1 Introduction

This chapter outlines the purpose and goals of the 2050 Facilities Plan (2050 FP), provides an overview of the Milwaukee Metropolitan Sewerage District (MMSD), summarizes the accomplishments that have been achieved subsequent to the issuance of the 2020 FP, and outlines the asset management approach that informed the development of the facilities plan. The 2050 FP is MMSD's first facilities plan that uses elements of an asset management approach to direct the efficient management of its infrastructure. The output from the future demand projections and existing facilities assessments[1] that were conducted during the development of MMSD's Asset Management Plan (AMP) were also used in the development of the 2050 FP. Once these studies were completed, the 2050 facilities planning process followed a traditional facilities planning approach to conduct alternative analyses and to identify the recommended projects to meet regulatory, permit, and internal goals.

1.1 Purpose and Goals of this Plan

The goals of this facilities plan are to:

1. Comply with its Wisconsin Department of Natural Resources (WDNR) wastewater discharge permit, which requires MMSD to periodically issue an updated facilities plan to the WDNR. [1]
2. Ensure compliance with Wisconsin Administrative Code, including Chapter NR 110. [2]
3. Meet non-permit goals, including 2035 Vision [3] and 2050 Foundational Goals.

The 2050 FP identifies the projects and other actions required to meet regulatory guidelines and permit requirements (Chapter 7) and addresses MMSD's 2035 Vision and 2050 Foundational Goals (Chapter 8).

The 2050 FP uses elements of an asset management approach to direct the efficient management of MMSD's infrastructure. This approach is based on effective planning, supported by sound data, and reliant on an understanding of asset risk and service delivery.

The asset management approach was selected to build upon the watershed approach used in MMSD's previous facilities plan, which has helped to improve the quality of area waterways and preserve Lake Michigan. Because MMSD's performance against permit requirements historically has been excellent, it was determined that the next step in its facilities planning journey was to broaden its planning scope to an asset management perspective while layering in a triple bottom line (TBL) approach. The TBL approach is consistent with NR 110.09(1)(a) and allows MMSD to broaden its focus to consider not only its financial bottom line, but also the social and environmental aspects of any investment.

In the 2050 FP, MMSD assesses the condition of its systems and associated risks, establishes needs for improvement, evaluates options to address the system needs, and recommends the projects and other actions needed to continue to meet existing and anticipated permit requirements and projected future conditions. These required actions have been guided by MMSD's Foundational Goals and by MMSD Commission policy direction.

[1] *The terms 'future demand' and 'existing' vary by asset system and type of assessment. Specific definitions are provided throughout this document for each term.*

The governing principles for the development of MMSD's 2050 FP come from MMSD Commission direction, including MMSD's 2035 Vision and Strategic Objectives, which is composed of two key elements: integrated watershed management and climate change mitigation/adaptation with an emphasis on energy efficiency. These are all elements that reinforce MMSD's commitment to continue its work as a utility of the future by transforming itself:

> *"MMSD protects public health and the environment through world-class, cost-effective water resource management, leadership, and partnership[2]"*

Additionally, the MMSD Commission issued Policy Direction Regarding 2050 Facilities Plan (Appendix 1A). The following sections outline the drivers, foundational goals, and Commission policy direction that guided this facilities planning effort.

Drivers

Critical social, economic, and environmental drivers will influence MMSD's future. Some of these drivers are addressed in the 2050 FP. MMSD considered and acknowledged the following drivers in the development of the 2050 FP:

- **Regulatory oversight:** Regulation of MMSD will only intensify over time. Regulations on nutrient discharges, air emissions, and nonpoint source discharges will be more stringent. MMSD is at a strong starting point for this driver with excellent permit compliance and the initial steps towards watershed management. Regulatory oversight includes both meeting Wisconsin Administrative Code Chapter NR 110, including level of protection for separate sewer overflows, and Wisconsin Pollutant Discharge Elimination System (WPDES) permit requirements.
- **Limited financial resources:** Financial resources will continue to be a limiting factor in MMSD's efforts. Fluctuations in Federal investment in clean water and the continued pressures locally to keep rates and taxes low will not go away. Sustainable long-term funding, efficient operations, partnerships, new technologies, and good planning are important to maximizing these resources.
- **Public participation:** The public will be more involved in how MMSD moves forward. As water quality improvement targets, such as reductions in nonpoint source pollution, become more external to MMSD, the public may continue to turn to MMSD for solutions. MMSD's willingness and ability to lead may dictate the outcome of this driver.
- **Climate adaptation and mitigation:** The climate is changing. Adapting to and mitigating these changes will be the most important driver for MMSD because it affects all of the other drivers. Further expanding green infrastructure ([GI], adaptation example) and renewable energy (mitigation example) places MMSD well along the path towards resiliency.
- **Cost of energy:** The cost of energy is a significant MMSD expense. Through cost-effective investments and energy management, it is possible to reduce MMSD's energy costs, which will benefit ratepayers.

[2] *https://www.mmsd.com/application/files/6315/4654/9635/2019_Operations_Maintenance_and_Capital_Budgets.pdf*

Goals

MMSD's overarching foundational goals for the 2050 FP include:

- Change MMSD from an organization that impacts the environment to an organization that benefits the environment (G1)
- Incorporate new technologies and operational improvements to minimize MMSD's financial burden on ratepayers (G2)
- Integrate GI into all facets of development and redevelopment (G3)
- Support urban biodiversity activities within the region (G4)
- Provide adaptive leadership to climate change and the other drivers listed above (G5)

Commission Policy Direction

In early 2015, MMSD's Commission adopted a document to guide the development of MMSD's 2050 FP. MMSD's Policy Direction Regarding 2050 FP (2050 FP Policy Direction) was created to align the efforts of the 2050 FP with the 2035 Vision and the achievement of MMSD's policies and strategic objectives with an emphasis on implementing asset management principles in the planning process. This document provides a high-level overview of the 2050 FP goals, which are summarized in the following sections. A copy of the 2050 FP Policy Direction can be found in Appendix 1A.

Intent

The intent of the 2050 FP Policy Direction is to support MMSD's mission to cost-effectively protect the quality of the region's water resources. It also supports the objective of an efficient and high-performance sewerage system and promotes effective planning that reliably and sustainably meets the needs of growth and redevelopment in a cost-effective manner without causing ratepayers to absorb unnecessary increases in fixed costs. Additionally, the 2050 FP Policy Direction notes that the 2050 FP should support integrated regional planning decisions across southeastern Wisconsin that will allow the service area and broader region to thrive economically and environmentally.

Efficient Use of Infrastructure

The 2050 FP Policy Direction notes that contiguous extensions of the sewer service area will promote the efficient and effective operation of the sewerage system, support the effectiveness of MMSD's flood management measures, protect the quality of the service area's waterways, and enhance economic competitiveness.

In the 2050 FP Policy Direction, the Commission encourages development approaches that reduce stormwater runoff by using GI and other cost-effective approaches to augment sanitary sewer conveyance capacity in both the combined and separate sewer service areas. These approaches will also reduce infiltration and inflow to the sanitary system and enhance the ability of the municipalities and MMSD to manage the impacts of wet weather. The efficient use of infrastructure in this manner will support the attainment of regional water quality goals that have been established over the past decade by entities such as MMSD, the Southeastern Wisconsin Regional Planning Commission (SEWRPC), WDNR, and the Southeastern Wisconsin Watersheds Trust, Inc. (SWWT, also known as Sweet Water).

The 2050 FP Policy Direction outlines the specific conditions that the Commission will use to approve the construction of additional conveyance capacity in the 2050 FP and the expansion of the sewer service area.

Integrated Watershed Management

The 2050 FP Policy Direction notes that the 2050 FP must include an integrated approach to watershed management that responds to inter-jurisdictional opportunities and limitations related to wastewater conveyance and treatment, stormwater management, flood risk reduction, and regional water supply strategies. WDNR has agreed to MMSD following an integrated watershed management approach toward water quality improvements as specified in the Total Maximum Daily Loads (TMDL) report approved by the U.S. EPA in March 2018. [4]

This integrated approach will focus on the infrastructure of the watersheds, seeking a healthy balance between two types of infrastructure: grey and green. Grey infrastructure is comprised of the pipes, water reclamation facilities, and other impervious surfaces that store, convey, or treat water. GI uses management approaches and technologies to infiltrate, evapotranspire, capture, and reuse water to maintain or restore natural hydrology.

The 2050 FP Policy Direction outlines that the 2050 FP shall address specific integrated watershed management goals for 2035 and evaluate further improvement initiatives for 2050.

Climate Change Mitigation/Adaptation with an Emphasis on Energy Efficiency

The 2050 FP Policy Direction notes that becoming more energy efficient and meeting more energy needs with renewable sources will help MMSD adapt to changing climate, but it must also consider that climate change may have significant impacts on MMSD in ways beyond energy usage. As the global climate changes, there are likely to be changes within the hydrosphere.

The 2050 FP Policy Direction notes that the 2050 FP shall incorporate specific climate change mitigation/ adaptation goals for 2035, such as reducing MMSD's carbon footprint by 90 percent from its 2005 baseline and evaluate further improvements initiatives for 2050.

Environmental Protection and Public Health

The 2050 FP Policy Direction notes that the 2050 FP should support the attainment of water quality standards and the prevention of waterborne disease. The Commission recognizes that point source pollution control must be accompanied by nonpoint source pollution control in order to meet Clean Water Act (CWA) goals.

The 2050 FP Policy Direction notes that the 2050 FP shall address several specific environmental protection and public health goals for 2035 and evaluate further improvement initiatives for 2050.

1.2 PLANNING HORIZON

The comprehensive 2050 FP is designed to meet MMSD's needs through the year 2050, also known as "Buildout." It recognizes an interim horizon of 2035 to align with MMSD's 2035 Vision and land use and population projections. It also includes a 20-year regulatory planning period from 2020 to 2040, consistent with WDNR facilities planning requirements (Wisconsin Administrative Code Chapter NR 110). The 2050 conditions are assumed to be 100 percent build out of the MMSD planning area, which may or may not occur by 2050. Chapter 3 – Planning Process explains the planning periods in more detail.

1.3 MMSD Overview

MMSD is a State-chartered governmental agency that provides water reclamation and flood management services for 28 municipalities with a population of about 1.1 million people in the greater Milwaukee area. MMSD's mission is to cost-effectively protect the quality of the region's water resources.

Although Milwaukee is the 31st largest city in the United States, its wastewater reclamation system is the largest under private operations. MMSD has consistently been an international leader in wastewater treatment, flood management, GI, financial strength, visioning, and management. In 2017, MMSD received the prestigious "Leading Utility of the World" award by the International Global Water Leaders Group. Additionally, MMSD has received many other awards, including the U.S. Water Prize from the U.S. Water Alliance.

MMSD is responsible for the construction, operation, and maintenance of interceptor sewers and water reclamation facilities within its sewer service area and has authority for flood management and watercourse improvements. MMSD has the authority to impose rules and regulations that may be promulgated by MMSD to promote the best operation of the system, prevent damage to the sewerage system, minimize surcharging in all or part of the sewerage system, prevent interference with the process of sewage treatment or disposal, or to comply with Federal or State pretreatment requirements (Wis. Stats. 200.45). MMSD may acquire property by gift, purchase, lease, or condemnation as necessary for the operations of the Commission (Wis. Stats. 200.11).

Background

MMSD was created in 1982 by the reorganization of its predecessor bodies - the Metropolitan Sewerage District of the County of Milwaukee and the City of Milwaukee Sewerage Commission. The composition of the MMSD Commission, which functions as MMSD's board, is authorized under Wis. Stats. 200.23 as follows: seven members are appointed by the Mayor of the City of Milwaukee (subject to Common Council confirmation) and four members (from outside City of Milwaukee) are appointed by an Executive Council of the Intergovernmental Cooperation Council. The Executive Council includes the elected executive officer of each village and city (except South Milwaukee) within Milwaukee County. MMSD has financial powers to raise funds for both its capital improvement program and its operation and maintenance responsibilities. The Commissioners establish and enforce MMSD policy through two standing committees: The Policy, Finance & Personnel Committee and the Operations Committee. Most of MMSD's major financing decisions require an approving vote of two-thirds of all Commissioners.

Planning Area Description

This section describes the approved MMSD service area as of 2019 and the planning area considered for the 2050 FP (2050 FP planning area).

MMSD is authorized by State statute to provide services to areas beyond its legal boundary, which is coincident with the boundary of Milwaukee County, excluding the City of South Milwaukee (discussed further in Chapter 4). To qualify for service, the areas must be within the multi-county drainage area delineated by SEWRPC and within the MMSD service area approved by SEWRPC and MMSD. The 2050 FP planning area encompasses approximately 423 square miles and is presented in Figure 1-1. In general, MMSD's planning area has not changed since the 2020 FP; however, the planning area used for the development of the 2050 FP, which will become MMSD's official planning area upon approval of the 2050 FP, includes the following additional areas: portions of Caledonia, Raymond, Brookfield, New Berlin, and Menomonee Falls. Tables 1-1 through 1-4 present an overview of the demographics and the land use within the 2050 FP planning area.

Approximately 26 square miles, or six percent of 2050 FP planning area, has combined sewers. The 2050 FP planning area is located within seven watersheds. All but the Fox River watershed drain to Lake Michigan; the Fox River watershed drains to the Mississippi River (Figure 1-2).

Asset Systems Description

MMSD manages the following major asset systems:

Conveyance and Storage Asset System: MMSD's active sewer system is composed of 295 miles of interceptor sewer, 6 miles of combined sewers, 24 miles of near surface collector systems, 25 miles of inline storage, 7 miles of remote storage, 3 miles of South Shore force main, and 1.25 miles of clear water pipes that convey and store wastewater for the region.[3]

WRFs and Biosolids Asset System: Wastewater within MMSD's service area is reclaimed at two WRFs: The Jones Island Water Reclamation Facility (JIWRF), which began operations in 1925, and the South Shore Water Reclamation Facility (SSWRF), which began operations in 1968. MMSD processes biosolids at JIWRF into a fertilizer product called Milorganite®.

Watercourse and Flood Management (WCFM) Asset System: The Watercourse and Flood Management Asset System includes streams for which MMSD has jurisdictional flood management authority. The jurisdictional streams are located within these six watersheds: Kinnickinnic River, Lake Michigan, Menomonee River, Milwaukee River, Oak Creek and Root River, as shown in Figure 1-2. It also includes MMSD's Greenseams® Program which is an innovative flood management program that permanently protects key lands containing water-absorbing hydric soils. The Greenseams® Program preserves regional flood capacity, preserves water quality, and protects MMSD's structural flood management projects.

GI Asset System: MMSD has implemented and promoted the use of GI assets because they either retain or detain the natural flow of water to discharge points and, by doing so, complement grey infrastructure by preserving capacity in MMSD's reclamation facilities as well as provide benefits to water quality, biodiversity, and climate change. These assets include rain gardens, stormwater trees, green roofs, bio-swales, porous pavement, native landscaping, and rainwater catchments. In general, MMSD does not own the GI assets included in the 2050 FP, but typically provides funding assistance to public and private entities for their construction and has maintenance oversight responsibility for a period of time after their construction. MMSD maintains an ownership interest in GI it funds via a conservation easement.

Administrative Facilities: MMSD owns several ancillary or support facilities, including:

- MMSD Headquarters Building
- MMSD Laboratory Building
- S. 13th Street Field Office
- N. 25th Street Maintenance Facility
- N. 32nd Street Field Office
- Milwaukee River Flushing Station

[3] *Data supplied by MMSD's Facility Information System as of December 2018*

- Kinnickinnic River Flushing Station
- Operations and Administration Buildings at the Jones Island WRF
- Operations and Administration Buildings at the South Shore WRF

The first four asset systems—Conveyance and Storage, WRFs and Biosolids, Watercourse and Flood Management, and GI—were evaluated as part of the development of the 2050 FP. A full evaluation of the Administration Facilities was not completed as part of the 2050 FP. For more details about these asset systems, refer to Appendix 1B, Functional Descriptions of MMSD Asset Systems.

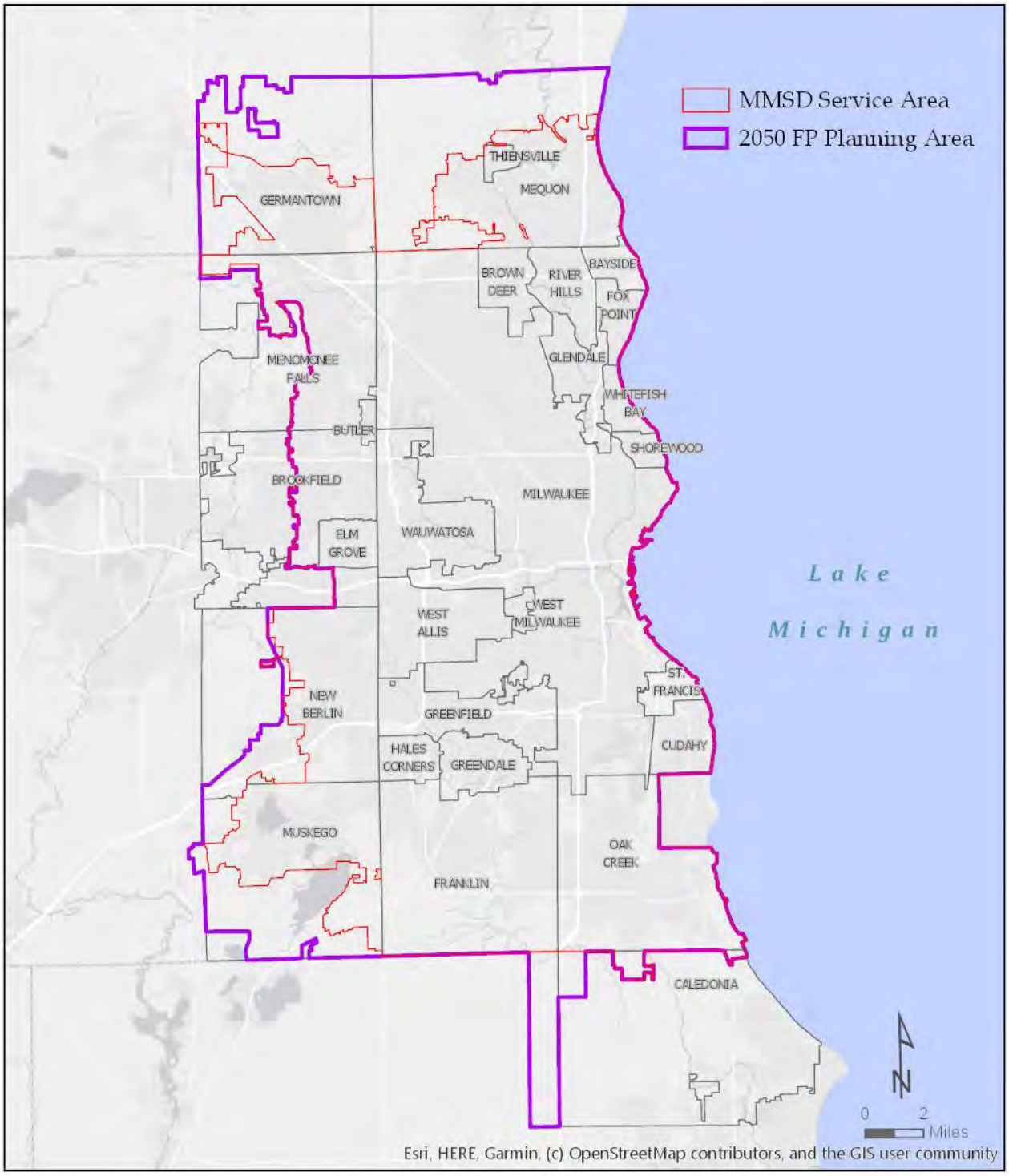

FIGURE 1-1: 2050 FP PLANNING AND SERVICE AREAS

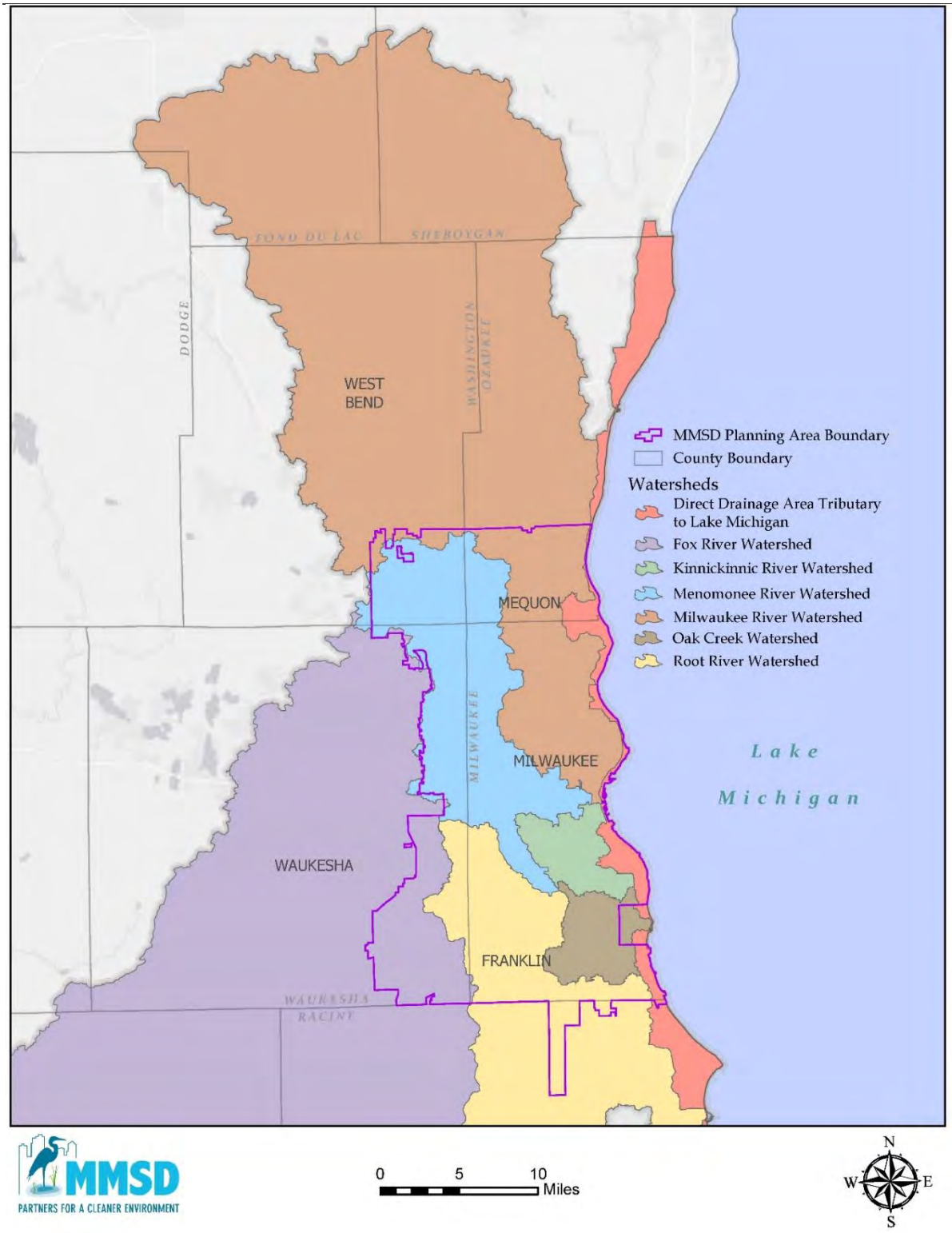

FIGURE 1-2: GREATER MILWAUKEE WATERSHEDS

TABLE 1-1: POPULATION AND HOUSEHOLDS BY CIVIL DIVISIONS

Municipalities within MMSD 2050 FP Planning Area	Population (2017)	Households (2017)
Village of Bayside	4,364	1,767
City of Brookfield	15,614	5,927
Village of Brown Deer	12,076	5,429
Village of Butler	1,847	895
Village of Caledonia	508	189
City of Cudahy	18,347	7,433
Village of Elm Grove	6,207	2,349
Village of Fox Point	6,706	2,777
City of Franklin	36,295	13,649
Village of Germantown	20,014	7,923
City of Glendale	12,319	5,306
Village of Greendale	14,293	5,964
City of Greenfield	36,895	16,568
Village of Hales Corners	7,704	3,162
Village of Menomonee Falls	30,236	12,538
City of Mequon	23,873	9,151
City of Milwaukee	599,445	230,650
City of Muskego	24,449	9,031
City of New Berlin	34,397	14,682
City of Oak Creek	35,579	14,078
Village of Raymond[1]	645	257
Village of River Hills	1,558	570
Village of Shorewood	13,367	6,016
City of St. Francis	9,532	4,681
City of Thiensville	3,182	1,542
City of Wauwatosa	47,687	20,395
City of West Allis	60,546	27,565
Village of West Milwaukee	4,200	1,970
Village of Whitefish Bay	14,099	5,229
Total	**1,095,984**	**437,693**

1) Village of Raymond is new, not one of the 28 municipalities currently in the MMSD's planning area.

Source: 2017 American Community Survey (ACS) 5-Year Estimate, U.S. Census

TABLE 1-2: RESIDENTIAL LAND USE

Municipalities within MMSD 2050 FP Planning Area	SEWRPC Residential Land Use Categories Square Miles (2010)			
	Low-Density	Mid-Density	High-Density	Suburban / Rural
Village of Bayside	0.9	0.0	0.0	0.4
City of Brookfield	5.6	0.0	0.2	0.3
Village of Brown Deer	0.4	0.0	0.2	1.4
Village of Butler	0.0	0.0	0.0	0.2
Village of Caledonia	0.2	0.0	0.0	0.1
City of Cudahy	0.0	0.0	0.7	0.7
Village of Elm Grove	1.9	0.0	0.1	0.0
Village of Fox Point	1.0	0.0	0.0	0.7
City of Franklin	4.2	0.0	0.7	2.6
Village of Germantown	2.5	0.0	0.5	2.1
City of Glendale	0.1	0.0	0.4	1.7
Village of Greendale	0.5	0.0	0.3	1.5
City of Greenfield	1.9	0.0	1.1	2.1
Village of Hales Corners	1.1	0.0	0.1	0.4
Village of Menomonee Falls	4.5	0.1	0.5	1.9
City of Mequon	10.0	0.7	0.6	0.2
City of Milwaukee	0.8	0.0	25.9	5.1
City of Muskego	4.0	0.4	0.3	2.3
City of New Berlin	5.7	0.0	0.6	2.3
City of Oak Creek	3.2	0.0	0.7	1.9
Village of Raymond[1]	0.4	0.0	0.0	0.0
Village of River Hills	0.6	1.9	0.0	0.0
Village of Shorewood	0.0	0.0	0.7	0.1
City of St. Francis	0.0	0.0	0.5	0.2
City of Thiensville	0.1	0.0	0.1	0.5
City of Wauwatosa	0.0	0.0	2.4	2.2
City of West Allis	0.4	0.0	2.9	1.4
Village of West Milwaukee	0.0	0.0	0.2	0.0
Village of Whitefish Bay	0.1	0.0	1.0	0.1
Total	**50.2**	**3.1**	**40.7**	**32.6**

1) Village of Raymond is new, not one of the 28 municipalities currently in the MMSD's planning area.

Source: 2010 SEWRPC Land Use

TABLE 1-3: COMMERCIAL, INDUSTRIAL, GOVERNMENTAL & INSTITUTIONAL, AND COMMERCIAL & UTILITY LAND USES

Municipalities within MMSD 2050 FP Planning Area	SEWRPC Land Use Categories Square Miles (2010)			
	Commercial	Industrial	Government and Institutional	Communication and Utilities
Village of Bayside	0.0	0.0	0.0	0.0
City of Brookfield	0.4	0.2	0.5	0.0
Village of Brown Deer	0.2	0.1	0.1	0.0
Village of Butler	0.0	0.2	0.0	0.0
Village of Caledonia	0.0	0.0	0.0	0.1
City of Cudahy	0.2	0.4	0.2	0.0
Village of Elm Grove	0.0	0.0	0.2	0.0
Village of Fox Point	0.0	0.0	0.1	0.0
City of Franklin	0.4	1.0	0.6	0.1
Village of Germantown	0.3	0.9	0.2	0.1
City of Glendale	0.3	0.3	0.3	0.1
Village of Greendale	0.1	0.1	0.2	0.0
City of Greenfield	0.4	0.0	0.6	0.2
Village of Hales Corners	0.1	0.0	0.1	0.0
Village of Menomonee Falls	0.5	1.1	0.3	0.0
City of Mequon	0.3	0.3	0.7	0.1
City of Milwaukee	3.2	4.8	6.1	0.8
City of Muskego	0.2	0.6	0.3	0.0
City of New Berlin	0.4	1.2	0.6	0.1
City of Oak Creek	0.5	1.0	0.5	0.7
Village of Raymond[1]	0.1	0.2	0.0	0.0
Village of River Hills	0.0	0.0	0.1	0.0
Village of Shorewood	0.0	0.0	0.1	0.0
City of St. Francis	0.1	0.1	0.2	0.1
City of Thiensville	0.0	0.0	0.0	0.0
City of Wauwatosa	0.4	0.4	1.0	0.0
City of West Allis	0.6	0.5	0.4	0.2
Village of West Milwaukee	0.1	0.3	0.0	0.0
Village of Whitefish Bay	0.0	0.0	0.1	0.0
Total	**8.7**	**13.8**	**13.8**	**2.7**

1) Village of Raymond is new, not one of the 28 municipalities currently in the MMSD's planning area.

Source: 2010 SEWRPC Land Use

TABLE 1-4: OPEN LANDS, FREEWAY, TRANSPORTATION, RECREATIONAL, AGRICULTURAL, AND LANDFILL USES

Municipalities within MMSD 2050 FP Planning Area	SEWRPC Residential Land Use Categories, Square Miles (2010)					
	Open Lands	Freeway	Transportation (w/out freeway)	Recreational	Agricultural	Land Fill
Village of Bayside	0.5	0.1	0.4	0.0	0.0	0.0
City of Brookfield	2.0	0.1	2.4	0.3	0.2	0.0
Village of Brown Deer	0.3	0.0	1.2	0.3	0.0	0.0
Village of Butler	0.1	0.0	0.3	0.0	0.0	0.0
Village of Caledonia	0.6	0.0	0.2	0.1	1.3	0.0
City of Cudahy	0.8	0.0	1.3	0.3	0.1	0.0
Village of Elm Grove	0.2	0.0	0.8	0.1	0.0	0.0
Village of Fox Point	0.2	0.0	0.6	0.1	0.0	0.0
City of Franklin	10.2	0.0	4.0	1.2	9.3	0.4
Village of Germantown	9.8	0.4	3.4	0.6	13.6	0.0
City of Glendale	0.7	0.2	1.6	0.3	0.0	0.0
Village of Greendale	1.4	0.0	1.2	0.4	0.0	0.0
City of Greenfield	1.6	0.6	2.7	0.2	0.0	0.0
Village of Hales Corners	0.5	0.0	0.7	0.2	0.0	0.0
Village of Menomonee Falls	3.7	0.2	3.9	0.5	1.7	0.6
City of Mequon	11.7	0.3	4.2	1.7	16.1	0.0
City of Milwaukee	11.4	2.6	30.4	5.0	0.6	0.1
City of Muskego	13.0	0.0	2.7	0.8	9.1	0.6
City of New Berlin	4.7	0.5	4.0	0.7	3.1	0.0
City of Oak Creek	9.0	0.5	4.3	0.7	5.5	0.0
Village of Raymond[1]	1.1	0.2	0.4	0.1	3.5	0.0
Village of River Hills	1.7	0.1	0.4	0.3	0.1	0.0
Village of Shorewood	0.1	0.0	0.5	0.1	0.0	0.0
City of St. Francis	0.6	0.0	0.6	0.1	0.0	0.0
City of Thiensville	0.1	0.0	0.2	0.0	0.0	0.0
City of Wauwatosa	1.7	0.4	3.6	1.0	0.0	0.0
City of West Allis	0.7	0.3	3.4	0.7	0.0	0.0
Village of West Milwaukee	0.1	0.0	0.4	0.0	0.0	0.0
Village of Whitefish Bay	0.1	0.0	0.5	0.0	0.0	0.0
Total	**88.7**	**6.4**	**80.7**	**15.9**	**64.2**	**1.8**

1) Village of Raymond is new, not one of the 28 municipalities currently in the MMSD's planning area.

Source: 2010 SEWRPC Land Use

1.4 FACILITIES PLANNING

What is Facilities Planning?

The basic purpose of facilities planning for a utility is to assess the condition of its system(s), establish a need for improvement, evaluate options to address system needs, and to identify the most cost-effective strategies to address system needs (See Wis. Admin. Code NR 110.09(1)). The cost-effective strategies are those that result in the expenditure of the minimum *total resources* costs over the planning period, where the total resources costs include not only financial costs, but also environmental and social considerations as well as other non-monetary factors (triple bottom line) (Wis. Admin. Code NR 110.09(1)).

History of Facilities Planning

Section 201 of the CWA requires that all wastewater treatment facilities have a plan to determine the control and treatment requirements needed to meet Federal water quality goals, and Section 208 of the CWA identifies the items that a plan should, at a minimum, include to be approved as an areawide waste treatment management plan. [5] The requirements of the CWA Section 208 have been approved by the state of Wisconsin and included in Wisconsin Administrative Code Chapter NR 110. [2] MMSD has taken the opportunity to expand its facility planning to address all of its major asset systems. Consistent with State regulations, to address MMSD planning area needs, and to provide responsible pollution abatement, MMSD has historically conducted facilities planning at 10-year intervals with a 20-year planning horizon.

The following sections outline prior facilities planning efforts conducted by MMSD from 1977 to 2007. In contrast to the planning effort for the 2050 FP, which incorporates an asset management approach, MMSD's previous planning efforts used a watershed approach (2020 FP) and a sub-regional approach (facilities plans prior to the 2020 FP).

Master Facilities Plan

In response to the CWA amendments and two legal actions, the Milwaukee Water Pollution Abatement Program (MWPAP) was initiated in 1977. The Master Facilities Plan, which defined the goals of the MWPAP, was adopted by the Commission in 1980 and approved by the WDNR and the U.S. EPA in 1981. The MWPAP, completed in 1996, was designed to meet the wastewater conveyance, storage, and reclamation facilities needs of MMSD's planning area, as defined by the Master Facilities Plan, through the year 2005. The MWPAP included the planning and construction of the deep tunnel system and the expansion and upgrade of MMSD's two water reclamation facilities. By reducing sewer overflows, the implementation of the MWPAP reduced the loading of pollutants to area waterways from separate and combined sanitary sewer overflows (SSOs/CSOs), which is a main source of point source pollution.

Milwaukee Estuary Study

In 1987, SEWRPC worked cooperatively with WDNR and MMSD to complete a plan to address water quality issues in the Milwaukee Harbor estuary. This Water Resources Management Plan for the Milwaukee Harbor Estuary (SEWRPC Planning Report No. 37) set forth recommendations to control water pollution from separate and combined sewer overflows. [6] This plan determined the level of protection that would be provided by such control as well as from other required point and nonpoint sources of pollution to achieve established water use objectives. The Milwaukee Estuary Study used state-of-the-art water quality modeling to evaluate the impacts of pollution control measures on water quality.

2010 Facilities Plan

The 2010 Facilities Plan was completed in 1998 to determine the facilities MMSD needed to construct to meet regional wastewater conveyance and treatment needs through the year 2010. The 2010 Facilities Plan was completed after the major components of the MWPAP were in operation; thus, the 2010 planning effort benefited from the operation of facilities and data that the MWPAP provided.

2020 Facilities Plan

The 2020 Facilities Plan was completed in 2007 to address needed improvements to all relevant systems so that these systems could accommodate regional growth and protect water resources. Consistent with evolving U.S. EPA policy, MMSD used a watershed approach in developing the 2020 Facilities Plan. The vision of the U.S. EPA's Watershed Rule is to provide a framework that advances State and local efforts in achieving the highest attainable uses of waters of the United States by promoting flexible, effective watershed approaches to manage and improve water quality. The 2020 Facilities Plan identified the facilities, programs, operational improvements, and policies necessary to achieve the water resource goals inspired by the public as well as those required under WDNR regulations, State law, and U.S. EPA regulations established and enforced under the Federal CWA. The key findings of the 2020 FP were:

1. Nonpoint pollution (e.g., stormwater runoff) is the largest source of fecal coliform bacteria, a primary pollutant of concern.
2. Reducing (or even eliminating) SSOs will result in little or no water quality improvement on an annual basis. A 5-year level of protection for SSO control was determined to be consistent with State and Federal requirements.
3. Significant improvements to water quality can only be achieved through regional implementation of extensive measures to reduce pollution from nonpoint sources.

1.5 ACCOMPLISHMENTS SINCE 2020 FACILITIES PLAN

The 2020 Facilities Plan identified a number of key elements to meet its goals. MMSD has implemented the key recommendations of the 2020 FP including developing 3rd party TMDLs, establishing the Fresh Coast Resource Center, and making a number of water reclamation facility energy improvements.

1.6 FACILITIES PLANNING APPROACH

After conducting the 2020 Facilities Plan and implementing the key recommendations, MMSD can shift the focus back to completing the necessary planning for facilities improvements within MMSD's planning area, similar to previous facilities plans. The 2050 FP incorporates an asset management approach into the traditional facilities planning process. The 2050 FP project team analyzed MMSD's assets against four possible failure modes (capacity, physical mortality, level of service, and economic efficiency) to identify when systems may be at risk of failure to achieve desired levels of service – identified as "gaps."

Alternative analyses and additional evaluations were conducted to identify recommended projects to meet regulatory guidelines and permit requirements within the 2020 to 2040 regulatory planning window and to meet 2050 Foundational Goals through the year 2050.

The resulting implementation plan (Chapter 9) includes a brief summary and an associated implementation schedule for recommended projects. The implementation plan also includes a financing plan with funding recommendations and estimated financial impacts on ratepayers.

1.7 STAKEHOLDER INVOLVEMENT

The 2050 FP has been developed as a tool to meet regulatory guidelines and permit requirements as well as the needs of MMSD stakeholders. To that end, Table 1-5 outlines the following key stakeholders that were consulted on the development of this facilities plan or had specific needs or requirements that influenced the plan.

TABLE 1-5: 2050 FACILITIES PLAN STAKEHOLDER ROLES

Stakeholder	Role in 2050 FP Development
VWM	MMSD's contracted operator provides input on the asset management processes and development of the Facilities Plan document. The task leads from MMSD and the 2050 FP project team worked closely with VWM in development of the conveyance and WRF sections of chapters 4 and 5 of the 2050 FP.
Municipalities and the Technical Advisory Team (TAT)	Technical staff from the 28 municipalities served by MMSD. MMSD staff regularly provide a briefing to the TAT on the 2050 FP. The TAT members serve as a technical reviewer of the facilities plan, including commenting on recommended projects and implementation plans.
WDNR	State agency that regulates the operation of MMSD's water reclamation facilities through permits and EPA. MMSD staff and 2050 FP project team members met regularly with WDNR to discuss the 2050 FP. WDNR members may also be present at other meetings (including TAT meetings) where the 2050 FP was discussed.
SWWT, also known as Sweet Water	Non-profit organization dedicated to securing the sustainable health of the Greater Milwaukee watersheds. MMSD shared information with and sought input from the SWWT Policy and Science Committees throughout the planning process. SWWT members also participated in a sub-group created for the Urban Biodiversity Plan, an early-out deliverable of the 2050 FP planning process.
SEWRPC	Official metropolitan planning organization and regional planning commission for the seven-county southeastern Wisconsin area. MMSD staff and 2050 FP project team members met regularly with SEWRPC to discuss the Asset Management Plan and the 2050 FP. SEWRPC members were also present at SWWT committee meetings where the 2050 FP was discussed.
Customers, General Public	The general public was invited to participate in the 2050 FP. The facilities plan was featured at the Wauwatosa Green Summit in 2018 and 2019, the Doors Open Milwaukee event at the Jones Island Reclamation Facility in 2016, 2018, and 2019, and information was shared at the Clean Rivers, Clean Lakes conference in 2016 and 2018.

Additionally, a draft version of the 2050 FP was published on MMSD's website on June 1, 2020 for the 30-day public review period.

1.8 APPENDICES

- Appendix 1A – 2050 Facilities Plan Policy Direction
- Appendix 1B – Functional Descriptions of MMSD Asset Systems

1.9 REFERENCES

[1] Wisconsin Department of Natural Resources, *WPDES Permit No. WI-0036820-04-0,* Madison, WI: WDNR, 2019.

[2] Legislative Reference Bureau, *Wisconsin Administrative Code, Chapter NR 110, Sewerage Systems,* Madison, WI: Legislative Reference Bureau, 2017.

[3] Milwaukee Metropolitan Sewerage District, "The Milwaukee Metropolitan Sewerage District's 2035 Vision and Strategic Objectives," MMSD, Milwaukee, WI, 2011.

[4] CDM Smith, "Total Maximum Daily Loads for Total Phosphorus, Total Suspended Solids, and Fecal Coliform Milwaukee River Basin, Wisconsin," CDM Smith, Milwaukee, WI, March 19, 2018.

[5] Senate and House of Representatives of the United States of America, "An Act to amend the Federal Water Pollution Control Act (Clean Water Act)," 92nd United States Congress, Washington D.C., 1972.

[6] Southeastern Regional Planning Commission, "A Water Resources Management Plan for the Milwaukee Harbor Estuary," SEWRPC, Waukesha, WI, March 1987.