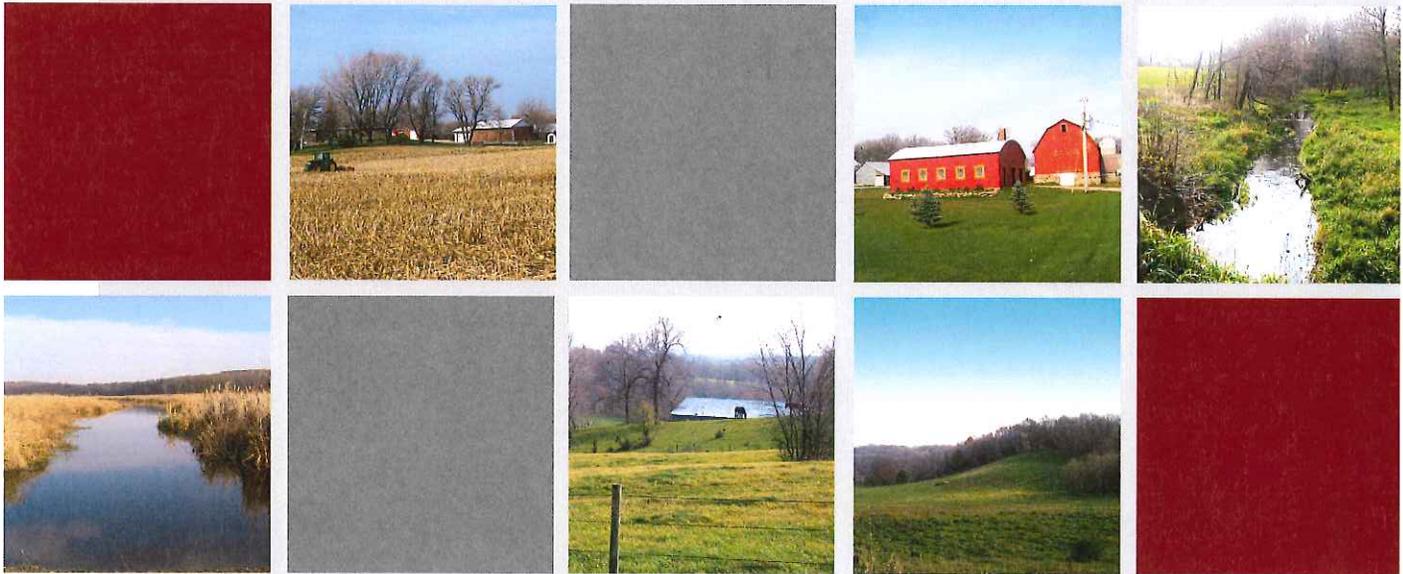


EUREKA TOWNSHIP LOCAL WATER MANAGEMENT PLAN

A CHAPTER OF THE TOWNSHIP'S 2040 COMPREHENSIVE PLAN



Eureka Township, Minnesota

September 2016
TKDA Project No. 15944.000

**EUREKA TOWNSHIP
LOCAL WATER MANAGEMENT PLAN**

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LIST OF ACRONYMS USED IN THE PLAN

(listed in alphabetical order)

| | |
|--------|---|
| AGQS | Ambient Groundwater Quality Study (Dakota County, 2006) |
| DNR | Department of Natural Resources |
| FEMA | Federal Emergency Management Agency |
| IBI | Index of Biological Integrity |
| GIS | Geographic Information System |
| LWMP | Local Water Management Plan |
| MCBS | Minnesota County Biological Survey |
| MCES | Metropolitan Council Environmental Services |
| MPCA | Minnesota Pollution Control Agency |
| MS4 | Municipal Separate Storm Sewer Permit |
| NCRWMO | North Cannon River Watershed Management Organization |
| NWI | National Wetland Inventory |
| Opdc | Prairie du Chien groundwater aquifer |
| SSTS | Subsurface Sewage Treatment Systems |
| SWCD | Soil and Water Conservation District |
| TMDL | Total Maximum Daily Load |
| VRWJPO | Vermillion River Watershed Joint Powers Organization |
| WCA | Wetland Conservation Act |
| WMA | Wildlife Management Area |
| WMO | Water Management Organization |

I. Executive Summary

This Local Water Management Plan (LWMP) for Eureka Township contains the elements that Minnesota Statutes 103B and Minnesota Rules 8410 require in local water management plans for communities that are not designated as MS4 (Municipal Separate Storm Sewer Permit) communities. The LWMP includes the following sections:

- The **Water Resource Management Plan and Agreements** with other organizations for water resource management.
- The **Description of the Township's Physical Environment and Land Use** summarizes available data regarding the existing and proposed land use in Eureka Township, and the water resources and natural resources in the Township.
- The **Existing Water Resource Problems** section summarizes the water resource issues identified by each of the Water Management Organizations' Watershed Management Plan.
- **Water Resource-Related Agreements** describes the Township's existing water resource-related agreements with other units of government.
- The **Local Goals and Policies**, section lists the Township's goals and policies adopted to address surface and groundwater management issues.
- The **Implementation** section summarizes the actions the Township will take to address the identified goals and policies.
- The **Amendment Procedures** outlines the process by which plan amendments will be incorporated into the plan.
- The Plan also includes figures and attachments that support the analysis.

This LWMP updates the plan that was included in the Township's 2030 Comprehensive Plan Update, and will be applicable until the Township is required to update its comprehensive plan for 2050. Periodic amendments may be required to incorporate changes made to the Watershed Management Plans of the watershed management organizations with jurisdiction in the Township.

II. Water Resource Management Plan Purpose and Agreements

This LWMP has been prepared to guide the Township in conserving, protecting, managing and improving its surface water resources. The plan meets the requirements described in Minnesota Statutes 103B and Minnesota Rules 8410. The plan is also consistent with the goals and policies of the Metropolitan Council's 2040 Water Resources Policy Plan and the plans and rules of the watershed management organizations with jurisdiction in Eureka Township.

Eureka Township is located primarily within two water management organizations: the North Cannon River Watershed Management Organization (NCRWMO) and the Vermillion River Watershed Joint Powers Organization (VRWJPO). The current *North Cannon River WMO Watershed Management Plan* was adopted in 2013, and the *Vermillion River Watershed Management Plan* was adopted in June, 2016.

The Township is one of the eight townships and three cities in southern Dakota County that is part of the Joint Powers Agreement (2000) that created the North Cannon River Watershed Management Organization (NCRWMO).

The Township is also part of the Joint Powers Agreement between Dakota and Scott Counties that created the Vermillion River Watershed Joint Powers Organization (VRWJPO) in 2002.

Activities within the shoreland and floodplain areas in the Eureka Township (and other Townships in Dakota County) are regulated by the County through Shoreland and Floodplain Management Ordinance 50.

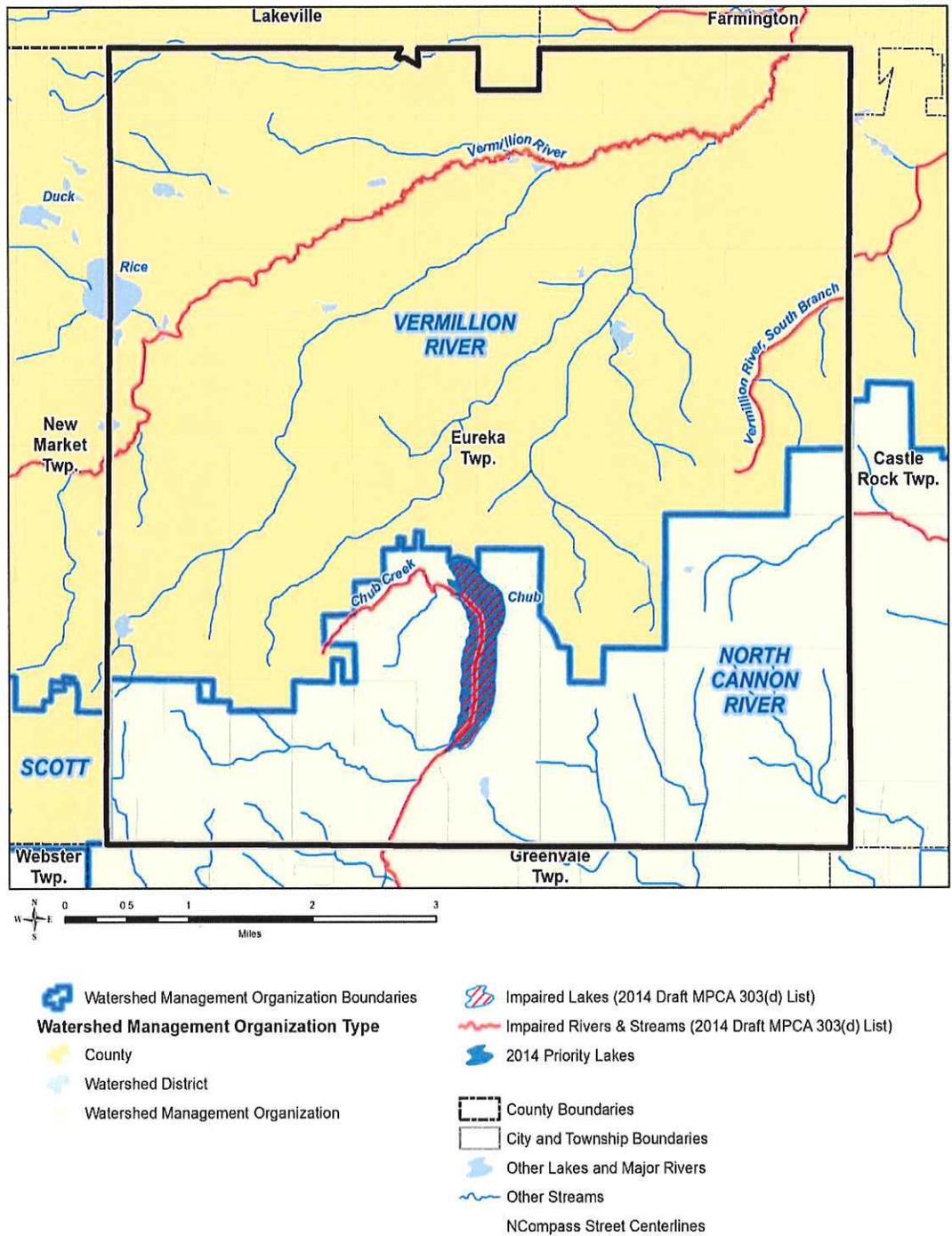


Figure 1. Watershed Management Organization Boundaries and Water Resources

III. Physical Environment and Land Use

1. Land Use

Eureka Township is a rural township in southern Dakota County. Land uses in the Township are dominated by agriculture and rural residential uses on large lots.

Existing land uses in the Township are identified in the Tables below and on Figures 2 and 3.

**Table 1:
Existing Land Use in Eureka Township**

| Land Use | Acres | Percent |
|--|--------------|----------------|
| Agricultural | 15625 | 69 |
| Farmstead | 323 | 1 |
| Single Family | 731 | 3 |
| Multifamily | 2 | <1 |
| Mixed Use Residential | 35 | <1 |
| Extractive | 125 | 1 |
| Airport | 235 | 1 |
| Park, Recreational, or Preserve | 358 | 2 |
| Industry and Utility | 71 | <1 |
| Institutional | 53 | <1 |
| Retail and Other Commercial | 35 | <1 |
| Open Water | 379 | 2 |
| Undeveloped | 4838 | 21 |
| TOTAL | 22,811 | 100 |

Metropolitan Council, Community Profile for Eureka Township

The Township's 2040 Comprehensive Plan includes goals to maintain the current types and patterns of Land Use in the Township through 2040. Land use in the Township is dominated by agricultural and residential uses. The Township is classified as an Agricultural Township by the Metropolitan Council, and its 2040 Land Use and Zoning maps designate the Township for Agricultural Use, with a developed overall density of no more than 1 dwelling unit per quarter-quarter section.

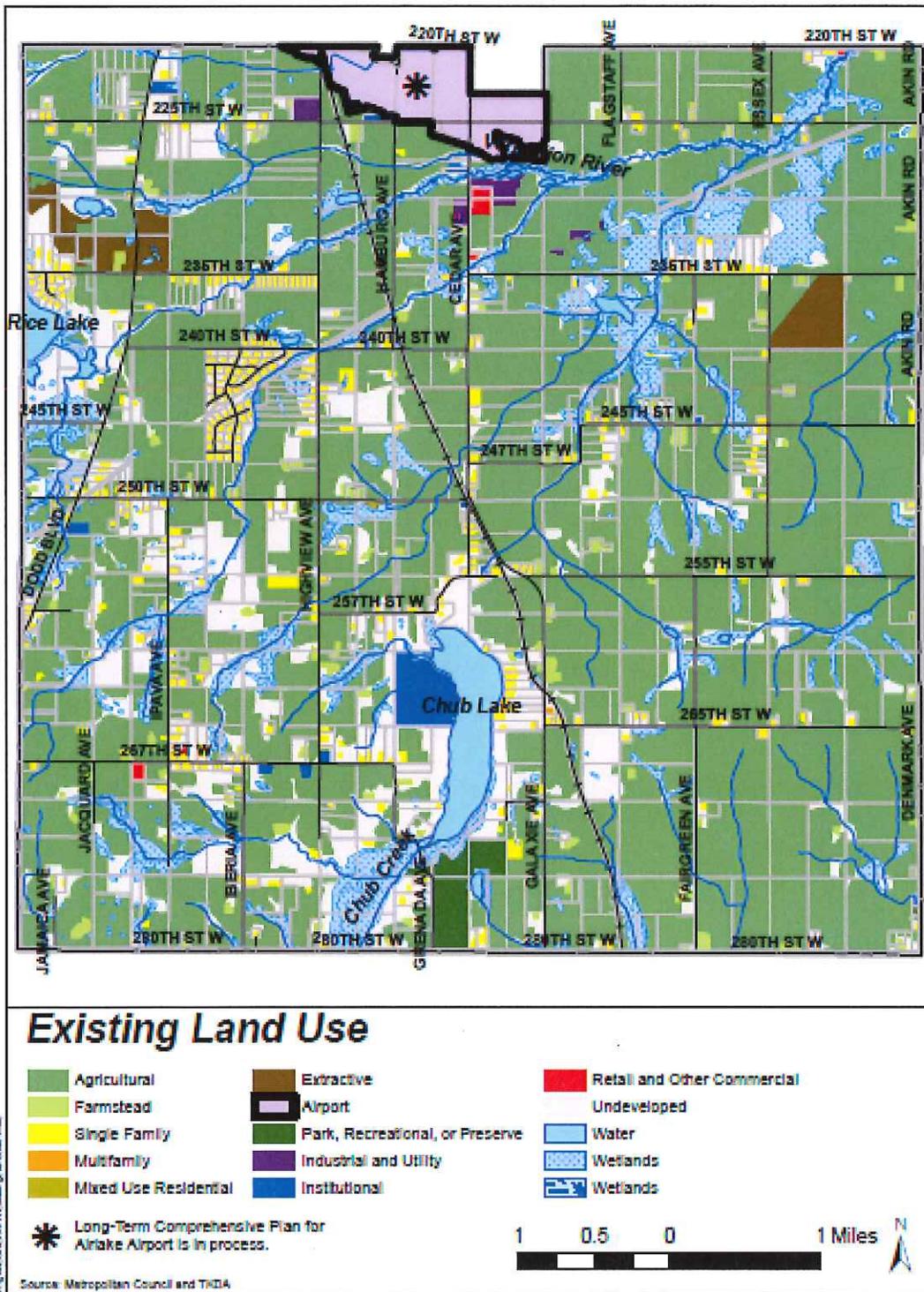


Figure 2. Existing Land Use

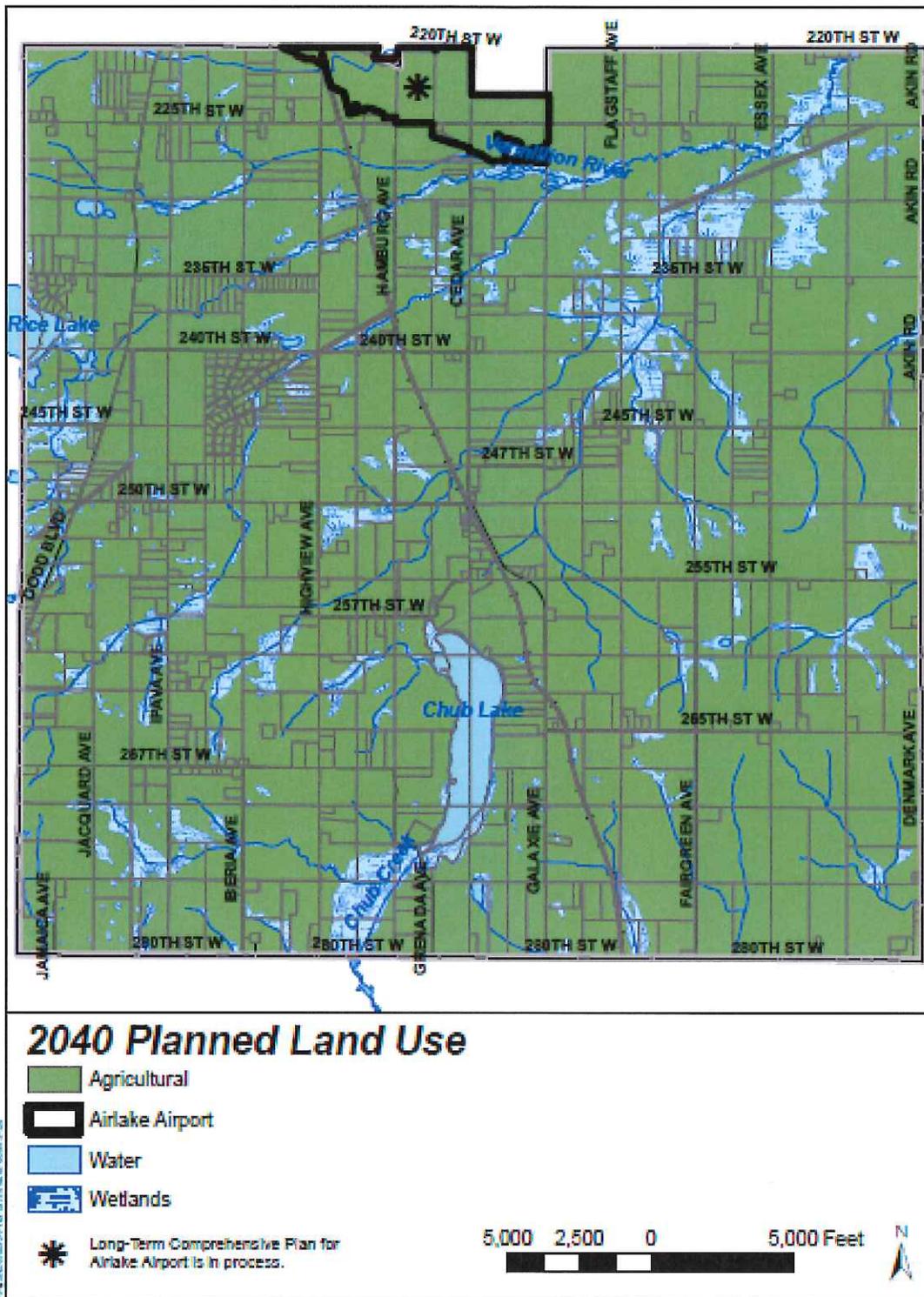


Figure 3. 2040 Planned Land Use

2. *Key Water Resources and Designations*

Eureka Township includes or drains to several significant water resources that are identified on Figure 1:

- Chub Creek – the creek drains to the Cannon River, a state-designated Wild and Scenic River
- Chub Lake – a natural 274-acre lake with a maximum depth of 10 feet, with a large adjacent wetland
- Vermillion River – a designated trout stream
- Vermillion River, South Branch – a designated trout stream
- Rice Lake – the eastern portion of the lake is located within the Township

Public Waters

The Minnesota DNR designates “public waters” based on criteria in Minnesota Statutes Section 103G.005, Subd. 15. Public Waters wetlands include all type 3, 4 and 5 wetlands that are 10 acres or more in size in unincorporated areas or 2.5 acres or more in size in incorporated areas, as well as lakes and streams. Public Waters within the Township are identified on the following table and on Figure 1. The DNR also classifies stream for Shoreland District management.

**Table 3:
DNR Protected Waters in Eureka Township**

| <u>Protected Waters Number</u> | <u>Name of Resource</u> |
|--------------------------------|--------------------------------------|
| 19-20 p | Chub Lake—Natural Environment Lake |
| 70-1 p | Rice Lake – Natural Environment lake |

3. *Impaired Waters*

Under the federal Clean Water Act (33 U.S.C.) the Environmental Protection Agency (EPA) requires the Minnesota Pollution Control Agency (MPCA) to set standards and assess Minnesota waters for impairments. The standards are set on a wide range of pollutants, including bacteria, nutrients (phosphorus, for example), turbidity and mercury. A water body is listed as impaired by the MPCA if it fails to meet one or more water quality standard. If a water body is listed as impaired, a Total Maximum Daily Load (TMDL) standard is established for the pollutant. The MPCA or the local watershed organization must complete a TMDL plan to identify actions to reduce the pollutant loading to meet the TMDL. Townships and Cities are required to participate in the implementation of TMDL plans for the water bodies within their communities.

The water bodies listed in Table 4 and shown on Figure 4 are the impaired waters within Eureka Township.

**Table 4:
Impaired Waters**

| Water Body | Type of Impairment | Watershed |
|--------------------------------|---|------------------|
| Chub Lake | Nutrients | NCRWMO |
| Chub Creek | Bacteria | NCRWMO |
| Vermillion River | Aquatic Life (Invertebrate & Fish IBI, Dissolved Oxygen, and Turbidity) Aquatic consumption (Mercury) Aquatic recreation (Fecal coliform) | VRWJPO |
| Vermillion River, South Branch | Aquatic Recreation (Fecal coliform) | VRWJPO |

4. Water and Natural Resources in Eureka Township

Each of the Watershed Districts has completed extensive inventories of the water and natural resources within their districts in their Watershed Plans. The Township has included a summary of natural resources based on DNR data and maps in its 2040 Comprehensive Plan. This LSWMP includes a summary of the information included in those plans that describes the resources of Eureka Township

Surface Water Resources

The significant surface water features in the Township include the following:

Chub Creek. Chub Creek originates in Chub Lake. It drains a portion of Dakota County and Rice County. The hydrology of the creek has changed substantially since European settlement in the area due to the loss of wetlands and ditching of tributary streams. Historically, the creek emptied into Lake Byllesby, but the channel was altered to empty into the Cannon River when Highway 56 was constructed. The creek is not a trout stream, but it offers some game fish such as Northern pike and largemouth bass. The riparian areas of the creek offer wildlife habitat and viewing opportunities.

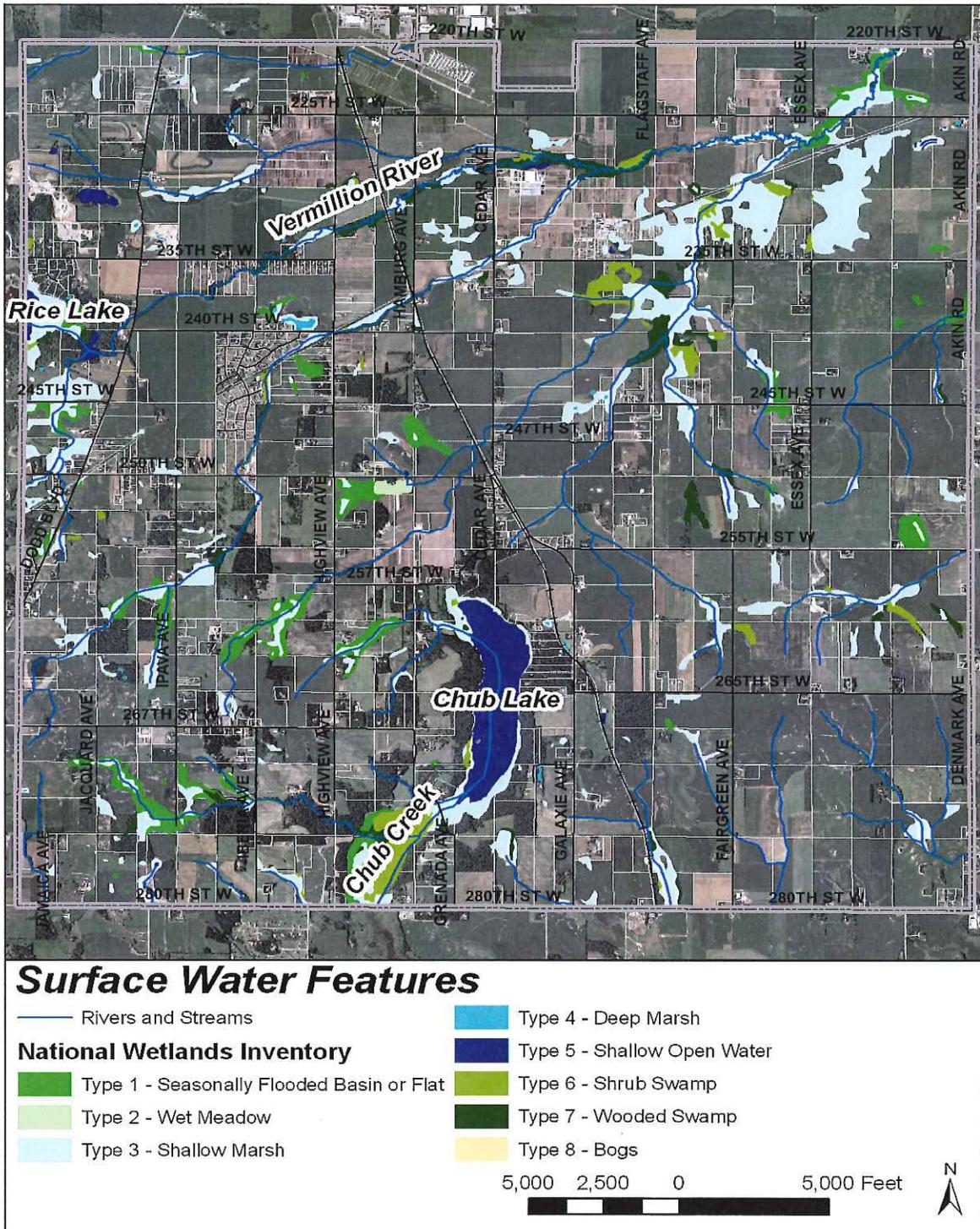
Chub Lake. Chub Lake is a natural 274-acre lake with a maximum depth of 10 feet and a large adjacent wetland. Public access is available at a Minnesota DNR Wildlife Management Area (WMA) on the south shore of the lake. The lake is only 2.5 meters deep, and its average water clarity is 0.5 meters. The lake is on the impaired-waters list for excess nutrients. The lake offers opportunities for canoeing, duck hunting, trapping, and fishing for non-game species.

Vermillion River. The majority of reaches of the Vermillion River and its tributaries were identified as DNR-designated trout streams between 2000 and 2010. Until recently, the MPCA followed the DNR trout stream designation and classified all designated trout streams as 2A cold-water resources. Stringent regulations apply to waters classified as 2A to protect sensitive cold-water species. The VRWJPO has requested that the MPCA consider a site-specific standard for the Vermillion River and its tributary trout streams, which have conditions intermediate to the 2A and 2B (warm-water trout streams) classifications.

Wetlands. The wetlands identified in the National Wetlands Inventory (NWI) are in Eureka Township are shown on Figure 4. In 2007 and 2008, the Dakota County SWCD completed the Wetland and Watercourse Inventory (WWIA) throughout the Vermillion and North Cannon River Watersheds. The project inventoried and remotely assessed the conditions of wetlands and streams within the watersheds. Characteristics of each wetland basin were recorded and mapped,

and high, medium and low value rankings were assigned to each wetland. The information is housed in a GIS database at the SWCD.

Figure 4. NWI Wetlands in Eureka Township



Shoreland Areas. The lakes and streams in the Township include Shoreland areas that are regulated by Dakota County through the Shoreland and Floodplain Management Ordinance. Each of the protected waters listed in the Protected Waters table above and the streams with the Township includes a shoreland management area.

Floodplain Areas. Dakota County recently completed a county-wide floodplain re-study including flood-prone regions in Eureka Township. The study was adopted by Dakota County in 2011 as an amendment to Ordinance 50, and by the Federal Emergency Management Agency (FEMA) in December, 2011. New floodplain maps are available for review at the Dakota County Water Resources Department, at the Town Hall, and on the FEMA website, www.fema.gov.

Other Natural Resources

Local Geology. The surface geology of the Township was shaped by glacially-derived and deposited materials and some non-glacial deposits. The non-glacial deposits include floodplain, colluvium, and organic deposits. Sand and gravel deposits in the Township are associated with glacial outwash areas. These deposits also allow for the formation of surface aquifers. Aquifers that are close to the surface are particularly susceptible to contamination.

The bedrock underlying the Township was formed during the Paleozoic Era (225-600 million years ago). The formations consist of marine sedimentary rock that includes dolomite, limestone, sandstones, and shales.

Groundwater Resources. Groundwater resources are discussed in detail in the Townships *Water Supply Plan* chapter that is included in the Township's 2040 Comprehensive Plan. The Prairie du Chien Dolostone Aquifer and Jordan Sandstone Aquifer are the primary water supplies for domestic and high-capacity irrigation wells in the area.

Dakota County's *Ambient Groundwater Study* (2006) included an extensive analysis of groundwater supplies and issues in the County. While no specific concerns related to groundwater quality or quantity were noted in Eureka Township, the study noted that the most common groundwater contaminant found in well monitoring in Dakota County is nitrate. The AGQS report notes that "nitrate is not dangerous at natural levels, but can pose health risks at elevated levels. With the increased use of fertilizers, especially in geologically-sensitive areas, nitrate levels are becoming an increasing problem in groundwater." The study recommended that private well owners complete regular testing of their wells to identify potential nitrate contamination.

The *NCRWMO Management Plan* notes that "Groundwater quantity and quality have not been limiting in either the Prairie du Chien or Jordan aquifer, though there is evidence that quality is becoming a concern in the Prairie du Chien"

Quality concerns are related to increases in nitrates noted in some monitoring wells. The *Vermillion River Watershed Management Plan* also noted general concerns related to water quantity in some areas of the Watershed, and quality concerns related to nitrate pollution.

The Minnesota Geological Survey maps for Dakota County (1990) note that there are several known springs within Eureka Township. The Vermillion River and its tributaries are also connected to groundwater resources. Maps in the Township's *Water Supply Plan* note the known areas of surface and groundwater interaction within the Township.

Soils. Eureka Township has well-drained to somewhat poorly-drained soils formed in loam and silt sediments and loamy glacial till. The well-drained loam soils are typically found on gently sloping to moderately-steep hills, and poorly-drained soils are found in depressional areas between the slopes. Hydric and predominantly hydric soils are found in small, scattered depressional pockets or along rivers and streams. The soils have a moderately high susceptibility to channelized erosion due to their texture, slope and permeability. Some highly-erodible soils exist on the steeper slopes adjacent to Chub Lake.

Ecoregions. The Minnesota DNR and U.S. Forest Service developed a statewide Ecological Classification System that is used to identify, describe and map areas with similar ecological features. The western half of Eureka Township is included in the North Central Hardwoods/Big Woods Ecoregion, and the eastern half of the township is included in the Western Corn Belt Plains/Lower St. Croix and Vermillion Valley.

The Big Woods ecoregion included a large area of deciduous forest at the time of European settlement. The topography of the area is gently rolling. Northern red oak, sugar maple, basswood, and American elm were common in this forested area. Most of the area is currently dominated by cropland and pasture. Only about 10-15 percent of the ecoregion remains forested.

The Western Corn Belt Plains is largely a cultivated area with row crops. At the time of settlement, the land cover was primarily tall-grass prairie, with forested riparian areas, floodplains, and wetlands.

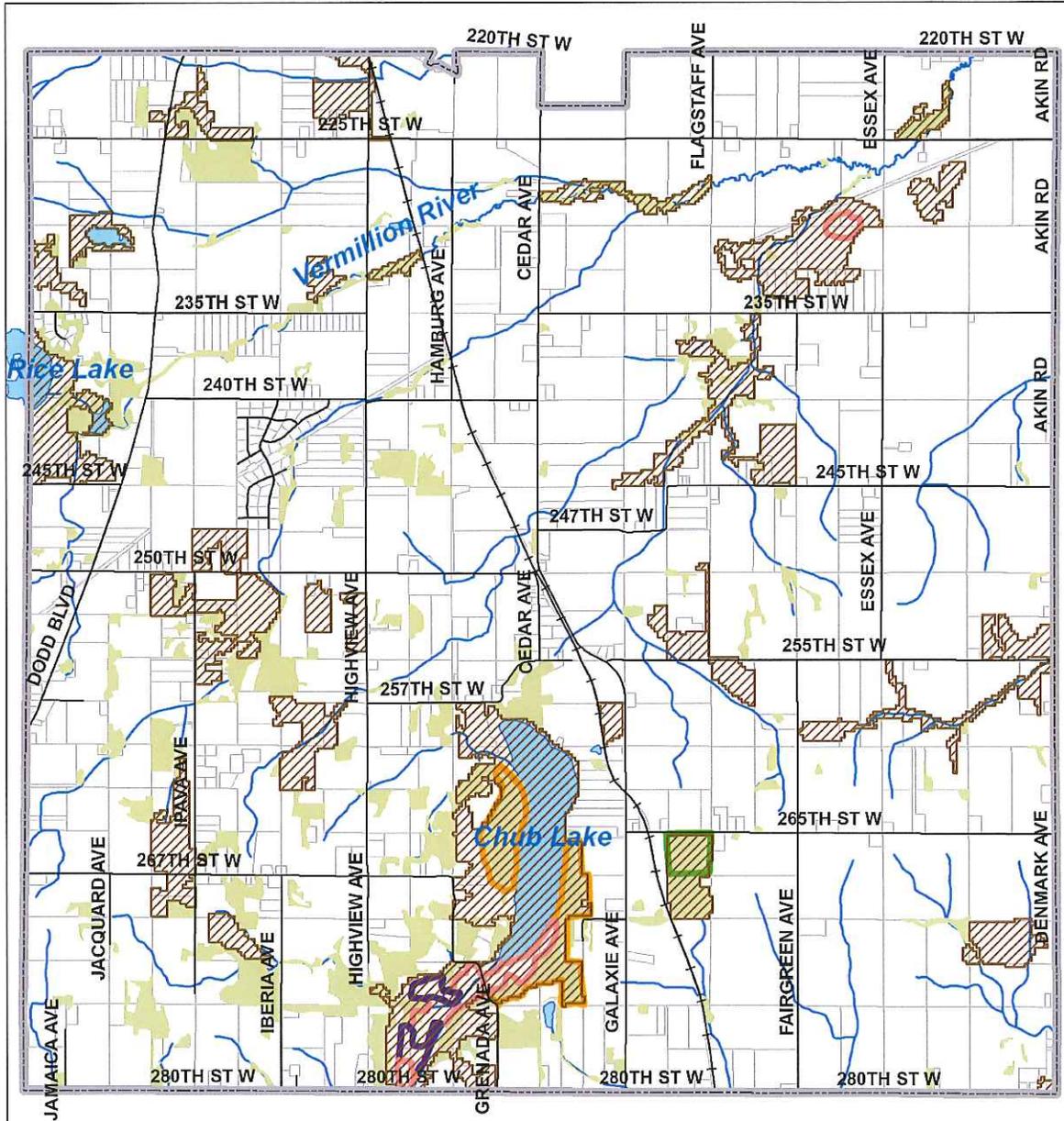
Natural Areas in the Township. The Minnesota DNR identified the native plant communities and natural areas that remain in the township in the Minnesota County Biological Survey (MCBS) and in a later study of areas of ecological significance in 2003. The WMO plans also include lists of rare species located within each watershed area. The remaining native plant communities and natural areas in the Township are significant because they provide habitat, biological diversity, connectivity, and ground water recharge areas. The Natural Areas map included in this plan (Figure 5) shows the remaining natural areas in the Township.

Natural Resource Corridors. The Township identified natural resource corridors that connect water resources and natural areas in the community in its 2030 Comprehensive Plan. The map is included in the 2040 plan and in this Local Surface Water Management Plan (Figure 6). Significant natural resources within and connected by the corridor network include:

- Chub Lake and Chub Creek and associated wetlands
- The Vermillion River corridor
- Rice Lake Area
- Wooded and forested plant communities
- Areas with native species and plant communities

Natural Resource Corridors provide habitat connections among the remaining large patches of natural areas within and outside the Township's boundaries. Dakota County has also identified a network of natural corridors within the County and Township. The location of corridors is similar to those that the Township has identified. County staff indicated that the County's corridors within the Township are primarily natural resource corridors, and the County has not located proposed trails or recreational facilities with the corridors in the Township.

Figure 5. Natural Areas in Eureka Township Identified by the Minnesota County Biological Survey



Natural Areas

County Biological Survey

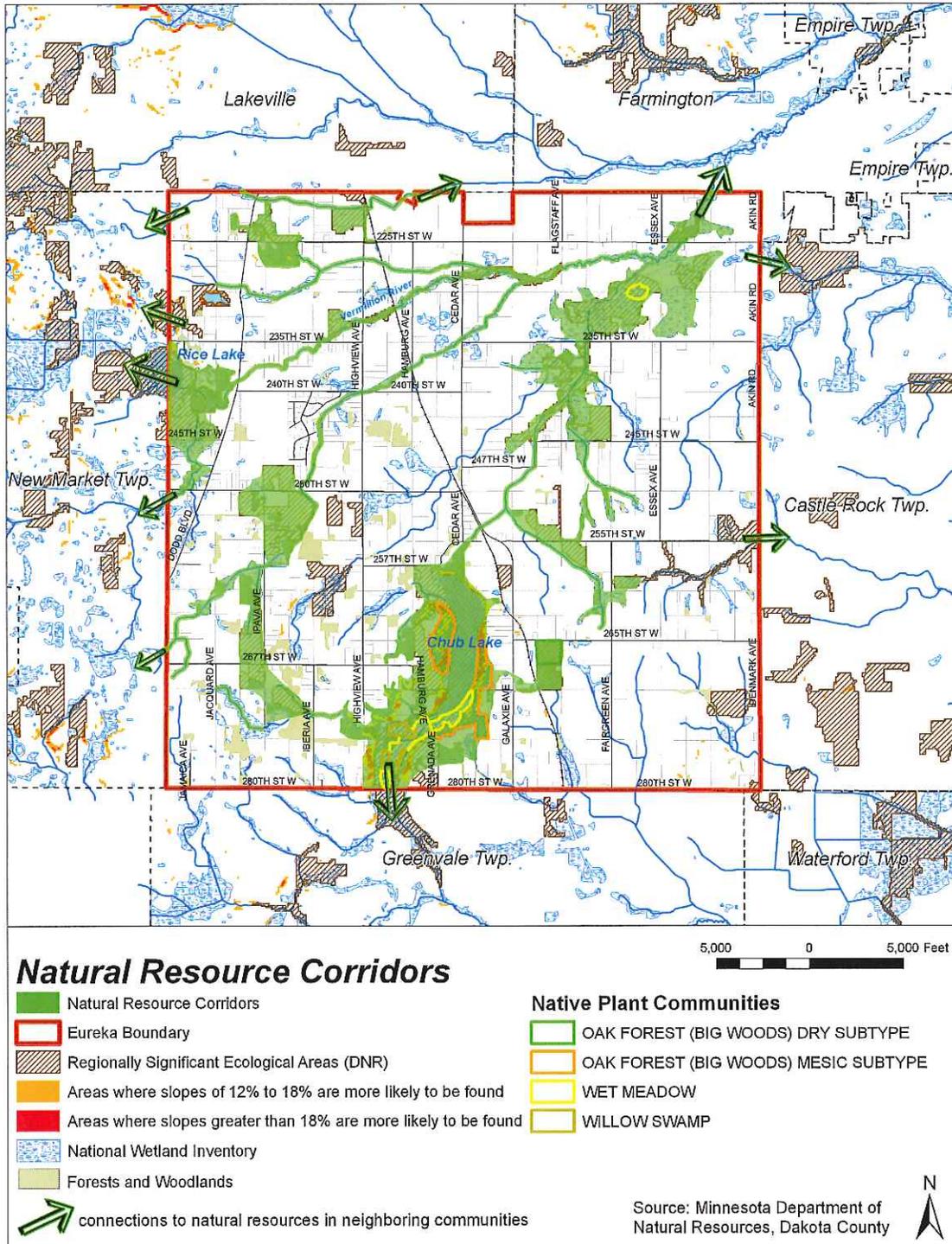
- OAK FOREST (BIG WOODS) DRY SUBTYPE
- OAK FOREST (BIG WOODS) MESIC SUBTYPE
- WET MEADOW
- WILLOW SWAMP

- Regionally Significant Ecological Areas (DNR)
- Forests and Woodlands

5,000 2,500 0 5,000 Feet



6. Natural Resource Corridors in Eureka Township



IV. Existing and Potential Water Resource Problems

1. North Cannon River WMO

The North Cannon River WMO Watershed Management Plan (2013) discusses the major water quality issues within the watershed, including Eureka Township. The District has been monitoring water quality and quantity since 1999. Issues include:

- Bacteria and nitrate concentrations

Chub Creek is on the impaired waters list for bacteria. Potential bacteria sources include failing septic systems, runoff from agricultural fields, livestock in streams, and wildlife. Sediments in water bodies may serve as a reservoir for bacteria. The NCRWMO was included in a region-wide bacteria Total Maximum Daily Load (TMDL) study in 2006. The study identified bacteria sources and possible practices to alleviate that pollution throughout southeast Minnesota.

- Turbidity

Turbidity is a measure of water clarity and is affected by suspended particles in the water. Common turbidity sources include agricultural runoff, in-stream erosion and algae.

The NCRWMO Plan notes that other water quality concerns may exist, but data are not currently sufficient to determine if conditions meet water quality standards. Dissolved oxygen concentrations are frequently near water quality standards, and may drop below levels needed to sustain aquatic life during periods of low flow and high summertime temperatures.

Chub Lake is a shallow, eutrophic lake. The lake was monitored by Metro Council staff in 2010 and 2011. The lake water quality was characterized by high nutrient concentrations and high chlorophyll-concentrations. The lake received a lake grade of F on the Metropolitan Council's lake Grading system in 2010 and 2011.

2. Vermillion River Watershed Joint Powers Organization

The VRWJPO has implemented a baseline monitoring program on the Vermillion River and its tributaries for more than a decade. A monitoring station is located just west of the Township boundary in New Market Township, and another is located on the boundary between Eureka Township and the City of Farmington. The Minnesota DNR identified most reaches of the Vermillion River as DNR-designated trout streams between 2000 and 2010.

The VRWJPO Watershed Management Plan notes the following trends in monitoring in recent years:

- Phosphorus and nitrate concentrations in the river were dramatically reduced when the MCES Empire Treatment Plant effluent was redirected.
- Nitrate concentrations have been steadily rising in the South Branch Vermillion River subwatershed, though levels do not exceed the state standard. The subwatershed has porous soils, agricultural land use, and artificial drainage systems that are the likely cause of the above-average nitrate concentrations in the South Branch.

The VRWJPO Plan identifies the following WMO-wide issues for water resource management:

- Surface water quality is threatened or impaired.
- Water quality improvement complete with other public, private, and individual priorities.
- Groundwater quality is at risk with known contamination above health risk limits for nitrates in some parts of the Watershed.
- Increasing consumption of groundwater threatens future water supply.
- Changing precipitation patterns, decreasing rainwater infiltration, and increased stormwater runoff have contributed to more intense fluctuations in river flow rate and volume.
- Public awareness and specific knowledge on the impacts of daily activities and appropriate stewardship is lacking.
- Several federal, state, and local agencies manage specific aspects of water protection, and limited coordination and communication among these agencies can create inefficiencies and cause confusion.
- Minnesota's climate is getting warmer and wetter, which poses a threat to water quality, wildlife, and infrastructure.
- The VRWJPO is a "young" organization in a dynamically changing landscape, and has not always been able to fill gaps and address new opportunities.
- Sensitive biological resources – plants fish, insects, and wildlife – in the Vermillion River are not as healthy as those in reference rivers.

Each WMO covers a larger geographic area than Eureka Township. All of the issues identified in the plans do not apply within the Township. The Township understands that management of land uses and activities has impacted water resources in the Township in

the past, and that management is required to protect the surface and groundwater resources of the Township. The next sections include the Township's goals, policies, and implementation plan to protect water resources consistent with the vision and land use plan proposed in the Township's 2040 Comprehensive Plan.

V. Local Goals and Policies

The following are the adopted *Surface Water Management Goals and Policies* for Eureka Township:

Goal 1: Eureka Township is committed to a goal of no adverse impacts to water resources in the area.

Policies:

- The Township will work cooperatively with local Watershed Management Organizations, state agencies, and landowners to protect local wetlands, lakes, streams and groundwater to preserve the values of these resources for future generations.
- The Township concurs with and adopts the NCRWMO and VMWJPO surface water plans and rules by reference through this LWMP.
- The Township will manage land use to support protection of surface and ground waters within the Township through its Zoning Ordinance (Ordinance 3), SSTS Ordinance (Ordinance 2010-3), and Watershed Management Ordinance (Ordinance 9).
- The Township will cooperate with the WMOs and Dakota County in managing land use to protect ground water resources, Shoreland and Floodplain areas.
- The Township will continue its current road maintenance policies that minimize impacts to water resources. Storm water runoff from road surfaces drains to and through the Township's grassy roadway drainage swales. The majority of the storm water is absorbed by vegetation. The established vegetation along the roadways prevents mobilization of roadway pollutants. The Township minimizes the use of sand and salt to the degree possible to maintain safe roadways and intersections.
- As the Township reviews Agricultural Preserves applications, it will include a review of potential erosion problems on the sites, as recommended by Dakota County.
- The Township will use its newsletter and website to periodically provide information and education to residents about surface and groundwater resources and stewardship.

VI. Implementation Plan

Eureka is a rural place. It is not an MS4 (Municipal Separated Storm Sewer System) community and therefore not subject to those rules of the Minnesota Pollution Control Agency. Instead, to achieve the goals established in this Plan, the Township will continue to manage land use to remain a rural community and will work cooperatively with other agencies, evaluating opportunities as they arise.

The Township adopted the WMO plans and its own surface water management ordinances that are consistent with the watershed organization plans and rules, and enforces the ordinances. A copy of the Watershed Management Ordinance and other ordinances listed below are included in the Appendices.

The Township will complete the specific actions listed below to implement this Local Water Management Plan:

1. The Township concurs with and adopts the Watershed Management Organizations' Watershed Management Plans, standards and rules.
2. The Township has adopted Ordinance 9: Watershed Management, and will enforce the ordinance for erosion control, surface water management, and land disturbance within the Township. The Township will update the ordinance as needed to be consistent with the WMO Management Plans.
3. The Township will continue to manage land use and subdivision to support protection of surface and ground waters through implementation of its Zoning Ordinance, Subdivision Ordinance, Mining Ordinance, and other ordinances.
4. The Township supports the cost-share and monitoring projects included in the WMO Plans and will provide information about these programs to Township residents.
5. The Township will implement its road maintenance policies, including the use of vegetated swales along its roadways to filter and absorb storm water and associated pollutants, and minimizing the use of salt and sand.

Capital Improvement Plan

The Township makes financial commitments through its annual budget process and its Comprehensive Plan, and does not have a formal capital improvement plan.

The Township does not own or maintain any storm water drainage facilities.

VII. Plan Timeline and Amendment Procedures

The Township's local surface water plan will be amended as needed with future updates to the District plans and the Township's Comprehensive Plan.

Appendices

Eureka Township Ordinances

1. Ordinance 9, Watershed Management (attached)
 - Chapter 1 - North Cannon River WMO
 - ? Vermillion River JPO
2. Ordinance 3, Zoning (available on-line)
3. Ordinance 6, Mining (available on-line)
4. Ordinance 2010-3 Subsurface Septic Treatment Systems (available on-line)
5. Ordinance 2015-5 Subdivision (available on-line)
6. Dakota County Shoreland and Floodplain Management Ordinance (Ordinance 50-available on-line)

Metropolitan Council Approval of LWMP