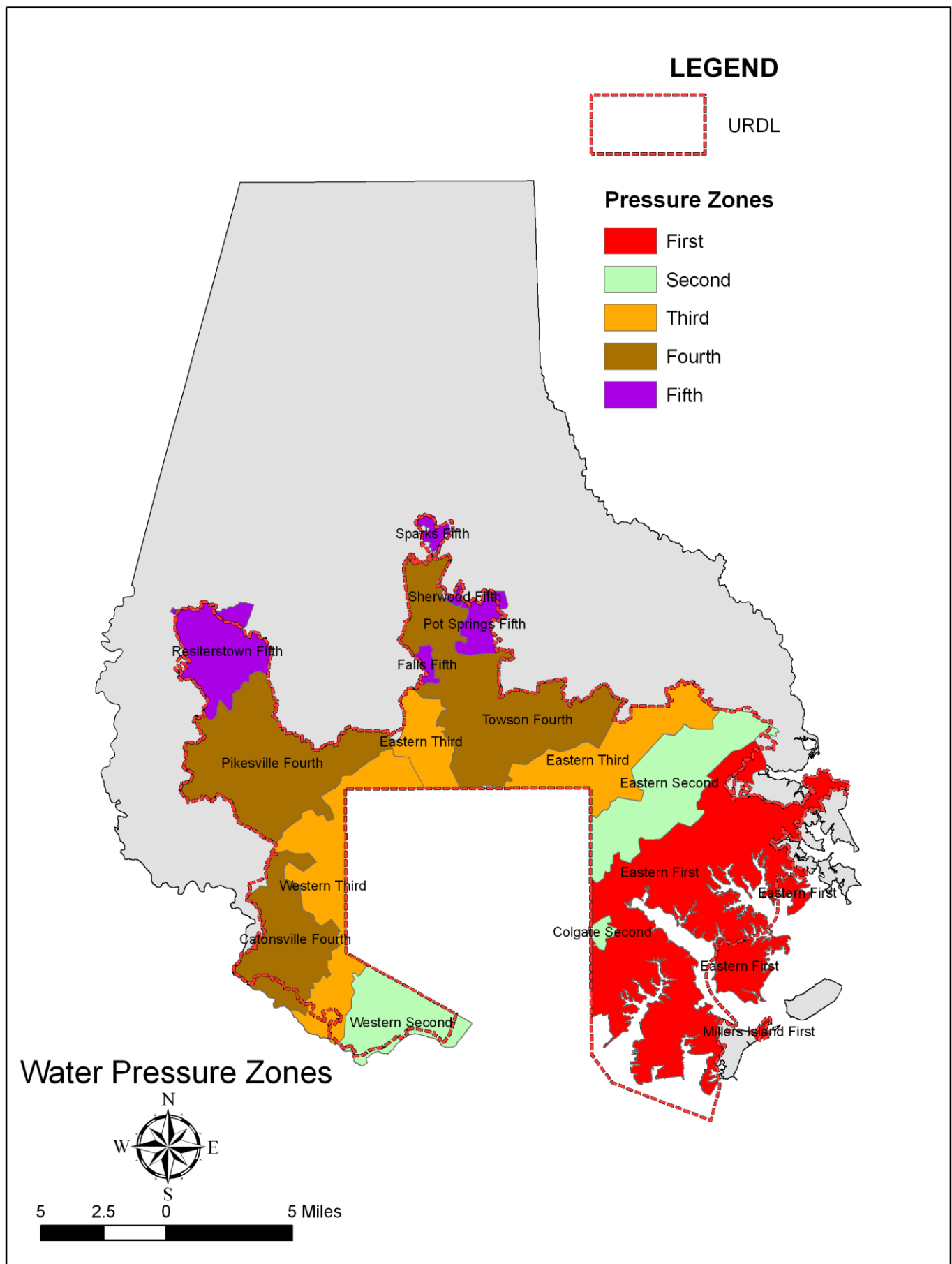
Baltimore County's economic health depends to a significant degree on industry, and water is a prerequisite. Ensuring new industry and an ample water supply will permit considerable growth and will encourage industrialization where consistent with the County's *Master Plan 2020*.

### Available Water Supply

The estimated Baltimore County 2020 average-day demand is 91.01 MGD. This quantity can be obtained from the existing sources of supply. The maximum-day demand of 185 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 - Current-2035

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 2035. The present thinking of planners is that the water service area in the year 2035 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 (see Chapter I Comparison Chart: City & County Water Billing. An average family of four uses 156.4 units of water per year, one unit being 100 cubic feet. One Cu. Ft = 7.4805 gallons.  $(156.4 \text{ units} \times 100 \text{ ft.}^3 / \text{unit} \times 7.4805 \text{ gal./ft.}^3) / (4 \text{ persons} \times 365 \text{ days per year}) = \mathbf{80.13 \text{ gpcd per person.}}$ )

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.

### Estimated Daily Use in the Year 2035

In the year 2035, the average daily use in Baltimore County is estimated to be 95.4 MGD, and the maximum-day consumption is estimated to be 186 MGD.

### 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 through the year 2035.

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 2013 Baltimore County used about 84 MGD from the Baltimore system. This amounts to about 41% of the average day water demand of 204 MGD. In fiscal 2013 there was 24.56% unaccountable water in the Baltimore Metropolitan Water System.

In recent years the County has financially participated at a rate of 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. In the past year, a leak survey was completed on the majority of the First Zone.
- Replacement of water tank altitude valves to stop unnecessary water overflows.

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. At last count, no meters were left to be uncovered in Baltimore County.

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 2015 alone, Baltimore County will be replacing over 25,000 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 18% 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:

#### Geologic Formation

#### Well Yield

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

Gniess & 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/RemediationSites/Pages/Programs/LandPrograms/Oil\\_Control/RemediationSites/index.aspx](http://www.mde.state.md.us/programs/Land/OilControl/RemediationSites/Pages/Programs/LandPrograms/Oil_Control/RemediationSites/index.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.*)<sup>9</sup>. 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 study were found to have elevated levels of sodium in the water.

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

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<sup>9</sup>Kaushal, 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.

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**

<b>Name</b>	<b>Location</b>	<b>Population Served</b>
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 <sup>1</sup>	Sweet Air Rd Phoenix	50
Chapel Hill Nursing Center	4511 Robosson Rd Randallstown	70
Sunnybrook Community Water	Club View La	400

Supply <sup>1</sup>	Phoenix	
Woodstock Job Corp	10900 Old Court Rd, Woodstock	675
Villa Julie Infirmary	1531 Greenspring Valley Rd, Stevenson	50
Total Population Served		1985

<sup>1</sup> Maintained by Baltimore County Department of Public Works



Table No. 3  
Projected Water Supply Demands and  
Planned Capacity

SERVICE AREA	2015							2025							2040						
	Population Thousands	GPCD Gallons	Residential Demand MGD	Commercial Industrial Demand MGD	Unaccounted Water MGD	GPCD Total Gallons	Total Demand MGD	Population Thousands	GPCD Gallons	Residential Demand MGD	Commercial Industrial Demand MGD	Unaccounted Water MGD	GPCD Total Gallons	Total Demand MGD	Population Thousands	GPCD Gallons	Residential Demand MGD	Commercial Industrial Demand MGD	Unaccounted Water MGD	GPCD Total Gallons	Total Demand MGD
FIRST	152.1	68	10.3	3.5	5.0	124	18.8	158.1	80	12.6	7.5	5.0	147	23.3	168	77	12.9	7.5	5.6	140	23.6
SECOND	97.3	68	6.66	0.7	2.7	103	10.06	101.0	73	7.4	0.7	2.7	101	10.2	107.6	70	7.5	0.7	2.7	96	10.3
COLGATE SECOND	5.9	63	0.37	0.07	0.04	81	0.48	6.0	70	0.42	0.07	0.04	112	0.67	6.0	70	0.42	0.07	0.09	112	0.67
EASTERN THIRD	87	60	5.21	1	3.7	114	9.91	88.1	68	6	1	3.7	124	10.9	91.3	68	6.20	1	3.7	122	11.1
WESTERN THIRD	75	76	5.71	0.9	1.1	103	7.71	76.3	69	5.3	0.9	1.1	118	9	78	69	5.4	0.9	1.1	117	9.1
CATONSVILLE FOURTH	53.8	80	4.3	0.64	0.9	108	5.84	54.8	88	4.8	0.64	0.9	119	6.54	57.6	85	4.9	0.64	0.9	115	6.64
PIKESVILLE FOURTH	98.2	69	6.82	2.2	3.1	123	12.12	102.4	73	7.5	2.2	3.1	126	12.9	105.6	72	7.6	2.2	3.1	123	13
TOWSON FOURTH	97.4	91	8.89	0.94	1.9	120	11.73	99.7	69	6.9	0.94	1.9	98	9.74	101.7	69	7	0.94	1.9	97	9.84
REISTERSTOWN FIFTH	38.8	69	2.69	0.07	0.6	87	3.36	39.6	76	3	0.07	0.6	87	3.45	40.6	76	3.1	0.07	0.6	87	3.55
FALLS FIFTH	4.3	100	0.43	0.21	1.2	427	1.84	4.3	77	0.33	0.21	1.2	400	1.72	4.4	77	0.34	0.21	1.2	393	1.73
POT SPRINGS FIFTH	12.8	78	1	0.01	0.6	126	1.61	13.1	83	1.09	0.01	0.6	143	1.87	13.1	85	1.12	0.01	0.6	145	1.90
SPARKS FIFTH	1.7	70	0.12	0.1	0.1	188	0.32	1.8	100	0.18	0.1	0.1	311	0.56	1.8	100	0.18	0.1	0.1	311	0.56
SHERWOOD FIFTH	0.49	143	0.07	0.1	0.1	2.65	0.13	0.5	200	0.1	0	0.1	320	0.16	0.54	203	0.11	0	0.1	315	0.17
TOTAL	687.9		48.43	14.44	21.04		83.91	712.7		55.62	14.34	21.04		91.01	742.7		56.72	14.34	21.04		92.15

Table No. 3 (Continued)  
Projected Water Supply Demands and  
Planned Capacity  
(MGD)

	2015		2025		2040	
SERVICE AREA	TOTAL DEMAND	PLANNED CAPACITY	TOTAL DEMAND	PLANNED CAPACITY	TOTAL DEMAND	PLANNED CAPACITY
First	18.8	30.0	23.3	30.0	23.6	30.0
Second	10.06	13.5	10.2	13.5	10.3	13.5
Colgate Second	0.48	0.70	0.67	0.70	0.67	0.70
Eastern Third	9.91	13.0	10.9	13.0	11.1	13.0
Western Third	7.71	9.6	9	9.6	9.1	9.6
Catonsville Fourth	5.84	8.3	6.54	8.3	6.64	8.3
Pikesville Fourth	12.12	14.2	12.9	14.2	13	14.2
Towson Fourth	11.73	15.5	9.74	15.5	9.84	15.5
Reisterstown Fifth	3.36	5.7	3.45	5.7	3.55	5.7
Falls Fifth	1.84	1.8	1.72	1.8	1.73	1.8
Pot springs Fifth	1.61	1.9	1.87	1.9	1.9	1.9
Sparks Fifth	0.32	0.6	0.56	0.6	0.56	0.6
Sherwood Fifth	0.13	0.2	0.16	0.2	0.17	0.2
TOTAL	83.91	115	91.01	115	92.15	115

All Zones have the necessary filtration, pumping or storage capacity to meet the planned capacity.

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 Steam Bed Feet	Flooded Area of Crest Elevation Acres	Lenght of Shore Line at Crest Elevation Miles	Area of Land Owned Acres	Water Over Flowed Crest For First Time	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)
(Ultimate)	500 MGD	(1893 TCMD)
Deer Creek Pumping Station (Initial)	3 Pumps @ 50 MGD each (189 TCMD)	
(Ultimate)	5 Pumps @ 50 MGD each (189 TCMD)	

- (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 & 237 MG (140 TCM)	Druid Lake 193 MG (730.6 TCM)	Lake Ashburton 220 MG (833 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 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		Proj Const Capital Budget Program Number	Status Start (Design) Fiscal Year
							Total \$	Baltimore County \$		
			N	E		<u>First Zone</u>				
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.	2,000,000	2,000,000	0036	2016
3-67-278	2015	W-1	585750.1	1467418.8	W23B	Replacement of 12,000 feet of cast iron pipe for Beechwood.	3,000,000	2,000,000	0067	2014
3-36-017	2014	W-3	610750.6	1479418.5	W17B	Rehabilitation of 37,000 LF of 36" Main Pulaski-Orem-Leland from Golden Ring Rd. to Bengies Road	3,000,000	3,000,000	0036	2016
3-67-	2013	W-1	580749.9	1457418.9	W23A	Rehabilitation of water mains in Dundalk	3,500,000	3,500,000	0067	2011
3-36-028	2014	W-3	617750.6 624750.7	1469418.4 1474418.4	W17B	9000 LF of 24" water main in Pulaski Highway from Mohrs Lane to Ebenezer Road	4,500,000	4,500,000	0036	2012
3-35-308	2015	W-6	617750.8	1487418.5	W17B	9500 feet of 16" water main in Ebenezer Rd. from Stumpfs Rd. to Harewood Rd.	2,000,000	2,000,000	0035	2011
3-36-021	2018	W-3	620750.5	1456418.3	W17A	Fullerton Reservoir	72,000,000	32,800,000	0036	2008
						<u>Eastern Third Zone</u>				
3-67-	2018	W-1	626750.3 628750.3	1431417.9 1427417.8	W17A	27,000 LF of main Hillen Road Goucher Boulevard Rehabilitation	1,200,000	1,200,000	0067	2016
3-11-	2016	W-1	619559.16 615038.9	1449238.95 1444910.54	W17A	5,500 feet of 24-inch Water Main in Belair Road between Northern Parkway and I-695	3,800,000	3,800,000	0011	2014

Table 8 (continued)  
Baltimore County Water Facilities  
Capital Improvement Program

<u>Project Job Order</u>	<u>Construction Start Date Fiscal Year</u>	<u>Priority</u>	<u>Maryland State Plane Coordinates NAD 83</u>		<u>Map</u>	<u>Project Description</u>	<u>Estimated Costs</u>		<u>Proj.Const .Capital Budget Program Number</u>	<u>Status Start (Design) Fiscal Year</u>
							<u>Total \$</u>	<u>Baltimore County \$</u>		
3-67-	2014	W-1	630750.5	1447418.1	W17A	6200 feet of 16"/12" main in Harford Rd. between Joppa Rd. and Cub Hill Rd.	2,000,000	2,000,000	0067	2011
3-35-	2017	W-1	640750.3	1407417.4	W16B	8000 feet 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	2016
						<u>Western Third Zone</u>				
3-5-21	2014	W-1	584749.3	1386417.9		9,500 LF of 20" main Melvin Avenue & Rolling Rd. from Frederick Rd. to Wilkens Ave.	3,700,000	2,700,000	0005	2008
3-67-	2016	W-1	588749.3	1385417.8	W22A	Cleaning & Lining of transmission mains located in Melvin Ave. (20"), Patterson Ave. (16"), Edmondson Ave. (10"), Frederick Rd. (10"), & Cooks Lane (20")	1,500,000	1,500,000	0067	2014
						<u>Pikesville Fourth Zone</u>				
3-35-	2016	W-1	625749.5	1361417.4	W16A	7,700 LF of 20" main Liberty & Deer Park Rds. from Chapman Rd. to Deer Park Tank	1,500,000	1,500,000	0035	2014
3-67-304	2015	W-1	620749.5	1367417.4						
			625749.9	1388417.4	W16A	7000 LF of 36" main between Painters Mill Rd. and Pleasant Hill Rd. in Reisterstown Rd.	6,500,000	6,500,000	0067	2011
			629749.9	1383417.3						

Table 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		Proj.Const .Capital Budget Program Number	Status Start (Design) Fiscal Year
							Total \$	Baltimore County \$		
3-12-489	2015	W-1			W16A	Pikesville PS Discharge Main-42"	5,000,000		0012	2013
3-35-452	2015	W-1			W16A	Pikesville PS Rehab	2,000,000	2,000,000	0035	2013
						<u>Towson Fourth Zone</u>				
3-35-445	2016	W-1			W16B	Towson PS Rehab	3,000,000	3,000,000	0035	2012
3-50-466	2015	W-1			W16B	York Rd-24"-Cockeysville Road to Shawan Road	7,000,000	7,000,000	0050	2013
3-6-288	2015	W-2	651750.5	1416417.4	W10B	15,000 LF of 24" water line in York Road from Padonia Road to Cockeysville Road	9,600,000	9,600,000	0006	2009
3-6-306	2014	W-1	629750.3	1427417.8	W16B	8600 LF of 42" transmission main in Hillen Rd., Towsontown Blvd. and Bosley Ave.	10,000,000	10,000,000	0006	2011
			633750.3	1422417.7		<u>Catonsville Fourth Zone</u>				
3-35-332	2015	W-1			W22A	Catonsville PS Rehab-New 36" Suction and Discharge Main	8,000,000	8,000,000	0035	2012
						<u>Sparks Fifth Zone</u>				
3-35-151	2014	W-3	670750.8	1412417.1	W10B	Improvements at the Sparks Pumping Station	2,000,000	2,000,000	0035	2013

Table 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		Proj. Const. Capital Budget Program Number	Status Start (Design) Fiscal Year
							Total \$	Baltimore County \$		
						<u>Reisterstown Fifth Zone</u>				
3-78	2018	W-1	641749.9	1372417.1	W16A	Replace 20,000 LF of 16" Main in Reisterstown Road from Pleasant Hill PS to Butler Road	6,000,000	6,000,000	0078	2016
3-78-0002	2016	W-3	618749.4	1361417.5	W10A					
			655804.6	1371593.7	W16A	2.0 MG Bond Avenue Tank	3,500,000	3,500,000	0078	2008
						<u>Falls Fifth Zone</u>				
3-75-	2016	W-3	652750.5	1407417.3	W16B	0.3 MG Elevated Tank	2,000,000	2,000,000	0075	2016
						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	400,000,000	240,000,000		2013
3-71-239	2017		611199.9	1421278.1		Guilford Reservoir Replacement	67,000,000	44,000,000		2011
3-71-474	2016					Druid Lake Storage Replacement	120,000,000	53,000,000		2013
3-71-475	2016					Ashburton Storage Replacement	110,000,000	48,000,000		2013

## CHAPTER IV - SEWERAGE PLAN

### GENERAL BACKGROUND

Baltimore County constructs, operates and maintains all sewage collection and pumping facilities within the County. There are twenty-two (22) sewersheds that are broken down into eighty (80) subsewersheds. 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.

### System Overview

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

# Sewersheds



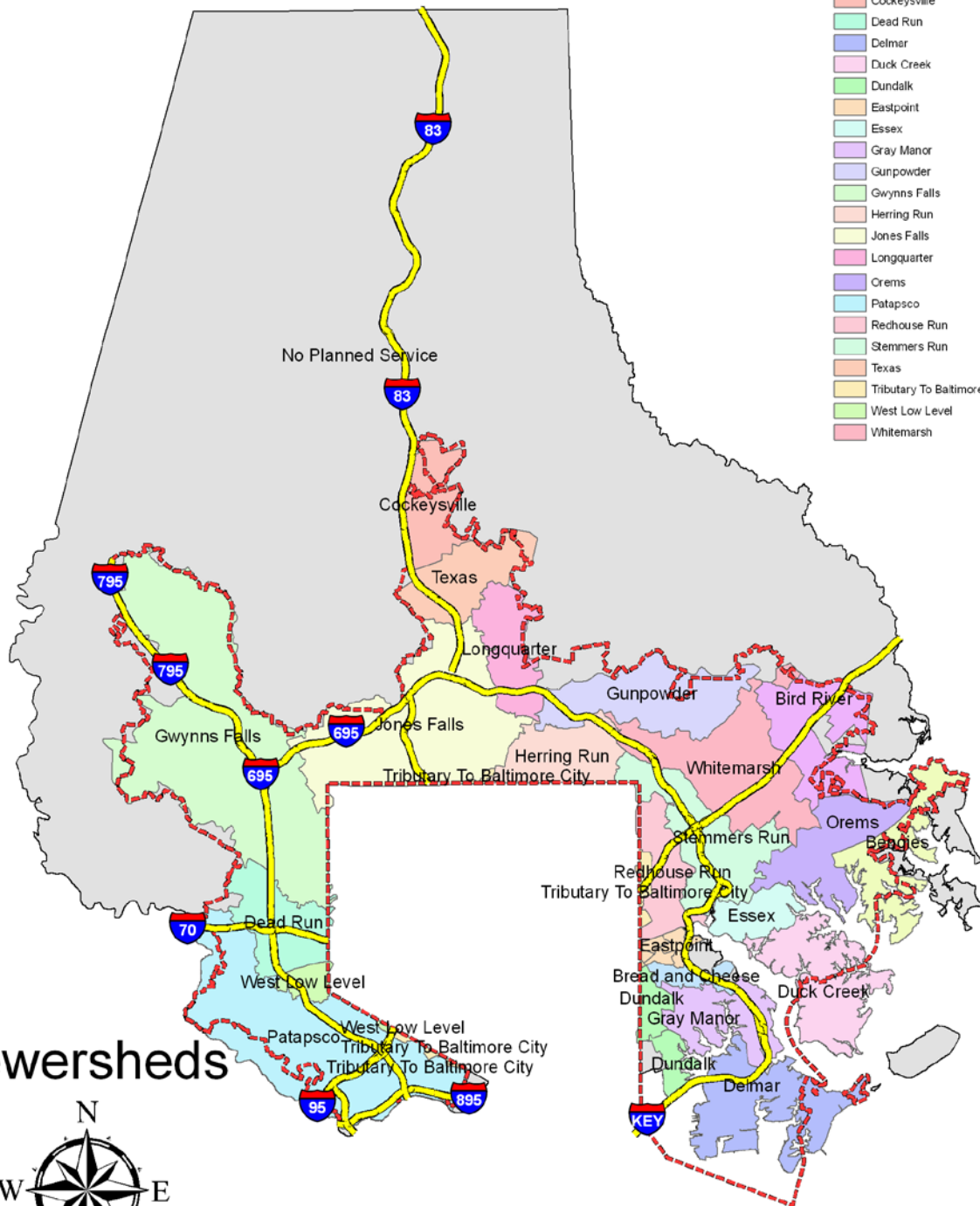
5 2.5 0 5 Miles

## Legend



## Sewersheds

- Bengies
- Bird River (Part of Whitemarsh)
- Bread and Cheese
- Cockeysville
- Dead Run
- Delmar
- Duck Creek
- Dundalk
- Eastpoint
- Essex
- Gray Manor
- Gunpowder
- Gwynns Falls
- Herring Run
- Jones Falls
- Longquarter
- Orems
- Patapsco
- Redhouse Run
- Stemmers Run
- Texas
- Tributary To Baltimore City
- West Low Level
- Whitemarsh



## 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 26,100 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"
Rossville	0.96	8" to 15"
Golden Ring	0.96	10" to 12"
Town & County	0.29	8" to 10"
Clover Heights	0.43	10" to 12"
Belair Road	0.76	10"
Rolling View	0.53	8" to 12"
Parkville	0.77	10" to 18"
Carney Heights	0.85	15" to 18"
Orems Road	1.05	30" to 36"
Kelso Drive	0.68	12" to 15"
Martin Boulevard	0.75	8" to 12"

### Pumped Flow

The existing 42 MGD and the new 71.7 MGD Stemmers Run Pumping Stations receive flow from the Orems Road and White Marsh Pumping Stations through the Brien Run Interceptor. The sewage is then transported through 48" and 54" force mains discharging into the outfall sewer at Back River Treatment Plant, nearly 15,000 feet south of the Stemmers Run 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 Stemmers Run. The SRRR Plan was approved on September 6, 2013, and needs to be implemented by September 6, 2014.

### Proposed Projects

The rehabilitation of the Brien Run interceptor is in design. Four additional pipeline rehabilitation projects totaling 113,885 feet are also in design. The Bagley Relief Sewer is in construction to eliminate SSO #130.



## 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 1600 acres with a population of 17,900 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"
Wampler Road Outfall	0.25	12"
Shore Road Sewer	0.76	8" to 12"

### Pumped Flow

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

	<----- Bengies	
Orem Road	<----- Stansbury Manor	<----- Wilson Point
Pumping Station	<----- Hawthorne I	
	<----- Hawthorne II	

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

### Existing Conditions

Upgrades to Orem Rd Pumping Station, and Hawthorn I Pumping Station have been completed. Upgrades to the Bengies Pumping Station, Hawthorne II and Wilson Point Pumping Station are under construction.

### Proposed Projects

Upgrade to the Stansbury Manor Pumping Station is under design. The Orem Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) is due in March 2016.

## **BENGIES**

### Location

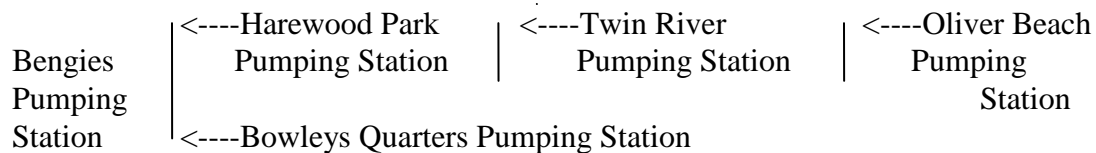
The Bengies drainage basin is in eastern Baltimore County and includes the Bowleys Quarters Peninsula and the area along Eastern Avenue northeast of Carroll Island Road. The area serves approximately 1450 acres with a population of 13,300 people.

### 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"
Holly Grove Road Outfall Sewer	0.51	15"
Eastern Avenue Int. East	3.31	24" to 48"
Ebenezer Road Sewer	0.28	12"
Harewood Park PS Collector Sewer	0.36	12"
Olivia Road Outfall Sewer	0.29	12" to 15"
Twin River Beach PS Outfall Sewer	0.51	18" to 24"
Twin River Beach Collector Sewer	0.15	12"
Oliver Beach PS Outfall Sewer	0.63	15" to 18"
Middle River Neck Interceptor	1.44	20"

### Pumped Flow

The 4.5 MGD Bengies Pumping Station receives flow from four (4) pumping stations. The Bowleys Quarters Pumping Station pumps to the Middle River Neck Interceptor. The remaining three (3) stations pump through the Eastern Avenue Interceptor.



### Existing Conditions

The upgrade to the Bengies Pumping Station is expected to be completed in 2015. The upgrade to the Twin Rivers Pumping Station is expected to be completed in 2014..

### Proposed Projects

The Bengies Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) is due in March 2016.

## 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 42,800 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"
Town Center Drive Outfall	0.55	8" to 10"
Barrington Outfall	0.59	10" to 20"
Linda Avenue Outfall Sewer	0.29	12"
Silver Lake Outfall Sewer	0.76	8" to 12"
Nottingham Interceptor	0.67	10" to 12"
White Marsh Mall Outfall	0.87	10"
West Branch White Marsh	4.41	10" to 27"
Belmont Outfall Sewer	0.58	12" to 18"
Upton Road Sewer	0.35	8" to 12"
Hallfield Manor Outfall	0.66	12" to 15"
Perry Hall TP Outfall	0.88	12" to 15"
Chapel Manor Outfall	0.69	8" to 10"
Chapel Road Outfall	0.47	8"
Belair Road to Forge Road 8"	1.51	8" to 12"
Bird River Interceptor	2.50	24" to 48"

### Pumped Flow

The new 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

There are no existing construction projects.

### Proposed Projects

The Whitemarsh Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) is due in March 2016.

## **GUNPOWDER**

### Location

The Gunpowder Wastewater Drainage Basin is located in northeast Baltimore County, generally north of Joppa Road and south of the Gunpowder River. The area served by the Gunpowder System is approximately 4,100 acres with a population of 35,300 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"
Hines Road Outfall Sewer	0.40	12" to 15"
Perry Hall Estates Outfall	0.23	18"
Jenifer Run Interceptor	1.85	12" to 18"
Cub Hill Outfall Sewer	0.73	8" to 12"
Satyr Hill Interceptor	1.84	12" to 16"
Minebank Sub-Interceptor	1.67	10" to 15"

### Pumped Flow

There are two (2) pumping stations tributary to the Gunpowder System: Campus Hills and Long Quarter Pumping Stations. The Gunpowder Pumping Station pumps sewage through a 36" force main to the northern end of the White Marsh Sewerage System.

### Existing Conditions

Upgrade to the Gunpowder Pumping Station has been completed.

### Proposed Projects

The design of the upgrade to the Campus Hills Pumping Station is nearing completion. The Gunpowder Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) is due in March 2016.

## TEXAS

### Location

The Texas Wastewater Drainage Basin is located between Cockeysville and Timonium in north-central Baltimore County. The Texas System serves approximately 2,100 acres with a population of 27,200 people.

### System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Sizes</u>
Texas East Interceptor	1.86	12" to 24"
Gateridge Road Sewer	0.66	10" to 16"
Texas South Interceptor	1.77	15" to 24"
Church Lane Outfall	0.43	12"
Padonia Road West	1.38	10" to 16"
Padonia Road Outfall	0.47	8" to 12"
Mays Chapel Outfall	0.83	12" to 16"

### Pumped Flow

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

Texas	<-----Cockeysville
Pumping	<-----Merrymans
Station	<-----Springdale "A"   <-----Springdale "B"

The Texas Pumping Station pumps through a 30" force main to the Long Quarter System.

### Existing Conditions

Upgrades to Merrymans, Springdale A and Springdale B Pumping Stations have been completed.

### Proposed Projects

The Texas Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) is due in March 2016.

## LONG QUARTER

### Location

The Long Quarter Wastewater Drainage Basin is located in north-central Baltimore County, between Towson and the Loch Raven Reservoir. The area served by the Long Quarter System is approximately 4,150 acres with a population of 24,300 people.

### System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
Greenridge (Fairmount Avenue)	2.30	10" to 24"
Southerly Road Outfall	0.35	10"
Radcliffe Road Outfall	0.12	8"
York Road North	0.33	8" to 10"
York Road South	0.47	8"
Goucher Boulevard Sewer	0.48	12"
Spring Branch Outfall	1.12	16" to 66"
Timonium Interceptor	1.54	33" to 42"
Spring Branch Interceptor	1.02	10" to 15"
Kelly Branch Interceptor	1.44	10" to 12"
Seminary Avenue Sewer	0.46	15" to 21"
Hampton Lane Outfall	0.67	12"

### Pumped Flow

The Long Quarter System receives flows from the Texas Pumping Station. The sewage from long Quarter Pumping Station is pumped through dual force mains to the top of the Gunpowder System. The present capacity at Long Quarter Pumping Station is 29.6 MGD and there is a projected future capacity of 42 MGD.

### Existing Conditions

There are no existing construction projects.

### Proposed Projects

The Longquarter Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) is due in March 2016.

## **COCKEYSVILLE**

### Location

The Cockeysville Wastewater Collection System is located in north-central Baltimore County. The area served by this system is approximately 1,400 acres with a population of 5,100 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"
Hunt Valley Mall Outfall	0.18	10" to 12"
Loveton Outfall Sewer	0.79	12"

### Pumped Flow

There is one (1) pumping station tributary to the Cockeysville System, which is the Loveton Pumping station. The sewage is pumped from Cockeysville Pumping station through a 24-inch force main southerly along the Pennsylvania Railroad to the Texas Pumping Station.

### Existing Conditions

Upgrade to the Loveton Estates Pumping Station has been completed.

### Proposed Projects

The Cockeysville Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) is due in March 2016.

## ESSEX

### Location

The Essex Wastewater Drainage Basin consists of the Essex area in eastern Baltimore County. The area served is approximately 1,900 acres with a population of 18,800 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"
Back River Neck Road	0.60	15"

### Pumped Flow

The 8 MGD Essex Pumping Station receives flows from four (4) pumping stations as shown below:

Essex	<-----Marine Oaks	
Pumping	<-----Marlyn Avenue	<-----Marlyn Manor
Station	<-----Country Ridge	

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

Upgrades to the Marlyn Avenue and Marlyn Manor Pumping Stations have been completed.

### Proposed Projects

The Essex Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) is due in March 2016.



## DUCK CREEK

### Location

This area 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 18,000 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"
Cape May Road Outfall	0.64	12" to 18"
Back River Neck Sewer	0.52	18"
Cape May PS Outfall	0.30	12"
Turkey Point Interceptor	0.99	8" to 24"

### Pumped Flow

The existing capacity of the Duck Creek Pumping Station is 10 MGD with an ultimate capacity of 18 MGD. The pumping station receives flows from fourteen (14) pumping stations as shown below:

Duck Creek Pumping Station	<-----Corsica <-----	<-----Helena Avenue
	<-----Prices Cove	<-----Wye Road
	<-----Hyde Park	
	<-----Thompson Blvd.	<-----Sue Creek Landing
	<-----Turkey Point <-----	<-----Bauernschmidt Manor
		<-----Vogts Lane <-----   <-----Cape May
		<-----Rosalie Avenue
		<-----Middle Back River Neck
		<-----Cedar Beach <--- Holly Neck
		<--- Back River Neck <--- Rocky Point

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

### Existing Conditions

The Helena Avenue Pumping Station upgrade was completed in 2013. Upgrade to the Wye Road Pumping Station is under construction.

### Proposed Projects

The Duck Creek Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) is due in March 2016.

## **BREAD AND CHEESE CREEK**

### Location

The Bread and Cheese Wastewater Drainage Basin 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 6,100 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"
North Point Blvd. West	0.41	12"
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

Upgrade to the Bread and Cheese Pumping Station has been completed.

### Proposed Projects

The Bread and Cheese Repair, Replacement and Rehabilitation Plan (SRRR) is due in March 2016.

## GRAY MANOR

### Location

The Gray Manor Wastewater Drainage Basin 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 31,300 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"
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"
Southbrook Road Outfall	0.19	12"
Shore Road PS Outfall	0.25	15"
Shore Road PS Collector Sewer	0.94	12" to 18"
Bearcreek Towne PS Outfall	0.26	18"
Beach-Bayside Drive Collector Sewer	1.02	10" to 16"
Wise Avenue (Bearcreek PS Outfall)	1.20	24" to 30"

### Pumped Flow

There is a total of fifteen (15) pumping stations that are tributary to the Gray Manor System as shown below:

Gray Manor Pumping		<----Peninsula
	<-----Shore Road <-----	<-----Rettiman's Lane
	<-----Bear Creek <-----	<--- Green Hill Cove
	<-----Bear Creek Towne	<----Edge Point
	<-----North Point Village	
	<-----Old Battle Grove	
	<-----Beachwood <-----	<----Lynhurst
	<-----Bletzer <-----	<----Rosebank
		<----Blenhurst

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

### Existing Conditions

Upgrades to the 8.0 MGD Bear Creek, 3.021 MGD Bear Creek Towne, 5.2 MGD Shore Road, 1.0 MGD Green Hill Cove and 2.11 MGD North Point Village Pumping Stations have been completed.

### Proposed Projects

The design of the upgrade of the 0.331 MGD Old Battle Grove Pumping Station has been completed. The upgrade of the 0.072 MGD Lynhurst Pumping Station is under design. The Gray Manor Repair, Replacement and Rehabilitation Plan (SRRR) is due in March 2016.

## DELMAR

### Location

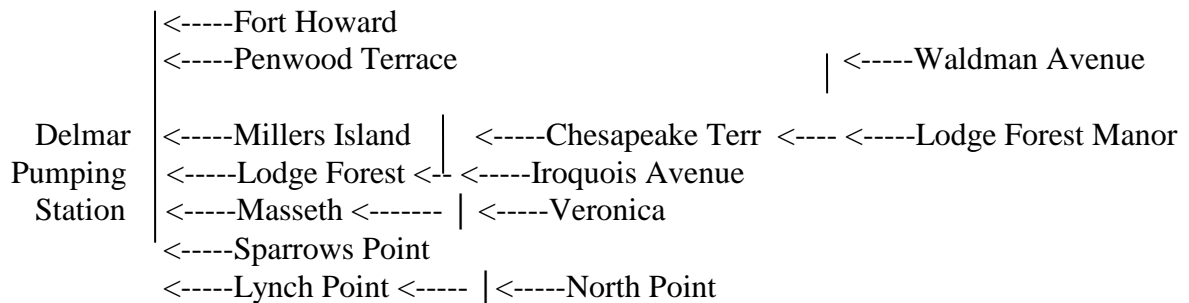
The Delmar Wastewater Drainage Basin is located in the extreme southeastern end of Baltimore County, south and east of North Point Boulevard and Patapsco Freeway. The area encompassed by the drainage basin is approximately 1,600 acres serving a population of 8,300 people.

### System Components

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

### Pumped Flows

The 25.3 MGD Delmar Pumping Station receives flows from thirteen (13) 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

Upgrades to the 25.3 MGD Delmar, 6.25 MGD Sparrows Point, 3.4 MGD Lodge Forest, 1.08 MGD Masseth, 2.017 MGD Chesapeake Terrace, 0.26 MGD Iroquois Avenue, and 0.263 MGD Veronica Pumping Stations have been completed. The 0.259 MGD North Point Pumping Station upgrade is under construction.

### Proposed Projects

Upgrades to the 0.23 MGD Waldman Avenue and the 0.42 MGD Lodge Forest Manor Pumping Stations are under design. The Delmar Repair, Replacement and Rehabilitation Plan (SRRR) is due in March 2016.

## **EASTPOINT**

### Location

The Eastpoint System 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 1,300 people.

### System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
Oriole Avenue Outfall Sewer	0.35	8" to 12"
Eastpoint Outfall Sewer	0.58	8" to 12"

### Pumped Flow

The Eastpoint Pumping Station has a capacity of 1.3 MGD and pumps to the Back River Wastewater Treatment Plant.

### Existing Conditions

The upgrade of the Eastpoint Pumping Station has been completed.

### Proposed Projects

The Eastpoint Repair, Replacement and Rehabilitation Plan (SRRR) is due in March 2016.

## **RED HOUSE RUN**

### Location

The Red House Run Wastewater Drainage Basin 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 19,000 people.

### System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
Red House Run Interceptor	4.35	18" to 30"
Chesaco Park Outfall	0.64	15" to 24"
Chesaco Park Collector Sewer	0.35	12" to 18"
Biddle Street Sewer	0.19	8" to 12"
Rosedale Heights Outfall	0.26	8" to 12"
Overlea High School Interceptor	0.31	10" to 12"
Overlea Outfall	0.49	12"
Elm Avenue Outfall	0.46	12"
Kenwood Avenue Outfall	0.30	12"

### Pumped Flow

There are two (2) pumping stations tributary to the Red House Run System. The 3.439 MGD Chesaco Park Pumping Station pumps to the Chesaco Park Outfall Sewer and 0.82 MGD Quad Avenue Pumping Station pumps directly to Red House Run Pumping Station. The 15 MGD Red House Run Pumping Station pumps directly to the Back River Wastewater Treatment Plant.

### Existing Conditions

There are no existing construction projects.

### Proposed Projects

The upgrade of the Quad Ave Pumping Station is in design. The Red House Run Repair, Replacement and Rehabilitation Plan (SRRR) is due in March 2016.

## **DUNDALK**

### Location

This area is located in southeastern Baltimore County west of Baltimore City. The area served is approximately 1,500 acres with a population of 21,300 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"
Long Place Outfall	0.51	12" to 15"
Keyway Road OF Sewer	0.24	12" to 18"
Sunship Road Sewer	0.04	12"
Cornwall Road Sewer	0.53	10"
Baybriar to Louth Road Sewer	0.77	10"
Liberty Parkway (Dundalk)	0.70	12" to 24"
Sollers Point Road Sewer	0.35	12" to 15'

### Pumped Flow

The 4 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

The upgrade of the Dundalk Pumping Station has been completed.

### Proposed Projects

The pipe bursting of 1,000 feet of gravity sewer upstream of the Dundalk Pumping Station is in final design. The Dundalk Repair, Replacement and Rehabilitation Plan (SRRR) is due in March 2016.



## **HERRING RUN**

### Location

The Herring Run Wastewater Drainage Basin 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 42,200 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"
Taylor Avenue Outfall	0.69	12"
Berrywood Avenue Outfall	0.67	12" to 15"

### Pumped Flow

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

### Existing Conditions

The Herring Run System is near full capacity in some areas. However, the area is for the most part built-out, and no major development is expected in the future. The Herring Run Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) was approved on September 6, 2013, and needs to be implemented by September 6, 2018.

### Proposed Projects

The County has seven design projects underway in order to address the rehabilitation of sewers that have been identified as either structurally deficient or having I&I issues. This includes the East Branch Herring Run Interceptor Relief Sewer to eliminate Sanitary Sewer Overflows (SSOs) #41 and #129.

## JONES FALLS

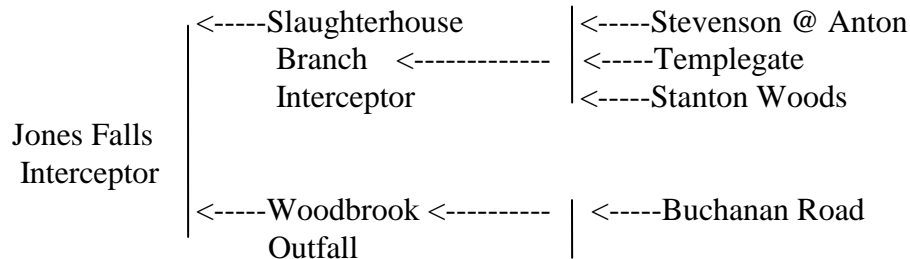
### System Components Location

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 51,600 people.

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
Jones Falls Interceptor	5.23	8" to 42"
Greenspring Avenue Outfall	0.28	15"
Western Run Supplemental Sewer	0.30	10" to 15"
Slade Avenue Outfall	0.40	12"
Woodbrook Outfall	1.22	12"
Towson Run Interceptor	3.83	8" to 24"
Chestnut Avenue Sewer	1.09	6" to 10"
Charles Street Avenue Sewer	0.77	6" to 8"
Sole Drive Sewer	0.79	10"
Bosley Avenue Sewer	0.37	12" to 15"
York Road South Towson	0.75	8" to 15"
York Road North Towson	0.33	8"
Roland Run Interceptor	5.60	15" to 42"
Malvern Avenue Outfall	0.82	12"
Thornton Road Outfall	1.07	8" to 15"
Seminary @ Thorton Outfall	0.86	8"
Longford Outfall	1.33	8" to 12"
Macer Jamieson Adcock Roads	0.42	8"
Jamieson Road Sewer	0.31	8"
Worleys Run Interceptor	1.81	15" to 24"
Timonium Road Sewer	0.22	12"
Deepdale Drive Outfall	1.31	8" to 16"
Pimlico Road Outfall	0.91	8" to 15"
Moore's Branch	3.11	12" to 18"
Lightfoot Drive Outfall	0.71	8" to 12"
Park Heights Avenue Outfall	2.12	8" to 12"
Slaughterhouse Branch	2.86	12" to 18"
Tally-Ho Road Outfall	0.63	8"

### Pumped Flow

There are four (4) pumping stations in the Jones Falls System as shown below:



The sewage from the pumping stations flows to the Jones Falls Interceptor and then to the Mt. Washington Flume at the Baltimore City Line. In accordance with the Consent Decree all five pumping stations will be evaluated.

### Existing Conditions

Upgrades to the 0.26 MGD Stevenson Pumping Station have been completed. The Jones Falls Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) was approved on September 6, 2013, and needs to be implemented by September 6, 2019.

### Proposed Projects

Upgrade of the 0.288 MGD Buchanan Road Pumping Station should begin August 2014. The design of the upgrade to both the 0.17 MGD Templegate and 0.363 MGD Stanton Woods Pumping Stations is near completion. The design of the Marnat Road Relief Sewer which is needed to eliminate Sanitary Sewer Overflow (SSO) #113 has been completed. The County has five additional design projects underway in order to address the rehabilitation of sewers that have been identified as either structurally deficient or having I&I issues.

## 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 (I695) easterly to the boundary of Baltimore City. The area served by this system is approximately 880 acres with a population of 7,850 people.

### System Components

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
West Low Level	1.51	10" to 21"
Maiden Choice Relief	0.49	8"

### Pumped Flow

There are no pumped flows within the West Low Level drainage basin.

### Existing Conditions

The West Low Level Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) was approved on September 6, 2013 and needs to be implemented by September 6, 2017.

### Proposed Projects

The County has four design projects underway in order to address the rehabilitation of sewers that have been identified as either structurally deficient or having I&I issues.

## **DEAD RUN**

### Location

The Dead Run Wastewater Drainage Basin 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 21,900 people.

### System Components

<u>Major Sewer</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
Dead Run Interceptor	3.25	15" to 30"
Cooks Lane Outfall	0.26	10" to 15"
Ingleside Avenue Outfall	1.63	12" to 16"
Catonsville Manor Outfall	0.65	12" to 15"
Dead Run Branch	1.85	16" to 24"
Security Boulevard Sewer	0.25	10"
Woodlawn Drive Sewer	0.76	10"
Johnnycake Road Outfall	0.23	12"
North Branch Dead Run	1.49	10" to 12"
Heraldry Square Outfall	1.69	8" to 15"
Kenicott Road Sewer	0.43	12"

### Pumped Flow

There are two (2) small pumped areas located in the area of Tudsbury Road at the northwest end of the Dead Run system. These are private pump stations and are tributary to the Heraldry Square Outfall Sewer.

### Existing Conditions

The Dead Run Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) was approved on September 6, 2013 and needs to be implemented by September 6, 2017.

### Proposed Projects

The County has four design projects underway in order to address the rehabilitation of sewers that have been identified as either structurally deficient or having I&I issues.

## **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 134,250 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"
East Branch Powder Mill	0.58	12" to 15"
Southern Cross Drive	0.52	10" to 12"
Gwynn Oak Avenue	0.17	12"
Essex Road Outfall	0.59	8"
Essex Road	0.38	10" to 12"
Woodmoor Outfall	0.95	8" to 15"
Beltway Crossing	0.34	15" to 16"
Liberty Gardens Outfall	0.34	8" to 16"
Scotts Level Interceptor	9.81	10" to 24"
Merrymount Outfall	0.60	15"
Old Court Road West	0.85	15"
Old Court Road & Green Lane 8"	0.29	8" to 10"
Randallstown PS Collector Sewer	1.24	8" to 16"
Offutt Road Outfall	0.64	12" to 15"
Kings Point FM Outfall	0.64	10" to 12"
Sudbrook Park Outfall	0.67	10" to 16"
McHenry Road Outfall	0.13	15" to 16"
Old Court Road Outfall	0.98	12"
Belle Farm Estates	0.19	10"
Mt. Wilson Lane Outfall	1.20	8" to 12"
Woodholme Avenue Sewer	0.45	8"
Woodholme CC Outfall	0.40	8"
Hawksbury Road Outfall	0.11	12"
Ner Israel Rabb. College Outfall	0.31	8" to 16"
Horse Head Branch Interceptor	1.14	18" to 21"
McDonogh Crossroads Outfall	0.83	8" to 16"
Craddock Estates Outfall	0.53	8" to 12"
Red Run Interceptor	4.71	16" to 36"
Painters Mill Road	0.41	12"
Owings Mills Towne Center	0.21	12" to 16"

Lyons Mill Road North Interceptor	1.32	12" to 16"
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System Components (cont.)

<u>Major Sewers</u>	<u>Length (Miles)</u>	<u>Pipe Size</u>
Lakeside Drive Sewer	0.34	12"
Painters Mill Road Outfall	0.35	10" to 12"
South Dolfield Road	0.34	12"
Morningside Heights Outfall	0.36	8" to 12"
Roaches Run Interceptor	2.62	10" to 18"
Academy Acres Outfall	0.45	10" to 12"
Wabash Avenue Outfall	0.57	10" to 12"
Reisterstown Road Sewer	0.29	8" to 10"
Westminster Pike OF Sewer	0.54	8"

#### Pumped Flow

There are thirteen (13) pump stations in the Gwynns Falls area. The thirteen (13) pumping stations are 3.3 MGD Randallstown, 0.32 MGD Montrose, 0.26 MGD Carroll Avenue, 1.5 MGD Valley Village, 0.43 MGD Reisterswood, 3.37 MGD Merrymount, 0.26 MGD Franklin Station, 0.37 MGD Windsor Mill, 0.2 MGD Ravens, 1.0 MGD Reisterstown Village, 1.73 MGD Kings Point, 0.288 MGD Fieldstone and 0.32 MGD Enchanted Hills.

#### Existing Conditions

Upgrades to Randallstown, Montrose, Carroll Avenue, Reisterswood, and Kings Point Pumping Stations have been completed. The upgrade to the Enchanted Hills Pumping Station is under construction. The Gwynns Falls Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) was approved on September 6, 2013 and needs to be implemented by September 6, 2018.

#### Proposed Projects

The County has nine design projects underway in order to address the rehabilitation of sewers that have been identified as structurally deficient or having I&I issues. These include four relief sewers to eliminate Sanitary Sewer Overflows (SSOs) #20, 22, 23A, 23B, 24, 103 and 106. The design of the upgrade of both the Valley Village and Fieldstone Pumping Stations is currently in progress.



## **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 77,225 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"
Baltimore Street Outfall	0.51	10" to 15"
Bero Road Outfall	0.17	8" to 12"
Lansdowne Outfall	1.51	12" to 20"
Hammonds Ferry Road	0.45	12"
Halethorpe Terrace Outfall	1.11	12" to 18"
Herbert Run	4.10	12" to 30"
First Avenue Sewer	0.43	12"
New Sulpher Spring Road OF	0.20	12"
Walk Avenue	0.46	12"
Herbert Run West	2.88	12" to 30"
UMBC Outfall Sewer	0.84	12" to 18"
Maiden Choice Outfall	0.57	10" to 12"
Paradise Avenue OF Sewer	0.51	8" to 10"
Rolling Road-Valley Road Sewer	0.58	18"
Relay St. Denis	1.04	12" to 15"
Bull Branch Interceptor	3.53	18" to 24"
Mellor Avenue Diversion	1.05	12" to 15"
Newburg Avenue Sewer	0.40	15" to 18"
Newburg Avenue PS Outfall	0.20	10" to 15"
Hilton Avenue Outfall	1.08	15" to 16"
Thistle Branch Interceptor	1.84	10" to 12"
Coopers Branch Interceptor	1.33	10" to 15"
Oella Avenue Sewer	1.17	8" to 12"
Millers Run	1.31	10" to 15"

Cedar Circle Drive OF	0.37	8" to 12"
Cedar Branch	1.33	10" to 12"
Parkview Trails Outfall	0.73	8" to 12"
Fairbrook OF Sewer	0.73	8"
<u>Pumped Flow</u>		

The recently upgraded 80 MGD Patapsco Pump Station receives flow from seven (7) pumping stations. Flow is pumped from the Patapsco Pumping Station to the Patapsco Wastewater Treatment Plant. The seven pumping stations are 3.54 MGD Frederick Road, 1.22 MGD McTavish, 0.45 MGD Oak Forest, 0.5 MGD Woodland Avenue, 0.142 MGD Woodwind, 0.26 MGD Westwood and 0.4 MGD Fairbrook Park.

#### Existing Conditions

Upgrades to Frederick Road, McTavish, Oak Forest, Woodland Avenue, and Westwood Pumping Stations have been completed. The Patapsco Sewershed Repair, Replacement and Rehabilitation Plan (SRRR) was approved on September 6, 2013 and needs to be implemented by September 6, 2021.

#### Proposed Projects

The County has four design projects underway in order to address the rehabilitation of sewers that have been identified as either structurally deficient or having I&I issues.

## 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.

## Tables

Table No.9A  
Projected Sewerage Demands and Planned Capacity  
Back River Waste Water Treatment Plant  
Full diversion prior to 1990  
Population

(Note : This Table is based on the “Comprehensive Wastewater Facilities Master Plan (2004)” for which updates are not yet available from Baltimore City. See appendices for the complete “Comprehensive Wastewater Facilities Master Plan (2004)” now in effect.)

JURISDICTION	POPULATION			PER CAPITA DEMAND (GPCD) NOTE 1.	TREATMENT CAPACITY	
	TOTAL	SERVED	UNSERVED		DEMAND (MGD)	PLANNED (MGD)
1980 (note 2)						
City	736,958	735,797	1,171			
Baltimore County	502,516	451,553	50,963			
Total	1,239,474	1,187,340	52,134	152.6	181.2	175.0
1990						
City	602,392	602,392	0			
Baltimore County	410,711	386,441	24,270			
Total	1,013,103	988,833	24,270	158.0	156.2	175.0
2000 (note 4)						
City	548,320	548,320	0			
Baltimore County	400,379	395,241	5138			
Total	948,699	943,561	5138		147	152
2020 (note 4)						
City	560,274	560,274				
Baltimore County	413,925	413,925				
Total	974,199	974,199	0		152	180

- NOTES: 1. Gal/Cap/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. This data is based on current Back River 201 Facility Plan information and is subject to change as the Plan is finalized. Also if waste flow from the two city water treatment plants is treated, the flows at Back River will increase from those shown by 1.4 mgd immediately and 1.9 mgd in 2003. Full Diversion is the total diversion of sewage from the Gwynns Falls service area through the Southwest Diversion pressure sewer to the Patapsco Waste Water Treatment Plant.
4. 2000 and 2020 date taken from Comprehensive Wastewater Facilities Master Plan by WRA, page 5-1, Vol 2, and 2006 Baltimore City Water & Sewer Master Plan, Table 4-2.

Table No. 9B  
Projected Sewerage Demands and Planned Capacity  
Patapsco Waste Water Treatment Plant  
Full diversion prior to 1990  
Population

(Note : This Table is based on the “Comprehensive Wastewater Facilities Master Plan (2004)” for which updates are not yet available from Baltimore City. See appendices for the complete “Comprehensive Wastewater Facilities Master Plan (2004)” now in effect.)

JURISDICTION	POPULATION			PER CAPITA DEMAND (GPCD) NOTE 1.	TREATMENT CAPACITY	
	TOTAL	SERVED	UNSERVED		DEMAND (MGD)	PLANNED (MGD)
1980 (note 2)						
City	48,436	48,436				
Baltimore County	100,227	88,240	11,987			
Howard County	32,015	20,934	11,081			
A. Arundel Co.	29,940	22,220	7,720			
Total	210,618	179,830	30,788	144.6	26.0	52.5
1990						
City	124,492	124,492				
Baltimore County	216,253	213,638	2,615			
Howard County	51,111	44,513	6,598			
A. Arundel Co.	34,459	24,276	10,183			
Total	426,315	406,919	19,396	163.9	66.7	70.0
2000 (note 4)						
City	102,842	102,842				
Baltimore County	248,876	248,876				
Howard County	52,330	52,330			5.2	11.5
A. Arundel Co.	30,956	27,891	3065		3.4	6.4
Total	435,004	431,939	3065		65	70
2020 (note 4)						
City	97,802	97,802				
Baltimore County	265,605	265,605				
Howard County	68,150	68,150			10.3	11.5
A. Arundel Co.	36,457	34,999	1458		5.5	6.4
Total	468,014	466,916	1458		65	81

NOTES: 1. See Note 1, Table 9A

2. See Note 2, Table 9A

3. This data is based on current Patapsco 201 Facility Plan information and is subject to change as the Plan is finalized. Full Diversion is the total diversion of sewage from the Gwynns Falls service area through the Southwest Diversion Pressure Sewer to the Patapsco Waste Water Treatment Plant.

4. 2000 and 2020 date taken from Comprehensive Wastewater Facilities Master Plan by WRA, page 5-2, Vol 2, and 2006 Baltimore City Water & Sewer Master Plan, Table 4-3

Table No. 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
<b>Municipal (Publicly Owned)</b>									
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
<b>Private / Community / Institutional</b>									
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	
Hillendale Country Club		h, a	925-607	S-11A	200	Overshot Run	0.015	Private	

Table No. 10 (continued from previous page)  
Inventory of Small Sewage Treatment Facilities

Hunt Valley Golf Club		h	910-610	S-10B	250	Greene Branch	0.010	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 No. 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 No. 11  
Inventory of Problem Septic Areas  
Individual and Community - Active

<u>Service Area</u>	<u>Location</u>	<u>No. of Properties</u>	<u>Date of DEPRM Memo</u>	<u>Status</u>
Bengies	Carroll Island Rd	2	4-11-14	
White Marsh	Hornago Ave	9	3-7-12	Going out to bid
Cockeysville	9 and 11 Boxwood Lane	2	6-12-09	Awaiting approval of easement from Baltimore City
White Marsh	4832, 4838, 4842, 4900, 4902, and 4904 Joppa Rd	6	9-12-07	In Design
White Marsh	4323 – 4364 Chapel Road	14	6-21-07	Designed but on Hold
White Marsh	9114 – 9211 Cowenton Ave	22	11-20-06	Under Construction
White Marsh	Babikow Rd and Shirleybrook Rd	30	11-14-05	No Current Plans to Correct
Gray Manor	Dundalk Mobile Home Park	100	1-27-03	Under Construction to connect to public sewer
Duck Creek	Tickwood Road	5	1-27-97	Complications with Access
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 No. 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> )

<i>Job Order</i>	<i>Project Name</i>	<i>Construction Funding</i>	<i>Budget Program</i>
201-0002	Neighborhood Petition/Health Extensions	\$7,500,000	FY16 thru 20
201-0052	Construction at Highway Sites	\$300,000	FY16 thru 20
201-0072	City/County Joint Use Facilities	\$180,000,000	FY16 thru 20
201-0073	Special Sewer House Connections	\$3,000,000	FY16 thru 20
201-0077	Main Relining, Rehab & Replacement	\$574,200,000	FY16 thru 20
201-0090	Miscellaneous System Improvements	\$60,000,000	FY16 thru 20

## CAPITAL BUDGET 2015

Adopted by the Baltimore County Council May 22, 2014

## CAPITAL IMPROVEMENT PROGRAM FY 2016 - 2020

### STAGE 7 – DEPT. 201 SEWER SYSTEM

Proj. No.	Title	Total Estimated Cost	Prior Authorizations	Total for 6-year Program	Budget Year FY 2015	FY2016*	FY 2018*	FY 2020*
0002	Neighborhood Petition / Health Ext	24,046,672	16,546,672	7,500,000	0	2,500,000	2,500,000	2,500,000
0052	Construction at Highway Sites	2,055,636	1,755,636	300,000	0	100,000	100,000	100,000
0072	City/County Joint Use Facilities	592,666,867	412,666,867	180,000,000	30,000,000	50,000,000	50,000,000	50,000,000
0073	Special Sewer House Connections	13,944,628	10,944,628	3,000,000	0	1,000,000	1,000,000	1,000,000
0077	Main Relining, Rehab & Replacement	1,000,896,780	426,696,780	574,200,000	0	191,400,000	191,400,000	191,400,000
0090	Miscellaneous System Replacements	358,701,143	298,701,143	60,000,000	0	20,000,000	20,000,000	20,000,000
	TOTAL	1,992,311,726	1,167,311,726	825,000,000	30,000,000	265,000,000	265,000,000	265,000,000

\* Baltimore County employs a Biennial Capital Budget.

# 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)

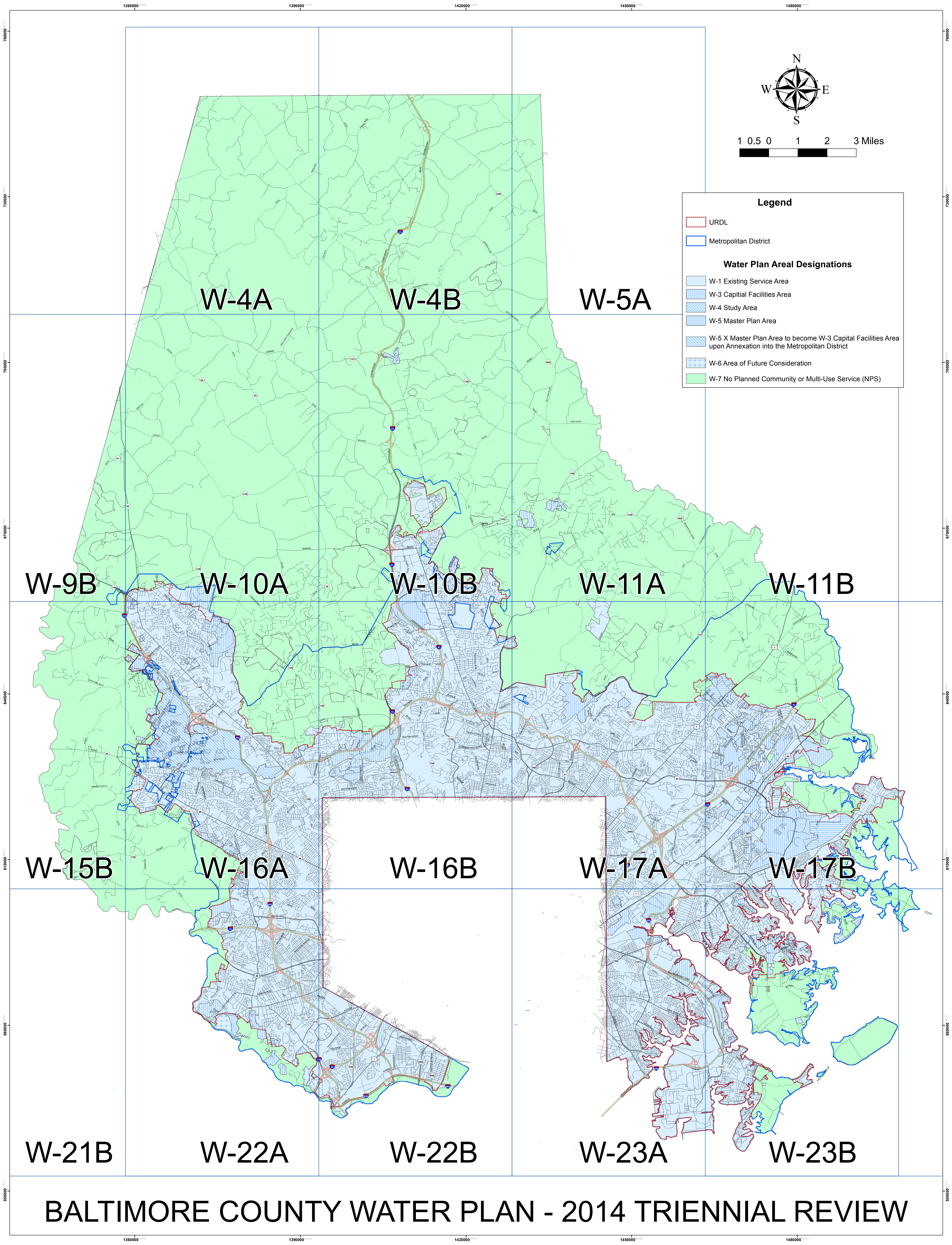
A system of water supply or sewerage disposal involving two or more property owners, regardless of the quantity or point of disposal.

**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

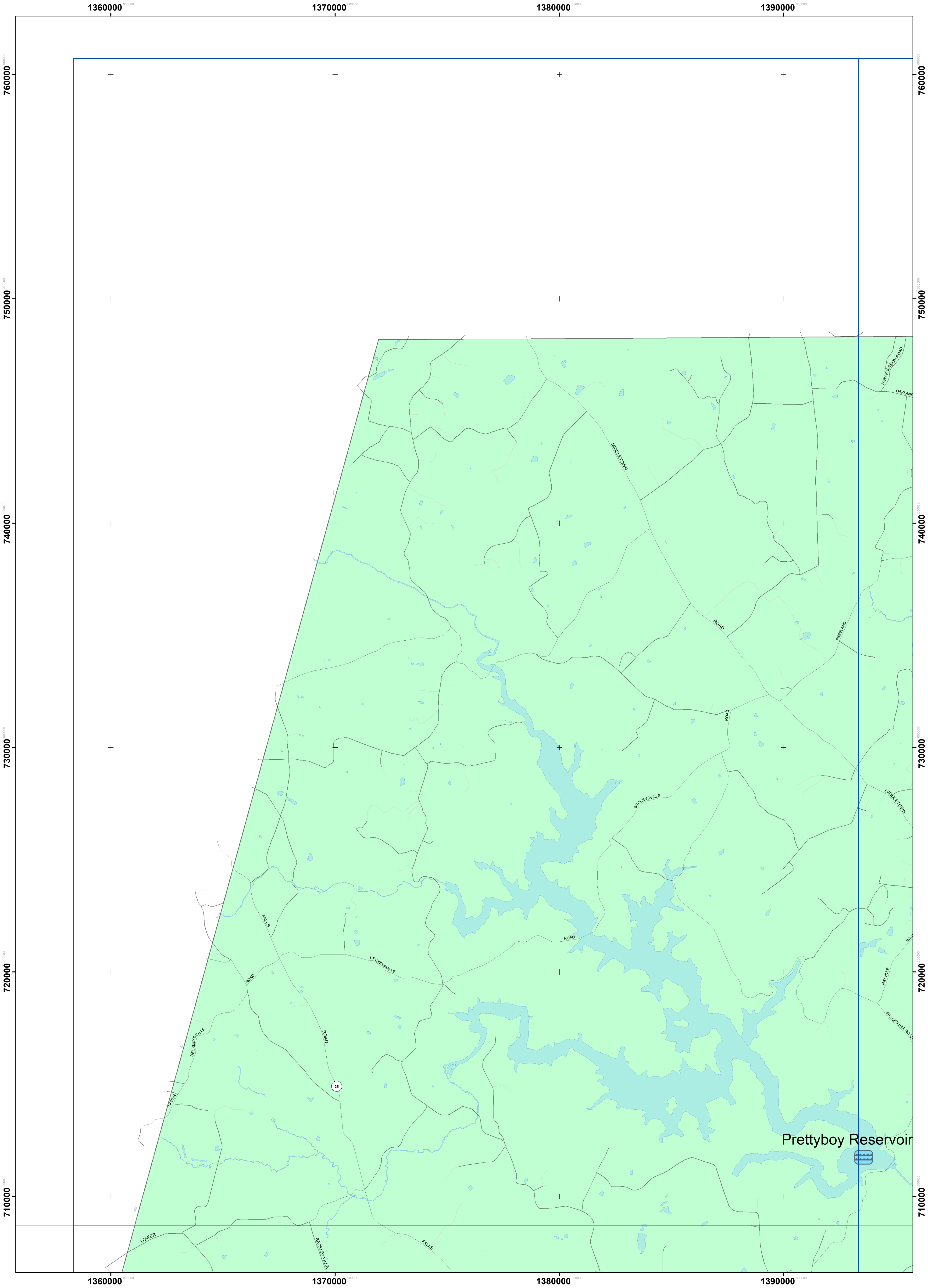
Information shown on the maps in this document **does not guarantee** that public water or sewerage service is available in any given area.





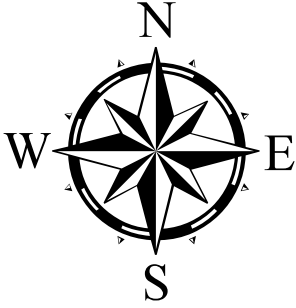
# BALTIMORE COUNTY WATER PLAN - 2014 TRIENNIAL REVIEW





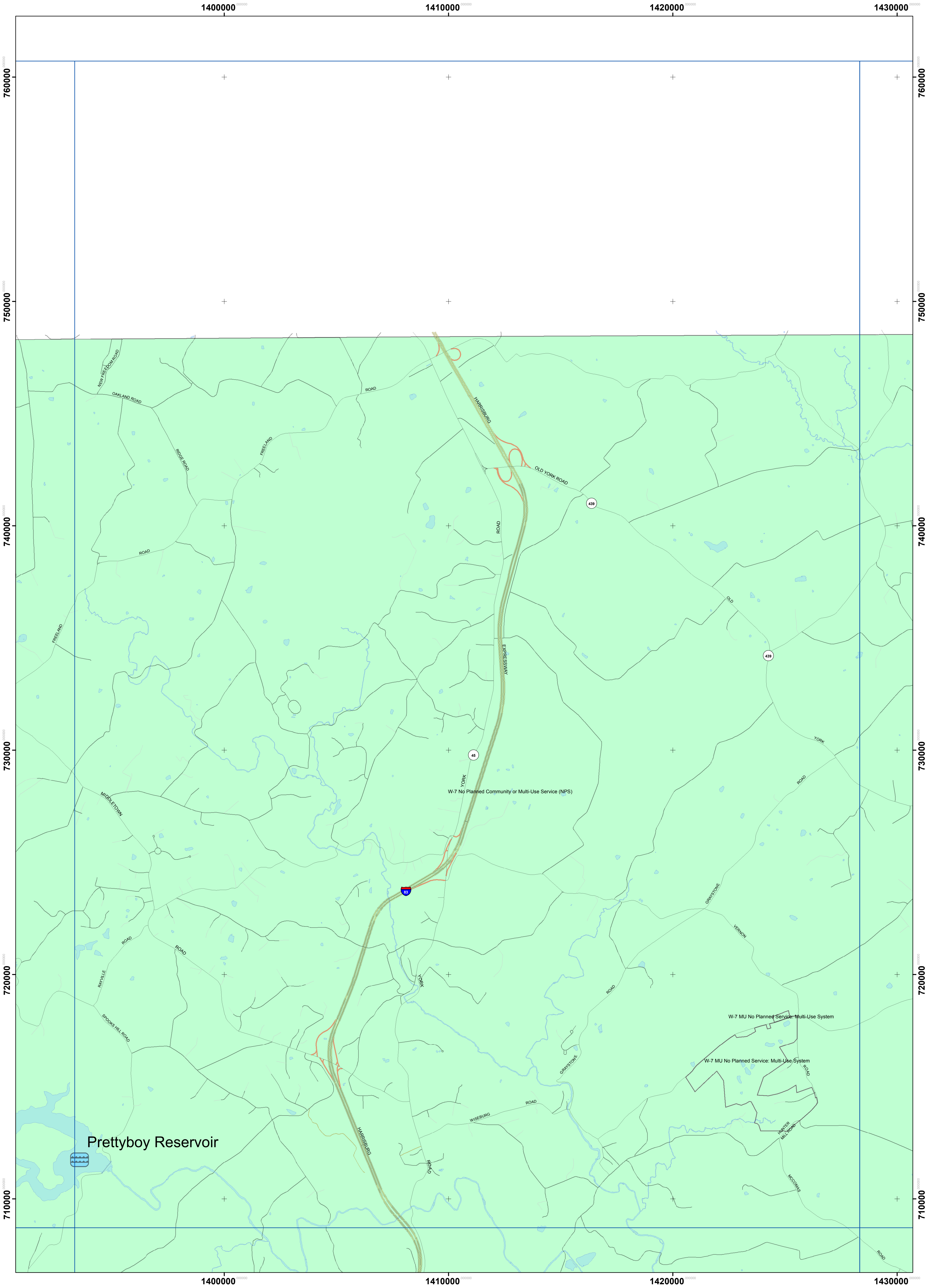
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- W-1 Existing Service Area
  - W-3 Capital Facilities Area
  - W-4 Study Area
  - W-5 Master Plan Area
  - W-5 X Master Plan Area to become W-3 Capital Facilities Area upon Annexation into the Metropolitan District
  - W-6 Area of Future Consideration
  - 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)

- Legend**
- Water System Facilities**
- Pumping Station
  - Reservoir
  - Tank
  - Treatment Plant
  - Main 12" and Greater
  - W&S Plan Grid Line
  - URDL
  - Metropolitan District Boundary



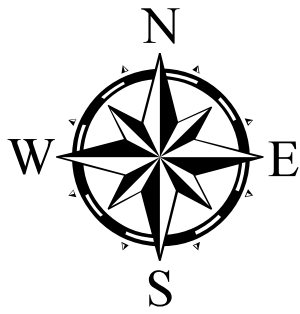
2,000 0 2,000 4,000 6,000 Feet

Baltimore County  
Water Plan  
2014 Triennial Review  
Map W-04A



- Water 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 to become W-3 Capital Facilities Area upon Annexation into the Metropolitan District
  - 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)

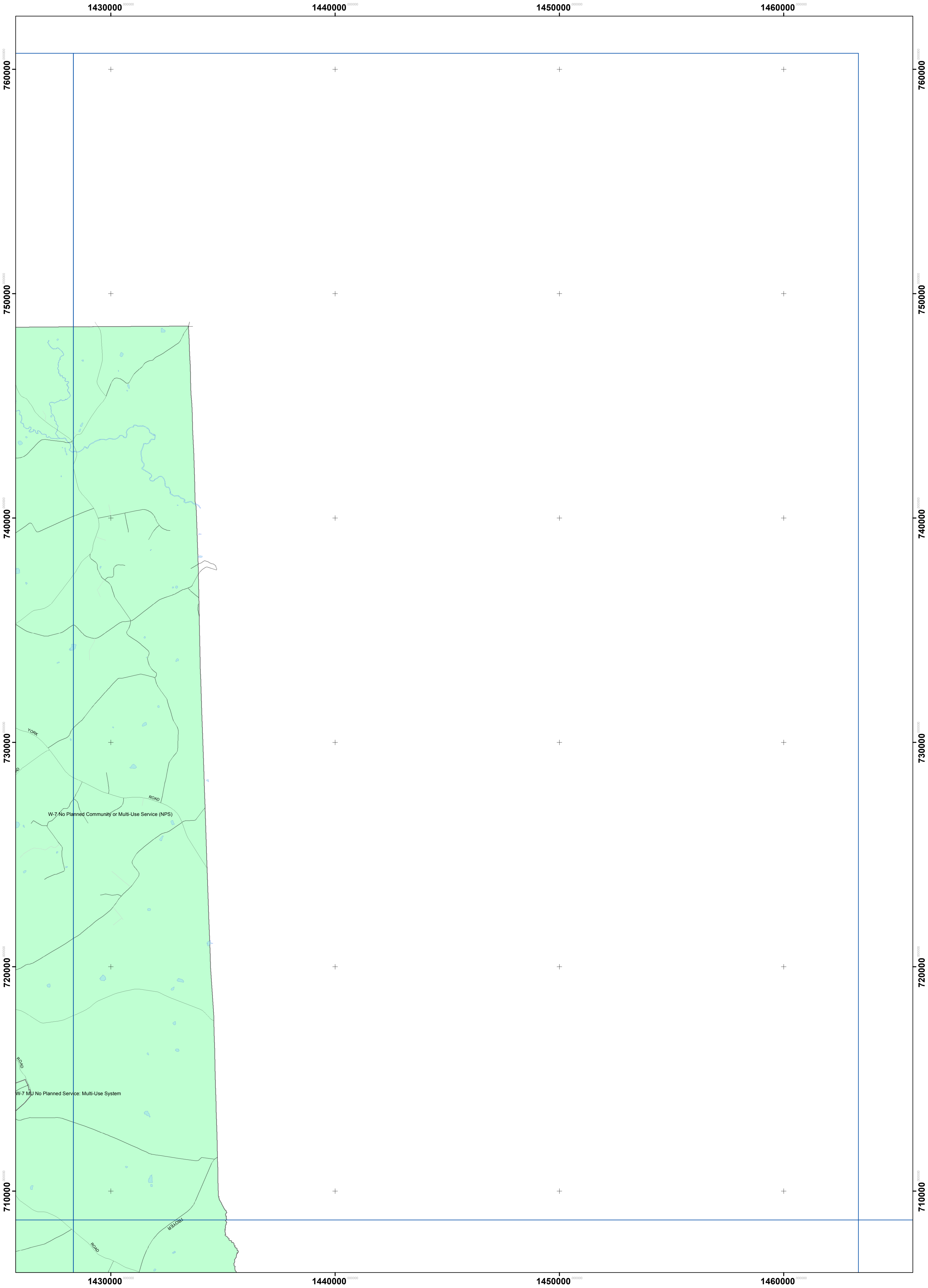
- Legend**
- Water System Facilities**
- Pumping Station
  - Reservoir
  - Tank
  - Treatment Plant
  - Main 12" and Greater
  - W&S Plan Grid Line
  - URDL
  - Metropolitan District Boundary



2,000 0 2,000 4,000 6,000 Feet

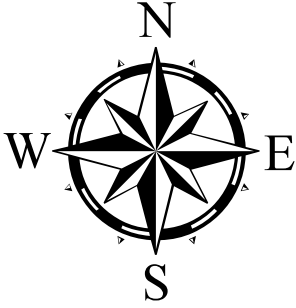
# Baltimore County Water Plan 2014 Triennial Review Map W-4B





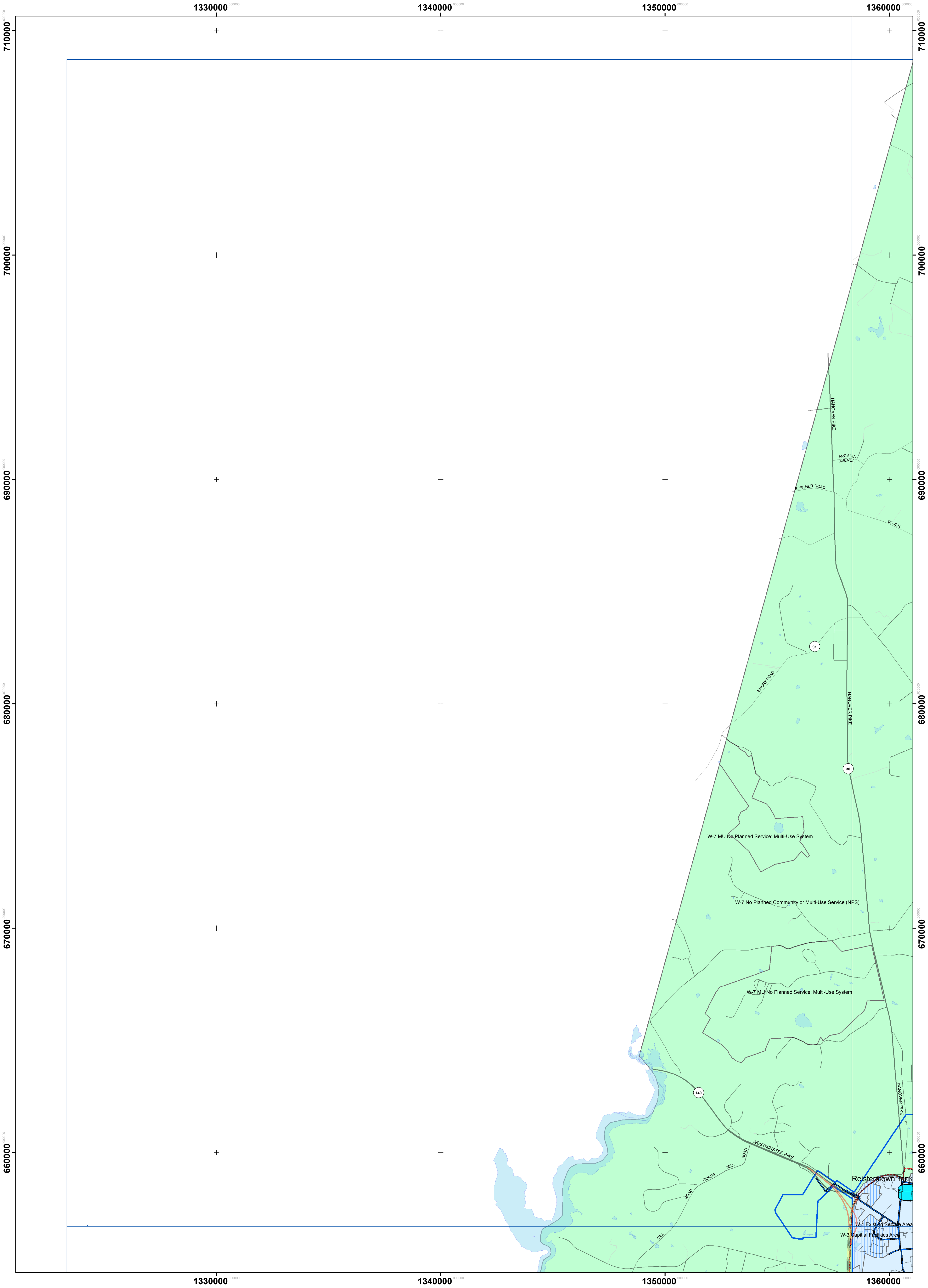
- Water Plan Areal Designations**
- W-1 Existing Service Area
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  - W-6 Area of Future Consideration
  - W-7 CS No Planned Service: Community System
  - W-7 MU No Planned Service: Multi-Use System
  - W-7 No Planned Community or Multi-Use Service (NPS)

- Legend**
- Water System Facilities**
- Pumping Station
  - Reservoir
  - Tank
  - Treatment Plant
  - Main 12" and Greater
  - W&S Plan Grid Line
  - URDL
  - Metropolitan District Boundary



2,000 0 2,000 4,000 6,000 Feet

Baltimore County  
Water Plan  
2014 Triennial Review  
Map W-5A



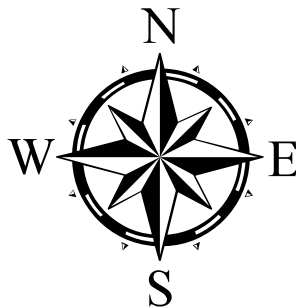
**Water Plan Areal Designations**

- 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 to become W-3 Capital Facilities Area upon Annexation into the Metropolitan District
- 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)

**Legend**

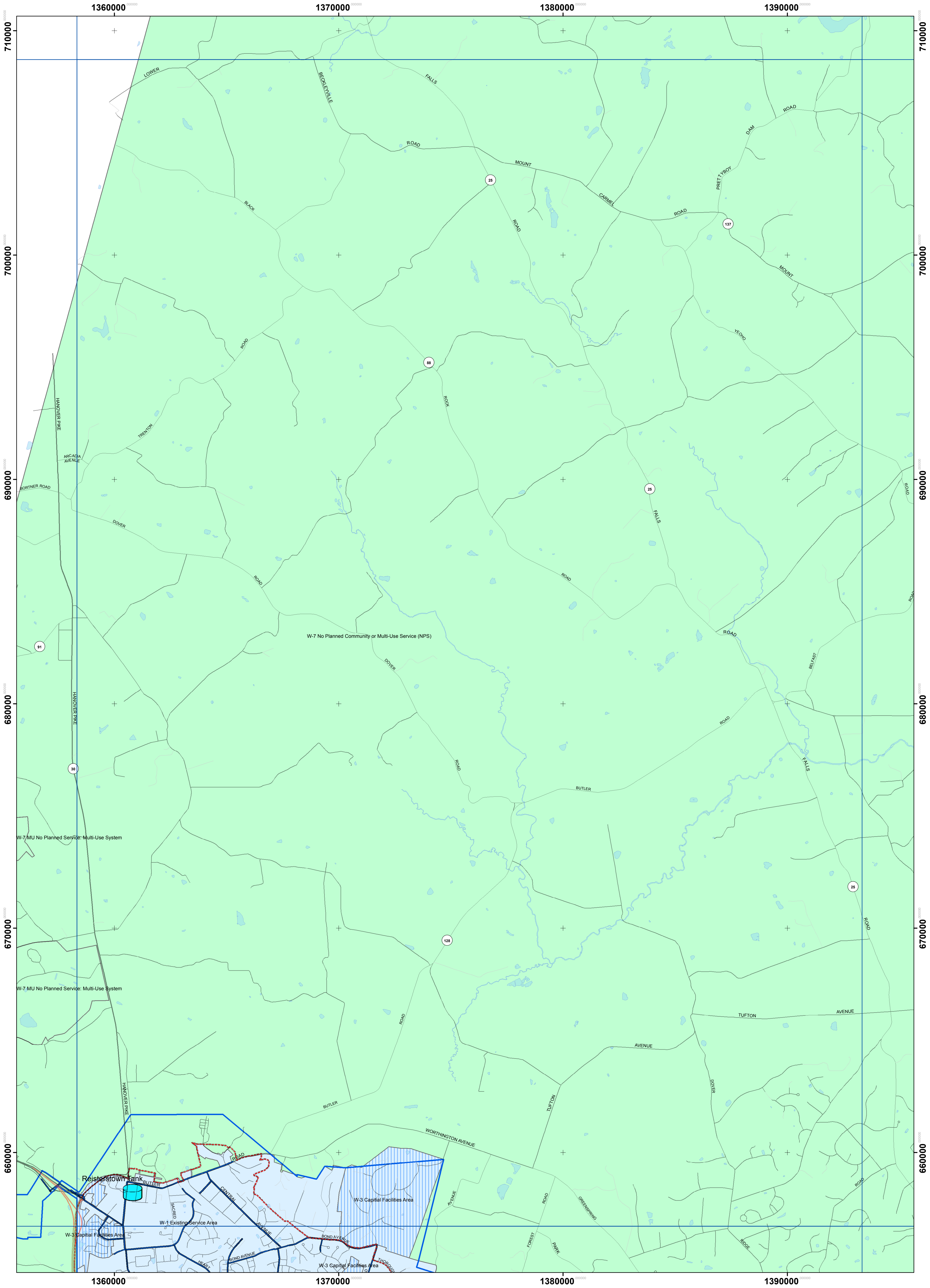
**Water System Facilities**

- Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Main 12" and Greater
- W&S Plan Grid Line
- URDL
- Metropolitan District Boundary



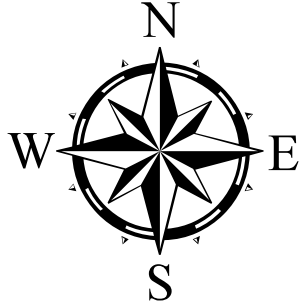
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**Baltimore County  
Water Plan  
2014 Triennial Review  
Map W-9B**



- Water 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 to become W-3 Capital Facilities Area upon Annexation into the Metropolitan District
  - 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)

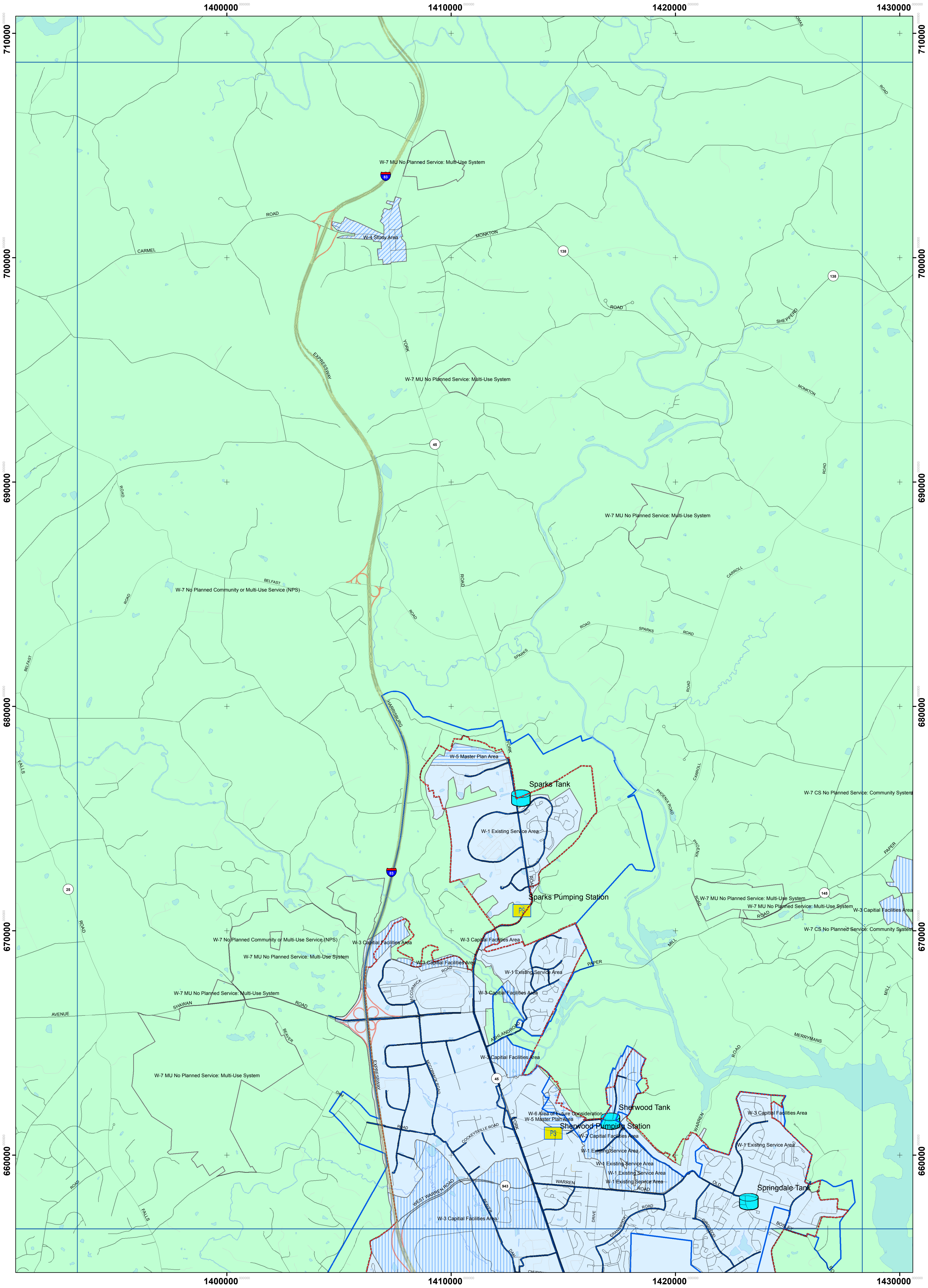
- Legend**
- Water System Facilities**
- Pumping Station
  - Reservoir
  - Tank
  - Treatment Plant
  - Main 12" and Greater
  - W&S Plan Grid Line
  - URDL
  - Metropolitan District Boundary



2,000 0 2,000 4,000 6,000 Feet

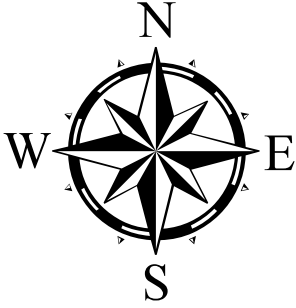
Baltimore County  
Water Plan  
2014 Triennial Review  
Map W-10A





- Water 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 to become W-3 Capital Facilities Area upon Annexation into the Metropolitan District
  - 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)

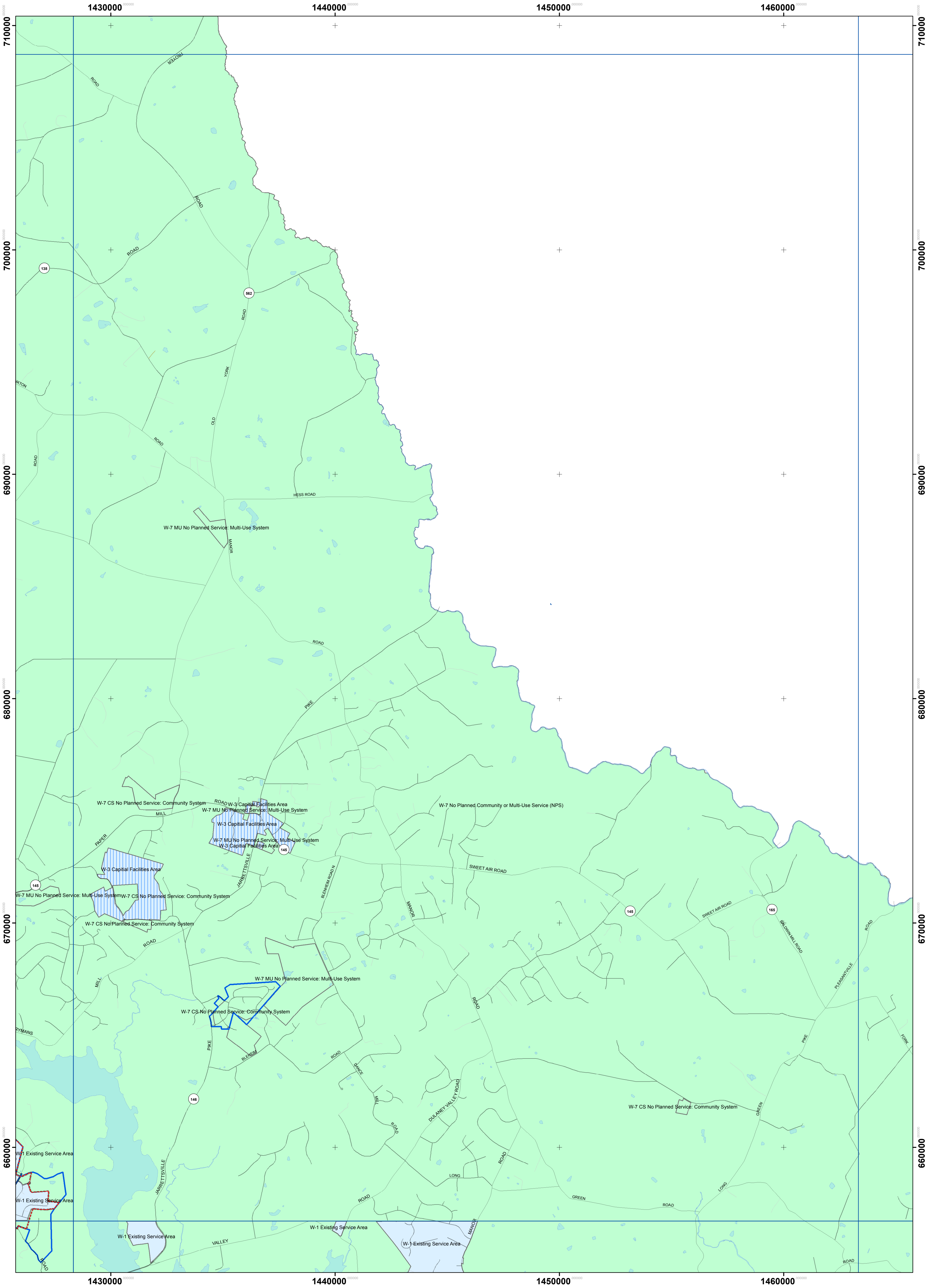
- Legend**
- Water System Facilities**
- Pumping Station
  - Reservoir
  - Tank
  - Treatment Plant
  - Main 12" and Greater
  - W&S Plan Grid Line
  - URDL
  - Metropolitan District Boundary



2,000 0 2,000 4,000 6,000 Feet

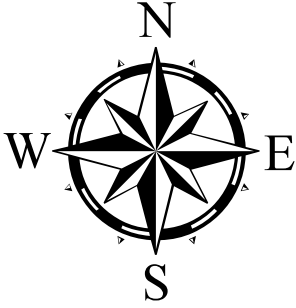
Baltimore County  
Water Plan  
2014 Triennial Review  
Map W-10B





- Water 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 to become W-3 Capital Facilities Area upon Annexation into the Metropolitan District
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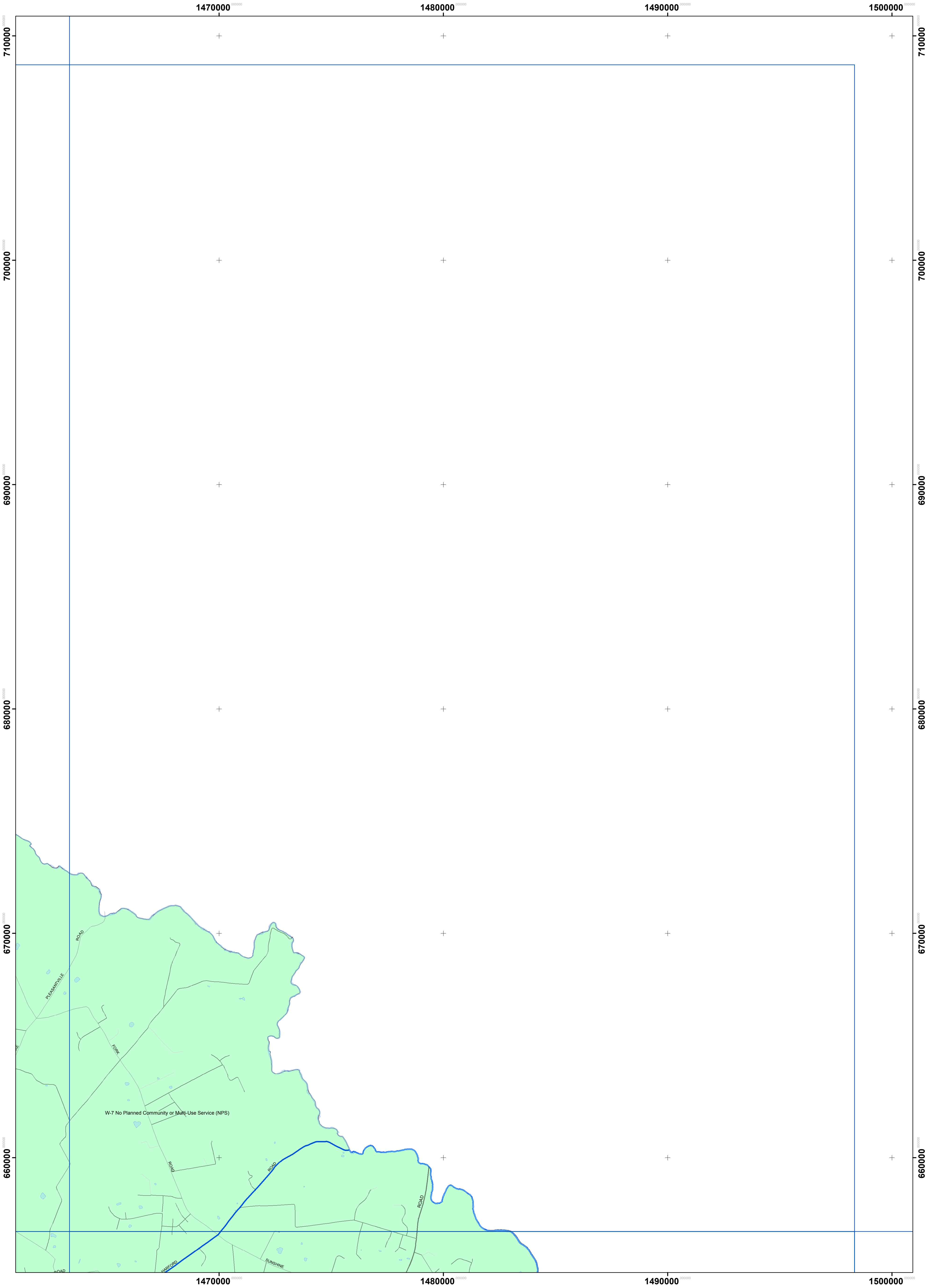
- Legend**
- Water System Facilities**
- Pumping Station
  - Reservoir
  - Tank
  - Treatment Plant
  - Main 12" and Greater
  - W&S Plan Grid Line
  - URDL
  - Metropolitan District Boundary



2,000 0 2,000 4,000 6,000 Feet

# Baltimore County Water Plan 2014 Triennial Review Map W-11A





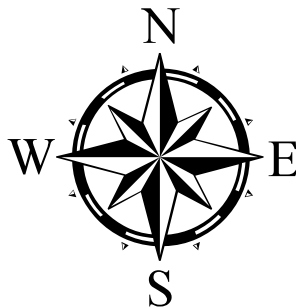
**Water Plan Areal Designations**

- 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 to become W-3 Capital Facilities Area upon Annexation into the Metropolitan District
- 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)

**Legend**

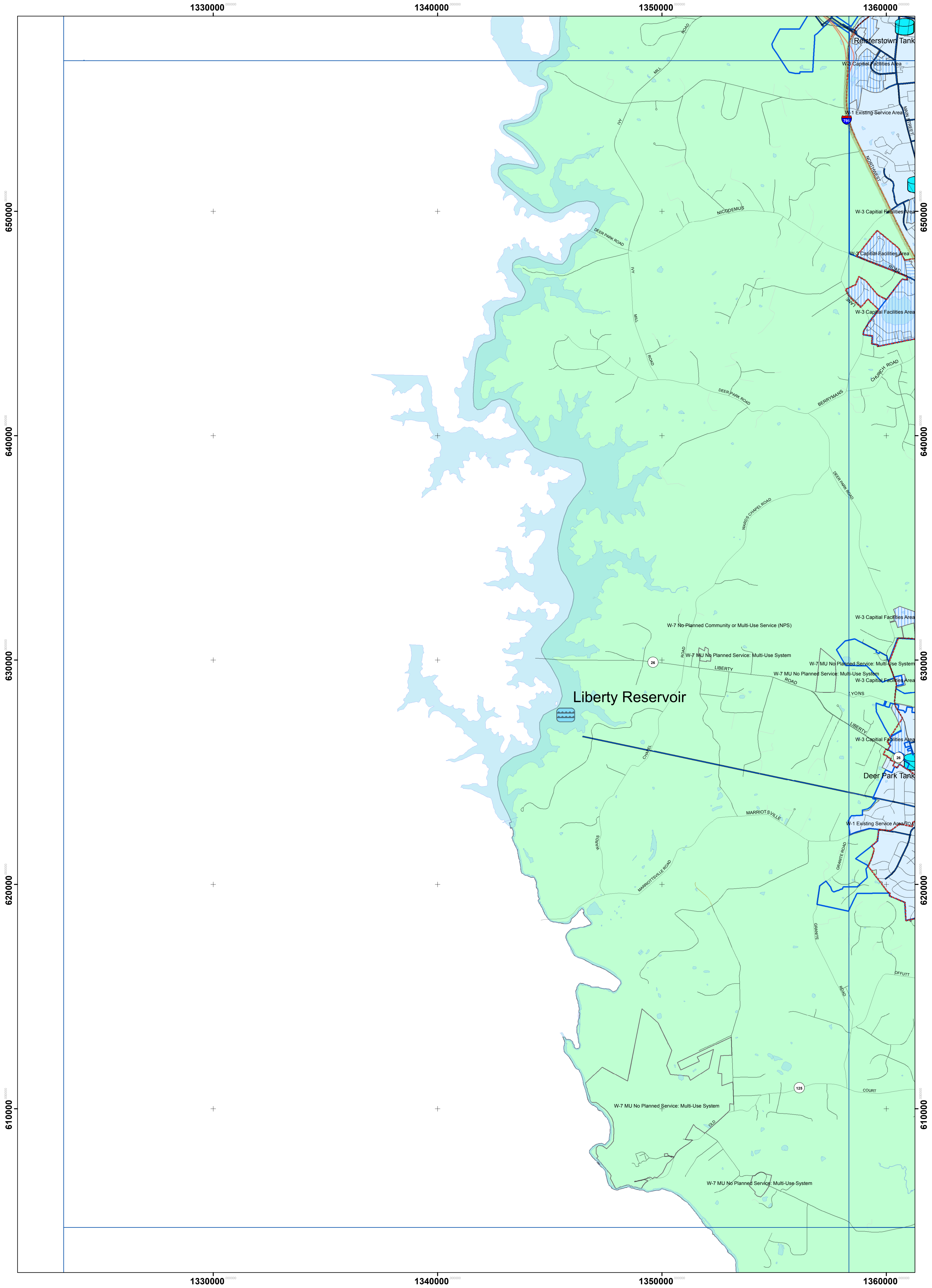
**Water System Facilities**

- Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Main 12" and Greater
- W&S Plan Grid Line
- URDL
- Metropolitan District Boundary



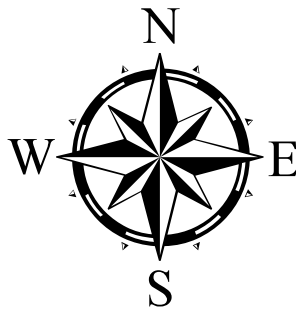
2,000 0 2,000 4,000 6,000 Feet

**Baltimore County  
Water Plan  
2014 Triennial Review  
Map W-11B**



- Water 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 to become W-3 Capital Facilities Area upon Annexation into the Metropolitan District
  - 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)

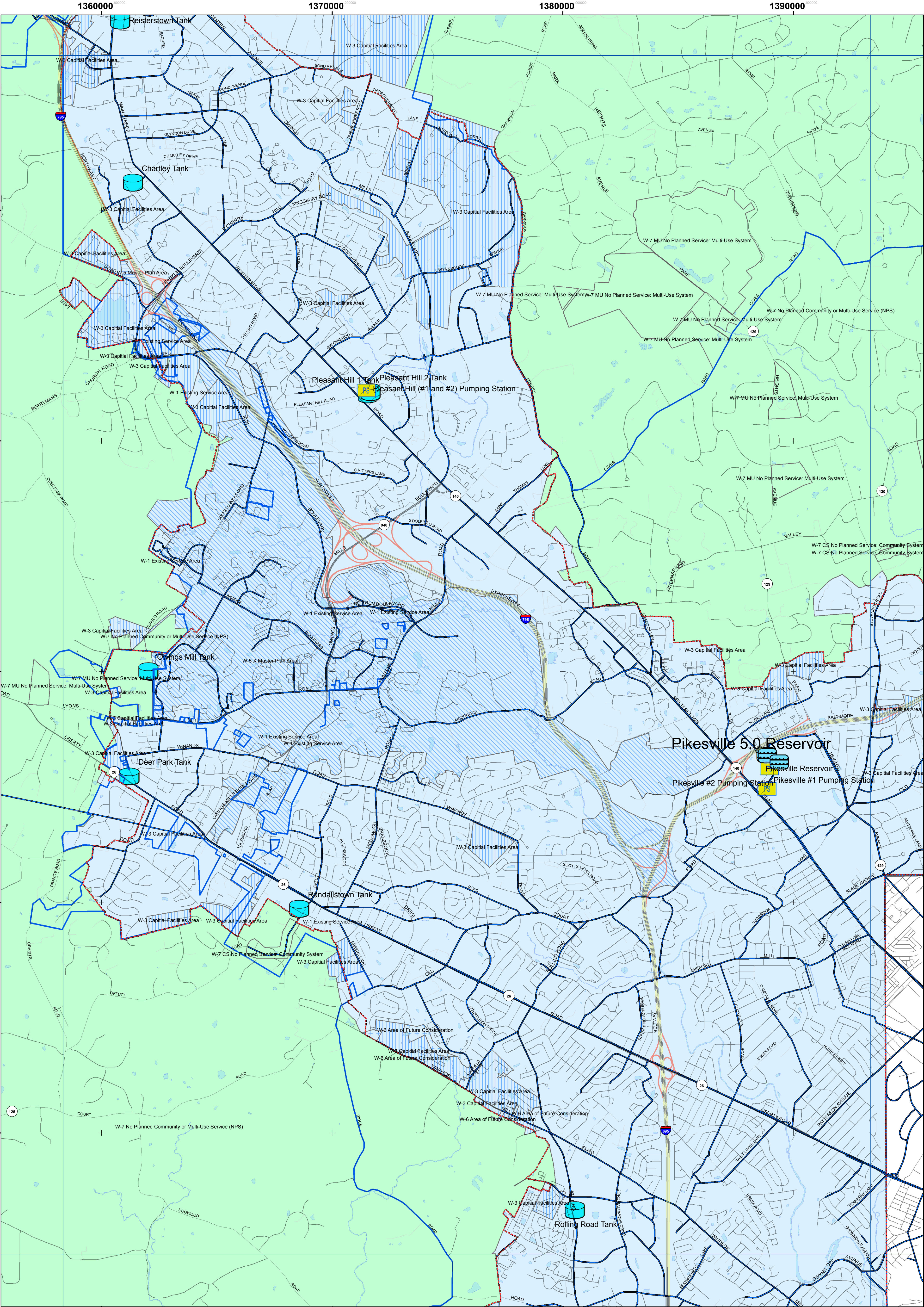
- Legend**
- Water System Facilities**
- Pumping Station
  - Reservoir
  - Tank
  - Treatment Plant
  - Main 12" and Greater
  - W&S Plan Grid Line
  - URDL
  - Metropolitan District Boundary



2,000 0 2,000 4,000 6,000 Feet

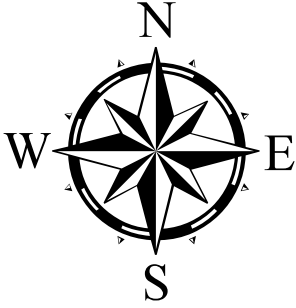
# Baltimore County Water Plan 2014 Triennial Review Map W-15B





- Water 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 to become W-3 Capital Facilities Area upon Annexation into the Metropolitan District
  - 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)

- Legend**
- Water System Facilities**
- Pumping Station
  - Reservoir
  - Tank
  - Treatment Plant
  - Main 12" and Greater
  - W&S Plan Grid Line
  - URDL
  - Metropolitan District Boundary



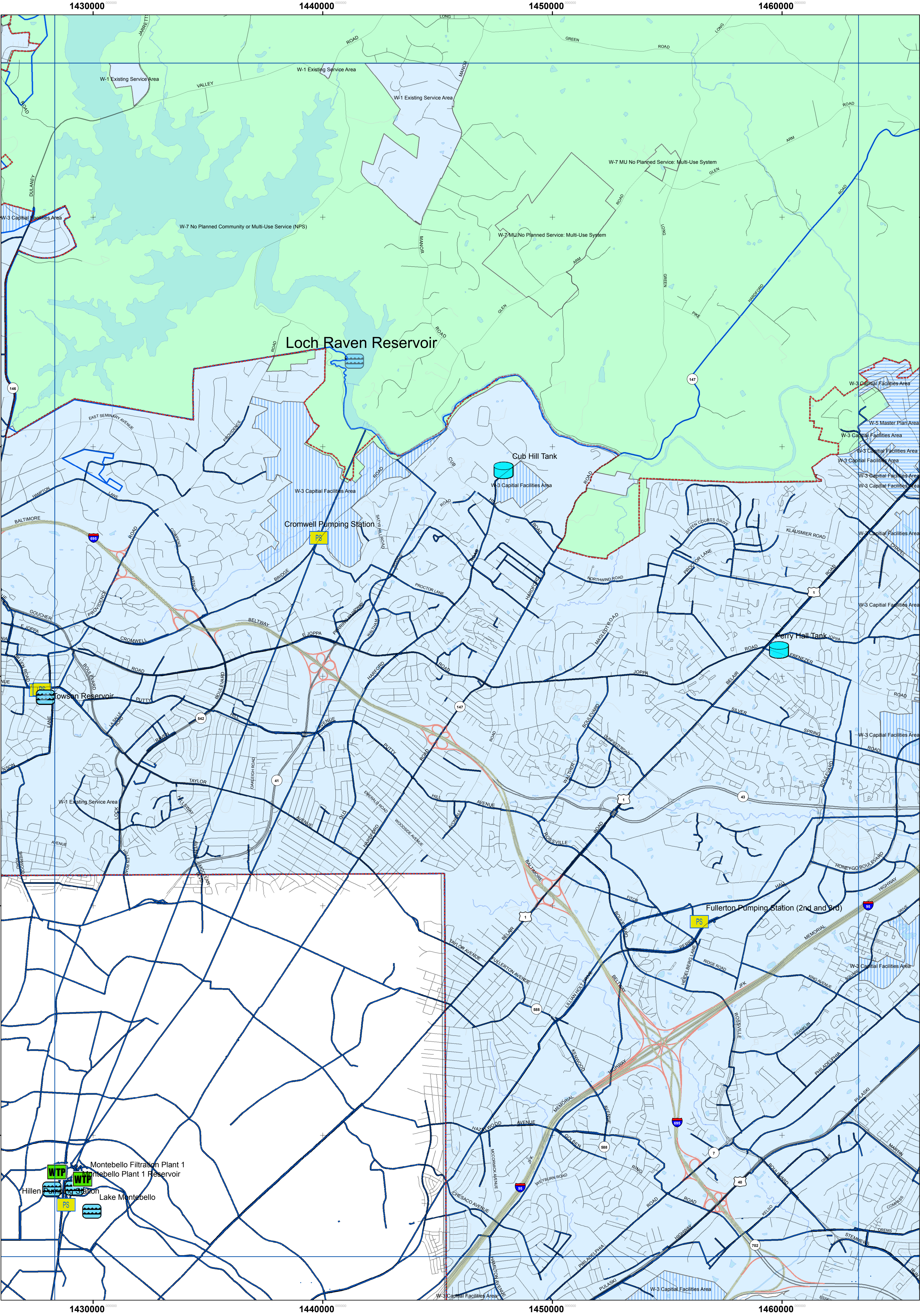
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Baltimore County  
Water Plan  
2014 Triennial Review  
Map W-16A



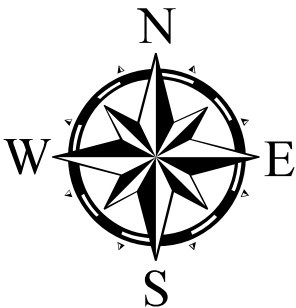






- Water Plan Areal Designations**
- W-1 Existing Service Area
  - W-3 Capital Facilities Area
  - W-4 Study Area
  - W-5 Master Plan Area
  - W-5 X Master Plan Area to become W-3 Capital Facilities Area upon Annexation into the Metropolitan District
  - W-6 Area of Future Consideration
  - W-7 CS No Planned Service: Community System
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  - W-7 No Planned Community or Multi-Use Service (NPS)

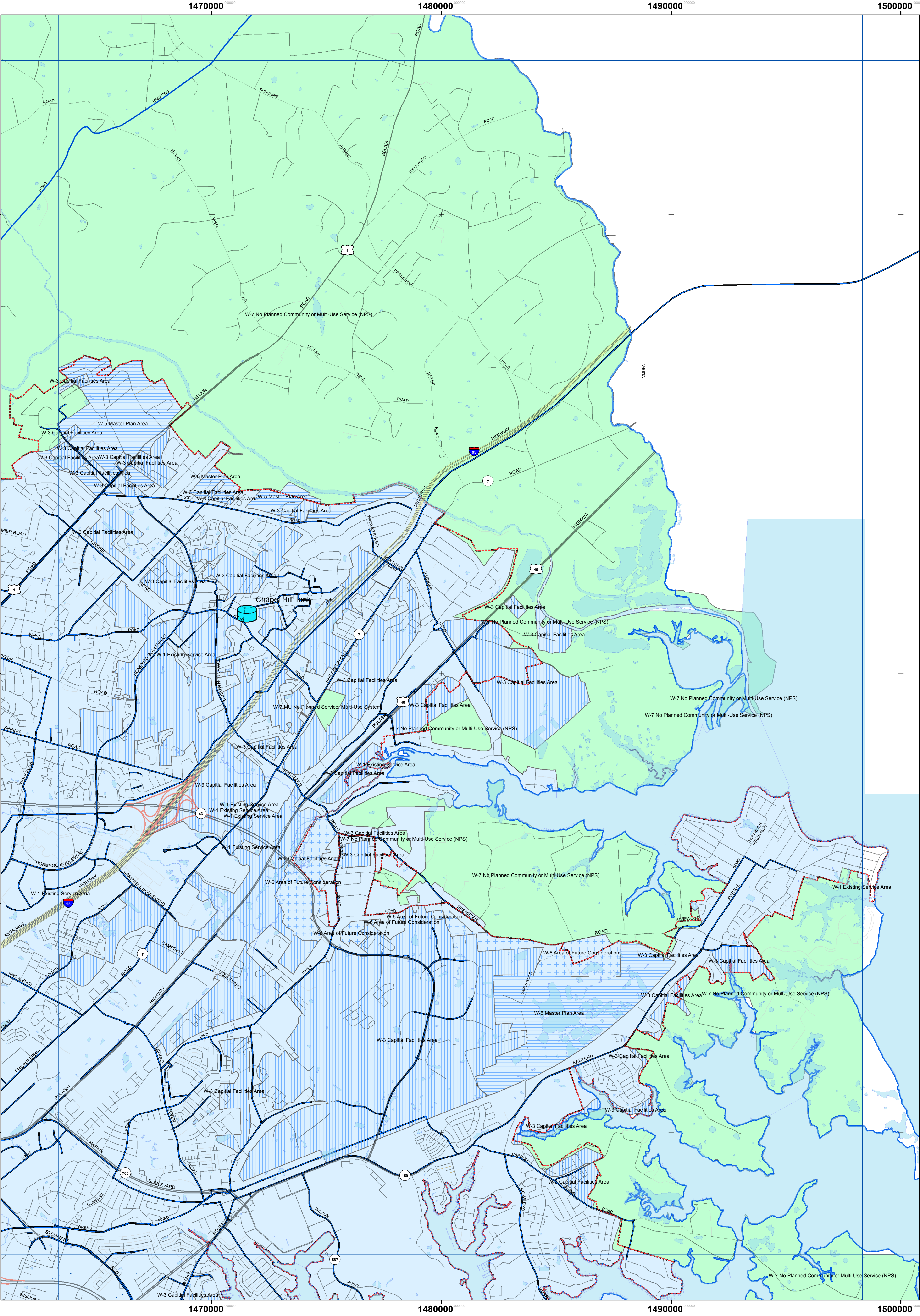
- Legend**
- Water System Facilities**
- Pumping Station
  - Reservoir
  - Tank
  - Treatment Plant
  - Main 12" and Greater
  - W&S Plan Grid Line
  - URDL
  - Metropolitan District Boundary



2,000 0 2,000 4,000 6,000 Feet

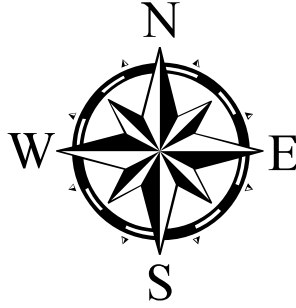
Baltimore County  
Water Plan  
2014 Triennial Review  
Map W-17A





- Water 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 to become W-3 Capital Facilities Area upon Annexation into the Metropolitan District
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  - W-7 CS No Planned Service: Community System
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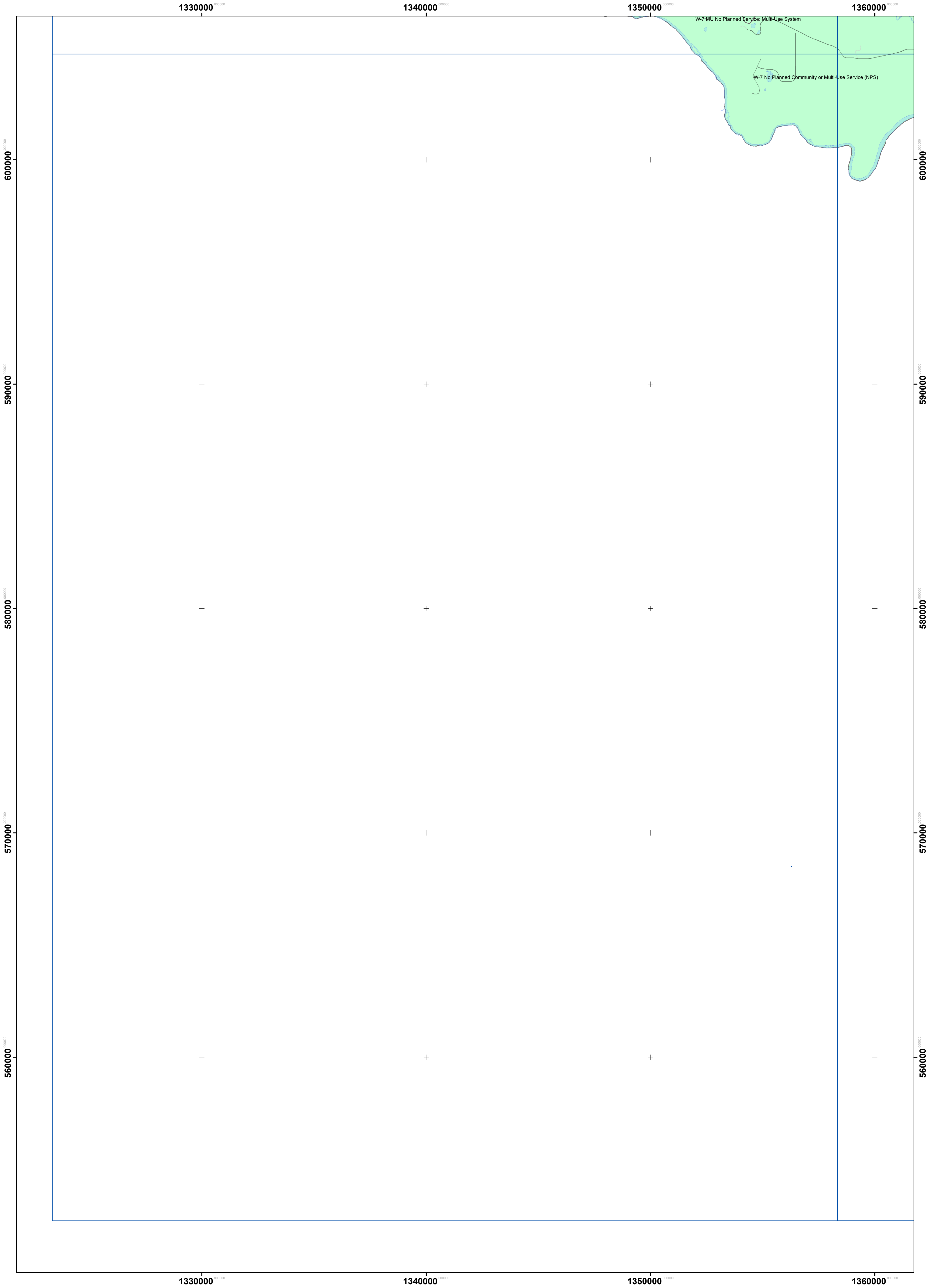
- Legend**
- Water System Facilities**
- Pumping Station
  - Reservoir
  - Tank
  - Treatment Plant
  - Main 12" and Greater
  - W&S Plan Grid Line
  - URDL
  - Metropolitan District Boundary



2,000 0 2,000 4,000 6,000 Feet

# Baltimore County Water Plan 2014 Triennial Review Map W-17B





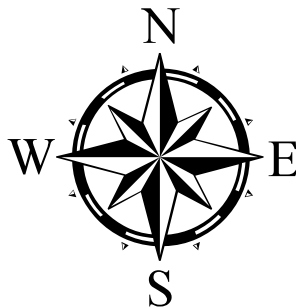
**Water Plan Areal Designations**

- 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 to become W-3 Capital Facilities Area upon Annexation into the Metropolitan District
- 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)

**Legend**

**Water System Facilities**

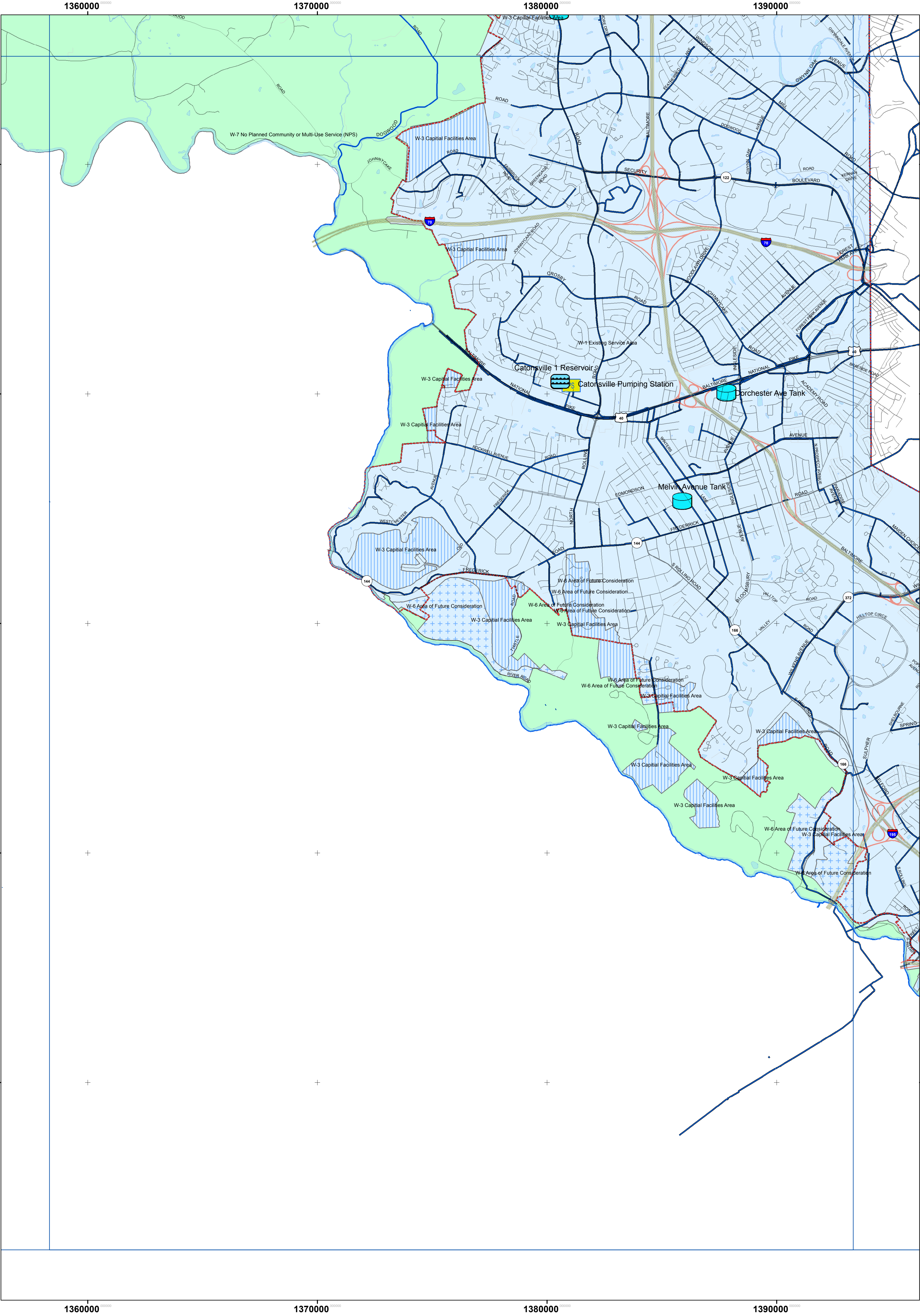
- Pumping Station
- Reservoir
- Tank
- Treatment Plant
- Main 12" and Greater
- W&S Plan Grid Line
- URDL
- Metropolitan District Boundary



2,000 0 2,000 4,000 6,000 Feet

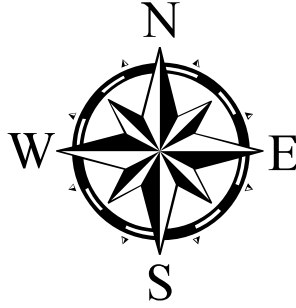
**Baltimore County  
Water Plan  
2014 Triennial Review  
Map W-21B**





- Water 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 to become W-3 Capital Facilities Area upon Annexation into the Metropolitan District
  - 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)

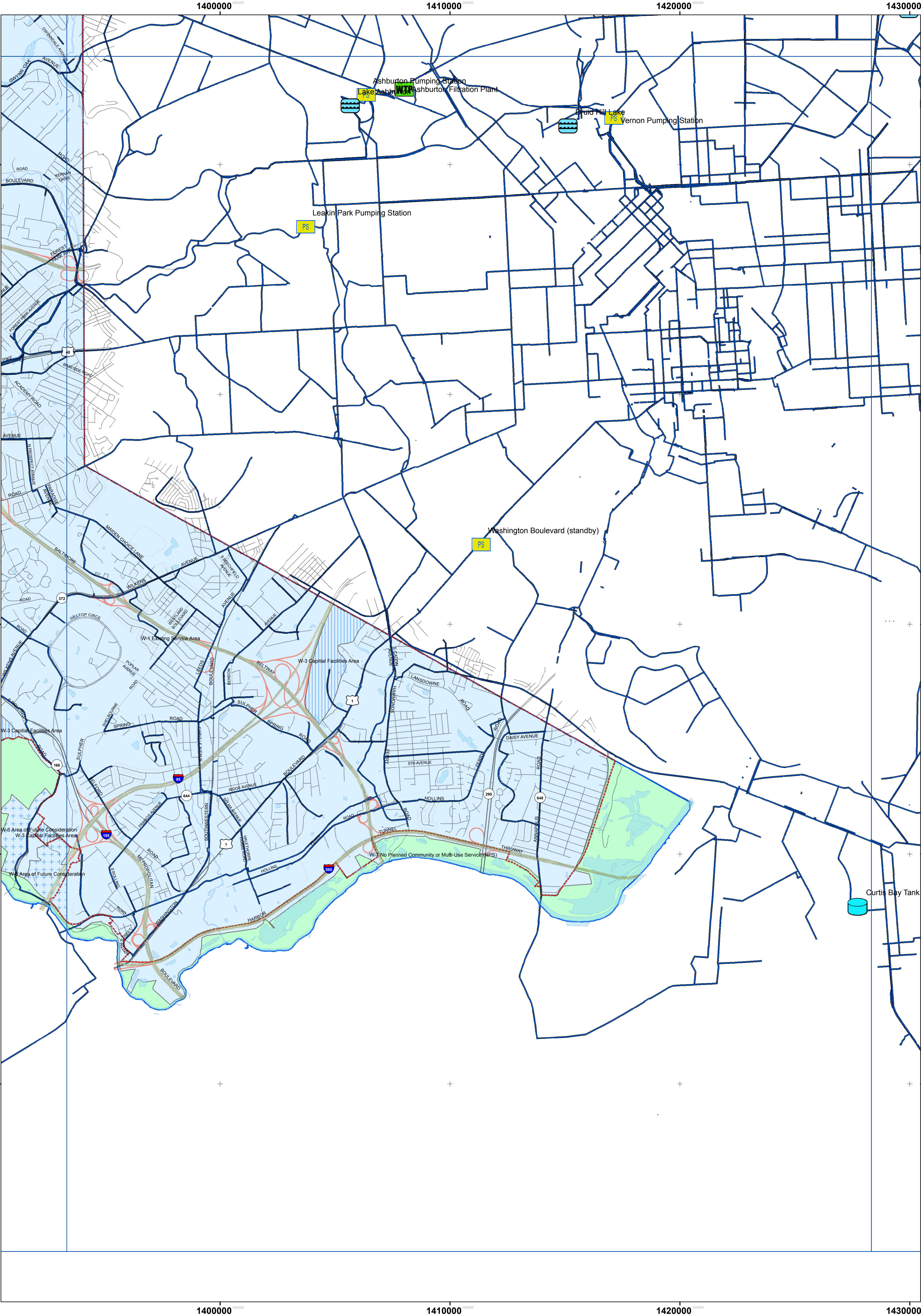
- Legend**
- Water System Facilities**
- Pumping Station
  - Reservoir
  - Tank
  - Treatment Plant
  - Main 12" and Greater
  - W&S Plan Grid Line
  - URDL
  - Metropolitan District Boundary



2,000 0 2,000 4,000 6,000 Feet

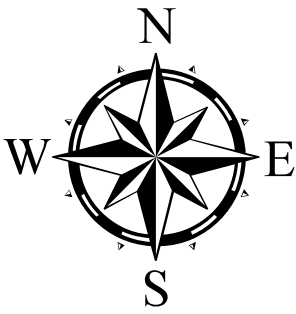
Baltimore County  
Water Plan  
2014 Triennial Review  
Map W-22A





- Water 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 to become W-3 Capital Facilities Area upon Annexation into the Metropolitan District
  - 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)

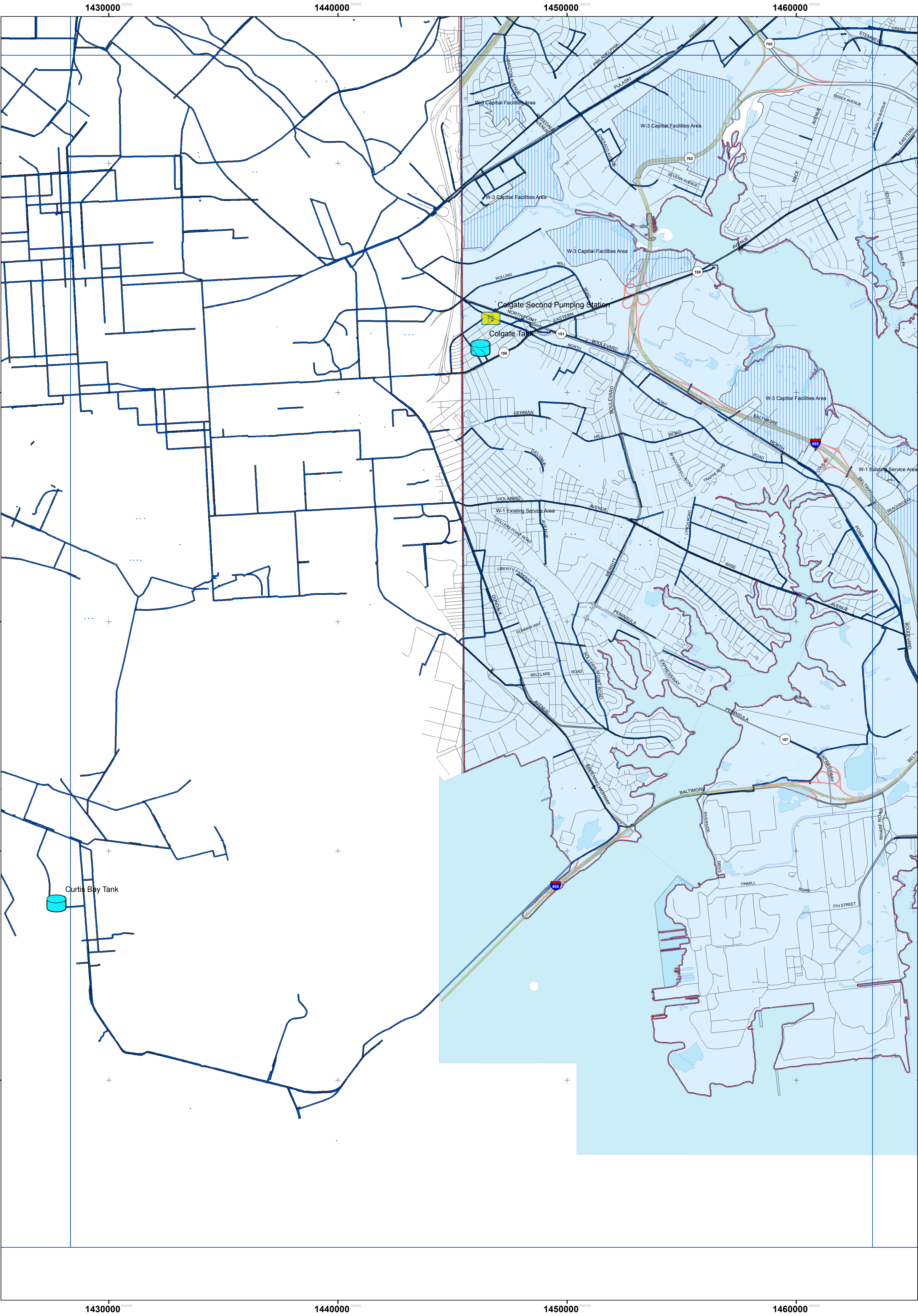
- Legend**
- Water System Facilities**
- Pumping Station
  - Reservoir
  - Tank
  - Treatment Plant
  - Main 12" and Greater
  - W&S Plan Grid Line
  - URDL
  - Metropolitan District Boundary



2,000 0 2,000 4,000 6,000 Feet

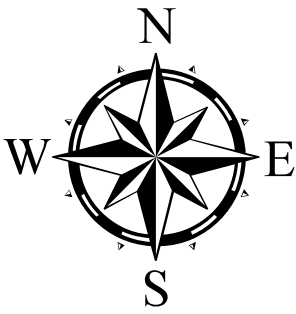
Baltimore County  
Water Plan  
2014 Triennial Review  
Map W-22B





- Water Plan Areal Designations**
- W-1 Existing Service Area
  - W-3 Capital Facilities Area
  - W-4 Study Area
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  - W-5 X Master Plan Area to become W-3 Capital Facilities Area upon Annexation into the Metropolitan District
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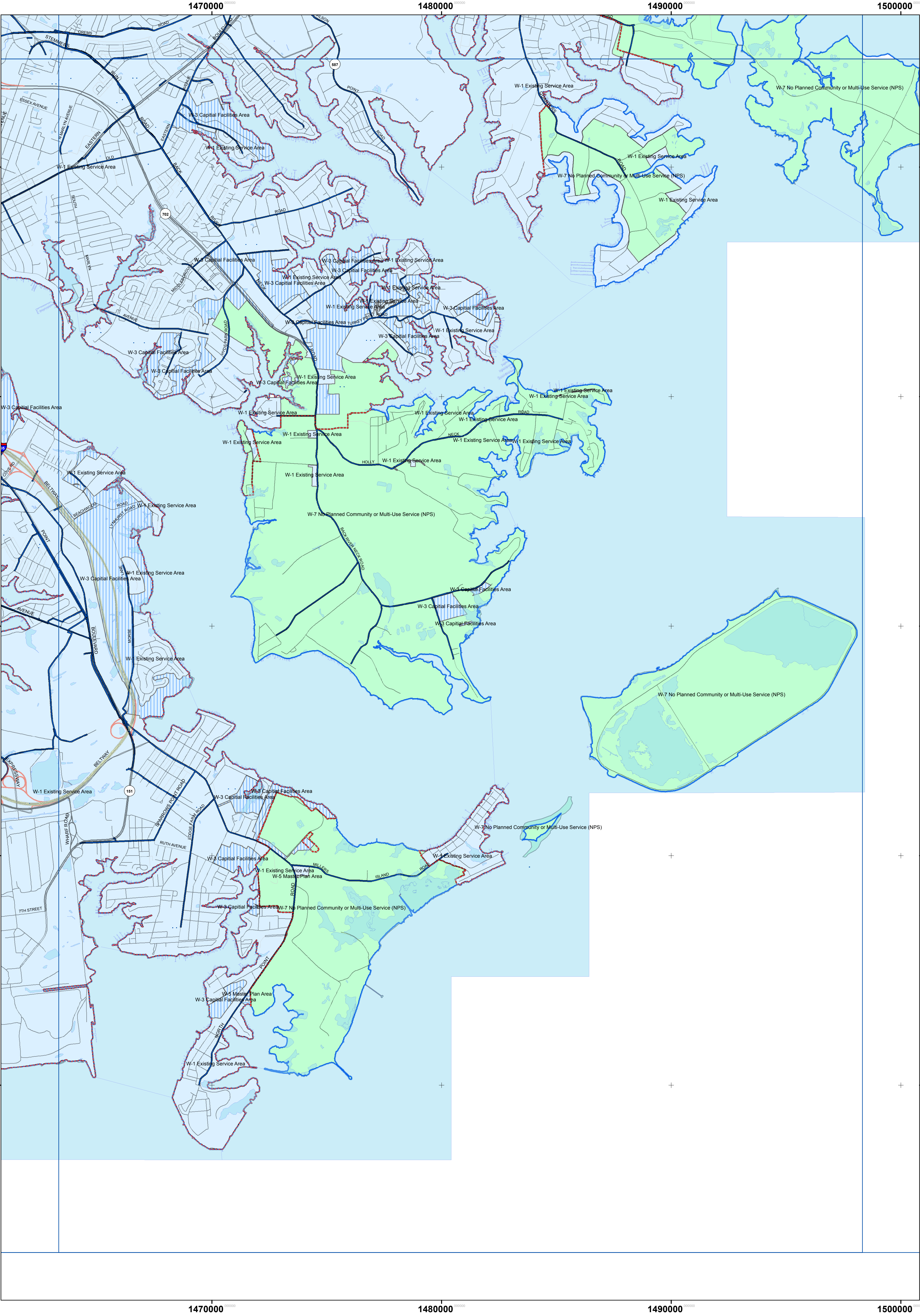
- Legend**
- Water System Facilities**
- Pumping Station
  - Reservoir
  - Tank
  - Treatment Plant
  - Main 12" and Greater
  - W&S Plan Grid Line
  - URDL
  - Metropolitan District Boundary



2,000 0 2,000 4,000 6,000 Feet

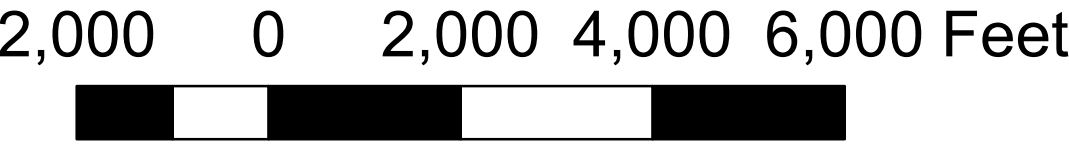
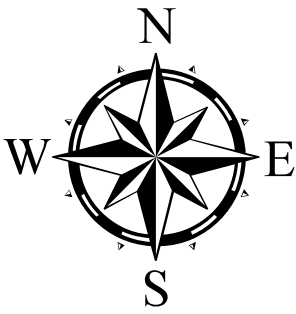
Baltimore County  
Water Plan  
2014 Triennial Review  
Map W-23A





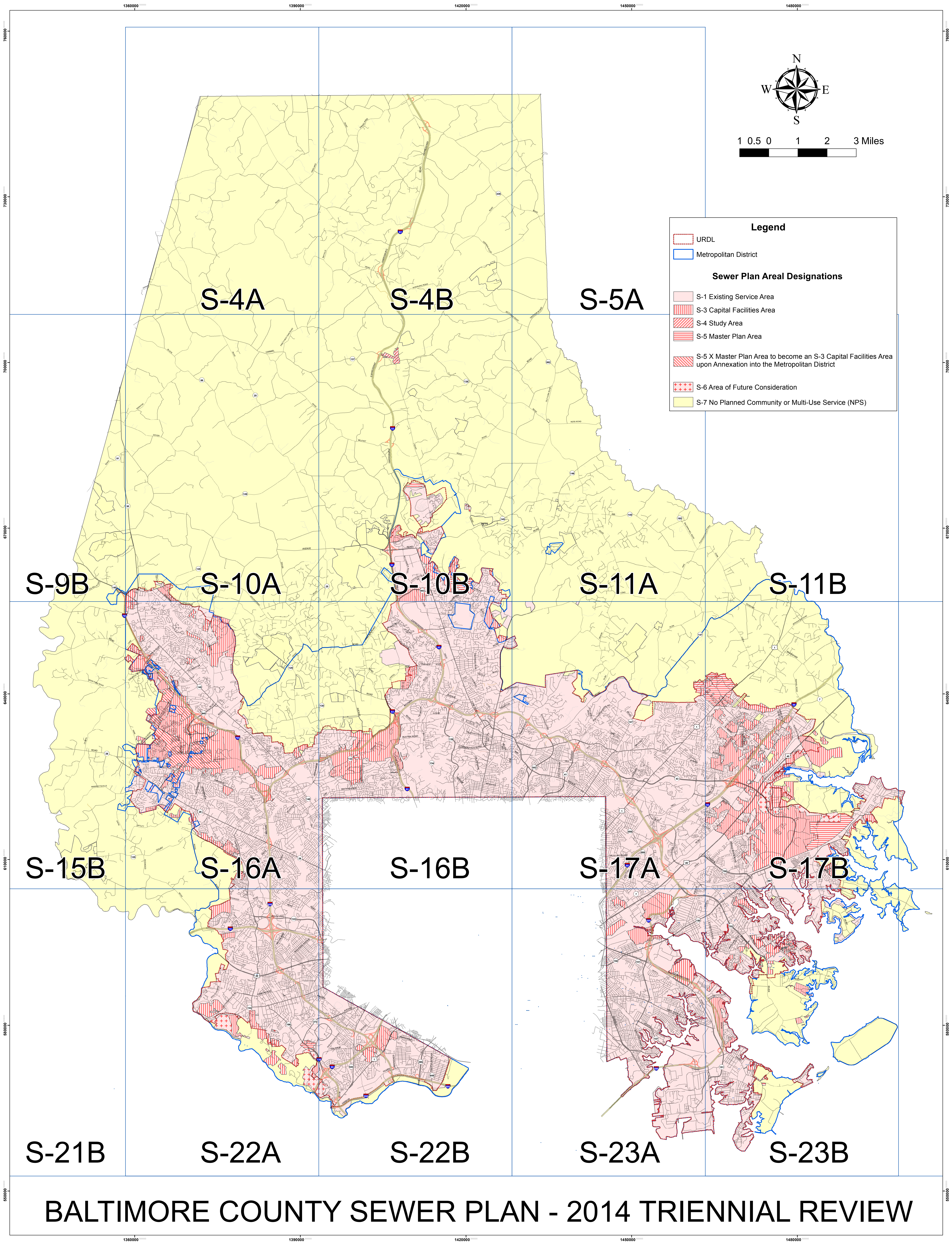
- Water Plan Area Designations**
- W-1 Existing Service Area
  - W-3 Capital Facilities Area
  - W-4 Study Area
  - W-5 Master Plan Area
  - W-5 X Master Plan Area to become W-3 Capital Facilities Area upon Annexation into the Metropolitan District
  - W-6 Area of Future Consideration
  - W-7 CS No Planned Service: Community System
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- Legend**
- Water System Facilities**
- Pumping Station
  - Reservoir
  - Tank
  - Treatment Plant
  - Main 12" and Greater
  - W&S Plan Grid Line
  - URDL
  - Metropolitan District Boundary



Baltimore County  
Water Plan  
2014 Triennial Review  
Map W-23B





**Legend**

URDL

Metropolitan District

**Sewer Plan Area Designations**

S-1 Existing Service Area

S-3 Capital Facilities Area

S-4 Study Area

S-5 Master Plan Area

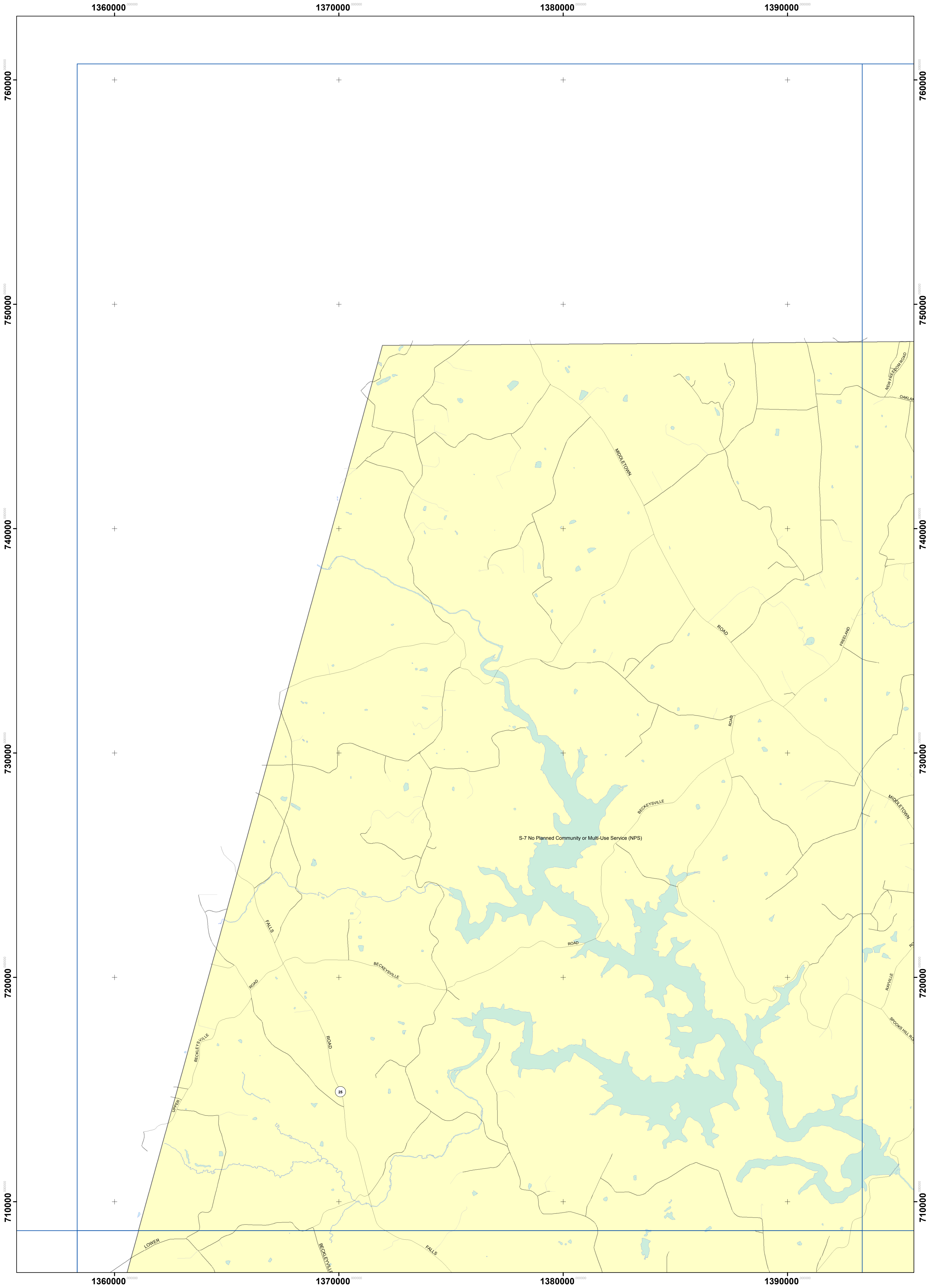
S-5 X Master Plan Area to become an S-3 Capital Facilities Area upon Annexation into the Metropolitan District

S-6 Area of Future Consideration

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

BALTIMORE COUNTY SEWER PLAN - 2014 TRIENNIAL REVIEW





- Sewer Plan Areal 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 to become W-3 Capital Facilities Area upon Annexation into the Metropolitan District
  - S-6 Area of Future Consideration
  - S-7 CS No Planned Service: Community System
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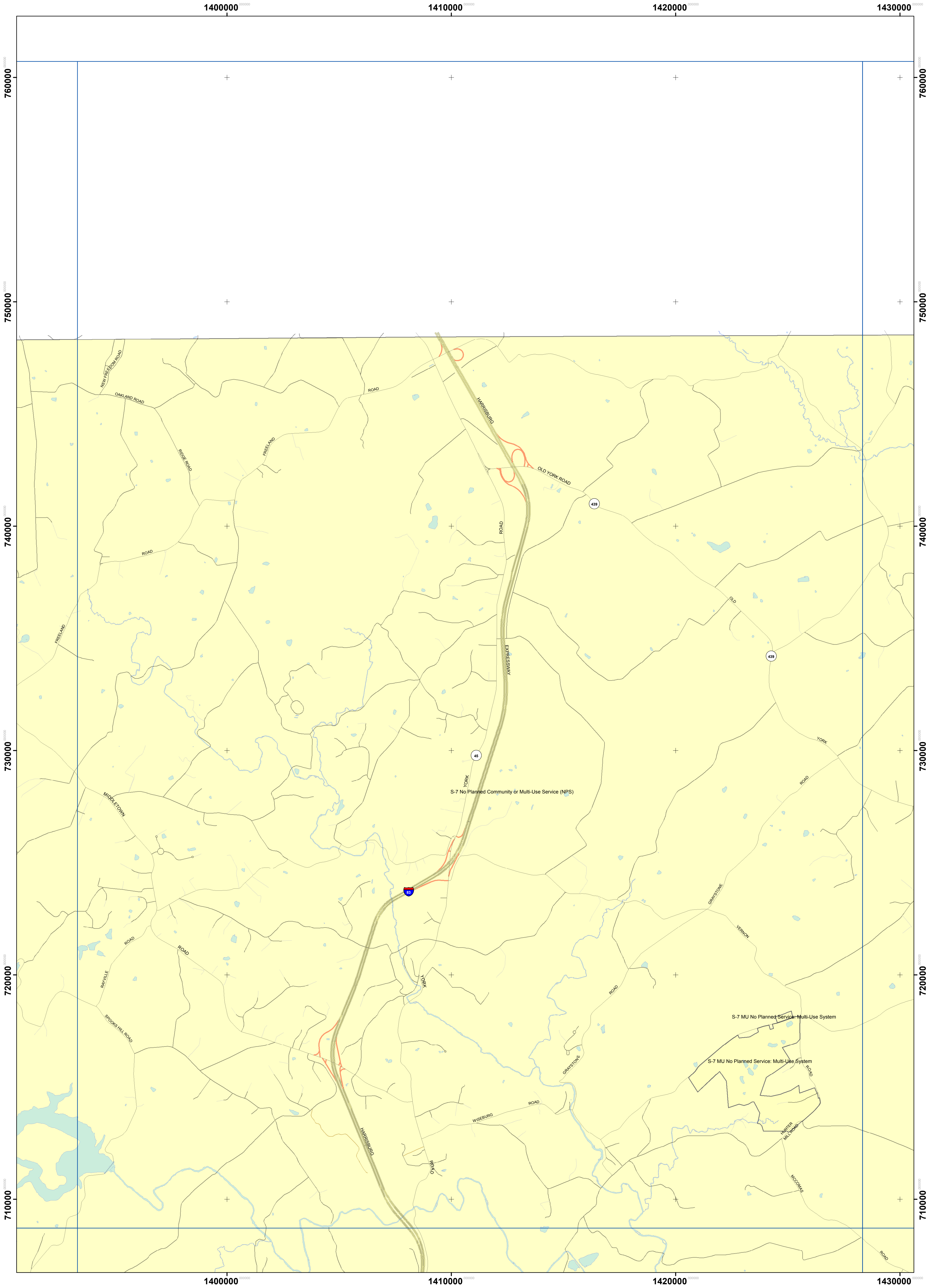
- Legend**
- Sewer System Facilities**
- Grinder Pump
  - Pump Station
  - Force Main
  - Gravity Main (12" and Greater)
  - Low Pressure Main (for Grinder Pumps)
  - W&S Plan Grid Line
  - URDL
  - Metropolitan District Boundary



2,000 0 2,000 4,000 6,000 Feet

Baltimore County  
Sewer Plan  
2014 Triennial Review  
Map S-4A





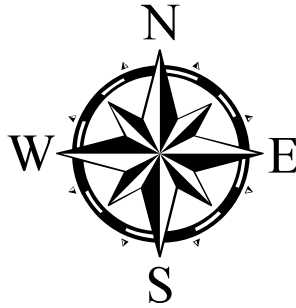
**Sewer Plan Areal Designations**

- 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 to become W-3 Capital Facilities Area upon Annexation into the Metropolitan District
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**Legend**

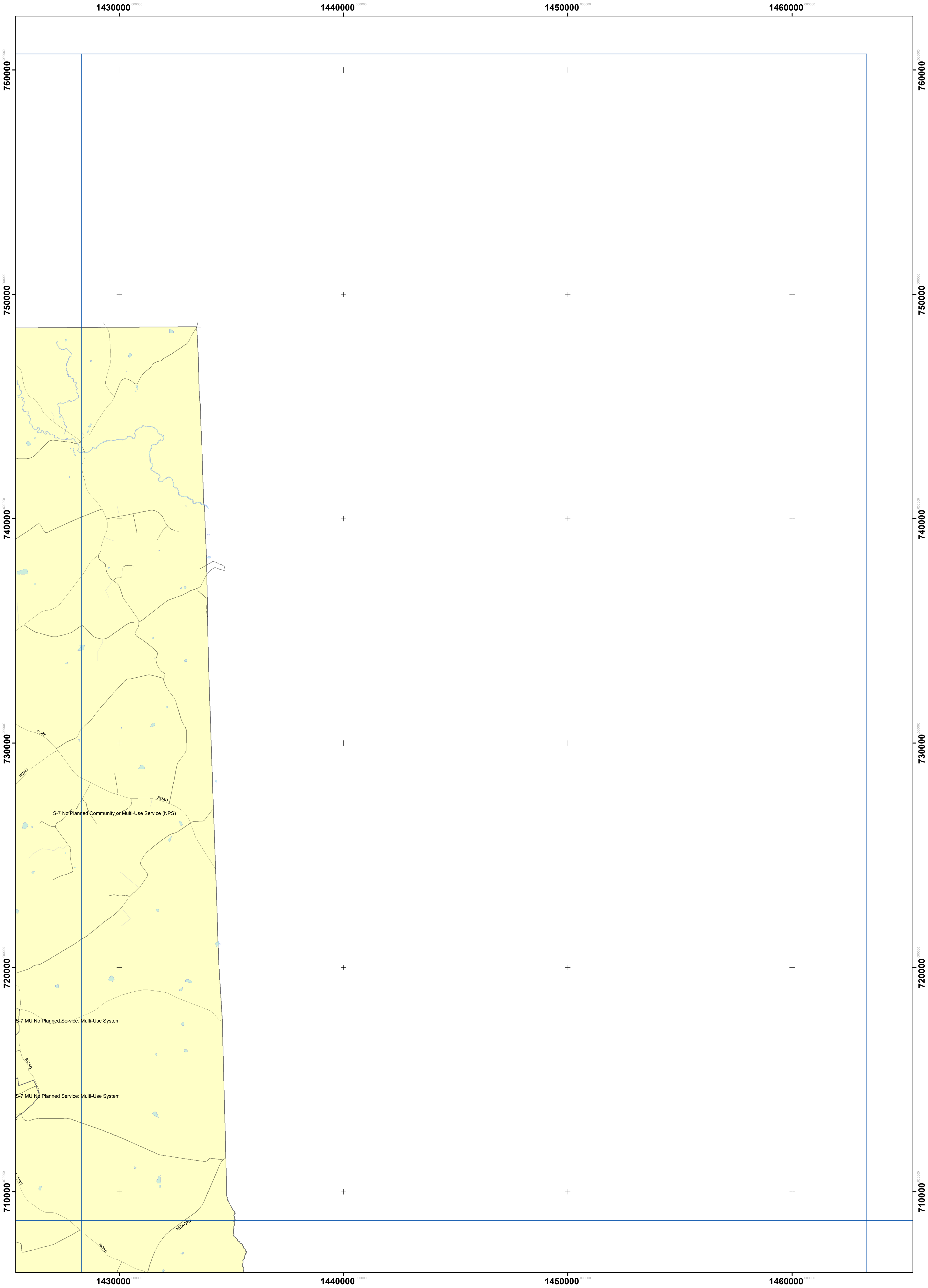
**Sewer System Facilities**

- Grinder Pump
- Pump Station
- Force Main
- Gravity Main (12" and Greater)
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- W&S Plan Grid Line
- URDL
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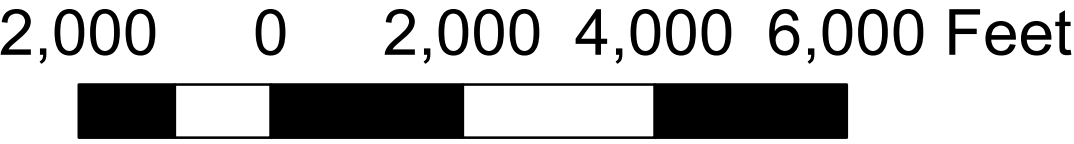
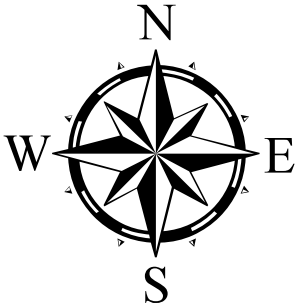
2,000 0 2,000 4,000 6,000 Feet

**Baltimore County  
Sewer Plan  
2014 Triennial Review  
Map S-4B**

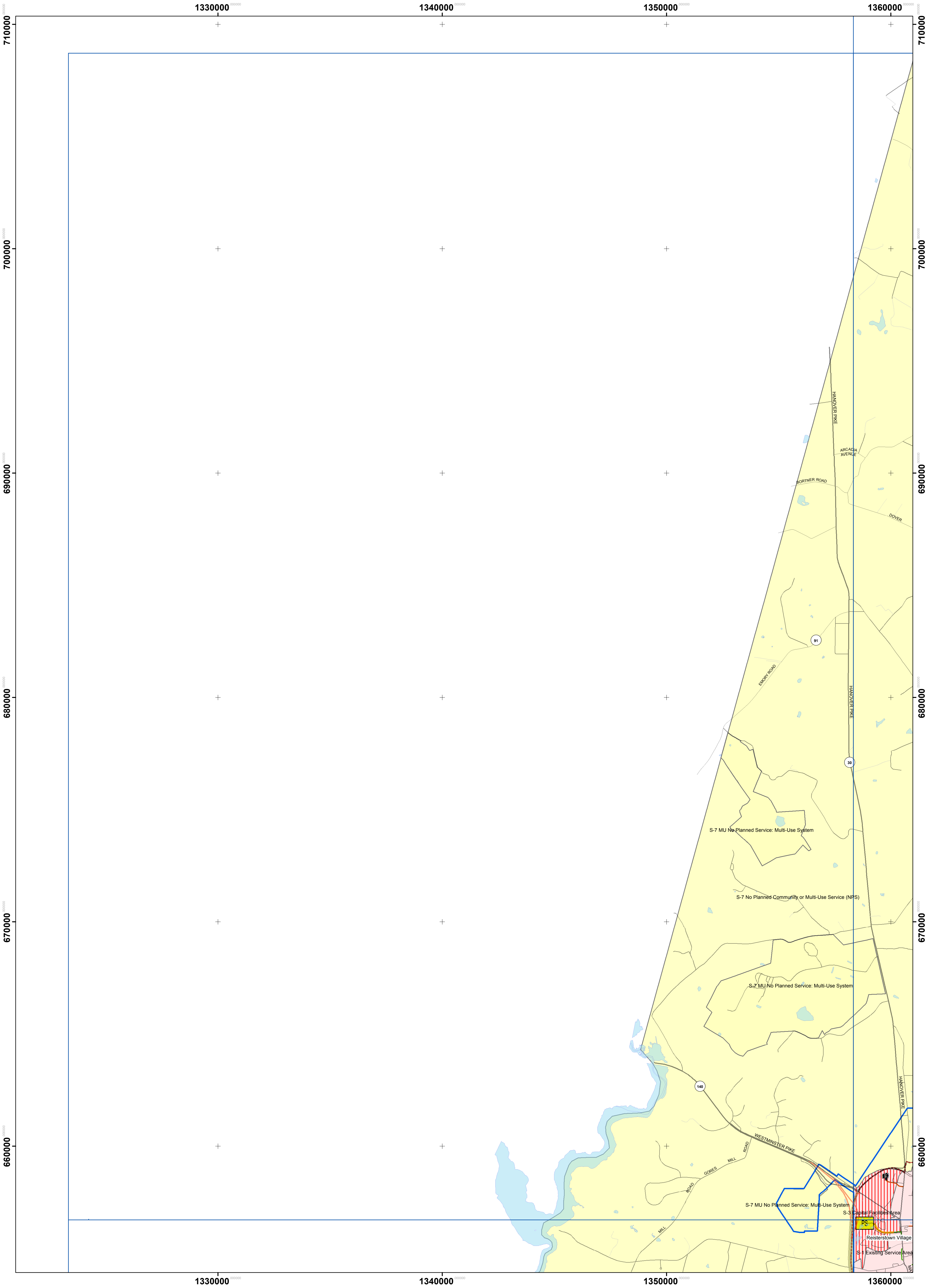


- Sewer Plan Areal Designations**
- S-1 Existing Service Area
  - S-3 Capital Facilities Area
  - S-4 Study Area
  - S-5 Master Plan Area
  - S-5 X Master Plan Area to become W-3 Capital Facilities Area upon Annexation into the Metropolitan District
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- Grinder Pump
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  - Force Main
  - Gravity Main (12" and Greater)
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  - W&S Plan Grid Line
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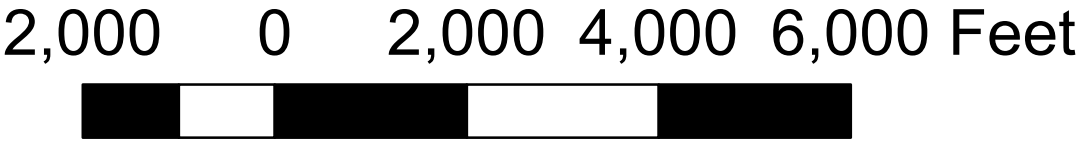
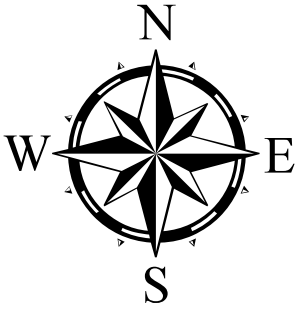


Baltimore County  
Sewer Plan  
2014 Triennial Review  
Map S-5A



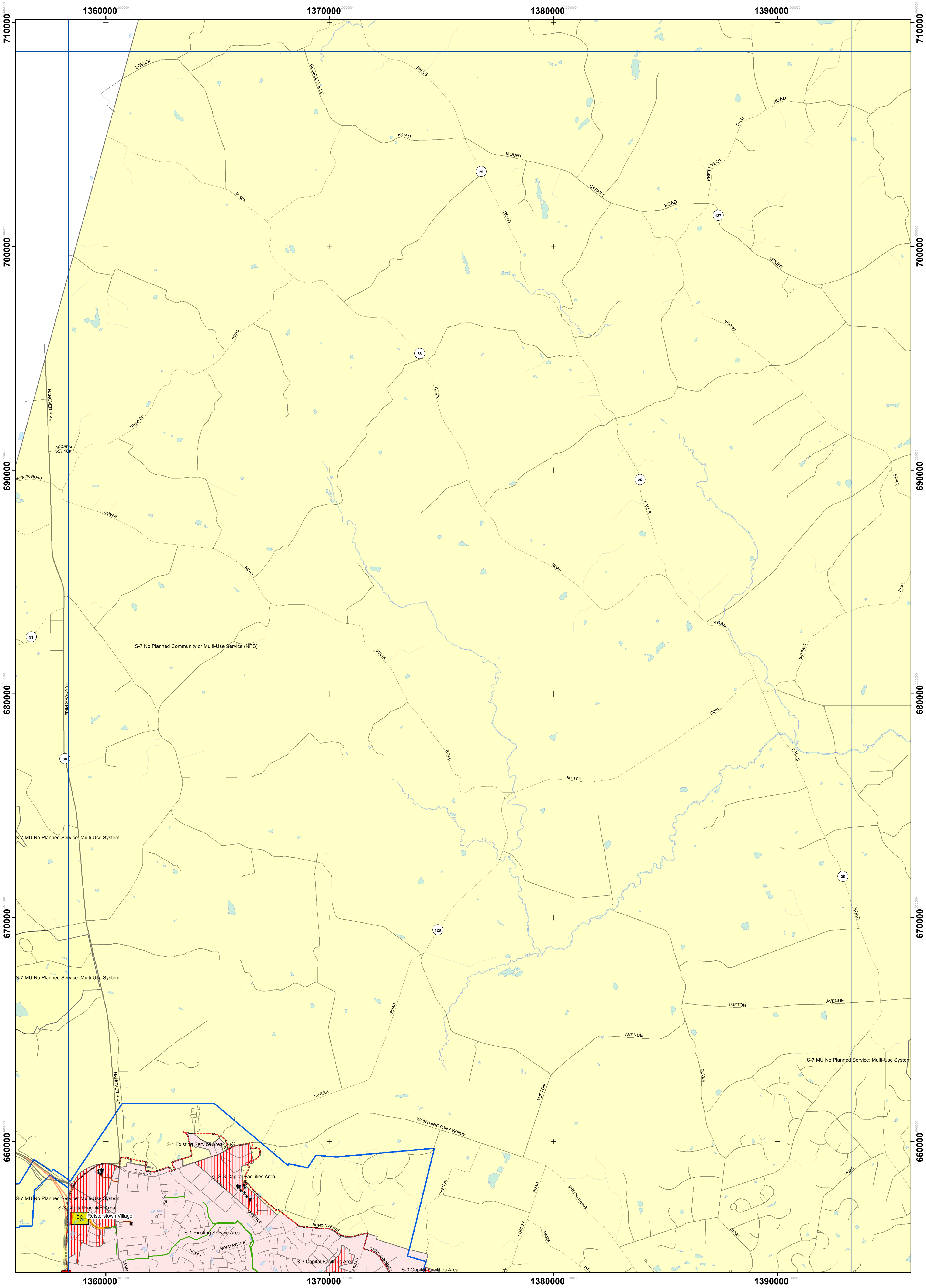
- Sewer Plan Areal Designations**
- S-1 Existing Service Area
  - S-3 Capital Facilities Area
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  - S-5 X Master Plan Area to become W-3 Capital Facilities Area upon Annexation into the Metropolitan District
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- Legend**
- Sewer System Facilities**
- Grinder Pump
  - Pump Station
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  - Gravity Main (12" and Greater)
  - Low Pressure Main (for Grinder Pumps)
  - W&S Plan Grid Line
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Baltimore County  
Sewer Plan  
2014 Triennial Review  
Map S-9B





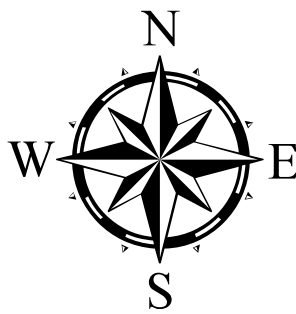
**Sewer Plan Area Designations**

- S-1 Existing Service Area
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- S-5 X Master Plan Area to become W-3 Capital Facilities Area upon Annexation into the Metropolitan District
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**Legend**

**Sewer System Facilities**

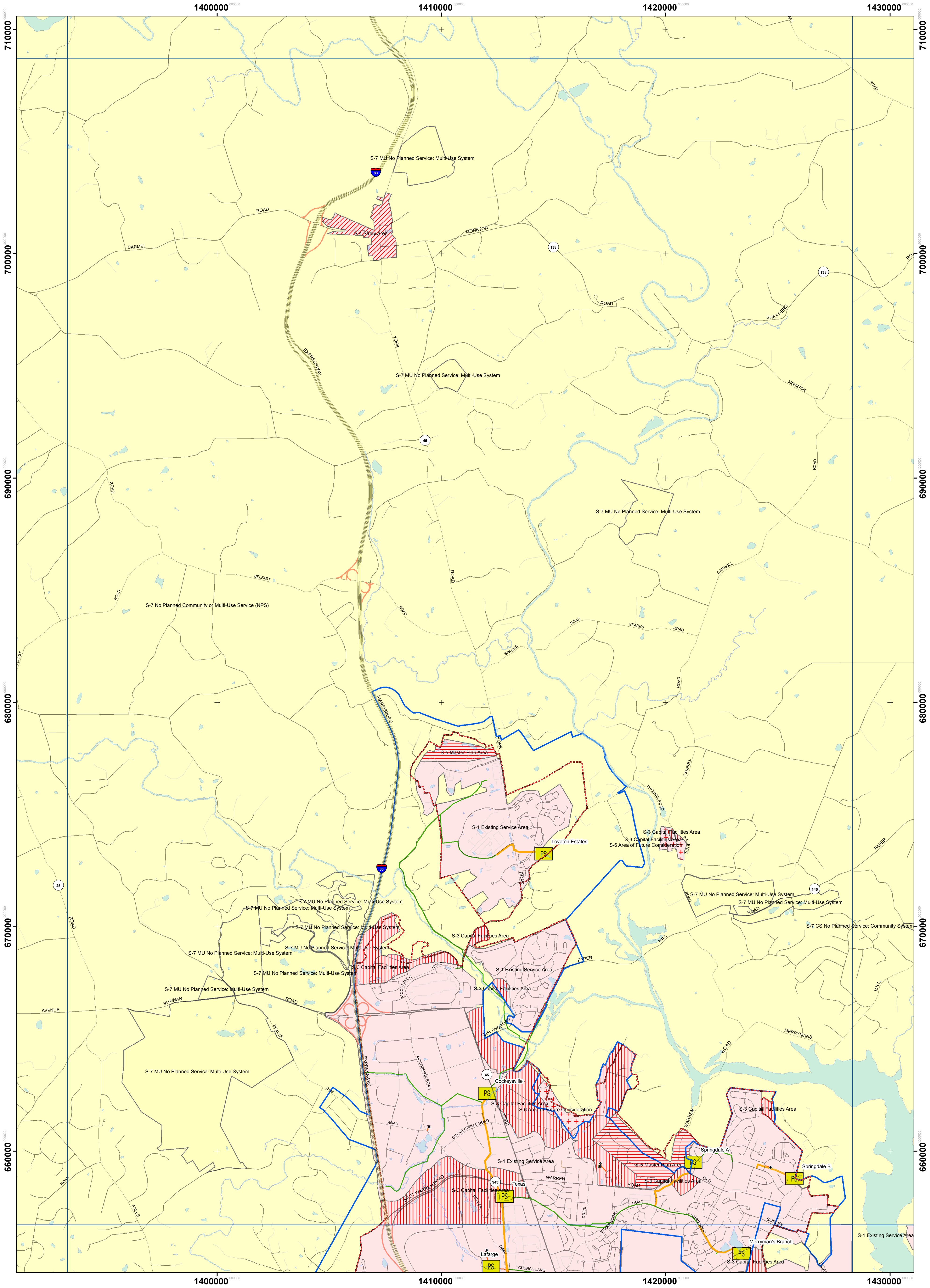
- Grinder Pump
- Pump Station
- Force Main
- Gravity Main (12" and Greater)
- Low Pressure Main (for Grinder Pumps)
- W&S Plan Grid Line
- URDL
- Metropolitan District Boundary



2,000 0 2,000 4,000 6,000 Feet

**Baltimore County  
Sewer Plan  
2014 Triennial Review  
Map S-10A**





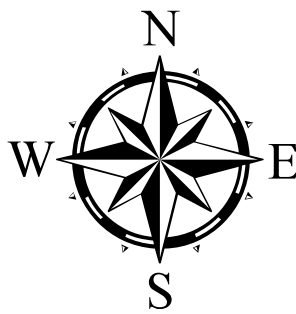
**Sewer Plan Areal Designations**

- 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 to become W-3 Capital Facilities Area upon Annexation into the Metropolitan District
- 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)

**Legend**

**Sewer System Facilities**

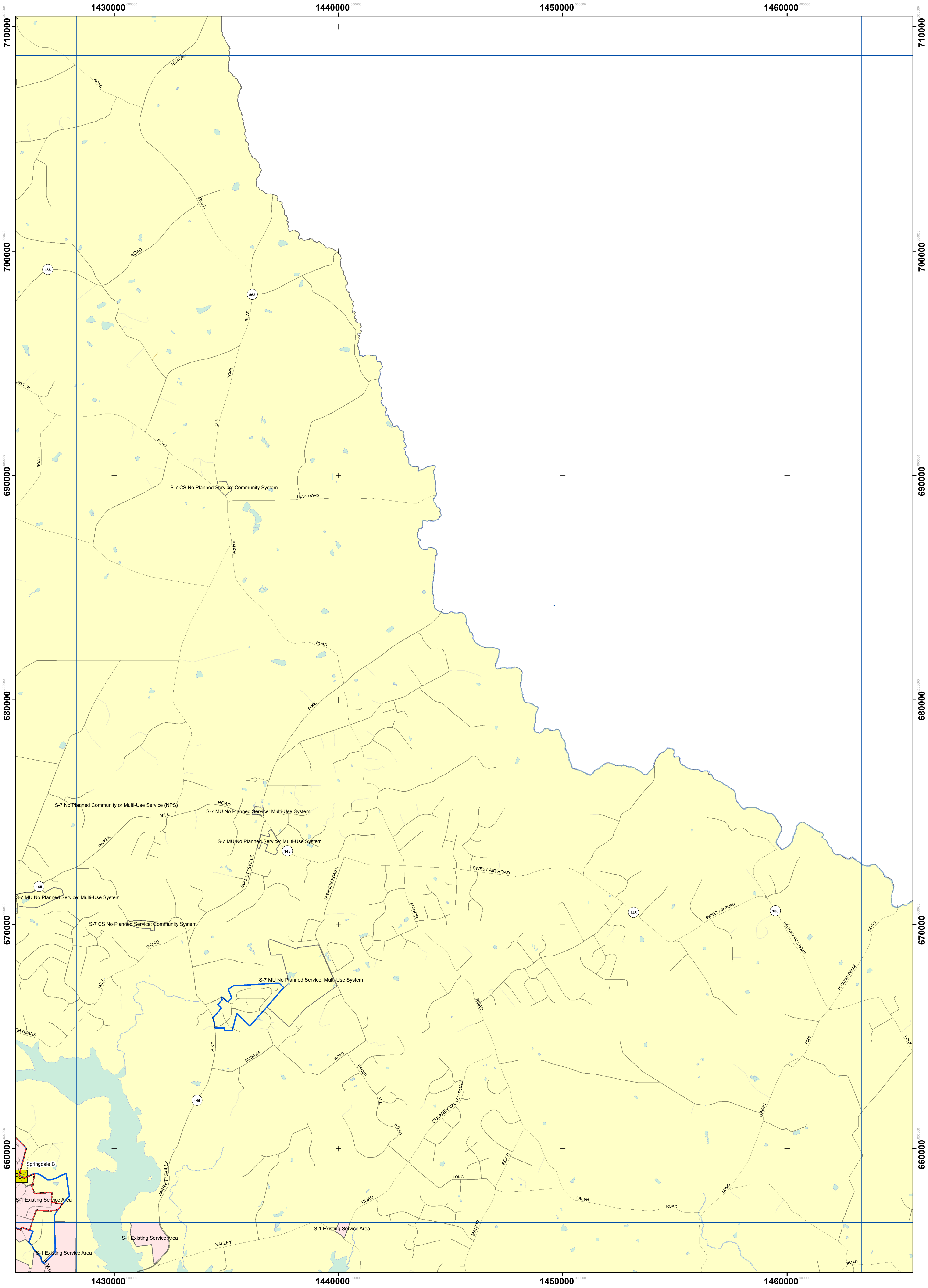
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- URDL
- Metropolitan District Boundary



2,000 0 2,000 4,000 6,000 Feet

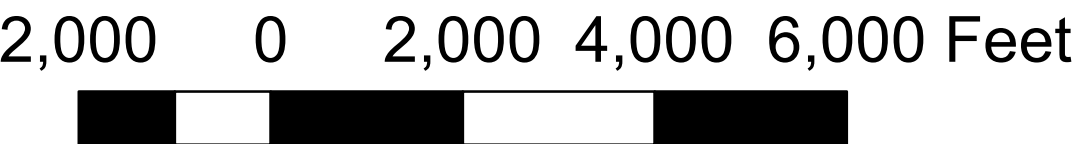
**Baltimore County  
Sewer Plan  
2014 Triennial Review  
Map S-10B**





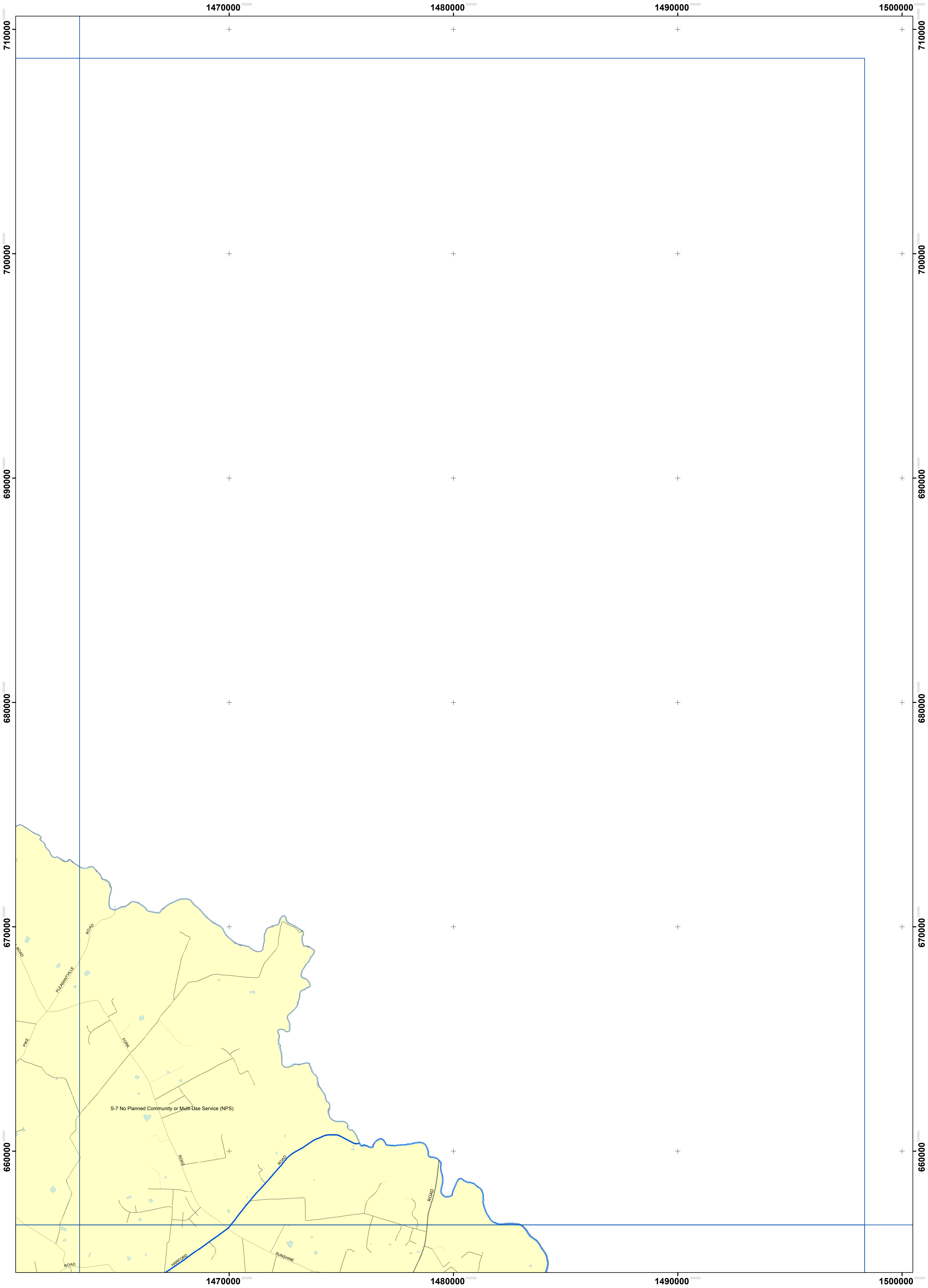
- Sewer Plan Area Designations**
- S-1 Existing Service Area
  - S-3 Capital Facilities Area
  - S-4 Study Area
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- Legend**
- Sewer System Facilities**
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  - Force Main
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  - Metropolitan District Boundary



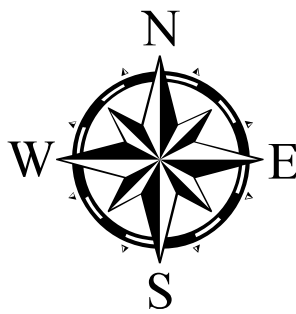
Baltimore County  
Sewer Plan  
2014 Triennial Review  
Map S-11A





- Sewer Plan Area Designations**
- S-1 Existing Service Area
  - S-3 Capital Facilities Area
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- Legend**
- Sewer System Facilities**
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  - W&S Plan Grid Line
  - URDL
  - Metropolitan District Boundary



2,000 0 2,000 4,000 6,000 Feet

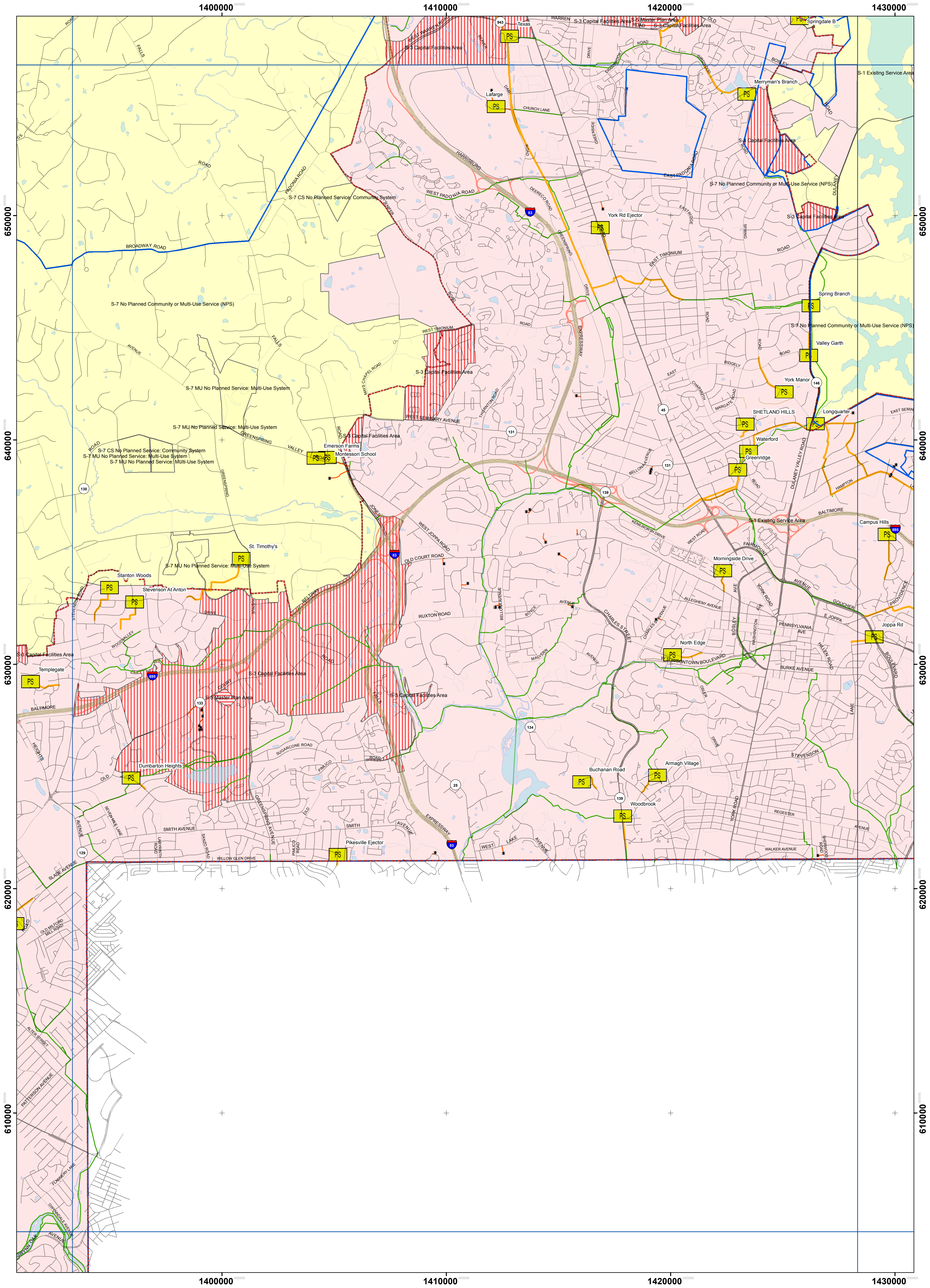
Baltimore County  
Sewer Plan  
2014 Triennial Review  
Map S-11B











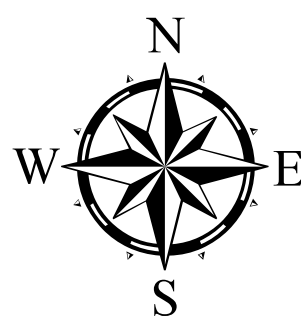
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**Legend**

**Sewer System Facilities**

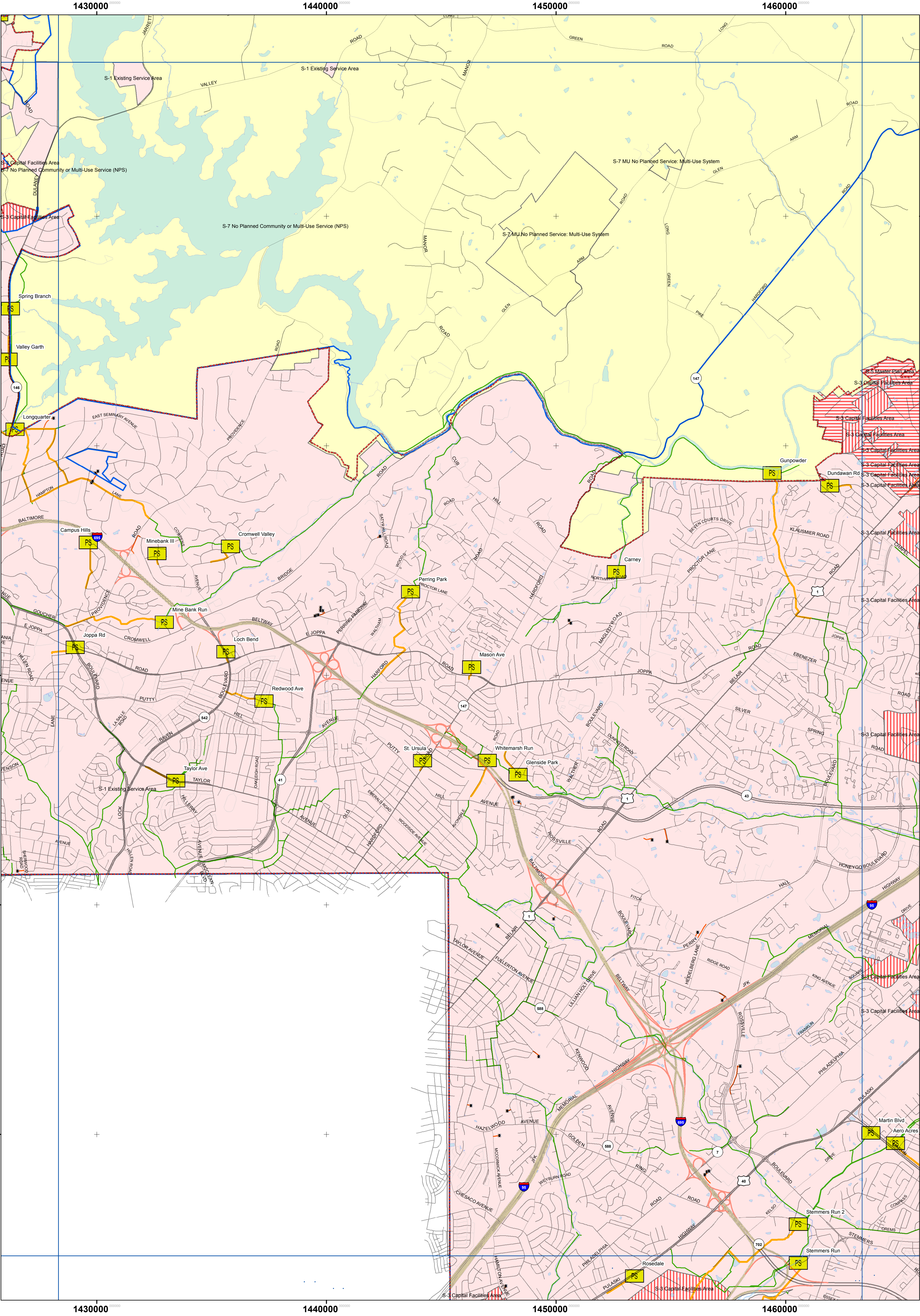
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2,000 0 2,000 4,000 6,000 Feet

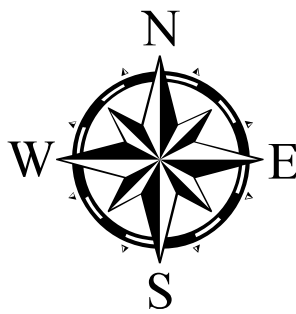
**Baltimore County  
Sewer Plan  
2014 Triennial Review  
Map S-16B**





- Sewer Plan Area Designations**
- S-1 Existing Service Area
  - S-3 Capital Facilities Area
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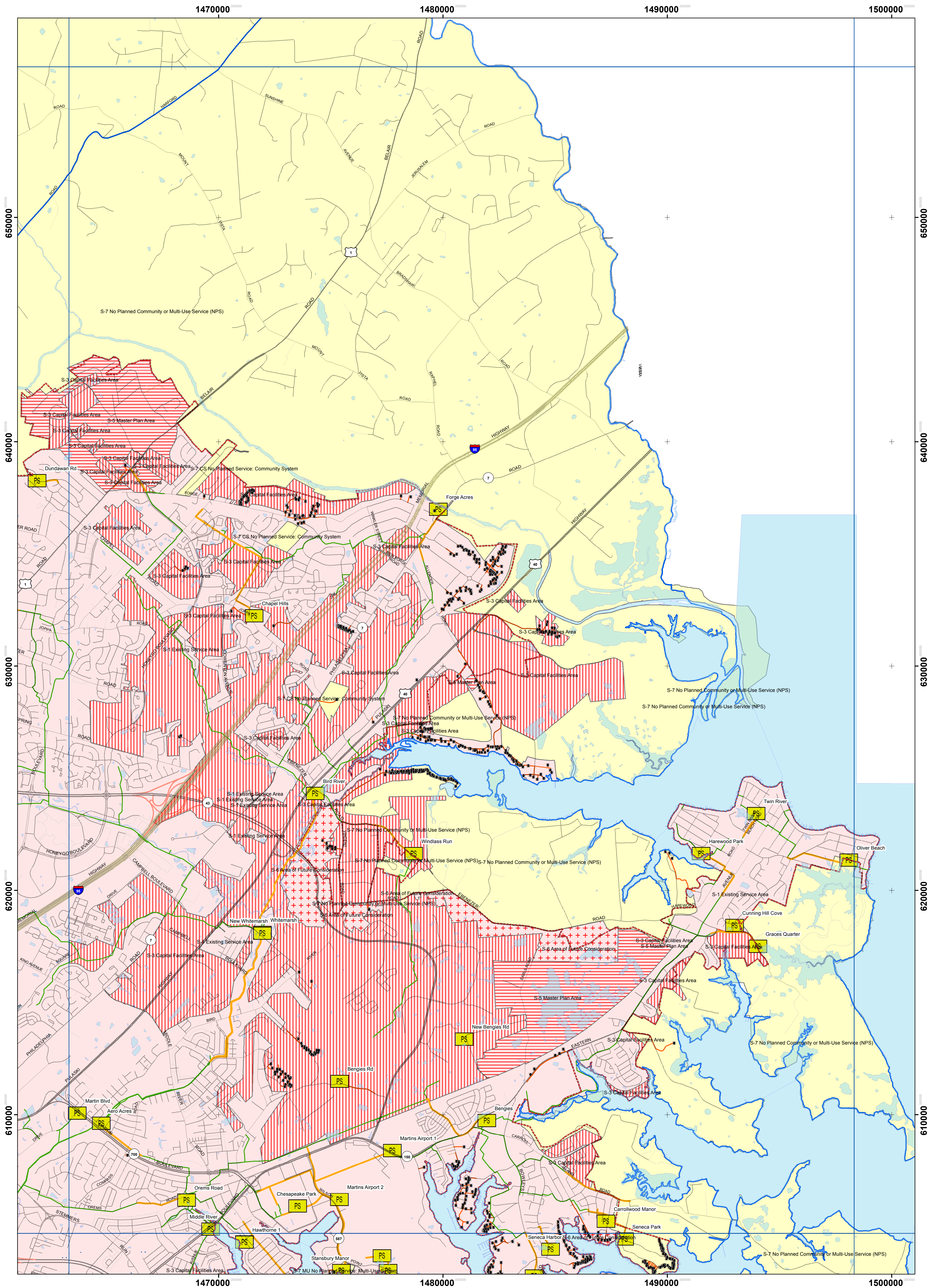
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2,000 0 2,000 4,000 6,000 Feet

Baltimore County  
Sewer Plan  
2014 Triennial Review  
Map S-17A



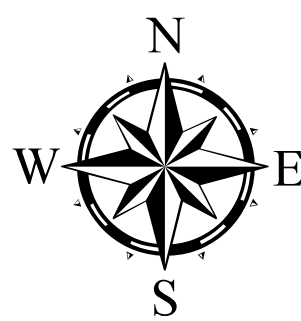


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**Legend**

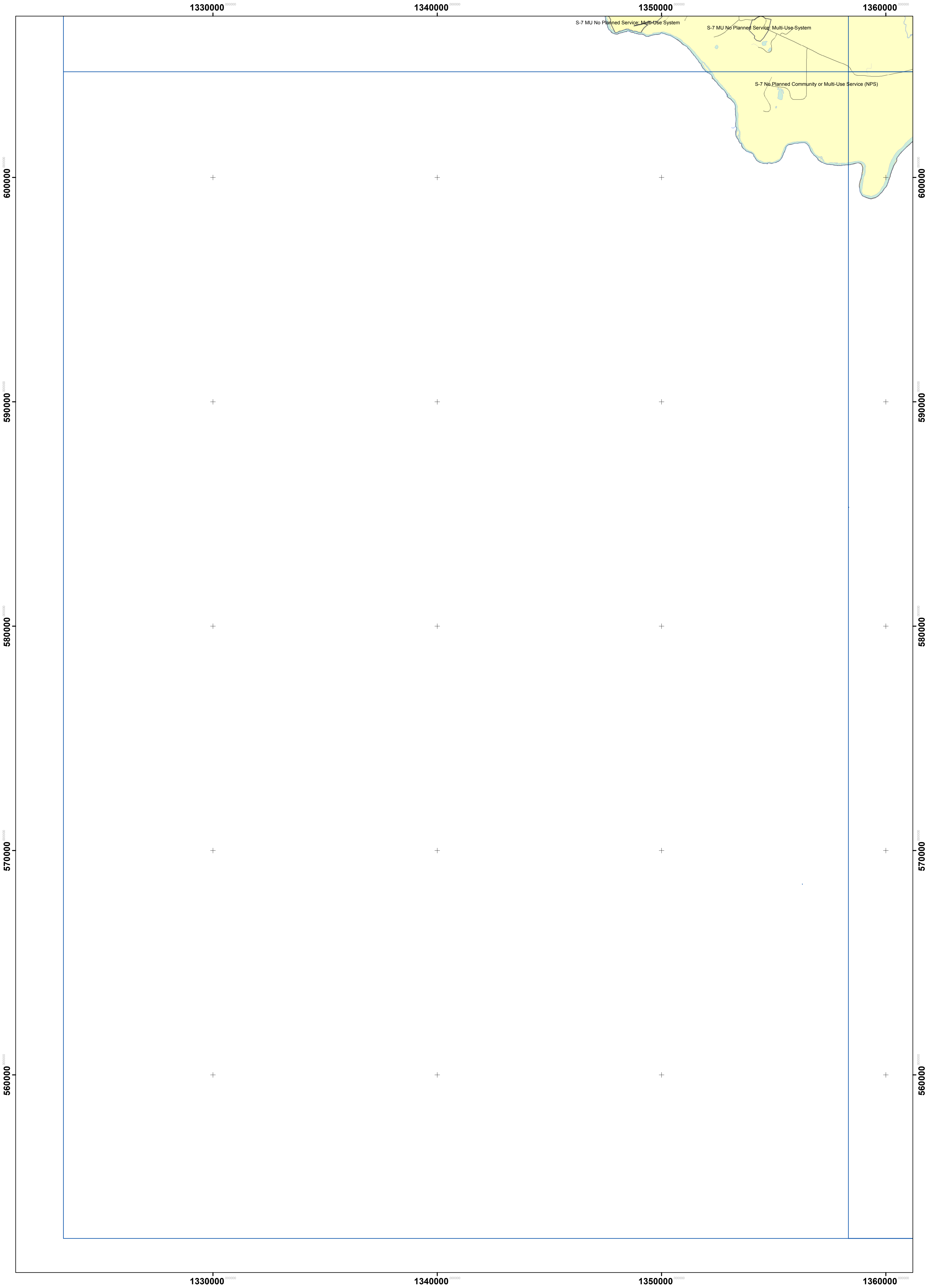
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2,000 0 2,000 4,000 6,000 Feet

**Baltimore County  
Sewer Plan  
2014 Triennial Review  
Map S-17B**





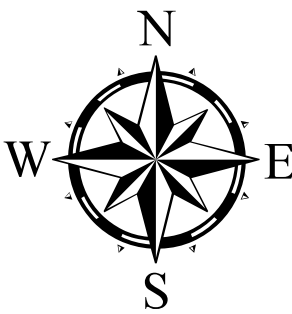
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**Legend**

**Sewer System Facilities**

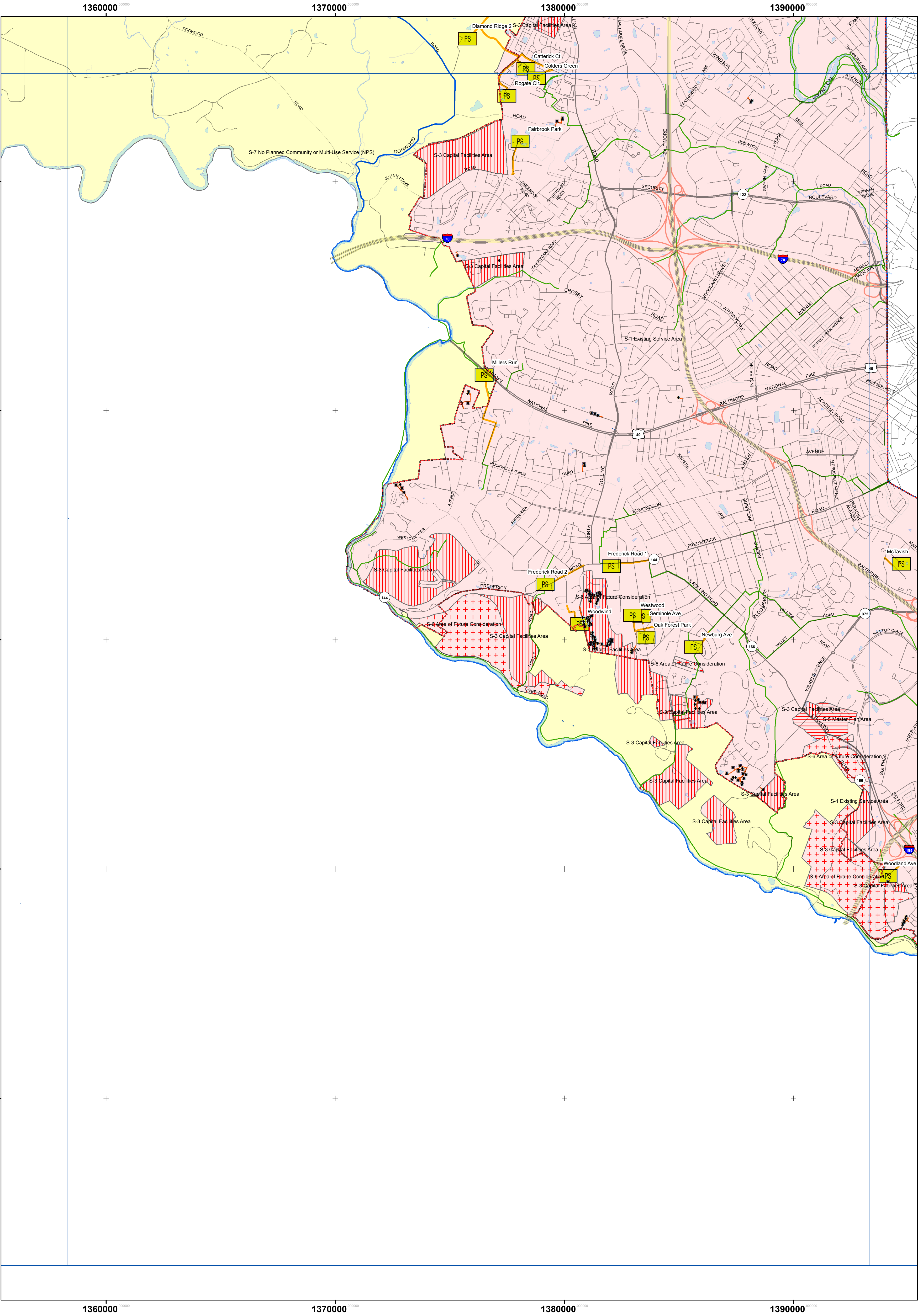
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2,000 0 2,000 4,000 6,000 Feet

**Baltimore County  
Sewer Plan  
2014 Triennial Review  
Map S-21B**





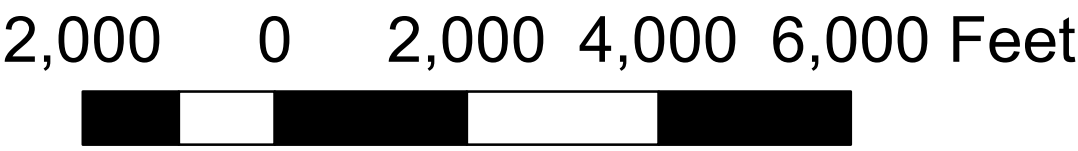
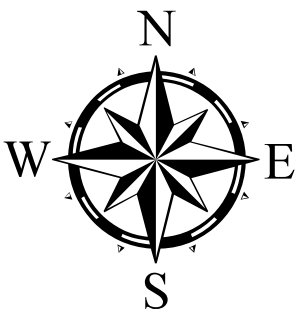
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**Legend**

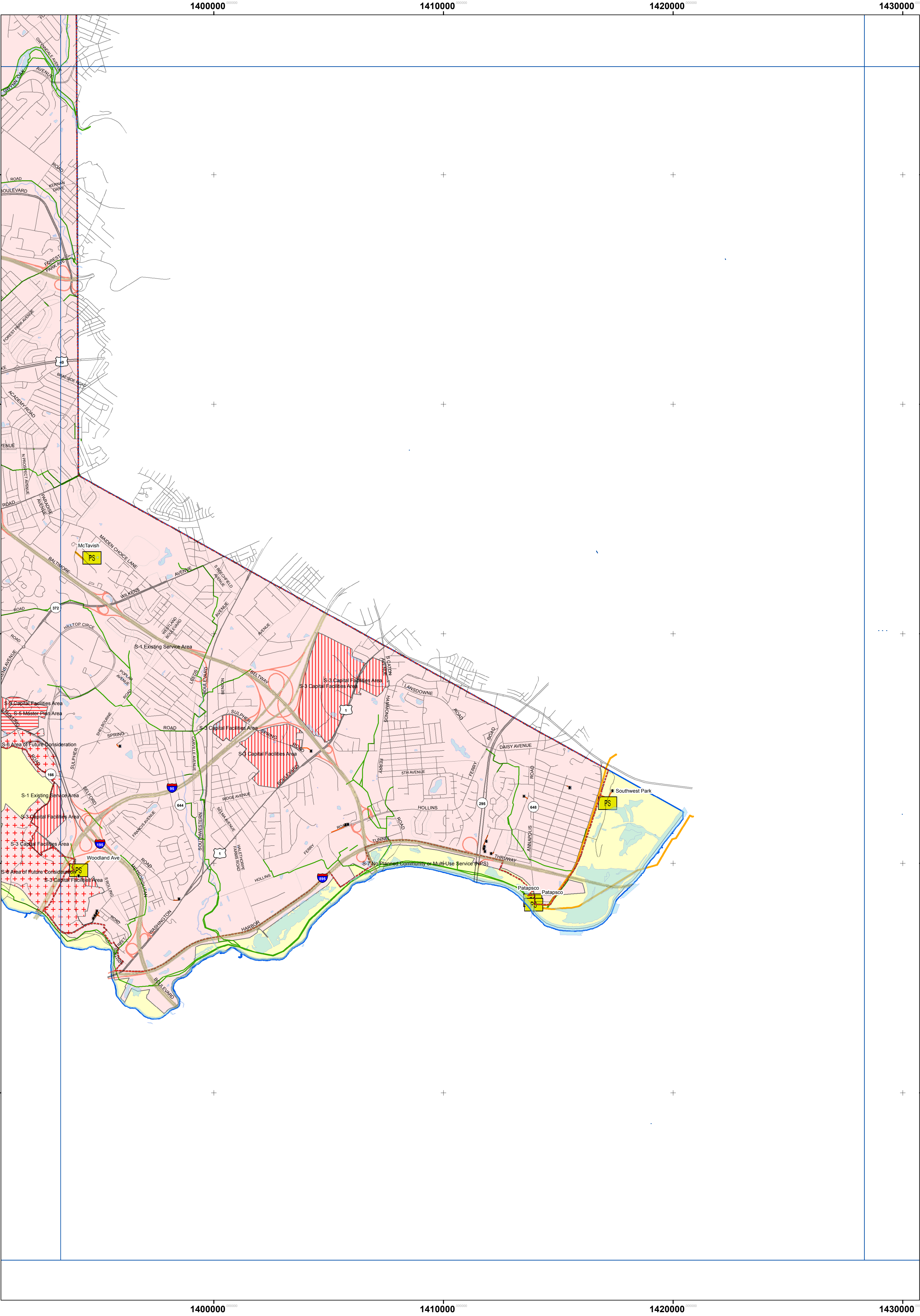
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**Baltimore County  
Sewer Plan  
2014 Triennial Review  
Map S-22A**





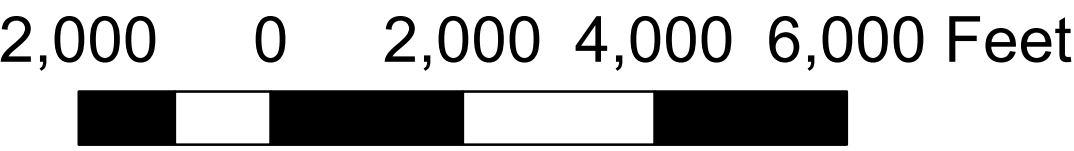
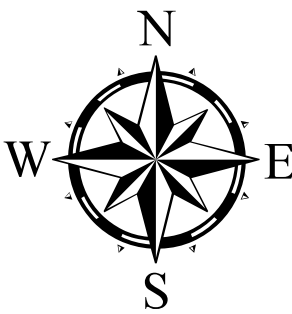
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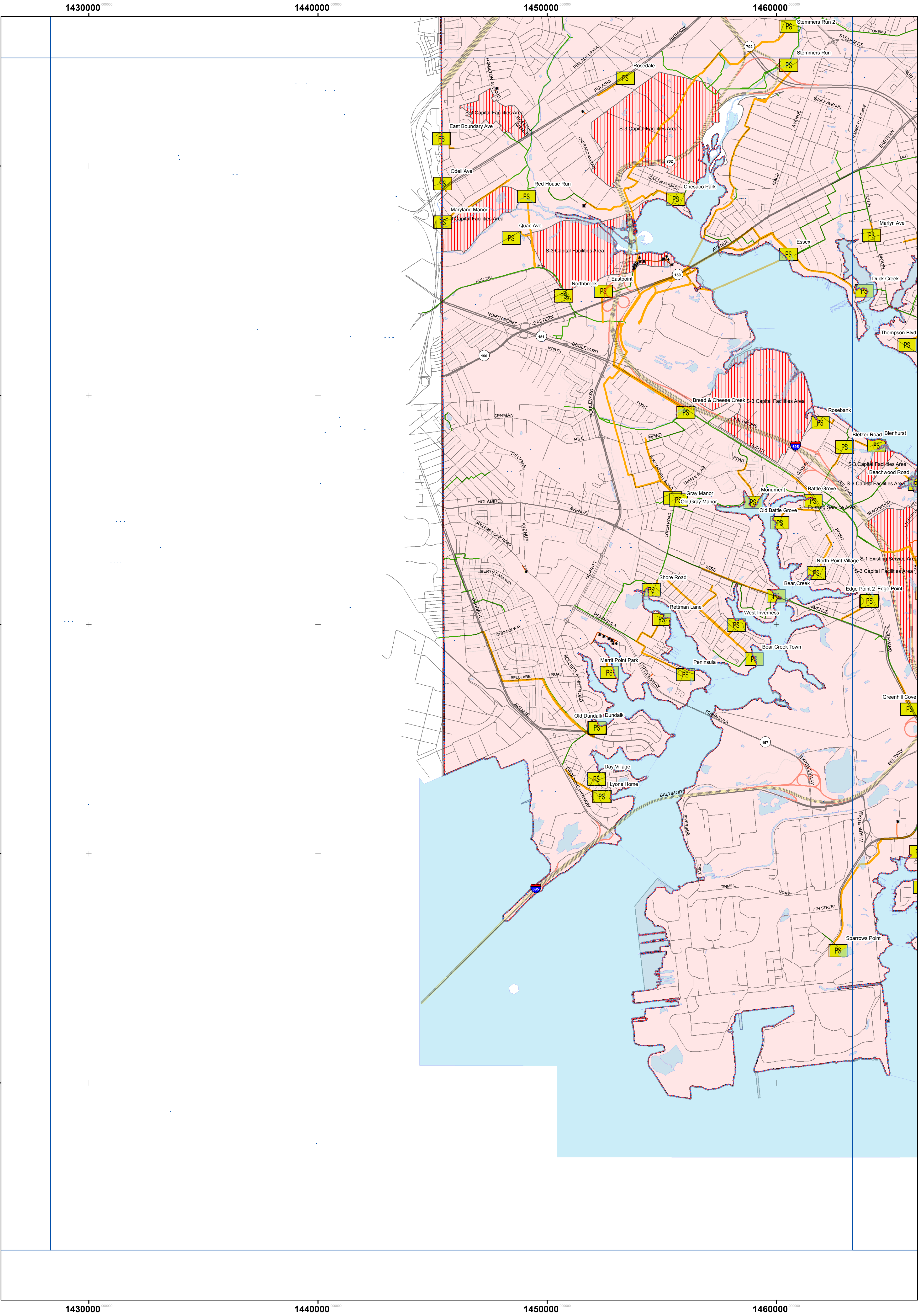
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**Baltimore County  
Sewer Plan  
2014 Triennial Review  
Map S-22B**





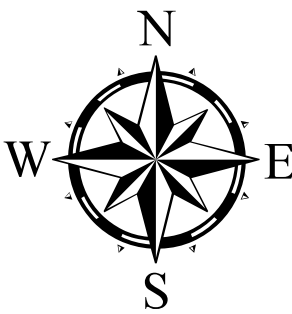
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**Legend**

**Sewer System Facilities**

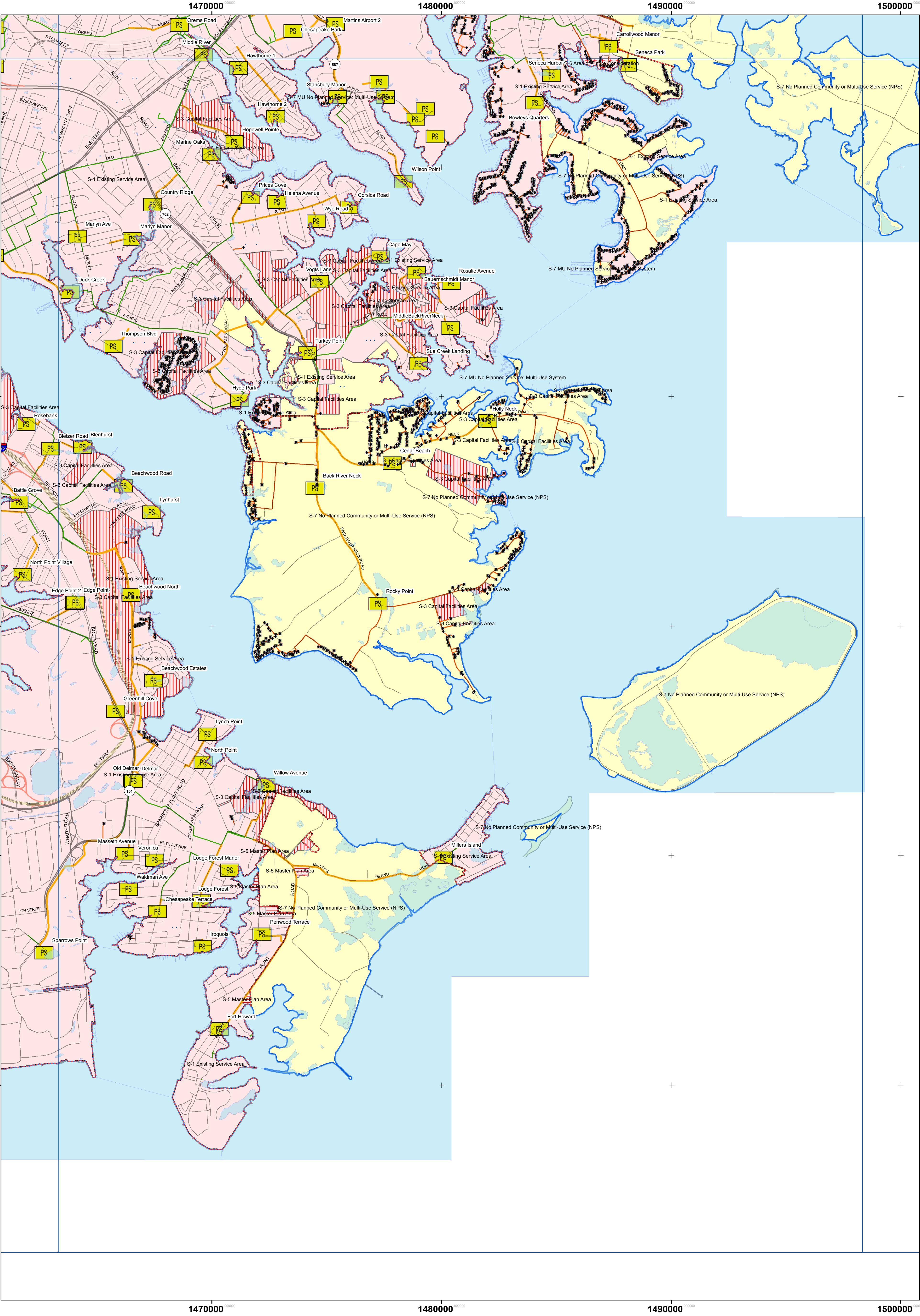
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2,000 0 2,000 4,000 6,000 Feet

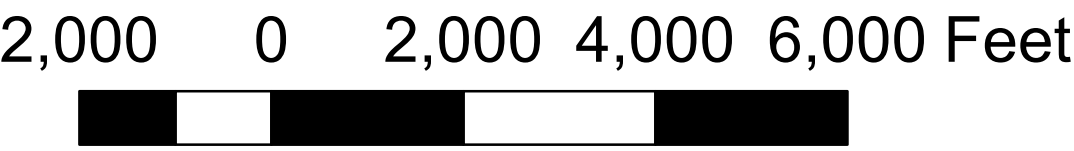
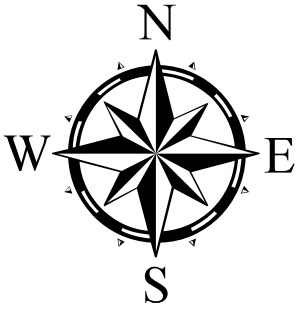
**Baltimore County  
Sewer Plan  
2014 Triennial Review  
Map S-23A**





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