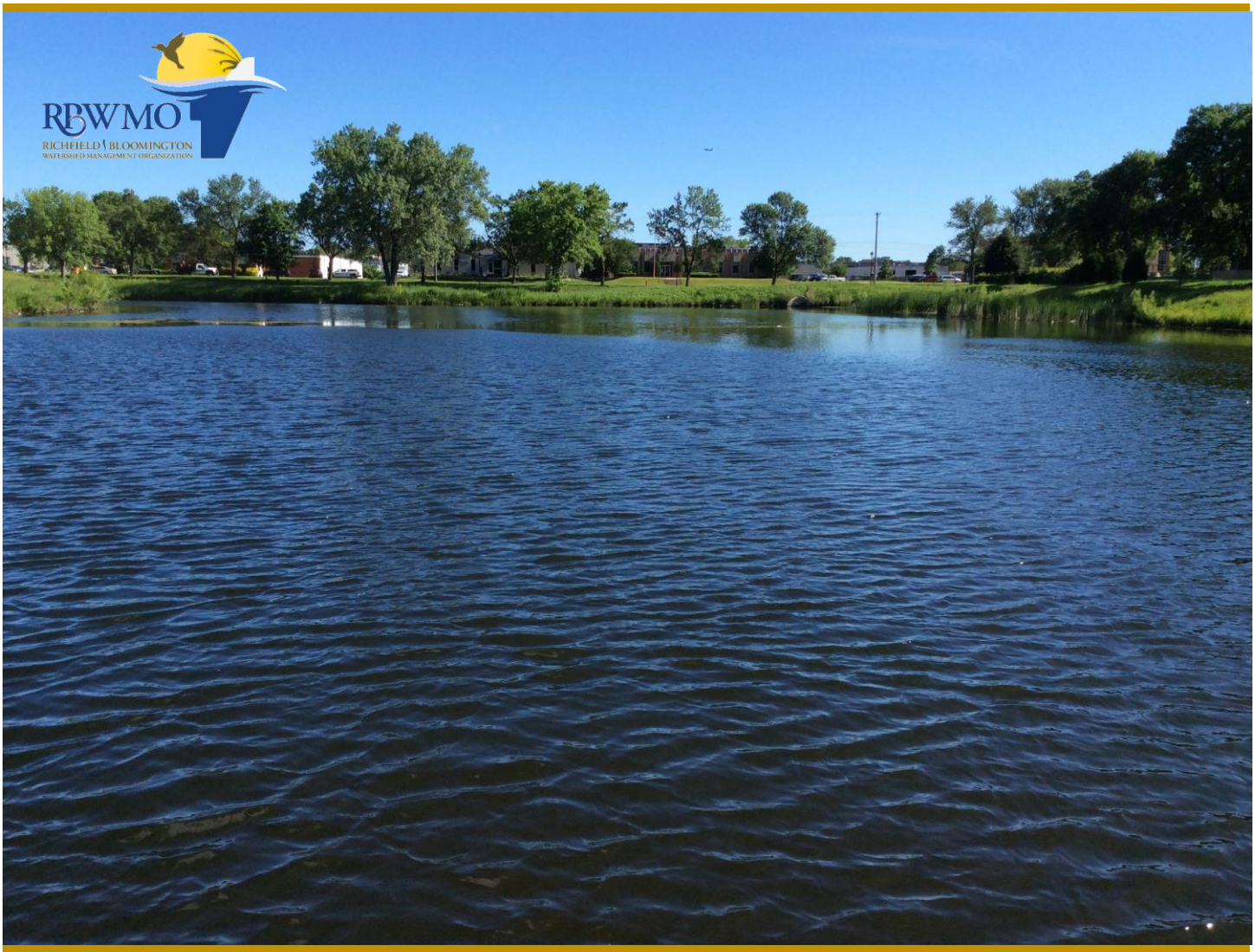

Comprehensive Watershed Management Plan
2018 – 2027

Richfield-Bloomington Watershed Management Organization

Richfield-Bloomington Watershed Management Organization
Comprehensive Watershed Management Plan
(**March, 2018**)

Approved by the Minnesota Board of Water and Soil Resources on December 20, 2017.

Adopted by the Richfield-Bloomington Watershed Management Organization (RBWMO) Board of Commissioners on March 5, 2018.

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Photo 0-1: Wood Lake Nature Center

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Appendix A: Joint Powers Agreement Establishing and Empowering the Richfield-Bloomington Watershed Management Organization

Acronyms and Abbreviations

Act	Metropolitan Surface Water Management Act
Board	Board of Commissioners
BWSR	Board of Water and Soil Resources
CAC	Citizen Advisory Committee
CIP	Capital Improvement Projects
DWSMA	Drinking Water Supply Management Area
H&H	Hydrology and Hydraulics
JPA	Joint Power Agreement
LMRWD	Lower Minnesota River Watershed District
LWMP	Local Water Management Plan
M.S.	Minnesota Statutes
MAISRC	Minnesota Aquatic Invasive Species Research Center
MDH	Minnesota Department of Health
MDNR	Minnesota Department of Natural Resources
MITPPC	Minnesota Invasive Terrestrial Plants and Pests Center
MNDOT	Minnesota Department of Transportation
MNRAM	Minnesota Routine Assessment Method
MPCA	Minnesota Pollution Control Agency
MSP	Minneapolis – St. Paul
NCHF	North Central Hardwood Forest
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NWS	National Weather Service
O&M	Operations and Maintenance
RBWMO	Richfield-Bloomington Watershed Management Organization
SDS	State Disposal System
Sq.mi.	Square miles
SWMP	Storm Water Management Plan

TAC	Technical Advisory Committee
TEP	Technical Evaluation Panel
TMDL	Total Maximum Daily Load
TP	Total Phosphorus
TP40	Technical Paper 40
TSI	Trophic State Index
USFWS	United States Fish and Wildlife Service
VIC	Voluntary Investigation and Cleanup
WCA	Wetland Conservation Act
WD	Watershed District
WHPP	Wellhead Protection Plan

Photo 0-1: Smith Pond 2000 Aerial Photo

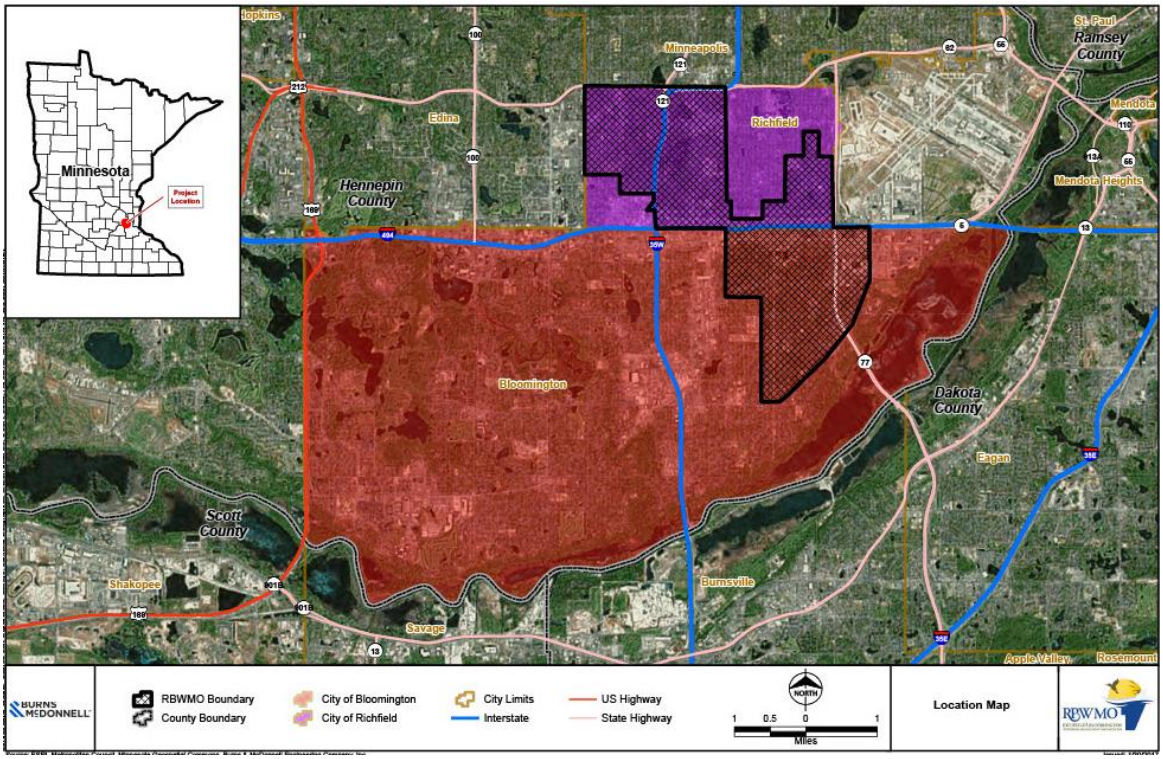
1 Executive Summary

In response to the 1983 Metropolitan Surface Water Management Act (the Act), the Richfield - Bloomington Watershed Management Organization (RBWMO) was formed December 19, 1983 through a joint powers agreement (JPA) between the cities of Bloomington and Richfield (Appendix A). Located entirely within Hennepin County, the RBWMO covers 7.6 square miles (sq. mi.). Approximately 4.3 sq. mi of the RBWMO area is within the City of Richfield, and the remaining 3.3 sq. mi. is within the City of Bloomington (Figure E-1).

The governing body of RBWMO is the Board of Commissioners (Board). The 12-member Board, made up exclusively of city council members, contains five commissioners from the City of Richfield and seven commissioners from the City of Bloomington. As stipulated in the JPA, the Board determines how specific costs, personnel requirements, contracting and bid responsibilities, and other expenses and requirements are shared by the cities. Otherwise, to the extent practicable, RBWMO costs and responsibilities are split geographically. Board meetings are held annually and are open to the public.

RWBMO also maintains two advisory committees: Community Advisory Committee (CAC) and Technical Advisory Committee (TAC). The CAC is made up of members from the City of Richfield's Community Services Commission and the City of Bloomington's Planning Commission. The CAC provides the Board advice on matters pertaining to stormwater management. The TAC, made up of staff from the cities of Bloomington and Richfield public works departments, meets annually and beyond that is convened and consulted on an as-needed basis.

Figure E-1 - Richfield-Bloomington Watershed Management Organization - Location Map



The expressed purposes of the RBWMO as presented in Minnesota Statutes 103B.201, are to:

- Protect, preserve, and use natural surface and groundwater storage and retention systems.
- Minimize public capital expenditures needed to correct flooding and water quality problems.
- Identify and plan for means to effectively protect and improve surface and groundwater quality.
- Establish more uniform local policies and official controls for surface and groundwater management.
- Prevent erosion of soil into surface water systems.
- Promote groundwater recharge.
- Protect and enhance fish and wildlife habitat and water recreational facilities.
- Secure the other benefits associated with the proper management of surface and groundwater.

The Act requires the RBWMO to review and update its watershed management plan (Plan) every ten years. This Plan represents the RBWMO's 2018–2027 management standards and procedures for addressing surface water, education and outreach, and groundwater issues. The Plan contains the following sections as required by Minnesota Administrative Rules 8410:

Executive Summary: Provides an overview of the Plan.

Section 1 – Introduction: Summarizes Minnesota State statutes and rules, and presents introductory information about the RBWMO including its background, boundary, governance, and management.

Section 2 - Land and Water Resources: Presents the existing and proposed physical environment, land use, and development in the area.

Section 3 - Issues, Goals, and Strategies: Provides an overview of the issues facing the RBWMO; goals and management strategies to address priority issues.

Section 4 - Implementation Program: Describes implementation elements of the Plan and its impact on local governments. This section also presents an implementation program including programs, capital improvement projects, and planning level cost estimates.

Section 5 - Plan Amendment: Provides the procedure for amending the Plan.

Section 6 - Annual Reporting and Evaluation Requirements: Addresses annual reporting and organizational evaluation requirements.

Photo 1-1: Wood Lake Nature Center

RBWMO embarked on visioning process designed to generate organizationally specific goals consistent with the expressed purposes of the watershed management organization (WMO). The visioning process by design asked the RBWMO to address three main questions:

Where are we now? This question focused the planning effort on evaluating the current status of the WMO. Through an on-line survey to watershed residents, stakeholder workshops, and a review of available data, several issues facing the WMO emerged.

Where are we going? This question focused efforts on the organization's vision through goal setting.

How do we get there? The answer to this question details the implementation strategies (policies, programs, capital improvement projects, etc.) that the RBWMO will use over the next ten years to achieve its identified goals.

Through the on-line survey and stakeholder workshops, the issues uncovered and management goals were generated. To achieve these goals, the WMO has identified strategies that guide present and future management decisions. RBWMO's 2018–2027 Issues, Goals and Strategies are presented in Table E-1.

Pursuant to Minnesota Statute 103B.231, following the approval and adoption of the Plan, the cities of Bloomington and Richfield shall each prepare a local water management plan (LWMP), updating capital improvement programs and official controls as necessary to bring local water management into conformance with the Plan. The LWMP must be consistent with and address the priorities identified in the Plan by December 2019.

Table E-1: Richfield-Bloomington Watershed Management Organizations 2018- 2027 Issues, Goals, and Strategies

Issues	Goals	Strategies
Issue 1: Surface water quality	Goal 1: Comprehensive understanding of water resources within the WMO through data compilation, evaluation, and monitoring activities.	Strategy: Establish water quality data management process Strategy: Work with partner agencies to understand current loading with respect to established and upcoming total maximum daily load (TMDL) targets and allocations Strategy: Stormwater management standards Strategy: Conduct regular water quality assessments to determine progress to meeting future impairment reduction needs
Issue 2: Water quantity and volume management - Localized flooding - Infrastructure adequacy concerns resulting from development and climate change	Goal 2: Identify opportunities to improve management of water quantity (localized flooding) and volume through reconstruction and redevelopment.	Strategy: Stormwater management standards Strategy: Develop regional flood control strategies Strategy: Develop regional storm water treatment strategies
Issue 3: Redevelopment opportunities and strategies - Fully developed watershed	Goal 3: Strive for layered benefits using redevelopment and stormwater solutions to maximize space limitations.	Strategy: Develop regional storm water treatment strategies Strategy: Identify potential problem areas and work with developers to maximize benefits Strategy: Stormwater management standards
Issue 4: Public education and outreach - Lack of well-defined education and outreach plan	Goal 4: Work more efficiently and effectively with public and private partners on engaging residents and youth in area schools without duplicating efforts.	Strategy: Develop a comprehensive education and outreach plan

Issues	Goals	Strategies
Issue 5: Wetland protection - Impact of water quality and invasive species - Wetlands connection to storm sewer system	Goal 5: Maximize the function and value of wetland resources committing to no net loss of quantity, quality, and type.	Strategy: Evaluate functions and values of wetlands Strategy: Stormwater Management Standards Strategy: Develop a comprehensive education and outreach plan Strategy: Maintain WCA TEP communications
Issue 6: Invasive species strategies and management - Existing infestation - Early species detection	Goal 6: Engage partner agencies to collaborate on education, management, and invasive species monitoring.	Strategy: Develop general guidance on managing invasive species
Issue 7: Standardized wellhead protection strategies - Inconsistent vulnerability areas' definition and development approach	Goal 7: Coordinate between cities as wellhead protection plans are updated to provide consistent infiltration standards.	Strategy: Develop consistent infiltration standards for development within DWSMA

2 Introduction

This section of the watershed management plan (Plan) provides introductory information about the Richfield-Bloomington Watershed Management Organization (RBWMO), including its background, boundary, governance, and management.

2.1 Background

In 1983, the Minnesota State legislature passed the Metropolitan Surface Water Management Act (the Act). The Act, established under Minnesota Statues (M.S.) 473.875 to 473.883 and renumbered M.S. 103B.205 to 103B.255, required local units of government in the seven-county metropolitan area without a water management organization to establish a watershed management organization through a joint powers agreement (JPA) by July 1, 1985. The expressed purposes of the water management organization as presented in M.S.103B.201, are to:

1. Protect, preserve, and use natural surface and groundwater storage and retention systems.
2. Minimize public capital expenditures needed to correct flooding and water quality problems.
3. Identify and plan for means to effectively protect and improve surface and groundwater quality.
4. Establish more uniform local policies and official controls for surface and groundwater management.
5. Prevent erosion of soil into surface water systems.
6. Promote groundwater recharge.
7. Protect and enhance fish and wildlife habitat and water recreational facilities.
8. Secure the other benefits associated with the proper management of surface and groundwater.

In response to the Act, the RBWMO was formed December 19, 1983 through a JPA between the cities of Bloomington and Richfield.

2.2 Boundary

Located entirely within Hennepin County, the RBWMO covers 7.6 square miles (sq. mi.). Approximately 4.3 sq. mi. of the RBWMO area is in the City of Richfield and the remaining 3.3 sq. mi. is within the City of Bloomington (Figure 2-1).

2.3 Governance and Management

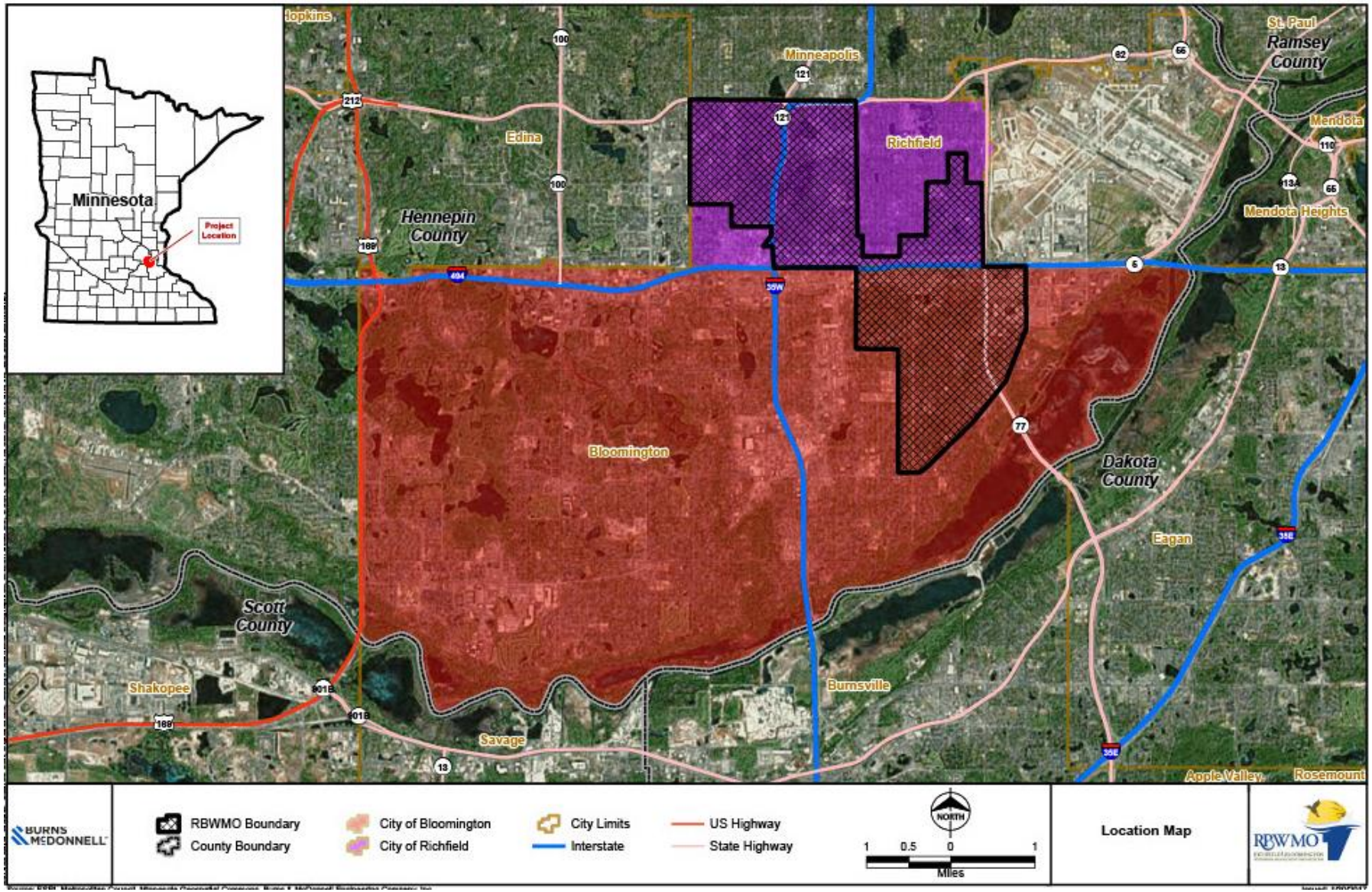
The governing body of RBWMO is the Board of Commissioners (the Board). The 12-member Board, made up exclusively of city council members, contains five commissioners from the City of Richfield and seven commissioners from the City of Bloomington. As stipulated in the JPA, the Board determines how specific costs, personnel requirements, contracting and bid responsibilities and other expenses and requirements are shared by the cities. Otherwise, to the extent practicable,

RBWMO costs and responsibilities are split geographically. Board meetings are held annually and open to the public.

RWBMO also maintains two advisory committees: Community Advisory Committee (CAC) and Technical Advisory Committee (TAC). The CAC is made up of members from the City of Richfield's Community Services Commission and the City of Bloomington's Planning Commission. The CAC provides the Board advice on matters pertaining to stormwater management. The TAC is made up of staff from the cities of Bloomington and Richfield Public Works departments. The TAC meets annually (at minimum) to discuss approaches to stormwater management on redevelopment projects, local activities, and other enforcement topics.

Photo 2-1: Wood Lake

Figure 2-1 : Richfield-Bloomington Watershed Management Organization - Location Map



3 Land and Water Resources

M.S. 103B.231 and Minnesota Administrative Rules 8410.0060 require this Plan to "describe the existing physical environment, land use, and development in the area and the environment, land use, and development proposed in existing local and metropolitan comprehensive plans." In accordance with the referenced rules and statutes, this section presents land and water resources information for RBWMO.

3.1 Topography

The elevations within the watershed ranges from approximately 800 to 900 above mean sea level. Figure 3-1 shows RBWMO's topography.

3.2 Soil

The predominant soil complex within the RBWMO is the Urban land-Hubbard complex (D64B) which represents approximately 40 percent of the watershed. The Urban land-Hubbard complex has a high infiltration capacity, its slope ranges from 0 to 8 percent, and the parent material is outwash-formed by glacial sediments deposited by meltwater. The other major soil complexes are the Urban land-Malardi complex (L55B) and the Urban land-Udipsamments complex (U4A) which are 25 percent and 18 percent, respectively. RBWMO soils are shown on Figure 3-2.

3.3 General Geology – Surficial and Bedrock

The surficial geology within the RBWMO is shown on Figure 3-3. Spatially, the cities of Bloomington and Richfield are located almost entirely on the Langdon and Richfield Terraces, respectfully. These terraces are a step-like landform that are remnants of the former floodplain of the Minnesota River, which were created by glacial meltwater that down-cut and shaped the terraces. The City of Bloomington has one portion of quaternary peat and muck which is aptly located under Wright's Lake. Similarly, the City of Richfield has locations of quaternary peat under Wood Lake and Richfield Lake. Wood Lake also has lacustrine deposits along the outside of the lake which consists of naturally, accumulating lake sediment. Along the northwest edge of the watershed, the Des Moines lobe deposited large quantities of sand known are the New Ulm Fm outwash.

The bedrock geology of the watershed is shown in Figure 3-4. The map depicts the bedrock units as they are exposed or covered with surficial materials. The bedrock geology is comprised of the Prairie du Chien Group, Decorah Shale, and the Jordan Sandstone.

Figure 3-1: Richfield-Bloomington Watershed Management Organization - Topographic Map

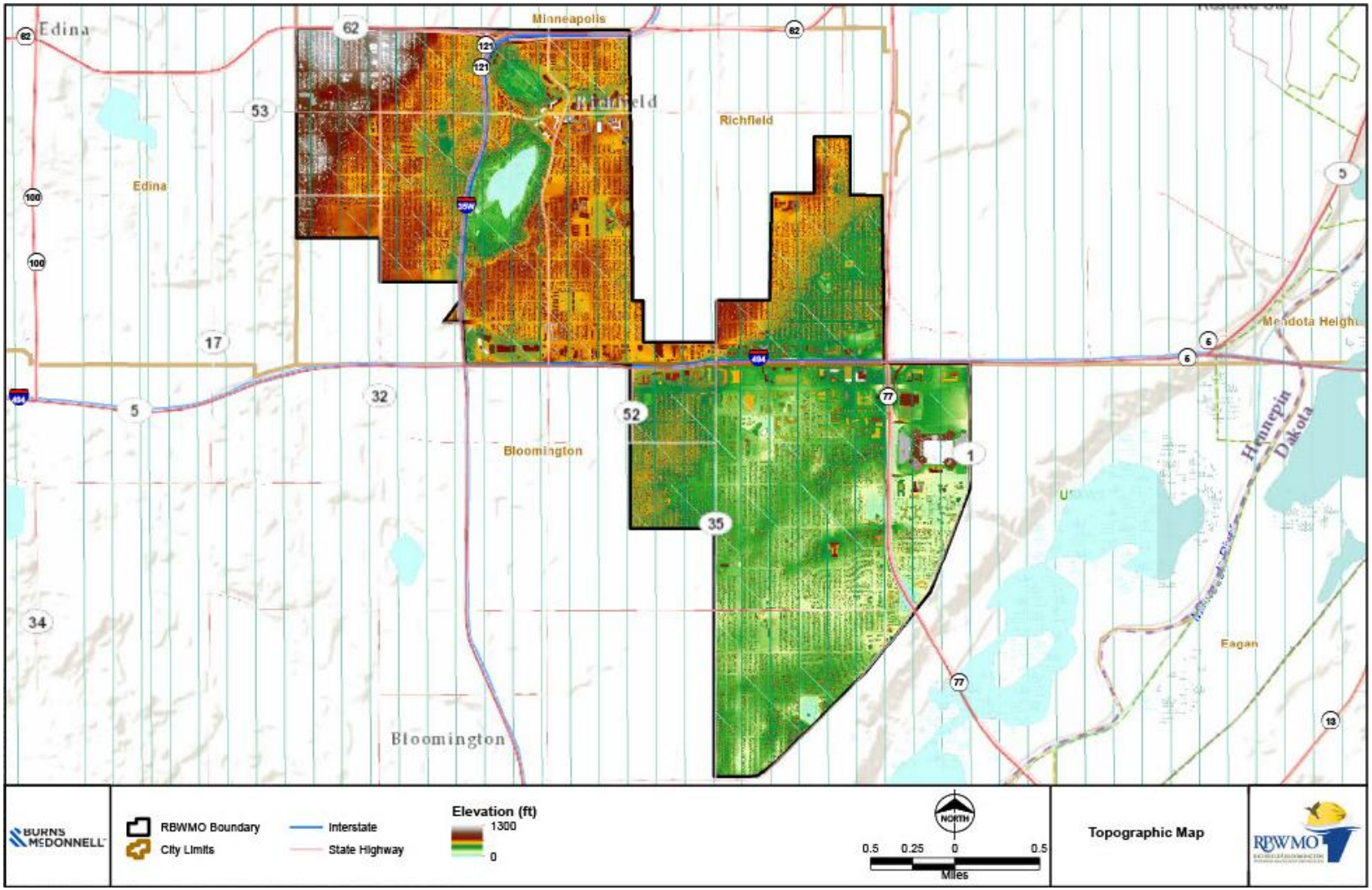


Figure 3-2: Richfield-Bloomington Watershed Management Organization - Soils Map

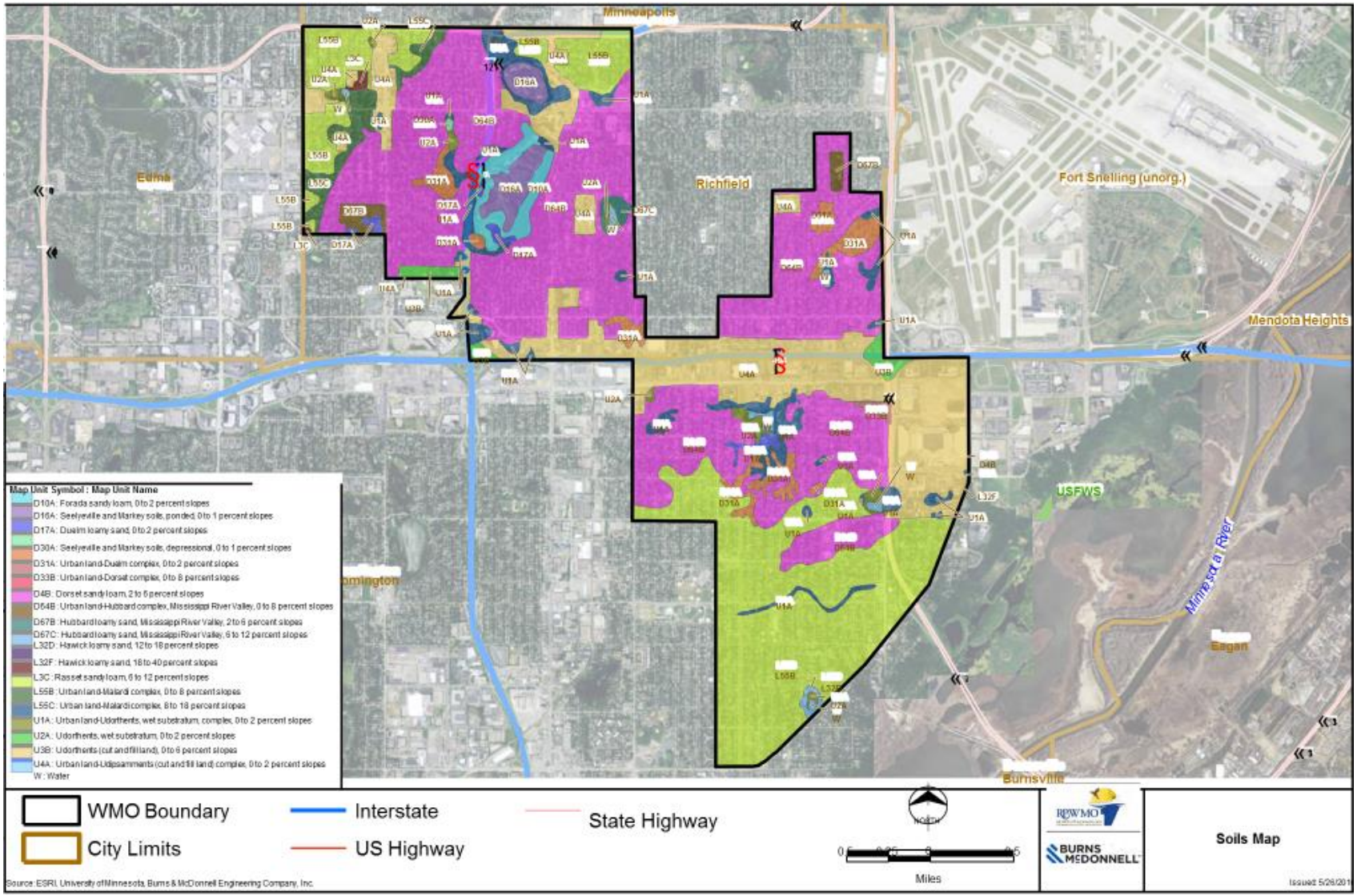


Figure 3-3: Richfield-Bloomington Watershed Management Organization - Surficial Geology Map

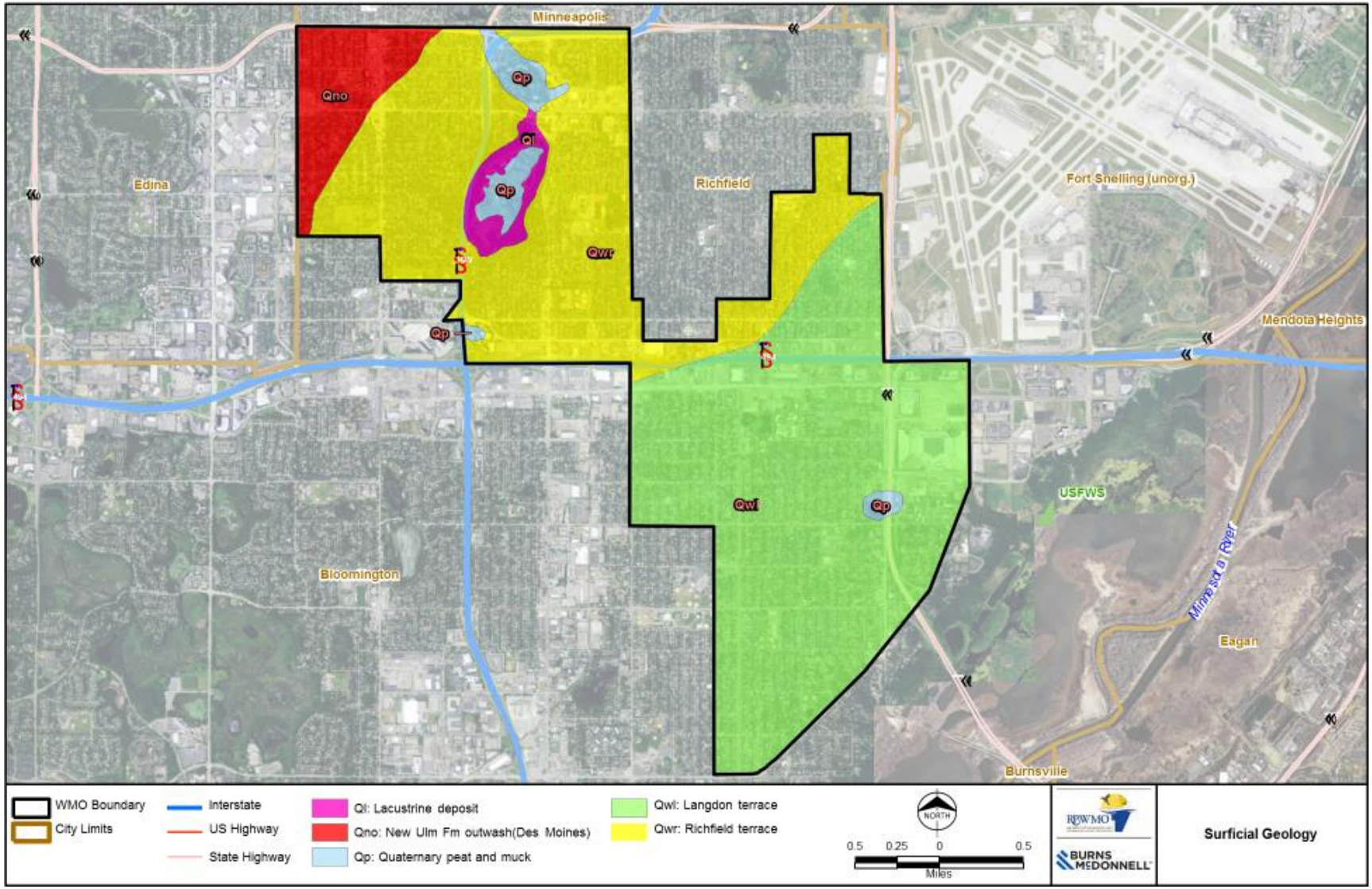
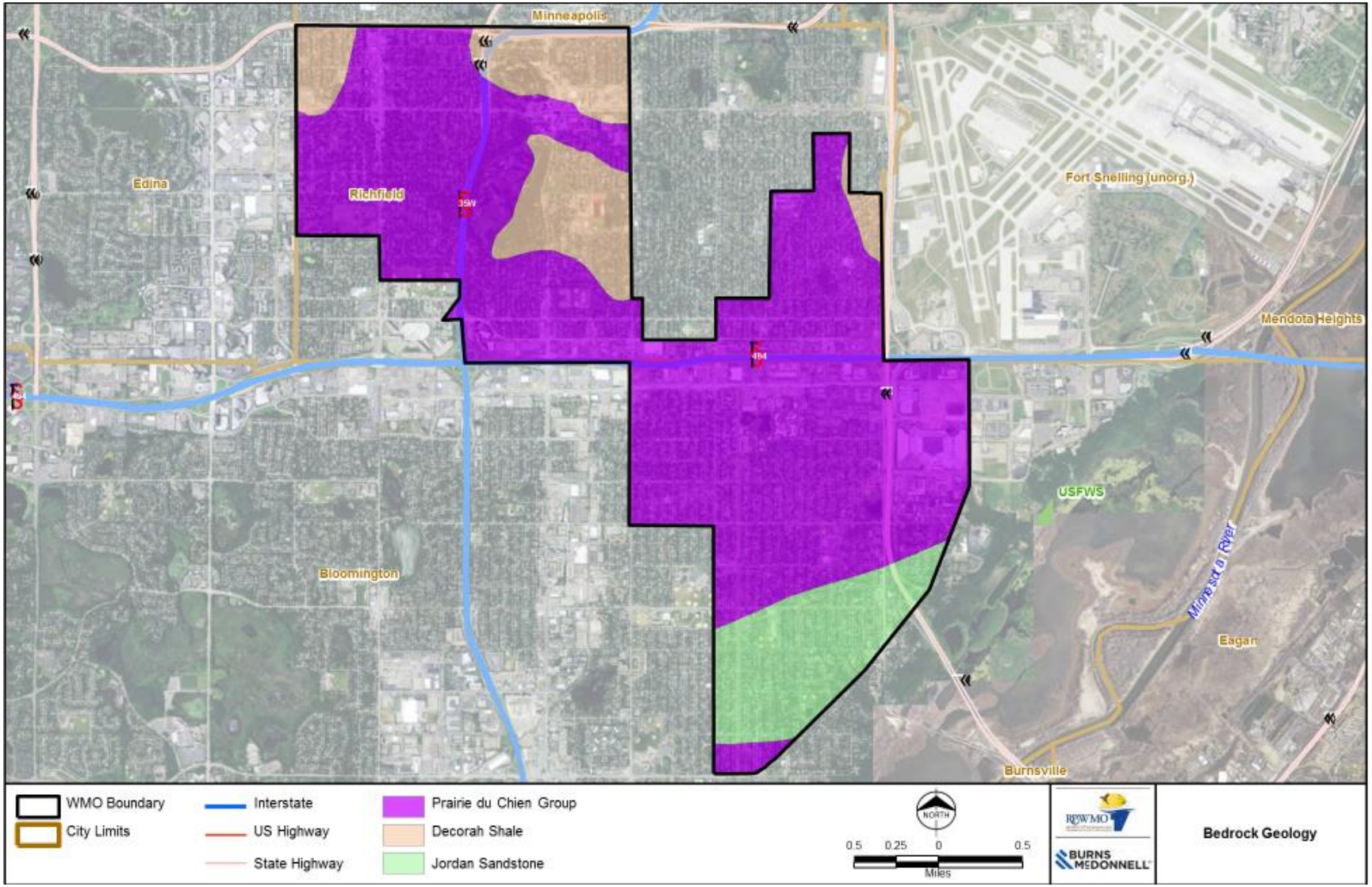


Figure 3-4: Richfield-Bloomington Watershed Management Organization - Bedrock Geology



3.4 Groundwater Resources

Groundwater management and protection with the state of Minnesota are important due to the state's high reliance on groundwater for domestic, municipal, agricultural, and industrial water supply needs. The following sections presents surficial and bedrock aquifer resources underlying RBWMO's boundary and wellhead protection plans.

3.4.1 Surficial Aquifers

The surficial geology of the Richfield-Bloomington watershed is composed of sand, gravelly sand, and loamy sand terrace deposits. These terrace deposits vary in both permeability and thickness to bedrock. Within these deposits are unconfined (water table) aquifers of sufficient water-bearing capacity to provide municipal and private water. The configuration of these surficial aquifers and the position of the water table are highly variable and complex. In general, surficial aquifers are not extensive and rarely continuous. The depth to water table varies between 0 feet near some of the ponds to over 30 feet. Unconfined aquifers are particularly susceptible to contamination from nonpoint sources of pollution because of possible high permeability of overlying materials, and they are relatively close to the land. Contaminants have direct access to these aquifers through infiltration and permeable soil materials.

Surficial aquifer recharge areas are those locations where water can reach the water table through percolation of water through soil and drift materials. Critical recharge areas are those areas where the soil materials are relatively thin, transmissivity is high, and water table depth is minimal. Areas with these characteristics have a greater potential to transport contaminants to the drift aquifers than other areas. Recharge can also occur from surface water bodies. Wetlands and floodplains can function as recharge, discharge, or flow-through areas, depending on the level of the water within the wetland or floodplain relative to the water table. Discharge can occur naturally through springs, seeps, and directly into streams and wetlands. These sand and gravel aquifers may also be hydrologically connected to the uppermost bedrock aquifer; hence, they may affect underlying water quality by allowing pollutants to migrate downward.

3.4.2 Bedrock Aquifers

Three major aquifers are located within the RBWMO's boundaries: the Prairie Du Chien-Jordan Aquifer, the Franconia-Ironton-Galesville (also known as the Tunnel City Group – Wonewoc Sandstone) Aquifer, and the Mt. Simon-Hinckley Aquifer. The lowest of the three aquifers is the Mt. Simon-Hinckley. It ranges in elevation from 600-700 feet above sea level in the Bloomington area and is characterized by Mt. Simon & Hinckley Sandstones. The Eau Claire Formation confines it from above. The Tunnel City Group – Wonewoc Sandstone Aquifer ranges in elevation from 700-800 feet above sea level in the Bloomington area.

Within the watershed, the Prairie du Chien-Jordan aquifer is the most significant in terms of water supply, as most municipal water wells draw from this aquifer. The recharge of the Prairie du Chien-Jordan aquifer and other aquifers is a complex process because recharge occurs everywhere within the metropolitan area. Also, the Prairie du Chien-Jordan aquifer is in contact with terrace deposits.

The absence of an upper confining unit makes it susceptible to contamination percolating through the drift.

Groundwater movement has been studied on a regional basis by the Metropolitan Council, Minnesota Geological Survey and the MPCA at selected areas surrounding the watershed in association with investigations of potential groundwater contamination sites. The studies have shown water movement in the Prairie du Chien, which aquifer moves generally in a south and southeasterly direction toward the Minnesota River. However, local flow patterns can be extremely complex because of varying degrees of development pressures on the aquifer.

3.4.3 Wellhead Protection

Within the RBWMO, municipal and private wells serve the water supply needs for the cities of Richfield and Bloomington, respectively. Water supply for the City of Bloomington is augmented with water from the City of Minneapolis. Pumping, a form of discharge, can induce aquifer recharge under certain conditions. For example, induced recharge occurs where wells are pumping from an aquifer near a hydraulic connection to a stream and are drawing the water level of the aquifer below that stream. Pumping may cause water from the overlying stream sediments to be induced into the aquifer by reversal in head differences. These flow reversals (from discharge to recharge) are gradual occurrences where groundwater discharge is first lessened -- affecting stream base flow -- before actual flow reversal occurs. Importantly, this pumping may draw contaminants through the induced recharge area and affect aquifer water quality.

3.5 Surface Water Resources

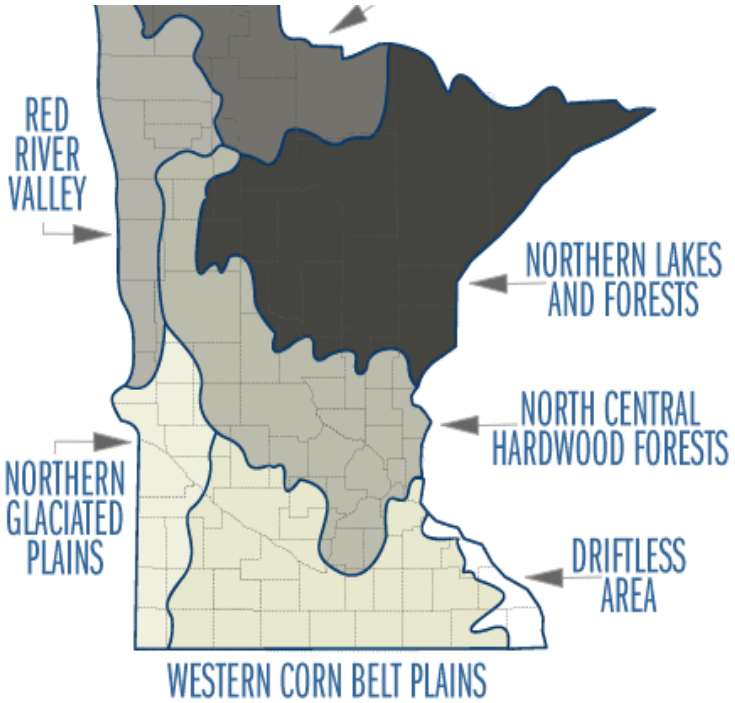
Surface water resources within the RBWMO consists of four public waters (Smith Pond Lake, Wright's Lake, Richfield Lake, and Wood Lake). A map of the surface water resources is shown in (Figure 3-6). There are no major creeks or rivers within the watershed and most stormwater runoff is conveyed by storm sewer systems in the southeasterly direction through a series of ponds and wetlands (outside of the RBWMO) before discharging to the Minnesota River (Figure 3-7).

3.5.1 Lakes

Lakes around Minnesota have different physical and chemical properties based on their location. Water quality reflects the variety of geographic and environmental conditions in the state. This diversity makes it difficult to explain what constitutes "good" water quality for an individual body of water. To make it easier, MPCA offers this guide to typical water quality conditions in these seven "ecoregions," large expanses of land containing a geographically distinct collection of plants, animals, natural communities, and environmental conditions. Minnesota uses ecoregions to set water quality targets for each specific region (Figure 3-5). These targets are used as typical levels so that any lake in the ecoregion can compare its own water quality values and have a good understanding on the health of the lake.

The RBWMO is part of the North Central Hardwood Forest (NCHF) ecoregion. The NCHF ecoregion is an area of transition between the forested areas to the north and east and the agricultural areas to the south and west. The terrain varies from rolling hills to smaller plains. Upland areas are forested by hardwoods and conifers. Plains include livestock pastures, hay fields, and row crops such as potatoes, beans, peas, and corn.

Figure 3-5: State of Minnesota Ecoregions



Typical NCHF ranges total phosphorus (TP), Secchi depth, Chlorophyll-a and Carlson trophic state index (TSI) are all listed in (Table 3-1) below along with standard criteria for other waterbodies. Within the TSI is a number that summarizes a lake's overall nutrient richness. Nutrient richness ranges from clear lakes, low in nutrients (oligotrophic), to green lakes with very high nutrient levels (hypereutrophic). These TSI scores reflect a water body that is mildly eutrophic with macrophyte problems and decreased transparency.

Table 3-1: Trophic State Index (TSI) - North Central Hardwood Forest Ecoregion

	Total Phosphorus (ug/L)				Chl-a (ug/L)				Secchi (meters)				Carlson TSI			
Trophic Status	O	M	E	H	O	M	E	H	O	M	E	H	O	M	E	H
Standard Criteria	<9	11-35	40 - 100	>100	<1.5	2 - 10	15-60	>65	>6.0	1.4-5	1 – 0.5	< 0.4	<35	40-50	55-65	<70
NCHF	23-50				5-22				1.5-3.2				49-66			
O= Oligotrophic, M= mesotrophic, E=eutrophic and H= hypereutrophic																

Figure 3-6: Richfield-Bloomington Watershed Management Organization - Water Resources and Wetlands Map

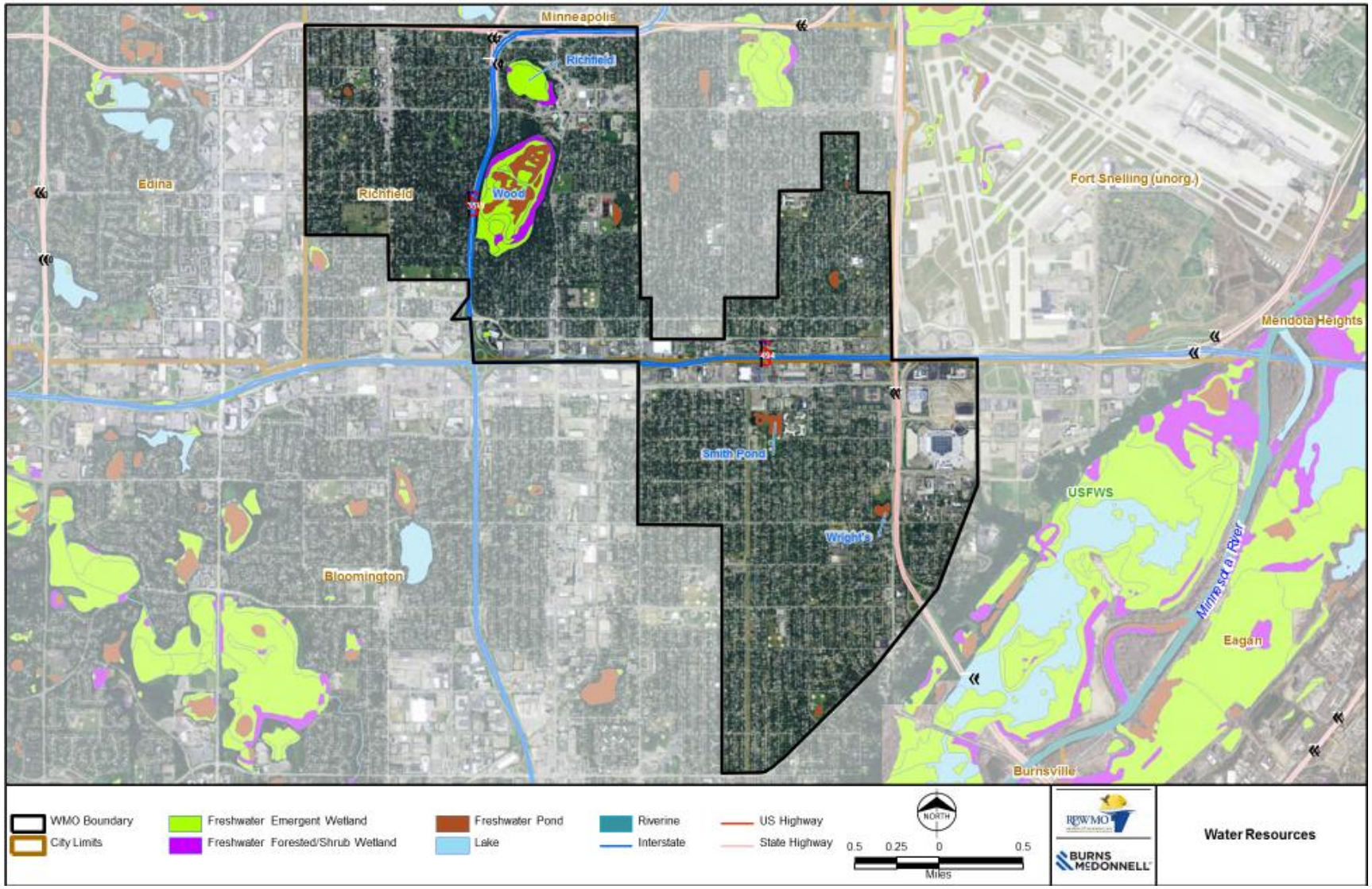
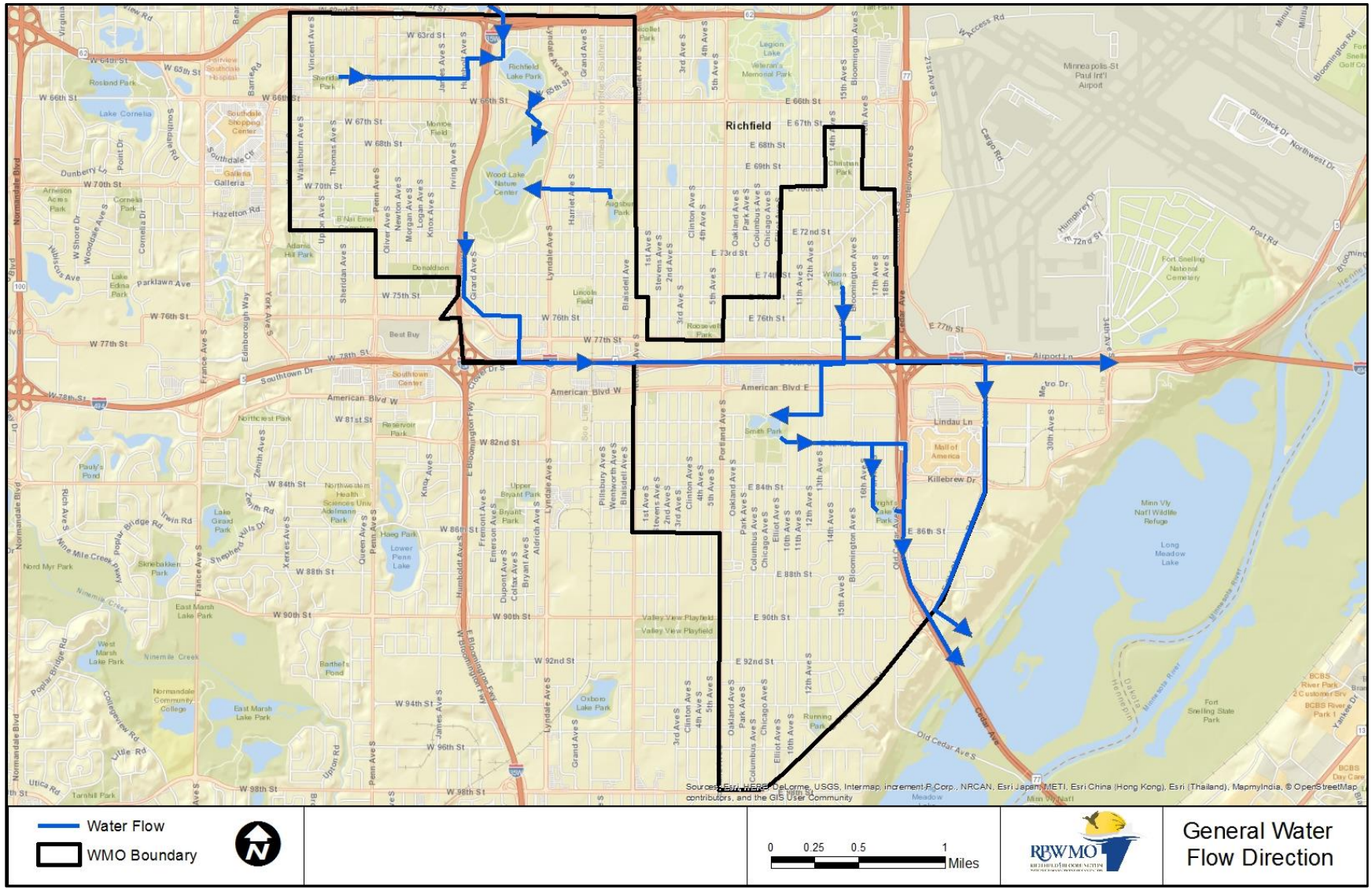


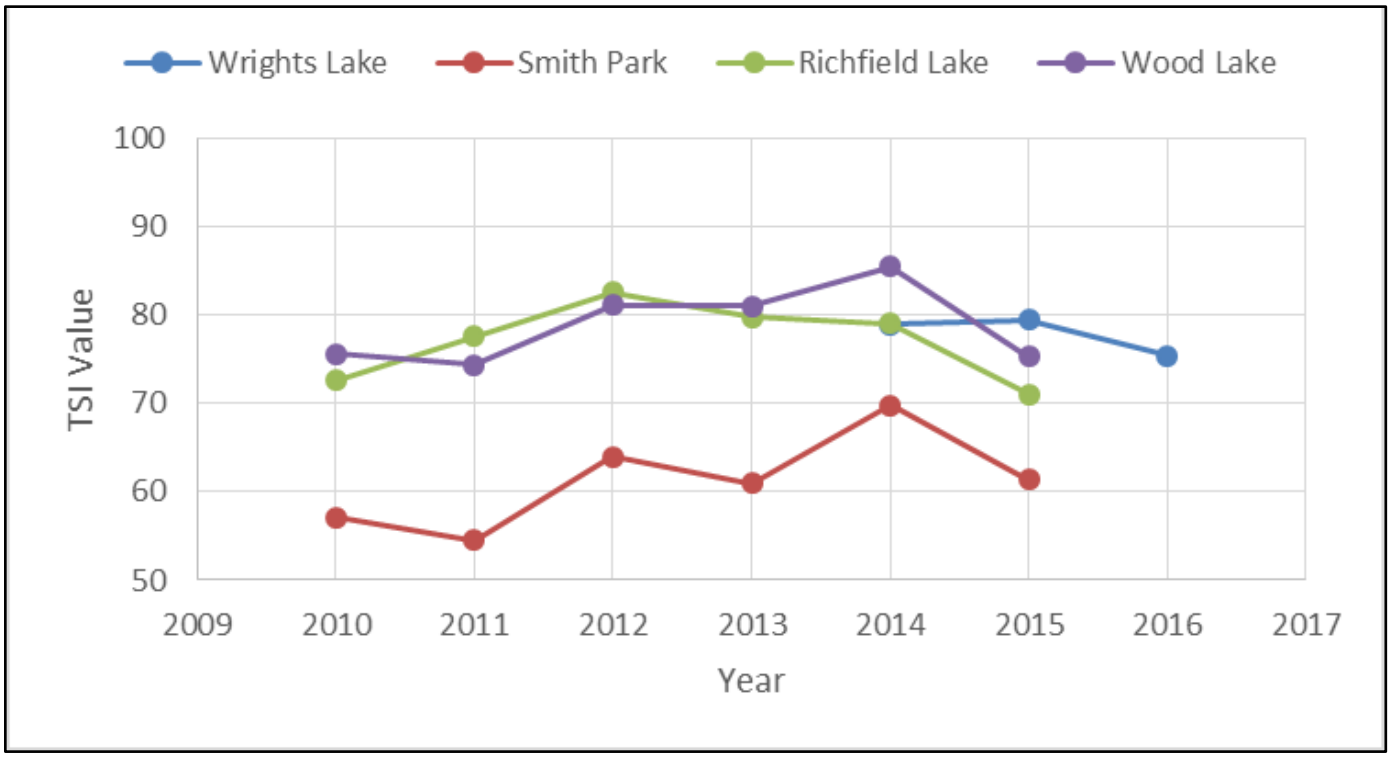
Figure 3-7: Richfield-Bloomington Watershed Management Organization – General Water Flow Direction



3.5.1.1 Wright's Lake

Wright's Lake, located in City of Bloomington, is about four acres large with an average depth of approximately 7.5 feet and a maximum depth of 9 feet. Although missing on the MPCA's website, the City of Bloomington has two and a half years of water quality sufficient monitoring data to calculate TSI scores. The information captured on Graph 3-1 portrays a lake with poor water quality. The TSI values are in the 70's which translates to the lake being hypereutrophic with possible heavy algae blooms in the summer and dense macrophyte beds.

Graph 3-1 Trophic State Index for Wright's Lake, Smith Lake, Richfield Lake, and Wood Lake in the Richfield-Bloomington Watershed Management Organization



3.5.1.2 Smith Pond Lake

Smith Pond Lake (or Smith Pond), located in Bloomington, Minnesota is about 7 acres and has an average depth of 8 feet with a maximum depth of 16 feet. Smith's Pond is stocked annually by the Minnesota Department of Natural Resources (MDNR) with Bluegills and Black Crappies. Fisheries in the lake also includes black bullheads, hybrid sunfish, pumpkinseed, and brook stickleback. Shoreline and prairie habitat has been restored around the lake to help protect water quality and improve habitat for fish. Water quality data is collected for Smith's Pond by the City of Bloomington. Applying the TSI calculations to data collected, Smith Pond Lake has relatively high TSI scores ranging from 51 to 60 for the past six years, as shown on Graph 3-1. TSI scores ranging from 51 – 60 represent eutrophic to hyper-eutrophic conditions within Smith Pond.

3.5.1.3 Richfield Lake

Richfield Lake, located in the City of Richfield, is approximately 29 acres with and average depth of 4 feet. The lake is also classified as a type 3 wetland. A type 3 wetland is an inland shallow fresh water marsh. The lakes TSI score ranges from 70 to 85 which means the lake is hypereutrophic (Graph 3-1). This could translate to heavy algal blooms in the summer and dense macrophyte bed. However, given its wetland designation, these conditions could be normal. Fisheries data on Richfield Lake is not available from the Minnesota Department of Natural Resources (MDNR).

3.5.1.4 Wood Lake

Wood Lake, located in the City of Richfield, and has similar TSI scores (70-85) to Richfield Lake, which is also seen in Graph 3-1. Wood Lake is about 45 acres with an avearge depth of 4 feet. The lake is also classified as a type 4 wetland which is an inland deep freshwater marsh. As with Richfield Lake, Wood Lake's wetland designation may warrant the TSI scores documented.

3.6 Climate and precipitation

The Minneapolis - St. Paul (MSP) area has a continental climate, with cold (often frigid winters) and warm summers. In additional, the area lies near the northern edge of the moisture influx from the Gulf of Mexico, making it susceptible to severe storms such as blizzards, freezing rains, and tornadoes. Successive high and low pressure systems migrate across the area causing fluctuations in temperature, wind direction, cloud cover, and precipitation. Monthly average precipitation and temperature measurements for the MSP Metropolitan areas are shown on Tables 3-2 and 3-3, respectively.

During the May through September growing season, which is about 150 days, monthly rainfall ranged from 26.68 inches 1987 to 10.17 inches 1988. It is unusual to see a significantly high yield year followed by a low yield precipitation year. Nevertheless, these months represent approximately 63 percent of the annual precipitation. Average monthly temperatures range from a high of 74.1 F in July to a low of 16.2 F in January (See Table 3-3).

Table 3-2: Minneapolis-St. Paul Metropolitan Area Monthly Average Precipitation Data (1986-2015)

	Precipitation (inches)												
Year	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	**Total**
1986	0.9	0.84	2.03	5.88	3.48	5.34	4.11	4.44	6.9	1.77	0.62	0.31	36.62
1987	0.63	0.13	0.64	0.16	1.88	1.95	17.9	3.67	1.28	0.6	2.07	1.25	32.16
1988	1.37	0.3	1.33	1.58	1.7	0.22	1.17	4.29	2.79	0.8	2.86	0.67	19.08
1989	0.52	1.04	2.19	2.66	3.38	3.5	3.5	2.92	1.28	0.53	1.38	0.42	23.32
1990	0.1	0.77	3.66	3.8	3.36	9.82	5.06	1.71	1.88	1.23	0.65	1.01	33.05
1991	0.49	1.03	2.29	3.58	6.35	2.57	2.95	3.14	5.43	2.52	5.29	1.05	36.69
1992	0.66	0.57	1.56	1.99	1.15	3.68	5.21	4.54	5.2	2.11	1.95	1.05	29.67
1993	1.25	0.39	1.25	1.99	4.02	6.28	5.58	6.5	2.04	0.79	1.57	0.55	32.21
1994	1.17	0.78	0.32	3.77	2.21	3.09	4.12	2.9	4.74	4.65	1.39	0.53	29.67
1995	0.36	0.25	2.11	1.9	2.43	3.38	2.72	4.59	2.21	3.68	0.88	1.15	25.66
1996	1.87	0.24	1.39	0.76	2.37	4.76	2.09	1.43	1.3	3.01	5.08	1.75	26.05
1997	1.71	0.3	1.18	1.01	1.7	3.7	12.6	6.01	3.19	2.03	0.69	0.31	34.43
1998	1.64	0.8	4.56	1.56	4.4	6.52	2.63	5.99	1.32	2.19	1.32	0.46	33.39
1999	2.67	0.4	1.86	3.43	6.56	3.68	4.55	2.64	2.73	0.92	0.77	0.33	30.54
2000	0.9	1.08	1.12	1.12	4.56	4.56	6.1	3.19	2.15	1.09	3.38	1.23	30.48
2001	1.21	1.33	1.09	7	4.53	6.35	2.12	2.31	3.5	1.28	2.77	0.74	34.23
2002	0.46	0.41	1.38	3.15	2.83	8.3	5.19	8.3	3.9	4.18	0.09	0.22	38.41
2003	0.22	0.54	1.44	2.4	6.14	4.66	2.05	1.12	2.2	0.62	0.71	0.62	22.72
2004	0.23	1.09	2.11	2.06	6.39	3.06	3.36	1.19	4.21	2.32	0.93	0.44	27.39
2005	1.21	0.96	1.37	2.3	2.78	4.24	2.94	5.22	4.44	5.45	1.53	0.97	33.41
2006	0.71	0.32	2.01	5.97	1.66	2.81	1.29	6.9	2.44	0.41	0.92	2.13	27.57
2007	0.31	1.37	3.64	1.11	1.99	2.05	3.29	9.32	6.04	3.63	0.09	1.48	34.32
2008	0.15	0.4	1.97	3.12	2.53	2.7	2.13	3.35	1.78	1.96	1.14	1.15	22.38
2009	0.57	0.93	1.5	1.57	0.53	2.86	2.17	6.43	0.46	5.57	0.38	1.83	24.80
2010	0.45	0.75	0.69	2.32	2.5	6.25	3.03	4.91	5.52	1.61	2.07	2.79	32.89
2011	1	1.12	2.06	2.8	4.04	5.28	5.23	3.03	0.36	0.7	0.3	0.99	26.91

Precipitation (inches)													
Year	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	**Total**
2012	0.36	1.71	1.4	3.04	9.34	3.59	4.9	1.38	0.3	1.3	0.63	1.64	29.59
2013	0.86	1.3	2.04	5.22	6.24	5.17	3.51	2.07	1.35	3	0.52	1.46	32.74
2014	1.42	1.41	0.82	6.27	4.55	11.36	2.27	2.9	0.92	1.75	0.87	0.86	35.40
2015	0.34	0.35	0.67	2.42	3.55	4.4	7.32	2.99	4.65	2.61	4.52	2.32	36.14

Table 3-3:Minneapolis-St. Paul Metropolitan Area Monthly Average Temperature Data (1986-2015)

Temperature (Fahrenheit or °F)												
Year	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
1986	17.5	15.7	33.9	49.6	59.4	68.6	73.9	67.31	59.8	49.2	28.2	24.7
1987	21.2	31.6	38.7	53.5	63.5	72.8	76	69	62.5	44.6	37.9	5
1988	10.4	13.9	33.8	47.4	65.4	74.4	78.1	73.9	62.4	44	32.7	20.5
1989	21.2	8.6	26.6	45.3	57.5	68.4	76.4	70.8	60.9	49.9	28	10.6
1990	26.3	23.7	35.7	46.8	56.3	69.5	71.3	70.6	64.4	48.1	37.4	16.9
1991	12.5	24.4	34.3	49.1	61.9	72.9	72.3	71.1	59	47.2	24.5	21.2
1992	21.9	28	33.1	43.6	60.5	65.6	65.8	65.9	59.6	47.4	31.4	21.2
1993	14.6	17.2	29.5	44.2	57.2	64.5	70.3	70.4	55	46.5	30.6	22.2
1994	4.4	13.2	34.7	45.9	60.7	69.9	70.1	67.4	64.3	52.2	38	24.5
1995	18.5	19.3	35	42.2	56.9	71.2	73.1	74.7	60.2	48.6	27.4	19.1
1996	10.2	18	25.3	41.4	55.6	67.4	70	70.5	62.2	48.8	25.4	13.7
1997	10.3	19.9	29.3	43	53.4	70	71	68.8	62.4	50.2	28.1	26.9
1998	19.1	31.9	31.9	50.7	63.4	64.9	72.6	71.6	66.6	51.2	37.2	24.6
1999	12.4	27.9	33.8	49	60.1	67.3	76.2	70.1	61.1	49.6	41.8	25.6
2000	15.9	27.9	41.1	46.7	60.9	66.1	72.4	72.2	61.6	53.3	31.2	7.6
2001	20	11.8	27.5	48.4	59.7	69.1	75.9	74.2	60.9	48.6	46.4	27.6
2002	24.6	28.3	24.9	45.7	54.6	71.1	77	70.9	65.5	41.8	33	26.2
2003	15.3	15.7	31.3	48.3	57.7	68.2	73.7	75.3	62.5	51.1	32.1	25

Temperature (Fahrenheit or °F)												
Year	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
2004	11.2	21.6	36	50	56.6	65.5	72.2	66.3	67.4	50.1	37.7	22.6
2005	15.6	26.5	31.8	52	56.4	73.4	76.8	71.7	66.3	52.4	36.6	19.4
2006	28.6	20	33.6	53.6	51.9	71	79.7	72.1	59.7	45.9	36.8	29.1
2007	19.7	13.5	38.4	47.2	64.2	72.7	76	72.1	64.8	54.3	34.5	16.6
2008	13.2	15.2	28.3	44	56.3	68.7	75.6	72.5	63.6	50.4	34.7	13.5
2009	8.3	20.8	32.2	47.6	60.8	67.7	70	69.5	66.5	43.2	42.7	17.3
2010	13.1	19.7	41	54.9	60.7	69.3	76.3	77	60.3	54.1	35.3	16.4
2011	12.1	18.8	29.5	46.2	58.4	69.5	78.8	73.6	62.9	55.4	39.3	27.8
2012	23.3	27.7	48.3	50.1	63.7	72.3	80.2	72	63.9	47.5	37.1	23.4
2013	16.9	19	27.2	41	58.3	68.9	75	74.7	67.2	49.1	33.2	12.4
2014	8	8.6	25.5	42.7	58.6	69.5	71.5	73.3	62.7	49.2	25.4	24.3
2015	19	11.2	35.5	49.7	59.2	69.7	73.4	70.7	67.9	52.1	41.4	30.2
Average	16.2	20.0	32.9	47.3	59.0	69.3	74.1	71.3	62.8	49.2	34.2	20.5

3.7 Regulated pollutant sources and permitted wastewater discharges

Regulated pollutant sources include a wastewater discharge point, construction stormwater permit areas, hazardous waste sites, tanks and leakage areas, wastewater discharge locations, voluntary investigation and cleanup (VIC) areas, and petroleum brownfields (See Figure 3-8). Each of these areas contain multiple potential pollution source activities. The areas with the highest potential risks are hazardous waste sites which could have both underground and aboveground storage tanks with contaminants that could impact surface and groundwater resources if they leak or fail.

3.8 Fish and wildlife habitat and rare and endangered species

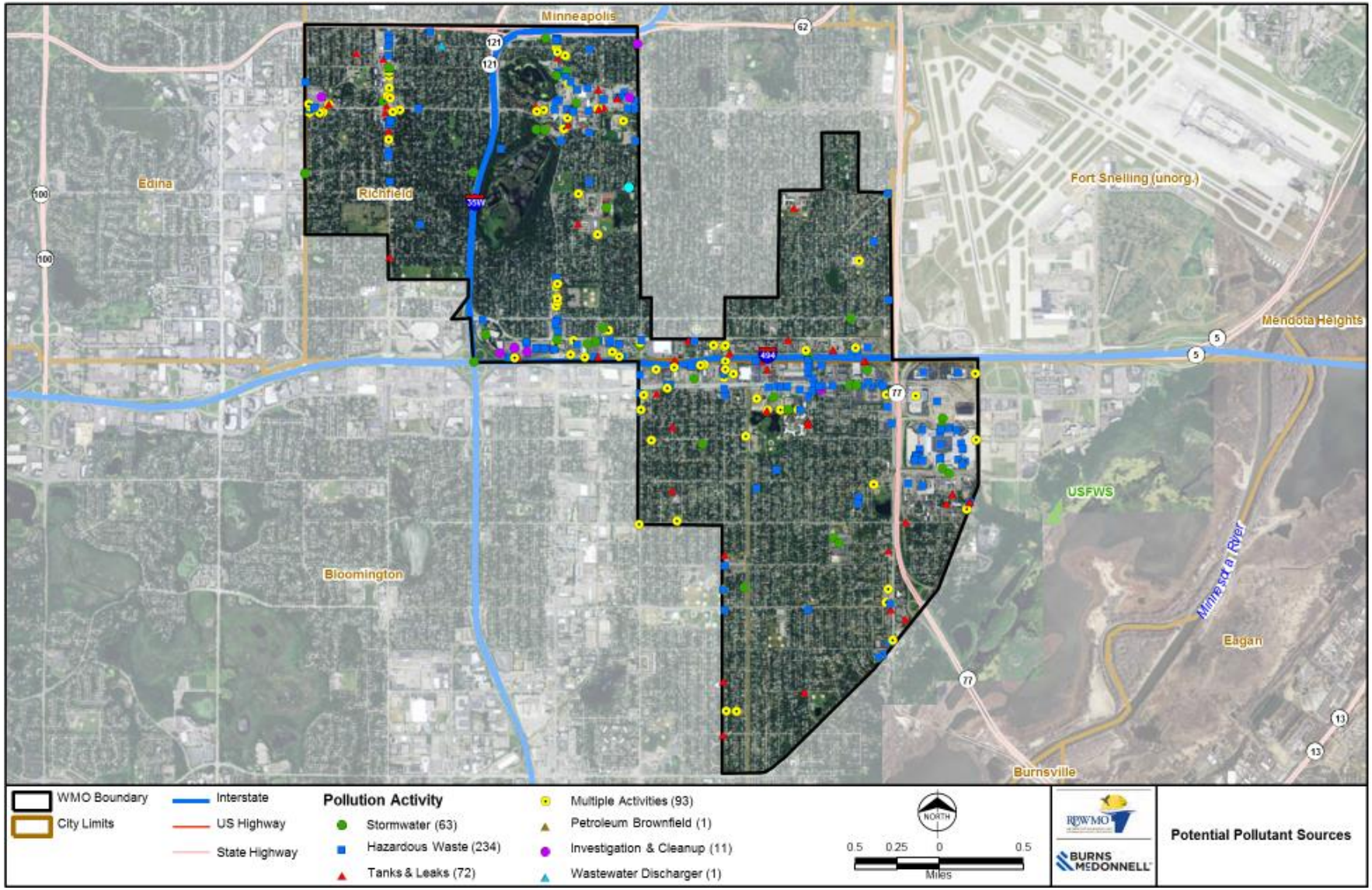
Within the RBWMO, parks and open spaces adjacent to water resources provide wildlife habitat for migratory birds and waterfowl. A couple of lakes within the watershed are stocked by the MDNR with game fish. The following threatened and endangered species may be found in the watershed (USFWS, 2016): northern long-eared bat (*Myotis septentrionalis),* rusty patched bumble bee (*Bombus affinis*), Higgins eye pearly mussel (*Lampsilis higginsii*), and snuffbox mussel (*Epioblasma triquetra*).

3.9 Water-based recreation areas

The park facilities listed below are within or adjacent to the RBWMO jurisdictional boundary. They offer hiking, biking, bird watching, and picnicking facilities as passive forms of water-based recreation, since most of them are next to water resources.

- Augsburg Park
- Richfield Lake Park
- Wood Lake Nature Center
- Sheridan Park
- Wilson Park
- Wright's Lake Park
- Running Park
- Smith Park

Figure 3-8: Richfield-Bloomington Watershed Management Organization - Potential Pollutant Sources



3.10 Land Use

Land use within the Richfield-Bloomington watershed continues to be influenced by several key factors: proximity to the City of Minneapolis and the MSP International Airport, major transportation routes, and local planning and zoning (Figure 3-9 and Figure 239). Because the watershed is fully developed, the year 2030 projected land use are either statistically insignificant or change in land use naming convention has been introduced (Table 3-4). Specifically, the introduction of the quasi-public designation potentially affected the areas previously assessed in the industrial, institutional, and open space.

Table 3-4: Richfield-Bloomington Watershed Management Organization Land Use Table

	Existing Land Use (2010), acres	Future Land Use (2030), acres
Residential	3,229	3,312
Commercial	543	529
Industrial	117	60
Institutional	271	178
Open Space	409	507
Transportation	312	295
Total Area	4,881	4,881

Figure 3-9: Richfield-Bloomington Watershed Management Organization - Existing Land Use (2010)

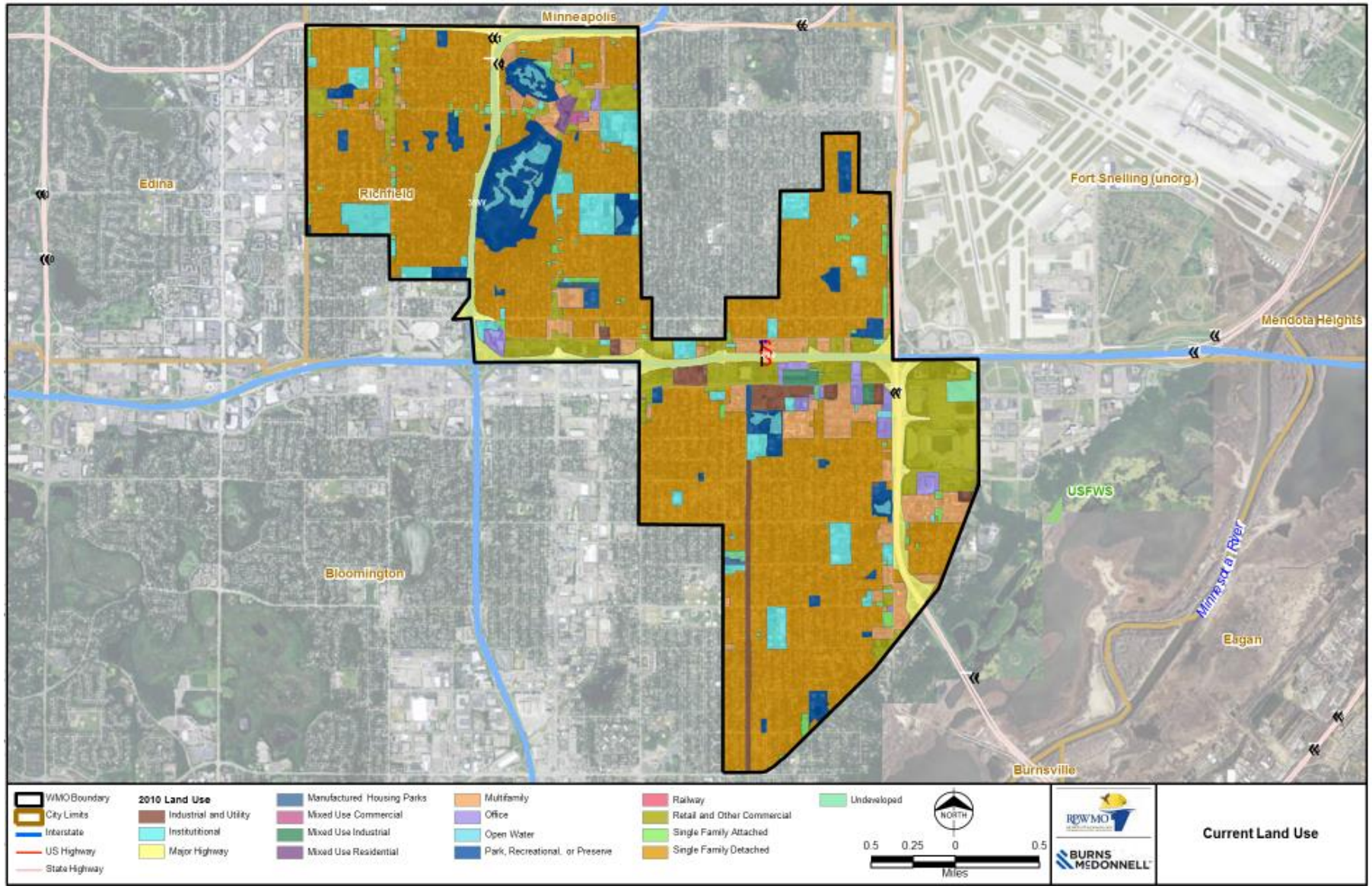
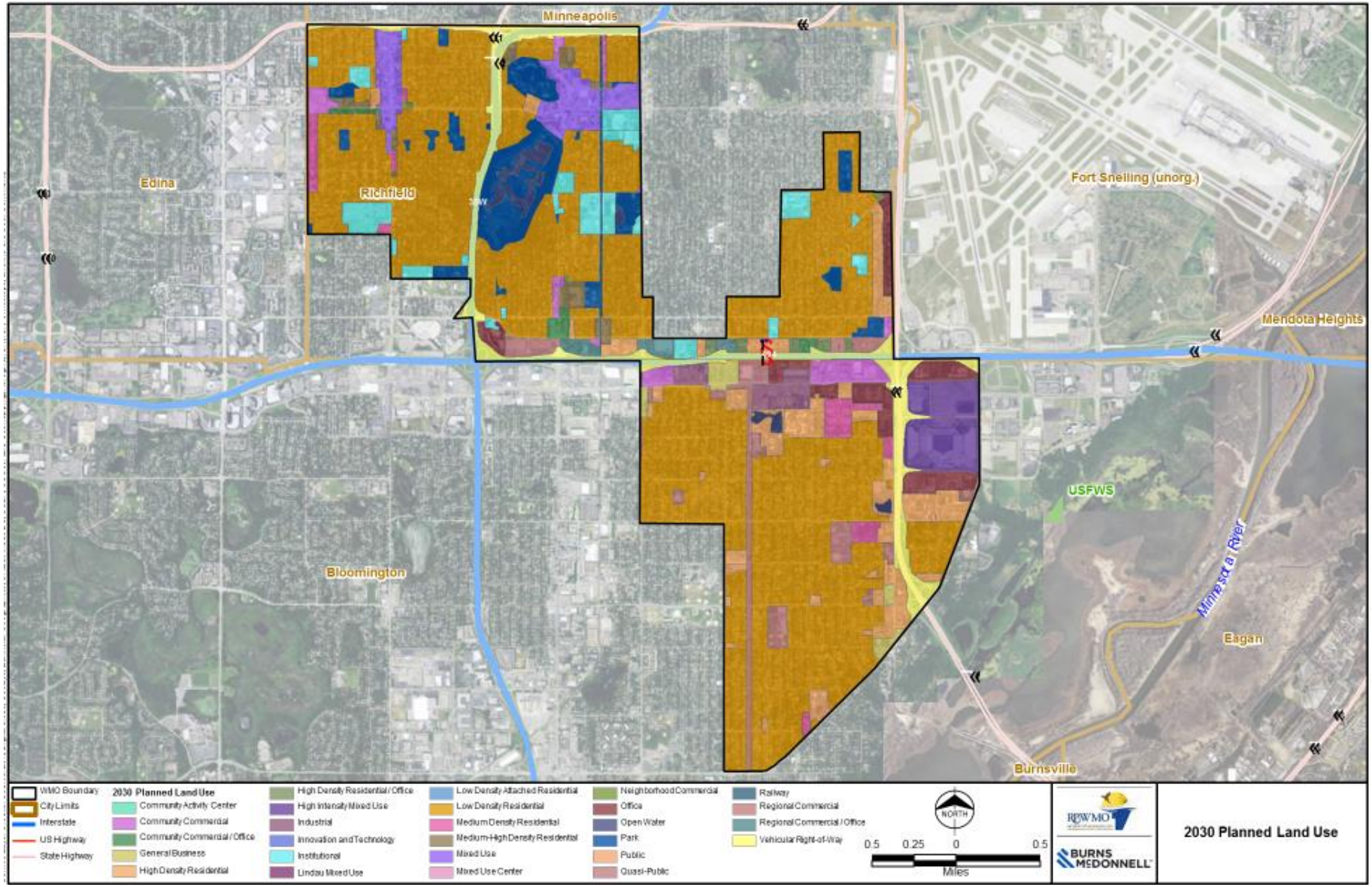


Figure 3-10: Richfield-Bloomington Watershed Management Organization - Future Land Use (2030)



4 Issues, Goals, and Strategies

The establishment of goals is paramount to successful organizational management. To develop these organization specific goals, RBWMO needed to fully understand its purpose as a watershed management organization and to assess the organizational realities associated with attaining its mandate. According to the Act, the purposes of the RBWMO (and other water management organizations) are to:

A. Protect, preserve, and use natural surface water and groundwater storage and retention systems.

B. Minimize public capital expenditures needed to correct flooding and water quality problems.

C. Identify and plan for means to effectively protect and improve surface water and groundwater quality.

D. Establish more uniform local policies and official controls for surface water and groundwater management.

E. Prevent erosion of soil into surface water systems.

F. Promote groundwater recharge.

G. Protect and enhance fish and wildlife habitat and water recreational facilities.

H. Secure the other benefits associated with the proper management of surface water and groundwater.

RBWMO embarked on visioning process designed to generate organizationally specific goals consistent with the expressed purposes of the WMO. The visioning process asked the RBWMO to address three main questions:

1. **Where are we now?** This question focused the planning effort on evaluating the current status of the WMO. Through an on-line survey to watershed residents, stakeholder workshops and a review of available data, several issues facing the WMO emerged.
2. **Where are we going?** This question focused efforts on the organization's vision through goal setting.
3. **How do we get there?** The answer to this question details the implementation strategies (policies, programs, capital improvement projects, etc.) to the RBWMO will use over the next ten years to achieve its identified goals.

The following sections present a discussion of the issues uncovered through the on-line survey, stakeholder workshops, management goals, and strategies.

4.1 Issues Summary

The following issues, presented in order of priority, were identified during the RBWMO stakeholder workshops.

4.1.1 Issue 1: Surface water quality and management strategies

Surface water quality data are collected for RBWMO lakes. However, the information has not been provided to the MPCA for review and analysis. In addition, it is unclear whether the information collected has undergone the Metropolitan Council Environmental Services – Quality Assurance Program procedures for lake water quality monitoring.

4.1.2 Issue 2: Water quantity and volume management

Recently, the National Weather Service Hydrometeorological Design Studies Center of the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) released NOAA Atlas 14, Volume 8, providing precipitation frequency estimates. These supersede estimates contained in Technical Paper No. 40 (TP40), NWS Hydro-35, and Technical Paper No. 49. This is important because NOAA Atlas 14's new estimates are based on data collection and evaluation improvements in three primary areas: denser data networks with a greater period of record, the application of regional frequency analysis using L-moments for selecting and parameterizing probability distributions, and new techniques for spatial interpolation and mapping (MDNR, 2016). The information shows updated precipitation amounts for all design frequencies resulting in the potential of localized flooding and storm sewer infrastructure concerns about the system's adequacy to withstand additional pressures.

4.1.3 Issue 3: Redevelopment opportunities and strategies

As presented in the land use section, the RBWMO is fully developed. Opportunities for incorporating regional treatment facilities or green sustainable infrastructure to attenuate stormwater runoff and minimize pollutant transport are limited. These limitations impair the RBWMO's ability to address surface water and groundwater quality issues in conventional ways. Recognizing these facts about the WMO, the opportunities to incorporate water quality and quantity measures are when redevelopment projects are proposed.

4.1.4 Issue 4: Public education and outreach

Public education and outreach is paramount to the public's understanding of the RBWMO's purpose of protecting, preserving, and restoring water resources within the WMO. Data collected shows the public and stakeholders are unclear about the RBWMO's education and outreach objective, its target demographic (adult, middle or high school student, politicians, municipal staff...etc.) and the WMO in general is relatively unknown.

4.1.5 Issue 5: Wetland protection

Protection of wetlands with the WMO are important duties of RBWMO and its member cities. As a local government units (LGUs), the cities of Richfield and Bloomington are responsible for administering the Wetland Conservation Act (WCA). In addition to managing wetlands within its boundaries, RBWMO has a secondary responsibility of protecting wetlands within the Minnesota Valley Wildlife Refuge (Refuge). Since, water discharged from the WMO travels through wetlands in the Refuge.

4.1.6 Issue 6: Invasive species strategies and management

Invasive species, as defined by the MDNR, are species that are not native to Minnesota and cause economic, environmental, or human health-related harm (MDNR, 2016). Within the RBWMO,

there are several thriving invasive species including goldfish and buckthorn. In addition, RBWMO wants to prevent new invasive species from entering the WMO, as well as working with partners to determine responses should invasive species enter the WMO.

4.1.7 Issue 7: Standardizing wellhead protection strategies

Groundwater protection is important to residents and businesses within the RBWMO that rely on groundwater supply for domestic, municipal, and industrial uses. To facilitate the protection of these resources, wellhead and source water protection plans have been completed and adopted by the both cities. However, results of the studies have some inconsistencies along municipal boundaries, thereby resulting in inconsistent messaging to project proposers and developers about how infiltration standards may affect underlying groundwater resources.

Photo 4-1: Wright's Lake, 2012

4.2 Goals and Strategies

The purpose of the WMO coupled with the issues present serve as the foundation for the goals, policies, and strategies summarized in subsequent sections and below in Table 4-1.

Table 4-1: Richfield-Bloomington Watershed Management Organization - Summary of Issues, Goals, and Strategies

Issues	Goals	Strategies
Issue 1: Surface water quality	Goal 1: Comprehensive understanding of water resources within the WMO through data compilation, evaluation, and monitoring activities.	Strategy: Establish water quality data management process Strategy: Work with partner agencies to understand current loading with respect to established and upcoming total maximum daily load (TMDL) targets and allocations Strategy: stormwater management standards Strategy: Conduct regular water quality assessments to determine progress to meeting future impairment reduction needs
Issue 2: Water quantity and volume management - Localized flooding - Infrastructure adequacy concerns resulting from development and climate change	Goal 2: Identify opportunities to improve management of water quantity (localized flooding) and volume through reconstruction and redevelopment.	Strategy: Stormwater management standards Strategy: Develop regional flood control strategies Strategy: Develop regional storm water treatment strategies
Issue 3: Redevelopment opportunities and strategies - Fully developed watershed	Goal 3: Strive for layered benefits using redevelopment and storm water solutions to maximize space limitations	Strategy: Develop regional storm water treatment strategies Strategy: Identify potential problem areas and work with developers to maximize benefits Strategy: Stormwater management standards
Issue 4: Public education and outreach - Lack of well-defined education and outreach plan	Goal 4: Work more efficiently and effectively with public and private partners on engaging residents and youth in area schools without duplicating efforts.	Strategy: Develop a comprehensive education and outreach plan

Issues	Goals	Strategies
Issue 5: Wetland protection - Impact of water quality and invasive species - Wetlands connection to storm sewer system	Goal 5: Maximize the function and value of wetland resources committing to no net loss of quantity, quality, and type.	Strategy: Evaluate functions and values of wetlands Strategy: Stormwater management standards Strategy: Water Quantity and Volume Management Strategy: Develop a comprehensive education and outreach plan Strategy: Maintain WCA TEP communications
Issue 6: Invasive species strategies and management - Existing infestation - Early species detection	Goal 6: Engage partner agencies to collaborate on education, management, and invasive species monitoring.	Strategy: Develop general guidance on managing invasive species
Issue 7: Standardized wellhead protection strategies - Inconsistent vulnerability areas' definition and development approach	Goal 7: Coordinate between cities as wellhead protection plans are updated to provide consistent infiltration standards.	Strategy: Develop consistent infiltration standards for development within DWSMA

4.2.1 Goal 1: Comprehensive understanding of water resources within the WMO through data compilation, evaluation, and monitoring activities.

Improving surface water quality represents the highest priority in RBWMO. To effectively facilitate RBWMO's commitment to surface water quality, the WMO must have a comprehensive understanding of its water resources. This involves implementing the following strategies identified through the planning process to protect and improve surface water resources towards meeting target state of Minnesota water quality standards, pursuant to Minnesota Administrative Rules 7050.

4.2.1.1 Strategy: Establish Water Quality Data management process

This strategy consists of collecting water quality on surface waters in the WMO and submitting the data annually to the MPCA. In addition, the capacity of stormwater treatment ponds will be assessed to determine their ability to provide water quality treatment.

4.2.1.2 Strategy: Work with partner agencies to understand current loadings with respect to established or upcoming TMDL targets/ allocations

This strategy consists of reviewing existing and future TMDLs for waste load allocations attributed to the RBWMO and developing load reduction related activities, projects and programs. This

includes the Metro Area Chloride TMDL where the WMO will review and consider public applicators chloride management strategy and works towards a private applicators chloride management strategy.

4.2.1.3 Strategy 3: Stormwater Management Standard

Below is the stormwater management standard for the RBWMO.

It is the policy of the RBWMO to:

a. Manage new development and drainage alterations by requiring each development or land disturbing activity to manage its stormwater effectively, either on- or off-site.
b. Promote and encourage a reduction in runoff rates, encourage infiltration and promote groundwater recharge.
c. Maximize groundwater recharge as a means of maintaining drinking water supplies, preserving base flows in streams, and limiting discharges of stormwater to downstream receiving waters.
d. Require that property owners control the rate and volume of stormwater runoff originating from their property so that surface water and groundwater quantity and quality is protected or improved, soil erosion is minimized, and flooding potential is reduced.
e. Protect and improve natural resources within the watershed to prevent further degradation.

Regulated Activities and Threshold

Development, redevelopment, and drainage alterations (including roads) creating new impervious areas greater than one acre.

Exceptions

The use of infiltration as a stormwater treatment method is prohibited in the following areas:

- Where industrial facilities are not authorized to infiltrate industrial stormwater under an NPDES/SDS Industrial Stormwater Permit issued by the Agency
- Where vehicle fueling and maintenance occur
- With less than three (3) feet of separation distance from the bottom of the infiltration system to the elevation of the seasonally saturated soils or the top of bedrock
- Where high levels of contaminants in soil or groundwater will be mobilized by the infiltrating stormwater

Standards

a. Rate Control: For new development stormwater runoff rates shall not exceed the existing conditions. For redevelopment stormwater runoff rates shall achieve a net reduction from pre-project conditions (on an average annual basis).
b. Volume
    1. New Development: For new, nonlinear developments that create one acre or more of new impervious surface on sites without restrictions, the post-construction stormwater runoff volume retained onsite shall be equivalent to 1.0 inches of runoff from impervious surfaces.
    2. Redevelopment: Nonlinear redevelopment projects on sites without restrictions that create one acre or more of new and/or fully reconstructed impervious surfaces shall

capture and retain onsite 1.0 inches of runoff from the new and/or fully reconstructed impervious surfaces.

c. Water Quality: For new development, water quality shall achieve a no net increase (on an average annual basis) of storm water discharges of TSS and TP. For redevelopment, water quality shall achieve a net decrease (on an average annual basis) of storm water discharges of TSS and TP. In some locations, water quality requirements may be met through regional treatment.
d. Credits: Volume control credits will be awarded as described in the Minnesota Stormwater Manual v3.0 - Wiki, as amended.
e. Maintenance and Easement
    1. All stormwater management structures and facilities must be designed for maintenance access and properly maintained in perpetuity so that they continue to function as designed.
    2. A maintenance plan that identifies and protects the design, capacity, and functionality of onsite and offsite stormwater management facilities; specifies the methods, schedule and responsible parties for maintenance shall be developed for every stormwater management facility.
    3. The maintenance agreement shall be recorded with the County as part of the local water plan agreement development approval process.
    4. A public entity assuming maintenance obligation may submit a written executed agreement in lieu of the recorded maintenance agreement.

Alternative Measures

For sites were infiltration is infeasible, comply with Part III. D of the NPDES General Construction Permit, issued by the Minnesota Pollution Control Agency, August 1, 2013, as amended.

4.2.1.4 Strategy: Conduct regular water quality assessments to determine progress to meeting future impairment reduction needs

This strategy consists of maintaining current monitoring schedule and incorporating the Metropolitan Council's Environmental Services quality assurance process. In addition, the RBWMO will perform periodic detailed assessment of water leaving the WMO to downstream water bodies.

4.2.2 Goal 2: Identify opportunities to improve management of water quantity (localized flooding) and volume through reconstruction and redevelopment.

4.2.2.1 Strategy: Stormwater Management Standards

Stormwater Management Standards (Section 4.2.1.3.) include standards for redevelopment to improve management of water quantity.

4.2.2.2 Strategy: Regional flood control strategies

Below is the floodplain (flood control) standard for the RBWMO.

4.2.2.2.1 Floodplain Standard

It is the policy of the RBWMO to:

a. Regulate alterations within the floodplain and drainageways within the watershed to provide flood protection to natural resources, permanent structures, and private lands.
b. Preserve existing water storage capacity below the 1% chance-year high water elevation of all

waterbodies in the watershed to minimize the frequency and severity of high water.

c. Minimize development below the 1% chance high water elevation that will unduly restrict flood flows or aggravate known high water problems.

Regulated activity and threshold

Alteration or infilling of land below the projected 1% chance high water elevation of a waterbody.

Exception

If the 1% chance high water elevation of a waterbody is entirely within a municipality, the waterbody does not outlet during the 1% chance event, and the municipality has adopted a floodplain ordinance prescribing an allowable degree of floodplain encroachment, the ordinance governs the allowable degree of encroachment.

Standards

a. Fill shall not cause a net decrease in storage capacity below the projected 1% chance high water elevation nor an increase in the 1% chance elevation of a waterbody.
b. The allowable fill area shall be calculated by a professional engineer registered in the State of Minnesota. Creation of floodplain storage capacity to offset fill shall occur before any fill is placed in the floodplain, unless it has been demonstrated that doing so is impractical and that placement of fill and creation of storage capacity can be achieved concurrently. Any placement of fill prior to creation of floodplain storage capacity will only be allowed upon a demonstration by a registered professional engineer that such work will not aggravate high water conditions.
c. All new residential, commercial, industrial, and institutional structures shall be constructed such that all door and window openings are at a minimum of 2 feet above the 1% chance high water elevation.
d. No person shall install or remove a culvert or other artificial means to remove or drain surface water, create artificial pond areas, or obstruct the natural flow of waters without demonstrating that there is no adverse impact on upstream or downstream landowners or water quality, habitat, or fisheries.

4.2.2.3 Strategy: Develop regional stormwater treatment strategies

This strategy requires the RBWMO to update its hydrology and hydraulics (H&H) model to incorporate NOAA Atlas -14 data. The H&H modeling effort will result in an inundation map highlighting opportunities to improve flood protection and areas with the greatest potential for flood storage. Also, as water quality ponds within the RBWMO are being assessed for water quality treatment benefits (Section 4.2.1.1), capacity should be assessed for its ability to provide flood storage.

4.2.3 Goal 3: Strive for layered benefits using redevelopment and stormwater solutions to maximize space limitations.

Work with current and future development communities to identify opportunities for large scale options (regional treatment options) – meet and or exceed treatment benefits and address rates

4.2.3.1 Strategy: Develop regional stormwater treatment strategies

See Section 4.2.2.3.

4.2.3.2 Strategy: Identify potential problem areas and work with developers to maximize benefits.

This strategy requires partnership between the RBWMO, municipal planning and zoning staff and developers to identify areas being considered for redevelopment.

4.2.3.3 Strategy: Stormwater Management Standards

Stormwater Management Standards (Section 4.2.1.3.) include standards for redevelopment to improve management of water quantity.

4.2.4 Goal 4: Work more efficiently and effectively with public and private partners on engaging residents and youth in area schools without duplicating efforts.

4.2.4.1 Strategy: Develop a comprehensive education and outreach plan

This strategy requires the development of a comprehensive and sustainable education and outreach plan that specifically engages students. The education and outreach plan should identify ways to engage schools, public and private partners, youth, and adults incorporating water resources educational programming at the Wood Lake Nature Center.

4.2.5 Goal 5: Maximize the function and value of wetland resources committing to no net loss of quantity, quality, and type.

The qualitative value placed on wetlands varies by community. RBWMO's goal is to actively preserve the health of wetland resources through activities focused on resource evaluation and protection.

4.2.5.1 Strategy: Evaluate and enhance functions and values of wetlands

This strategy requires each municipality with the RBWMO to evaluate wetlands and to determine ways to enhance their functions and values. This requires, if dated, the completion of Minnesota Routine Assessment Method (MNRAM) for each wetland to accurately assess the regulatory function of these resources.

4.2.5.2 Strategy: Stormwater Management Standards

Refer to Section 4.2.1.3. Stormwater Management Standards

Refer to Section 4.2.2. Goal 2 and Section 4.2.1.3. Stormwater Management Standards.

4.2.5.3 Strategy: Develop a comprehensive education and outreach plan

Refer to Section 4.2.4. Goal 4

4.2.5.4 Strategy: Maintain WCA TEP communication

The technical evaluation panel (TEP) provisions within the Minnesota Wetland Conservation Act (WCA) provide forums to discuss site-specific interpretations of laws, rules, and technical data affecting wetland resources. This strategy requires appropriate consultation with the TEP when projects or issues arise impacting wetland resource. Also, the TEP could be used to discuss anticipated regulatory changes to WCA and how they would affect municipal wetland management and planned development/redevelopment projects.

4.2.6 Goal 6: Engage partner agencies to collaborate on education, management, and invasive species monitoring.

4.2.6.1 Strategy 17: Develop general guidance on managing invasive species

Thriving goldfish populations in Wood Lake and the presence of buckthorn throughout the watershed requires decisive action to effectively manage these and other invasive species. This strategy calls for the development of general guidance for managing invasive species in partnership with Minnesota Aquatic Invasive Species Research Center (MAISRC) and Minnesota Invasive Terrestrial Plants and Pests Center (MITPPC) incorporating education, monitoring, and maintenance protocols.

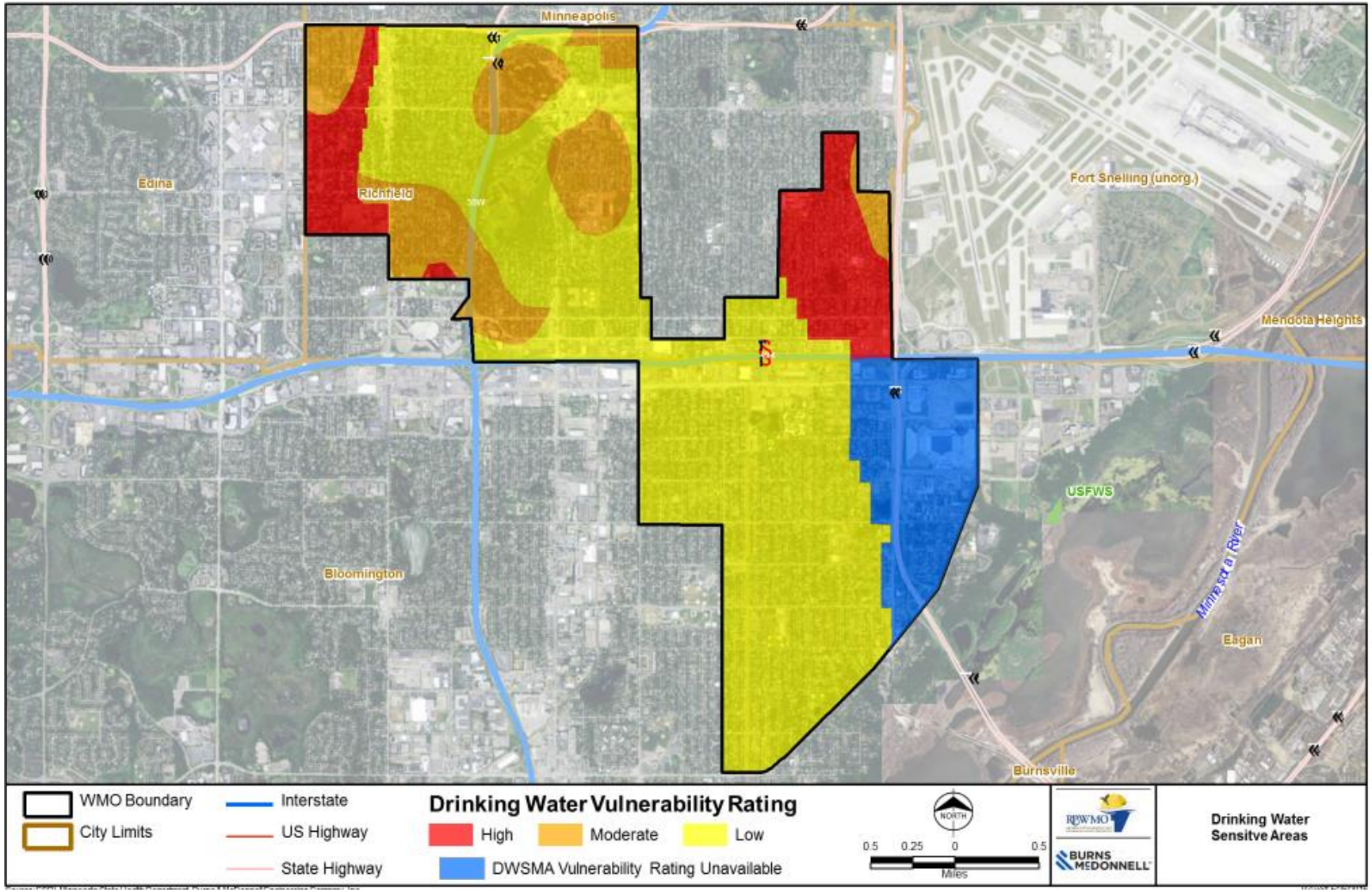
4.2.7 Goal 7: Coordinate between cities as wellhead protection plans are updated to provide consistency infiltration standards.

Much of the land mass within the RBWMO is within a DWSMA with vulnerability to contamination ranging from low to high (Figure 4-1). Considering MPCA restrictions on infiltration, it is important to manage these areas effectively and to have a coordinated approach across political boundaries. Unfortunately, through the independent development of wellhead protection plans, the interpretation of where infiltration of stormwater should be restricted within the DWSMA can be inconsistent, resulting in an inconsistent approach and messaging to developers.

4.2.7.1 Strategy 18: Develop consistent infiltration standards for development within DWSMA

This strategy requires the RBWMO to work in cooperation with the Minnesota Department of Health (MDH) and other local water management agencies to communicate the need for a more consistent identification of vulnerable areas and presentation of clearer recommendations on how infiltration should be managed in DWSMA areas with varying containment vulnerabilities. The desired outcome of this strategy is consistent infiltration standards that can be used throughout the RBWMO.

Figure 4-1: Richfield-Bloomington Drinking Water Sensitive Areas



5 Implementation Program

This section presents the Implementation Program (the Program) for this Plan. The RBWMO's Program addresses the issues and water resources challenges in Section 4.1 and applies goals and strategies generated by the RBWMO's stakeholders in Section 4.2. The Program consists of administrative and managerial efforts, coordination, studies, and programs; capital improvement projects (CIP); and funding mechanisms to successfully execute the Plan. Each element, if not described in Section 4, is described below.

The RBWMO Program schedule and budget is presented in Table 5-1. The estimated impacts of the implementation program on residents and local government are presented in the next section. RBWMO will review the Program every two years, at minimum, and at that time consider what programs the WMO may want to consider for grant funding.

5.1 Administrative and managerial

As stipulated in the JPA, administrative and managerial efforts will be carried out by staff from the cities of Bloomington and Richfield. Staff will take care of the day-to-day operation of the District, maintenance, and upkeep of the WMO's website, and implement other elements of the Program, as discussed below.

5.2 Operation and Maintenance Program

Activities detailed in this Program require both on-going and new operation and maintenance (O&M) activities. The cities of Bloomington and Richfield shall incorporate O&M activities as part of their stormwater management program budgets associated with their municipal separate storm sewer system (MS4) permits.

5.3 Education and Outreach Program

This implements Goal 4. The goal of the Education and Outreach Program is to complete the comprehensive education and outreach plan and to subsequently engage and educate youth about water and natural resources using the Wood Lake Nature Center.

Photo 5-1: Wood Lake Nature Center

5.4 Monitoring Program

Monitoring and data collection are crucial to determining the current state of water resources and to document the effectiveness of the RBWMO's ongoing management and improvement strategies. Meeting in-lake nutrient reduction and stormwater runoff goals may require nutrient reduction strategies, and implementation could require adaptive management principles. Adaptive management is appropriate because it is difficult to predict the lake response. Future technological advances may alter the course of actions detailed in this plan. Continued monitoring and "course corrections" responding to monitoring results are the most appropriate strategy for attaining the various goals established in this Plan.

5.5 Capital Improvement Projects

The capital improvement projects (CIP) identified below includes projects that will move the RWBMO toward achieving its goals. The CIP, limited by financial and human resources, is not a comprehensive list of all capital needs nor potential required projects. The inclusion of a project in the CIP is not a determination that the project will be implemented. Table 5-1 contains planning level cost estimates for the CIP identified for the period between adoption of this Plan and the biennial Plan review.

5.6 Special Studies

The CIP includes funding to update the suite of special studies that serve as the basis for the WMO's management planning. It also includes additional special studies to enhance the RBWMO's understanding of problems and issues in the watershed and to refine management planning. These special studies include:

- Establishing a water quality data management and evaluation process
- Reviewing TMDL's for waste load allocations attributed to the RBWMO
- Updating the H&H models incorporating NOAA Atlas-14 data
- Developing a comprehensive education and outreach plan

- Updating the functional assessment of wetlands.
- Developing a comprehensive invasive species management plan

5.7 Local Water Plans

Pursuant to M.S. 103B.231, following the approval and adoption of the Plan, the cities of Bloomington and Richfield shall each prepare a local water management plan (LWMP), updating capital improvement programs and official controls as necessary to bring local water management into conformance with the Plan. The LWMP must be consistent with and address the priorities identified in the Plan by December 2019. Since both cities have MS4 permits with MPCA approved stormwater pollution prevention programs (SWPPP), significant portions of their SWPPP may be incorporated into their LWMP.

Table 5-1: Richfield-Bloomington Watershed Management Organization Implementation Program Schedule and Budget (2018 – 2027)

Action	Funding Source	Year									
		2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Administrative/ Managerial											
General Administrative Services	Funded by Municipal SWU Fees	$7,000	$7,000	$7,000	$7,000	$7,000	$7,000	$7,000	$7,000	$7,000	$7,000
Technical and Citizen Advisory Commissions	Funded by Municipal SWU Fees	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2000
Studies and Programs											
Operation and Maintenance Program	Funded by Municipal SWU Fees	$505,000	$505,000	$505,000	$505,000	$505,000	$505,000	$505,000	$505,000	$505,000	$505,000
Education and Outreach Program	Funded by Municipal SWU Fees	$8,000	$8,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000

Action	Funding Source	Year									
		2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Monitoring Program	Funded by Municipal SWU Fees	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000
Water Quality Data Management and Evaluation	Funded by Municipal SWU Fees	$10,000			$10,000			$10,000			$10,000
H&H Model Update	Funded by Municipal SWU Fees	$50,000	$50,000	$50,000							
Education and Outreach Plan	Funded by Municipal SWU Fees		$20,000								
MNRAM Wetland Assessments	Funded by Municipal SWU Fees						$30,000				
Invasive Species Management Plan	Funded by Municipal SWU Fees				$20,000						

Action	Funding Source	Year									
		2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Capital Improvement Projects											
Sheridan Pond Dredging Project			$200,000								
Christian Pond Dredging Project				$200,000							
77th Street Underpass Project					$850,000						
66th Street Sewer Improvement Project		$1,500,000									
Total	**City of Bloomington**	$200,500	$178,000	$145,500	$163,000	$145,500	$160,500	$153,000	$145,500	$145,500	$153,000
	City of Richfield	$1,896,500	$624,000	$641,500	$1,259,000	$391,500	$406,500	$399,000	$391,500	$391,500	$399,000

6 Plan Amendment

This Plan provides direction to RBWMO for management activities through the year 2027. At a minimum, RBWMO is required to evaluate Plan implementation every two years. If the evaluation results in changes to the implementation actions in the Plan, an amendment to the Plan would be required unless the changes were clarifying in nature or minor. In addition, the Board may initiate amendments to the Plan at any time based on new requirements, policies, programs, or practices.

6.1 Amendment Procedure

All amendments to the Plan, except minor amendments, shall adhere to the full review and process set forth in M.S. 103B.231, and this section. The Board shall adopt proposed major Plan amendments upon their approval by the BWSR in accordance with M.S. 103B.231. The amendment procedure for minor Plan amendments shall be in accordance with Minnesota Administrative Rules 8410.0140, or as subsequently amended.

6.2 Form of Amendment

RBWMO will send draft and final amendments electronically, unless a paper copy is requested. Draft amendments will show edited text and new text as underlined, unless the entire Plan is being revised as part of a major amendment or Plan update. All final amendments adopted by RBWMO will incorporate renumbered pages and the amendment's effective date.

All stakeholders and review agencies will receive electronic copies of the Plan, and the Plan will be posted on RBWMO's website within 30 days of adoption.

7 Annual Reporting and Evaluation Requirements

Annually, the RBWMO will conduct a comprehensive evaluation of organizational activities and complete a report documenting findings of the evaluation. As part of the report, the strategies identified in this plan will be reviewed for progress on goals and to measure the success of the goals. Additionally the RBWMO will provide an annual review of upcoming projects or programs where grant funding may be applicable. Both the annual report a financial audit shall be submitted to BWSR. Refer to Minnesota Administrative Rules 8410.0150 for specific timeline and report requirements.

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Appendix A: Joint Powers Agreement Establishing and Empowering the Richfield-Bloomington Watershed Management Organization