Staff Analysis of Proposed Amendment to the *Dane County Water Quality Plan*

Revising the Point Discharge Locations of Treated Effluent from the Nine Springs Wastewater Treatment Plant

"MMSD Nine Springs WWTP Effluent Revision"

Prepared by the Staff of Capital Area Regional Planning Commission

July 30, 2024

Contents

History of Verona Wastewater Treatment

Treated wastewater from the Verona Urban Service Area was discharged directly to Badger Mill Creek until 1978, when the discharge point was moved downstream to the Sugar River. Facilities planning at that time had opted to construct a new outfall at the Sugar River to accommodate additional loading from the growing service area. In 1991, the City of Verona initiated another facilities planning process to address existing operational issues and future capacity needs. The Facilities Plan recommended the abandonment of the existing treatment facility and connection to the Madison Metropolitan Sewerage District (MMSD, or District) over further investment into local treatment capacity. This required an amendment to the *Dane County Water Quality Plan* (DCWQP, or Water Quality Plan) and approval by the Wisconsin Department of Natural Resources (WDNR, or DNR).

The subsequent environmental assessment by the Dane County Regional Planning Commission (DCRPC) concluded that all proposed options produced potential for significant hydrologic impacts to the surface waters in the Sugar River Basin, especially Badger Mill Creek. Hydrologic models at the time suggested that groundwater from the Sugar River Basin was being drawn into adjacent basins due to well water withdrawals. Moreover, the recommended option would eliminate effluent discharge to the Sugar River, further diverting water from the basin. Concerns about this interbasin water transfer formed the basis of a recommendation to postpone action on the original 1993 Water Quality Plan amendment. Following several interagency discussions, MMSD annexed the City of Verona into the MMSD service area and assumed operation of the Verona WWTP to further investigate alternatives that would mitigate impacts of interbasin water transfer.

In October 1994, MMSD completed their facilities planning process and selected to return treated effluent to Badger Mill Creek. This alternative was widely supported at the local level as it addressed concerns about declining baseflow in Badger Mill Creek and the diversion of water from the Sugar River Basin. By January 1995, the development of the effluent return strategy was underway, and the Verona WWTP was approaching full capacity. The Water Quality Plan was amended in May 1995 (Resolution No. 738) to allow the construction of new infrastructure to provide Verona with additional treatment capacity for the interim period. By July 1996, construction of Pump Station #17 and the force main was completed, enabling a portion of Verona's wastewater to be pumped to the Nine Springs WWTP and discharged to Oregon Branch of Badfish Creek via a wastewater effluent channel (generally referred to as the Badfish Creek discharge location). Following the approval of hydrologic and engineering studies, the Water Quality Plan was amended again in February 1997 (Resolution No. 796) to approve the abandonment of the Verona WWTP and its Sugar River outfall, the conveyance of all Verona wastewater to the Nine Springs WWTP, and the return of effluent to Badger Mill Creek. Since August 1998, MMSD has returned highly treated effluent to the headwaters of Badger Mill Creek, in addition to their historical discharge to Badfish Creek.

Overview of Amendment

Description of Proposal

The proposed amendment to revise the point discharge locations of the Nine Springs Wastewater Treatment Facility (WWTF) was brought forth by the District to proceed with its selected final compliance solution to meet Water Quality Based Effluent Limits (WQBELs) for phosphorus at Outfall 005 (Badger Mill Creek). The proposed amendment would cease effluent discharge to Badger Mill Creek (approximately 3.6 million gallons per day, MGD) and divert the flow to Badfish Creek (Outfall 001). The District's 2020 Wisconsin Pollutant Discharge Elimination System (WPDES) (see Appendix A) permit established a schedule for compliance with the state's Total Phosphorus WQBELs, mandating 0.225 mg/L as a monthly average and 0.075 mg/L as a 6-month average. MMSD currently pumps approximately 3.6 million gallons per day (MGD), or 5.6 cfs, of treated effluent from the Nine Springs WWTF to Badger Mill Creek. MMSD's 2022 Compliance Maintenance Annual Report (CMAR) (link to 2022 CMAR) reported phosphorus effluent quality at Outfall 005 well above the proposed WQBELs, with a monthly average of 0.32 mg/L (102-191% of the new limit) and a 6-month average of 0.33 mg/L (387-493% of the new limit). The new phosphorus WQBELs will take effect on March 31, 2028. The timing of the cessation of effluent discharge to Badger Mill Creek is unknown. The additional phosphorus loading at Badfish Creek would be remediated through the Yahara WINS Adaptive Management Project.

Alternatives Considered

MMSD evaluated various alternatives to achieve phosphorus compliance by 2028. MMSD's *Preliminary Compliance Alternatives Assessment* reviewed the viability of six compliance options: tertiary treatment, adaptive management, water quality trading, diversion of flow, variance, and site-specific criterion. The variance option was not considered viable due to high costs and the District's recent experience with its chloride variance. The site-specific criterion option was also dismissed because it was heavily constrained by the downstream phosphorus criterion on the Sugar River.

Remaining alternatives included tertiary treatment, water quality trading, adaptive management, and discontinuation of flow. These alternatives are explained in depth in the District's Final Compliance Alternatives Plan (FCAP), titled *Final Alternatives Assessment for Phosphorus Compliance Report*, which ultimately recommended discontinuation of flow to Badger Mill Creek. A brief overview of each alternative is provided below:

- Tertiary Treatment: The selected tertiary treatment option involved the construction of a new building and installation of a new BluePRO reactive filtration system, which in total would cost ratepayers $24.3 million, or a 2-3% service charge increase (based on estimates provided in the FCAP). In the FCAP, the District suggested that incorporation of a new treatment system may cause harmful delays in other capital projects and disruptions to standard operations and maintenance. The District determined that tertiary treatment was feasible but would negatively impact goals of reducing energy consumption and maintaining fiscal responsibility to ratepayers.
- Water Quality Trading: The District's water quality trading option would require offsetting the 2,200 pounds of phosphorus released to the Badger Mill Creek in exceedance of the permit limits. Due to the location of the point of compliance, the District would be limited to trades

within the highly urbanized Badger Mill Creek subwatershed. The District concluded that development pressure in the area would compromise the longevity of any potential trades, thereby ruling out water quality trading as a viable compliance solution.

- Adaptive Management: The District found that an effective adaptive management plan to meet water quality requirements in Badger Mill Creek would need to offset 7,620 pounds of phosphorus per year from within the Badger Mill Creek subwatershed (HUC 12). Due to the substantial urbanization of the subwatershed, the District concluded that the existing phosphorus load was too low for adaptive management to be a viable solution. The District also explored the option of moving the point of compliance further downstream to the Sugar River to include the Upper Sugar River HUC 12 in the plan. In March 2023, WDNR noted that the plan would still need to achieve compliance with water quality criteria in Badger Mill Creek upstream of its confluence with the Sugar River, regardless of the expanded planning area. Based on this information and the lack of a Total Maximum Daily Loads (TMDL[1]) requirement, the District concluded in April 2023 that the adaptive management option was infeasible[2].
- Discontinuation of Flow: Concerns over the costs associated with maintaining effluent return in the long term led the District to evaluate the potential ramifications of ceasing flow to Badger Mill Creek. Based on a series of water quality assessments completed by the District and their consultants, the District estimated that removing flow would have a minimal impact on the overall health of the stream. In addition, the District anticipated that compliance with water quality criteria would only become more challenging, especially given recent discussions over the reclassification of Badger Mill Creek to a cold water trout fishery (for the purpose of wastewater permitting). The District also found that approximately twice as much energy was required to pump effluent to Badger Mill Creek as compared to the default outfall at Badfish Creek. Overall, the option to discontinue flow proved most ideal as it exempted the District from maintaining compliance with stringent water quality criteria and substantially reduced the District's operating costs and energy consumption.

In May 2023, the MMSD Commission approved selection of the option that would discontinue effluent return to Badger Mill Creek and consolidate the District's outfalls to Badfish Creek, per the final

[1] Refer to Wisconsin DNR webpage for information on TMDLs: https://dnr.wisconsin.gov/topic/TMDLs

[2] In a letter from DNR staff, dated July 23, 2024, sent to CARPC in response to inquiry, DNR provided commentary on the phosphorus reduction requirements, suggesting that the District's load reduction targets may be unnecessarily high. Further investigation by DNR staff found that long-term average values for stream flow in Badger Mill Creek were lower than assumed by the District. Using the updated flow data, the load reduction target could be as low as 2,851 pounds per year. In addition, DNR's Pollutant Load Ratio Estimation Tool reported 6,534 lbs/year of nonpoint source phosphorus loading within the Badger Mill Creek HUC 12, a value significantly higher than the required offset. See Appendix B.

recommendation in the FCAP. Since the selected alternative involves elimination of Outfall 005, MMSD is required to pursue an amendment to the *Dane County Water Quality Plan*.

Trial Periods of Flow Cessation

The District's application includes data from three (3) periods during which effluent discharge to Badger Mill Creek was partially or fully ceased, including:

- **May 19 – June 3, 2021**: Effluent return to Outfall 005 began being ramped down from 3.5 MGD on May 10, 2021 and was ceased by May 19, 2021. It remained at no return flow until June 3, 2021. The water was slowly restarted and returned to 3.5 MGD by June 18, 2021.

- **February 6 – April 17, 2023**: Effluent return to Outfall 005 began being ramped down from 3.1 MGD on January 30, 2023. The flow was ceased on February 6, 2023 and remained off until April 17, 2023 when flow was slowly ramped back up. Flow was returned to 3.1 MGD by April 21, 2023.

- **February 1 – February 23, 2023 (Partial):** Effluent return to Outfall 005 was ramped down February 1, 2024 from 3.1 MGD to 1.5 MGD and remained at 1.5 MGD until February 23, 2024 when it began being ramped up and returned to 3.1 MGD by February 29, 2024.

Existing Conditions

Land Use

The Badger Mill Creek subwatershed contains portions of the City of Verona, City of Fitchburg, City of Madison, Town of Middleton, and Town of Verona. It is approximately 43,000 acres, with 68% of the land area undeveloped. The Badfish Creek (HUC 10) watershed contains the Village of Oregon and portions of the City of Fitchburg, Village of Brooklyn, Town of Dunkirk, Town of Dunn, Town of Oregon, and Town of Rutland, as well as the Town of Porter and Town of Union, located in Rock County. It is approximately 189,000 acres, with 74% of the land area undeveloped.

Agriculture comprises the largest portion of the land in both watersheds, making up between 40 and 50 percent of the total area. Residential land and the transportation network make up the two largest developed land uses in both watersheds. See Table 1 for additional information.

Table 1
Land Use Breakdown

	Badfish Creek (HUC 10)		Badger Mill Creek (HUC 12)	
Agriculture	91,761	48.4%	26,842	48.4%
Commercial	1,220	0.6%	1,207	0.6%
Industrial	82	0.0%	71	0.0%
Institutional/Governmental	908	0.5%	638	0.5%

Manufacturing	88	0.0%	110	0.0%
Mineral Extraction	846	0.4%	497	0.4%
Open Land	25,746	13.6%	8,114	13.6%
Recreation	6,972	3.7%	3,565	3.7%
Residential	25,897	13.7%	9,162	13.7%
Transportation, Communications & Utilities	14,812	7.8%	4,976	7.8%
Under Construction	176	0.1%	159	0.1%
Vacant Subdivided Land	2,330	1.2%	1,160	1.2%
Water	5,433	2.9%	1,840	2.9%
Wholesale And Retail Trade	12	0.0%	22	0.0%
Woodlands	13,202	7.0%	4,239	7.0%
	189,485 Acres		**62,603 Acres**	

Source: 2020 land use data (CARPC, Dane County)

Natural Resources

Wastewater from several area communities is treated at the Madison Metropolitan Sewerage District (MMSD) Wastewater Treatment Facility (see Map 1). Treated effluent is currently discharged to Oregon Branch of Badfish Creek (Outfall 001) and Badger Mill Creek (Outfall 005). Several notable natural resources exist in the Badger Mill Creek (HUC 12: 070900040201) and Oregon Branch subwatersheds (HUC 12: 070900020801) (see Map 2), where the two existing MMSD effluent outfalls are.

Dry Tributary to Badger Mill Creek

An unnamed intermittent stream, often referred to as the Dry Tributary to Badger Mill Creek, feeds into Badger Mill Creek within the City of Verona, downstream of the MMSD effluent discharge location (Outfall 005). The stream channel is approximately 6 miles long, from its mouth at Badger Mill Creek, near the south edge of the City of Verona, upstream to Valley View Road. Dry Tributary to Badger Mill Creek is classified as an intermittent stream, meaning it flows only after rainfall or snowmelt, and as a result is dry most of the year. Water quality and biotic index data are not collected for Dry Tributary to Badger Mill Creek because of these flow conditions.

Badger Mill Creek

Badger Mill Creek (WBIC 888100 / WATERSID 13654) is 5 miles long and flows through the southwest side of the City of Madison and bisects the City of Verona, before connecting to the Sugar River. The Badger Mill Creek subwatershed is approximately 34 square miles and encompasses predominantly residential and agricultural land uses until its confluence with the Upper Sugar River in the Town of Verona. Badger Mill Creek is included on the state 303d list of impaired waters for total phosphorus due to high phosphorus levels. There is only limited data on the phosphorus loading in the Sugar River coming from the Badger Mill Creek. Based on correspondence with USGS staff using DNR/USGS stream

monitoring data, it is estimated that the contribution of the total phosphorus loading in Sugar River attributed to Badger Mill Creek is approximately 30-50%[3].

There has been a citizen-based stream monitoring location on Badger Mill Creek at State Highway 69 (Station ID 10011966) since 2006. Field measurements at Station 1011966 from 2023 indicated dissolved oxygen levels of 9.72 to 16.6 mg/L, transparency of 120 cm, pH of 8.18, and a macroinvertebrate index score of 4.18 (DNR SWIMS). The active USGS baseflow monitoring station (USGS 05435943) in this stream is downstream of Outfall 005, west of Bruce Street, and collects data on discharge rates, dissolved oxygen, specific conductance, water level, and temperature. Daily water quality measurements at this USGS station from the last two years indicated mean dissolved oxygen (DO) levels (Figure 1) of 4.5 to 14 mg/L and minimum dissolved oxygen levels of 1 to 11.4 mg/L, mean specific conductance (Figure 2) of 253 to 1,620 µS/cm, mean water temperature (Figure 3) of 1.4 to 23.3 degrees Celsius (34.5 to 73.9 degrees Fahrenheit), and mean discharge rates (Figure 4) of 5.3 to 197 cfs. As shown in the figures below, there was an approximate three-month period in both 2022 and 2023 when the daily minimum dissolved oxygen fell below 6.0 mg/L. This appears to correlate with summertime, warm water temperatures.

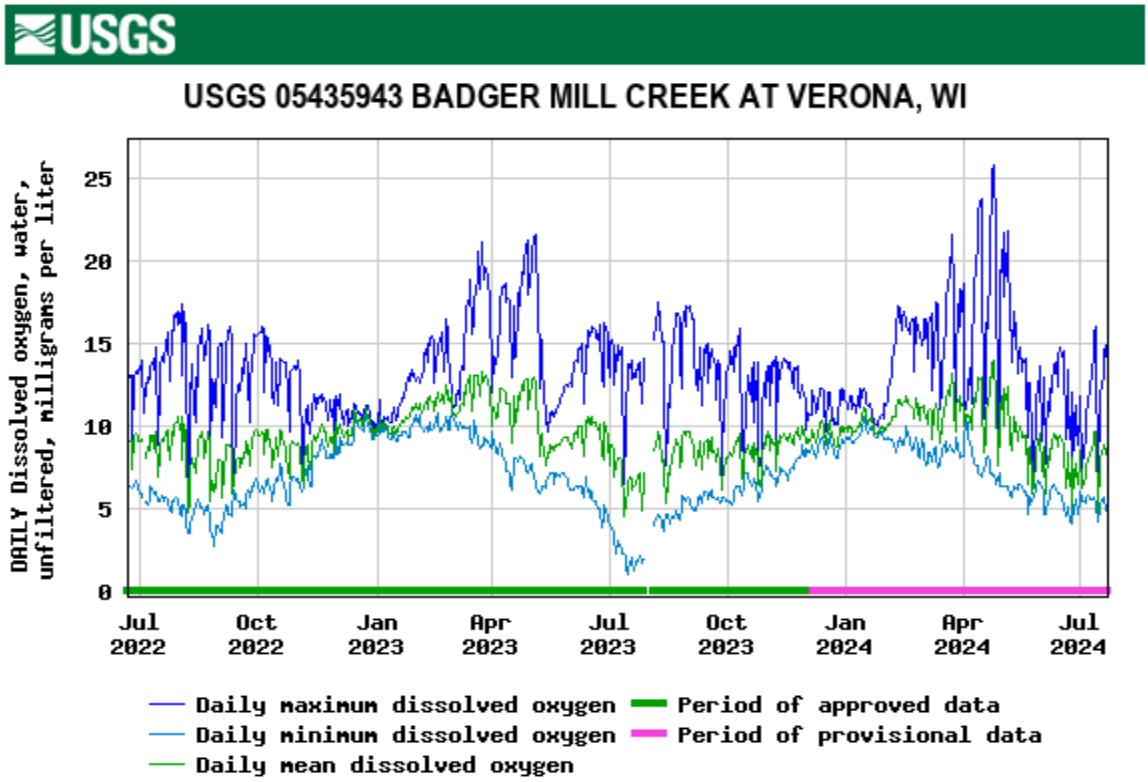

Figure 1. Dissolved oxygen levels at USGS 05435943 (USGS Wisconsin Water Center - Madison, WI)

[3] Based on mean discharge and median total phosphorus at USGS monitoring stations: 05435943 and 05435950

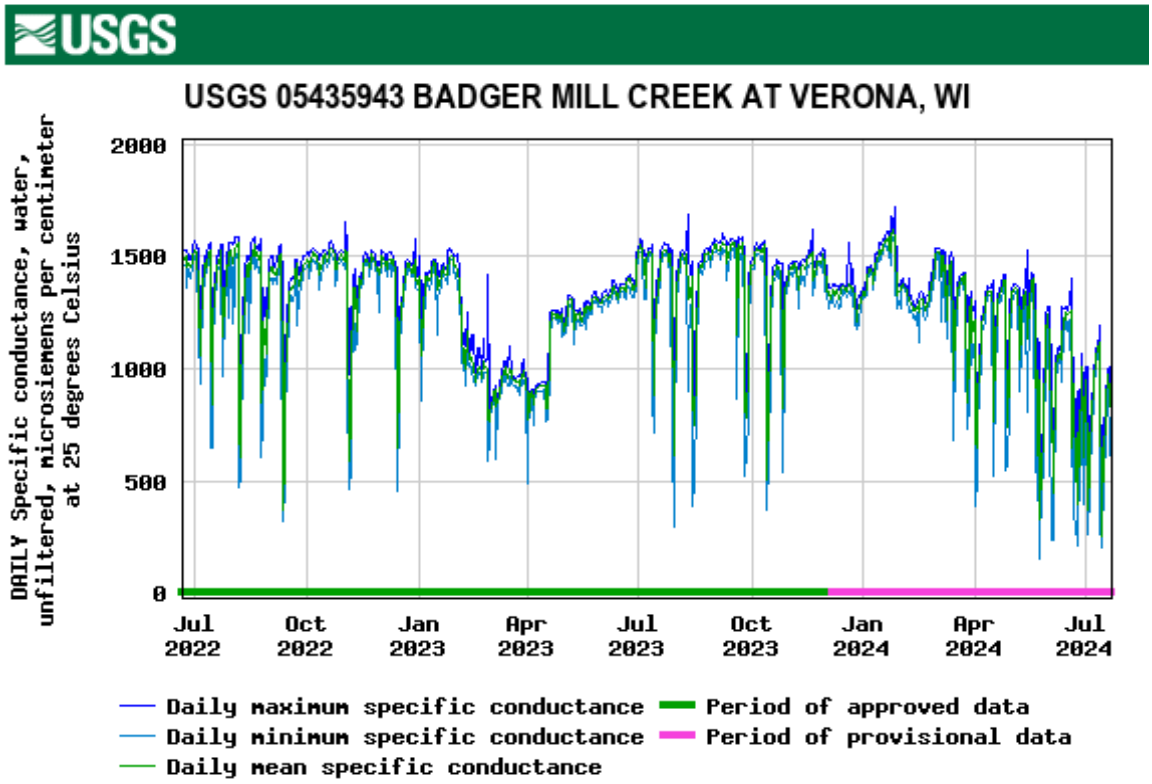

Figure 2. Specific conductance at USGS 05435943 (USGS Wisconsin Water Center – Madison, WI)

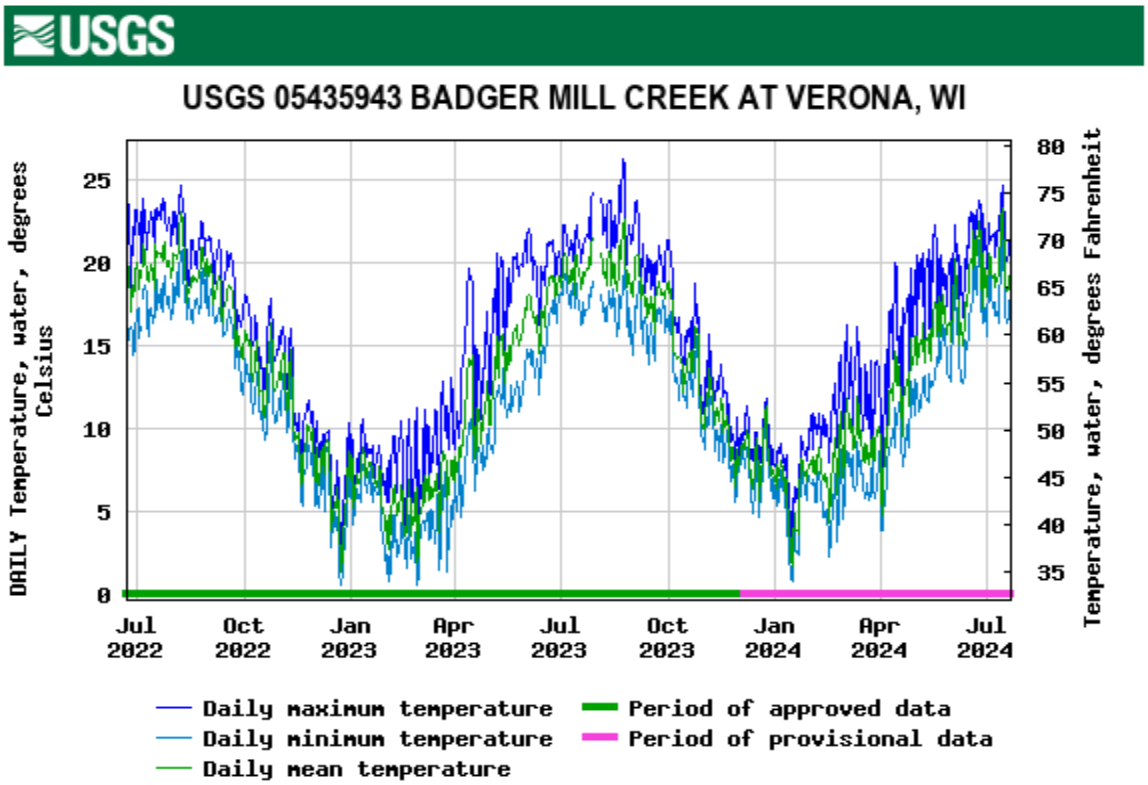

Figure 3. Water Temperature at USGS 05435943 (USGS Wisconsin Water Center - Madison, WI)

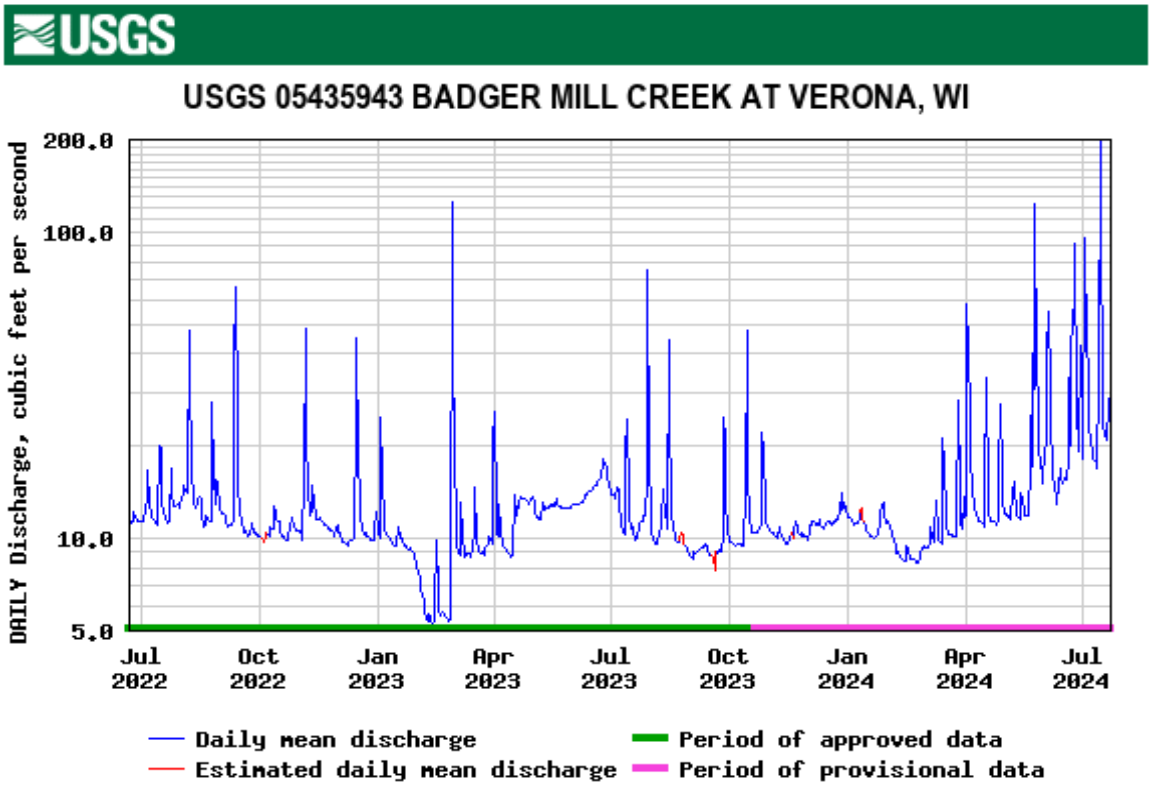

Figure 4. Discharge rates at USGS 05435943 (USGS Wisconsin Water Center – Madison, WI)

The main branch of Badger Mill Creek from the confluence with Sugar River to just upstream of the MMSD Outfall 005 (mile 0.00 to 5.00) is designated as a Class II trout stream by the WDNR for fish management purposes[4], as defined by NR 1.02(7). According to the WDNR's Water Detail page, Badger Mill Creek supports a cold water community coinciding with the trout stream designation, and default FAL upstream of that. Badger Mill Creek is also listed as a Variance Stream per NR 104.05(2), which allows the WDNR to relax certain water quality standards for this stream to allow discharge of treated municipal wastewater.

Sugar River

Sugar River (WBIC 875300 / WATERSID 1520990), is an Exceptional Resource Water (ERW) under the state's anti-degradation rules, per NR 102 and NR 207. ERWs are not significantly impacted by human activities and provide valuable fisheries or unique habitat features. The Sugar River is also designated as a Class II trout cold water community. The headwaters of the Sugar River are located on the outskirts of the expanding Madison metropolitan service area. Though historically and predominantly agricultural, this portion of the watershed is experiencing a gradual change in land use. Changes in land use,

[4] Refer to Wisconsin DNR webpage for classified trout streams: https://apps.dnr.wi.gov/water/troutlist.aspx?code=dane

hydrology, and sediment transport within the watershed will have long-term impacts on all areas downstream.

There has been a citizen-based stream monitoring location on Sugar River at Riverside Rd (Station 133548) since 1990. Field measurements from 2023 indicated dissolved oxygen levels of 9.37 to 13.93 mg/L and an average transparency of 120 cm (DNR SWIMS). There are no active USGS baseflow monitoring stations in this watershed.

The Sugar River section downstream of its confluence with Badger Mill Creek (miles 56.14 – 82.33) was added to the WDNR's list of impaired waters in 2020 for total phosphorus. This addition was prompted by high phosphorus concentrations which pose a risk for the river's biological community. This was an increase from 2017 phosphorus concentrations which did not warrant an impaired listing. Even though phosphorus concentrations are high, the river's biological community is not degraded (macroinvertebrates received a "Fair" score; fish scored as "Excellent"). However, continued high phosphorus concentrations will likely lead to lower-quality biological communities over time. Decreasing phosphorus contributions to the river would help sustain current biological communities. As a cold water system fed by groundwater, warm runoff poses an issue for the Sugar River. Occasionally, the river exceeds ideal temperatures which is also expected to decrease the quality of the fish community. Proper thermal controls in runoff management are required within the watershed. The Sugar River is an important regional resource and maintaining its exceptional qualities requires responsible management of both agricultural and urban land uses.

Ditch to Oregon Branch of Badfish Creek

The Ditch to Oregon Branch of Badfish Creek (WBIC 800800 / WATERSID 1516935) is 4.79 miles long and falls entirely within Dane County. It begins at the MMSD effluent Outfall 001 (located north of CTH B and east of Southview Road) and flows south until the confluence with the Oregon Branch of the Badfish Creek. This ditch originates in the Lake Waubesa-Yahara River subwatershed, as mapped, (HUC 070900020703) and continues through the Oregon Branch subwatershed (HUC 070900020801). By definition within NR 102.03, this ditch is not considered a "surface water" in terms of designated uses and water quality criteria defined below.

This waterway was listed as impaired in 2012 for polychlorinated biphenyls (PCBs). There are two DNR monitoring stations (Station 10033395 and Station 10051574) on the ditch, but none with recent data. It was last monitored in 2021 for per- and polyfluoroalkyl substances (PFAS). Other water quality data was last collected in 2018. This water is considered a cool-warm mainstem, cool-warm headwater natural community.

Oregon Branch of Badfish Creek

The Oregon Branch of Badfish Creek (WBIC 800700 / WATERSID 11656) is a small spring-fed stream that originates within the Village of Oregon and flows southeast approximately ten miles to the confluence with Rutland Branch to form Badfish Creek (Map 2). The 22.1 square-mile Oregon Branch subwatershed encompasses predominantly agricultural lands. The creek has a low gradient of 8.2 feet/mile. Prior to the 1920s, Oregon Branch was considered a marginal trout water, but habitat was destroyed by stream ditching and straightening. The combined historic effects of stream channelization, urban and

agricultural nonpoint source pollution, and wastewater discharges have greatly modified the original stream characteristics. The first 4 miles of Oregon Branch (from the MMSD effluent ditch downstream to its confluence with Rutland Branch) is classified as a limited forage fishery (LFF).

Oregon Branch has been listed as impaired for PCBs in fish tissue since 2012. This water was last assessed by DNR during the 2024 listing cycle. There are two DNR monitoring stations on Oregon Branch, one at Rutting Road (Station 133105) and one at Sunrise Road (Station ID 133102). Summer 2023 monitoring at Sunrise Road station indicated field measurements of dissolved oxygen of 9 to 10.5 mg/L, an average transparency of 120 cm, and a macroinvertebrate index score of 1.86 (DNR SWIMS). Chloride samples were collected in 2023, but results are not available. There are no active USGS baseflow monitoring stations on Oregon Branch. Oregon Branch has cool-warm headwaters, cool-warm main stem natural community.

Badfish Creek

Badfish Creek (WBIC 799500 / WATERS ID 11652), a small stream formed by the confluence of its Oregon and Rutland Branches, has also been ditched, straightened, and widened. It is 13.2 miles long and originates in Dane County, enters Rock County near Cooksville, and flows east to the Yahara River. The creek is the recipient of effluent from the MMSD and Oregon sewage treatment plants. In the 1970s water quality was poor due to the large volume of effluent from MMSD and Oregon's treatment plant. Improvements in wastewater treatment capabilities and effluent quality since then have improved water quality in Badfish Creek. Since 1983, more than 42 fish species have been observed.

Pollutants of concern in the Badfish Creek are PCBs and total phosphorus, which have resulted in high phosphorus levels, PCB-contaminated fish tissue, and PCB-contaminated sediments. TMDL priority is low for Badfish Creek. Badfish Creek has been listed as an impaired water since 1998 for PCBs and 2012 for phosphorus. This creek was assessed during the 2024 listing cycle and supports a Warmwater Sport Fishery. It is considered a cool-warm mainstem natural community.

There are no active DNR monitoring stations along Badfish Creek. USGS baseflow monitoring on Badfish Creek near Cooksville in Rock County (Station ID 05430150) measures discharge and water level but does not currently collect water quality data.

Springs

Springs represent groundwater discharge visible to the casual observer. The Wisconsin Geological and Natural History Survey (WGNHS) maintains an inventory of springs in Dane County and throughout the state. From 2014 to 2017, the WGNHS surveyed springs statewide that were expected to have flow rates of at least 0.25 cubic feet per second (cfs). The Oregon Branch subwatershed contains one inventoried spring, Dane County Spring #26. Dane County Spring #26 is at Thomson Park, south of County Highway MM/Janesville St and east of South Perry Parkway (see Map 2). It was surveyed in 2016 with a discharge rate 0.53 cfs, specific conductance of 860 µS/cm, temperature of 50° F, and a pH of 7.12. There are no known springs in the Badger Mill Creek subwatershed.

Groundwater & Baseflow

Generally, groundwater discharge occurs along the entire length of perennial streams and is the source of stream baseflow. Groundwater modeling using the 2016 Groundwater Flow Model for Dane County, developed by the WGNHS (link to website), has been used to model estimated baseflows in many streams throughout Dane County. Based on a presentation by the WGNHS at the MMSD's Stakeholder Group[5], utilizing results of the groundwater flow model, it is understood Badger Mill Creek tends to lose baseflow to groundwater toward the headwaters (near the current MMSD outfall location) and gain baseflow from groundwater toward the confluence with the Sugar River. Using results from the modeling, three locations were analyzed for the proposed amendment, including: Sugar River at USH 151, Badger Mill Creek at the confluence with Dry Tributary to Badger Mill Creek, and Oregon Branch at Sunrise Road (see locations on Map 2). The modeling shows a decline in baseflow within Sugar River from predevelopment (i.e., no pumping) conditions to 2010 modeled conditions, and further decline to 2040 modeled conditions. These reductions are primarily due to the cumulative effects of well water withdrawals from multiple municipalities in the ground-watershed to support increasing development. The modeling shows an *increase* in baseflow within Badger Mill Creek and Oregon Branch from predevelopment to 2010 modeled conditions, which is primarily due to treated effluent (MMSD and Oregon WWTPs) discharge upstream of the location of analysis. However, a slight decline in baseflow is again anticipated from 2010 conditions to 2040 modeled conditions because of well water withdrawals. The results of this modeling are shown in Table 2 below.

Table 2
Modeled Baseflow Results Due to Current and Anticipated Future Municipal Well Water Withdrawals

Stream	No Pumping	2010	2040
Badger Mill Creek (7704)	3.3 cfs	3.9 cfs	3.4 cfs
Sugar River (7549)	10.2 cfs	8.3 cfs	7.9 cfs
Oregon Branch of Badfish Creek (8226)	2.7 cfs	67.2 cfs	67.0 cfs

Source: 2016 Groundwater Flow Model for Dane County, developed by the WGNHS (link to website)

Based on reporting in the District's FCAP report, actual conditions observed during the District's study period in January and February of 2023 (during frozen ground conditions intended to simulate low-flow conditions), the actual flow in Badger Mill Creek was higher than what the modeling has estimated. This

[5] Badger Mill Creek Stakeholder Group meeting on June 12, 2024, presentation by Anna Fehling, WGNHS: https://www.madsewer.org/wp-content/uploads/2024/07/20240612-BMCSG-DaneCounty-Groundwater-Model.pdf

is supported by long-term data (1997-2024) at the USGS monitoring station (USGS 05435943) which indicates an average baseflow of approximately 7 cfs. This may be attributed to improvements in farming practices and stormwater regulations in recent decades leading to better water management, however the long-term trend based on modeling predictions remains that increased demand on groundwater supply is resulting in lower base flows in most streams. The loss of baseflow from the cumulative effects of well water pumping and urbanization is a regional issue. This issue is discussed along with potential management options in the updated *Dane County Groundwater Protection Planning Framework* (link to report). Maintaining pre-development groundwater recharge by infiltrating stormwater runoff helps to replenish groundwater, maintain baseflow, and mitigate this impact. The regional groundwater model is a useful tool for evaluating different configurations and scenarios on these stream systems.

Endangered Resources

The WDNR Bureau of Endangered Resources maintains a database representing the known occurrences of rare plants, animals, and natural communities that have been recorded in the Wisconsin Natural Heritage Inventory (link to website). A screening review of this database conducted by CARPC staff for species designated as endangered, threatened, or of special concern identified one threatened bird species adjacent to the Ditch to Oregon Branch of Badfish Creek and two special concern species (one bird and one reptile species) adjacent to Badfish Creek. Two state lands were identified adjacent to the flow path from Outfall 001 to the Yahara River: Hook Lake/Grass Lake Wildlife and Natural Area and Badfish Creek Wildlife Area.

Designated Uses & Water Quality Criteria of Receiving Waters

Wis. Stat. § 281.15(1) requires the DNR to promulgate rules setting standards for water quality applicable to waters of the state which shall protect the public interest, which includes the protection of the public health and welfare and the present and prospective future use of such waters for public and private water systems, propagation of fish and aquatic life and wildlife, domestic and recreational purposes and agricultural, commercial, industrial and other legitimate uses. In accordance with this mandate, the department has established water quality standards contained in Wis. Admin. Code chapters NR 102-105. Specifically, designated uses for waterbodies applicable to this amendment are contained in chapters NR 102 and 104. Section NR 102.04 lays out the different designated use categories of surface waters of the state, which are fish and other aquatic life (FAL) uses, recreational use, public health and welfare use, and wildlife use. All surface waters shall be suitable for supporting each of the designated uses. Furthermore, within the FAL use category, each surface water shall belong to one of the following subcategories: cold water community, warm water sport fish community, warm water forage fish community, limited forage fish community, or limited aquatic life. Section NR 104 provides additional criteria and designations when a surface water is determined to be unable to attain stated water quality goals (e.g., variance waters).

Section NR 102 also lays out the water quality criteria necessary to meet the designated uses. Since Badger Mill Creek and the Oregon Branch of Badfish Creek must meet all four designated uses, water quality criteria for each use must be met. The collective criterion for all designated uses includes dissolved oxygen, pH, toxic substances, temperature, bacteria, taste and odor, phosphorus, and other

criteria as defined by narrative. The narrative criteria generally describe prohibiting the presence of pollutants or substances which may interfere with public rights, or which may be harmful to humans or other life. Flow rates or water volume are not a defined criterion of the water quality standards established under s. 281.15 and contained in NR 102, except possibly to the extent that the change in flow affects compliance with the water quality criteria required to meet the waterbody's designated uses. The illustration below shows the four (4) designated uses and associated water quality criteria:

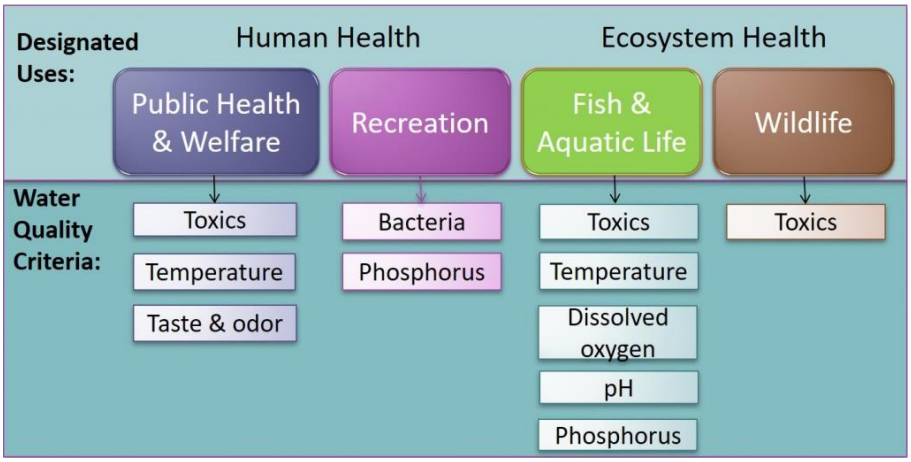

Figure 5.Water Quality Criteria for Designated Uses (WDNR)

Badger Mill Creek

The designated use for Badger Mill Creek (mile 0.00 to 2.00 and mile 2.00 to 5.00, respectively) is listed as cold water on the DNR's Water Detail pages. Badger Mill Creek is classified as a Class II trout stream from the confluence with Sugar River to just upstream of the MMSD outfall (mile 0.00 to 5.00) under NR 1.02(7), and therefore, qualifies as a cold water community under NR 102.04(3)(a). However, Table 3 in NR 104 lists Badger Mill Creek from Verona STP (i.e., from Bruce Street) downstream to STH 69 as a variance water requiring maintenance as a Limited Forage Fishery (LFF). There have been efforts by DNR in recent years to revise NR 104 given the current conditions; however, until such time this section of stream shall be considered a limited fish forage community[6]. It is appropriate to consider the designated use of downstream waters until a point at which the contributions of effluent are relatively insignificant; and thus, given the relative flow volume (as a portion of total flow) of the effluent within Badger Mill Creek down to the confluence with Sugar River, it is Staff's opinion that it is appropriate to conservatively apply water quality criteria for that of a *cold water community* in the assessment of this proposed amendment.

Oregon Branch of Badfish Creek and Badfish Creek

The designated use for Oregon Branch of Badfish Creek is listed as limited fish forage on the DNR's Water Detail page, translating to the *limited forage fish community* FAL use subcategory. The designated

[6] Based on letter from DNR staff, dated July 23, 2024, sent to CARPC in response to inquiry. See Appendix C.

use for Badfish Creek is listed as warm water sport fishery on the DNR's Water Detail page, translating to the *warm water sport fish community* FAL use subcategory.

Wastewater Treatment at Nine Springs

Madison Metropolitan Sewerage District (MMSD) provides wastewater treatment at the Nine Springs Wastewater Treatment Facility (WWTF) located on Moorland Road, Madison. The WWTF currently discharges treated effluent to Badfish Creek (Outfall 001) within the Badfish Creek Watershed (Lower Rock River Basin) and Badger Mill Creek (Outfall 005) within the Upper Sugar River Watershed (Sugar-Pecatonica Basin). The rated monthly design flow capacity of the facility is 56.0 million gallons per day (MGD) and the maximum daily design flow capacity is 68.6 MGD. In the year 2022, the facility received an average monthly influent hydraulic loading of 36.3 MGD (65% of the 56.0 MGD design capacity), including infiltration and inflow, according to the 2022 Compliance Maintenance Annual Report (CMAR) (link to 2022 CMAR). Approximately 8% (up to 3.6 MGD) is discharged to Badger Mill Creek, while the remaining 92% (50 MGD) of the effluent is discharged to Badfish Creek, according to the WDPES permit (Appendix A). For the 20-year planning period, treatment is expected to remain at the existing wastewater treatment facility location with expanded capacity of the system as the need is foreseen.

MMSD did not have issues meeting its WPDES permit limits for the quality of effluent discharged to Badfish Creek and Badger Mill Creek, according to their 2022 CMAR. Permit limits are specific to each outfall; however, effluent sampling is performed upstream of the flow split to each outfall. Effluent quality summarized here refers to Badfish Creek (Outfall 001, where nearly all discharge is released). Below is a summary of the major effluents reported on in the 2022 CMAR for the Badfish Creek outfall:

- The biochemical oxygen demand (BOD) effluent quality for 2022 was well below the monthly average limit, with a monthly average of 3.0 mg/L (16% of the limit) and a maximum concentration of 4 mg/L (21% of the limit) for the month of January through April.

- The total suspended solids (TSS) effluent quality for 2022 was below the monthly average limit, with a monthly average of 5.3 mg/L (27% of the limit) and a maximum concentration of 7 mg/L (35% of the limit) for the month of September and November.

- The ammonia (NH3) effluent quality for 2022 was below the monthly average limits (limits vary by month), with a monthly average of 0.213 mg/L (3-12% of the limit) and a maximum concentration of 0.452 mg/L (12% of the limit) for the month of March.

- The phosphorus (P) effluent quality for 2022 was below the current monthly average limit, with a monthly average of 0.32 mg/L (23-43% of the limit) and a maximum concentration of 0.43 mg/L (43% of the limit) for the month of September.

Badfish Creek is a tributary to the Rock River, and thus the WPDES permit for MMSD includes phosphorus and TSS limits for effluent to Badfish Creek to comply with the TMDL developed for the Rock River Basin to protect and improve water quality. In addition to the TMDL limits, future water quality-based effluent limits (WQBEL) have been considered in the WPDES permit. Beginning in May 2020, the interim limits for phosphorus discharged to Badfish Creek had been a six-month average of 0.6 mg/L

(May through October and November through April) and a monthly average of 1.0 mg/L, which is what the above 2022 CMAR reporting is based on. Final WQBEL limits now require a six-month average of 0.075 mg/L and a 0.225 mg/L monthly average. To meet the WQBEL for phosphorous in Badfish Creek, MMSD has implemented a Watershed Adaptive Management (WAM) approach, leading a diverse group of partners called Yahara Watershed Improvement Network (Yahara WINs) in implementing phosphorus reducing practices in the Yahara Watershed (link to Yahara WINs website). To meet the WQBEL for phosphorus in Badger Mill Creek, MMSD is proposing to eliminate effluent flow to Badger Mill Creek entirely and consolidate all effluent discharge to the Badfish Creek outfall. With this change, MMSD would need to update the Yahara WINs Adaptive Management plan to account for the additional loading being delivered to Badfish Creek.

The Nine Springs WWTF does not remove chloride from influent. A 2015 study completed by AECOM determined that while possible, treatment would be cost-prohibitive, energy intensive, and involve other environmental impacts (link to report). MMSD has been granted a variance from the chronic water quality standard for chloride of 395 mg/L required by NR 105. With this variance, the WPDES permit sets interim (variance) monthly limits above the chronic water quality standard and requires MMSD to implement chloride source reduction measures. One such source reduction initiative which MMSD participates in is the Wisconsin Salt Wise Partnership (link to Salt Wise website), which provides education and awareness around best practices for salt usage for deicing and water softening.

Interbasin Water Transfer

Interbasin water transfer refers to the conveyance of water from one river basin to another using non-natural means. Often water transfers occur to address needs for irrigation, public water supply, navigation, or flood control[i]. Ground-watersheds are conceptually similar to surface watersheds, especially in upper aquifers (unconfined), in that the movement of water generally is from high points to low points (e.g., outlets such as streams, lakes, and wells). However, the exact boundaries do not always coincide and there is even more variability in deep (confined) aquifers where water movement is subject to hydraulic and geologic properties of the aquifer in addition to surface topography[ii].

Regionally, there is an upper aquifer (above the shale Eau Claire layer) and a lower aquifer (Mount Simon layer made of sandstone). Private domestic wells generally draw water from the upper aquifer, while municipal and other high-capacity wells are deeper and draw from both the upper and the lower aquifers. Nonetheless, well withdrawals at all depths influence groundwater flow by redirecting water to replenish what is pumped out[7]. The concern is that over time this can disrupt the hydrologic water balance within a system and affect baseflow in area streams.

[7] Refer to CARPC webpage on Aquifers for additional information: https://www.carpcwaterqualityplan.org/groundwater/groundwater-resources/

The DNR regulates interbasin transfer between the Great Lakes basin (HUC 2: 04) and the Mississippi River basin (HUC 2: 07) through rules contained in NR 854 and NR 851 (see Figure 6)[8]. At a smaller watershed scale, the DNR does not regulate water transfers, and therefore, the issue of interbasin water transfers would not be a controlling factor in decisions made by DNR[9]. Within Dane County, interbasin water transfer is a common occurrence at the HUC 10 and 12 watershed levels where several municipalities, as well as the many private domestic wells outside of municipal borders, draw from groundwater from within a certain HUC 10 watershed for public water supply, then send their wastewater to the MMSD Nine Springs WWTF which discharges to the Badfish Creek (HUC 10) watershed, bypassing the Yahara chain of lakes. At the HUC 8 subbasin level, interbasin water transfers still do occur—multiple City of Verona and City of Madison wells pump groundwater from within the Sugar River subbasin and transfer water to the Middle Rock River subbasin (see Map 3 and 4). Based on coordination with City of Madison Water Utility, it is believed that, in general, increased conservation (i.e., lowering of per capita water use) and recharge (through improvements in stormwater management and precipitation) are leading to sustainable long-term management of the aquifer.

Figure 6. Interbasin Water Transfer (WDNR)

Impacts of Proposal

Approval of the proposed amendment would cease discharge of treated effluent to Badger Mill Creek, estimated to be an average of approximately 5.6 cfs, and instead discharge this flow to Badfish Creek. This flow represents approximately 8% of the total effluent flow from Nine Springs Wastewater Treatment Plant.

Specific impacts to the two receiving water bodies can be difficult to predict, particularly over the short term. General anticipated impacts of the proposed amendment are discussed below as well as specific water quality criteria defined in s. 281.15.

[8] Refer to Wisconsin DNR webpage on the Great Lakes Compact for additional information: https://dnr.wisconsin.gov/topic/WaterUse/Compact.html

[9] Based on letter from DNR staff, dated July 23, 2024, sent to CARPC in response to inquiry. See Appendix B.

General Impacts to Badger Mill Creek

The current approximate volume of effluent discharged to Badger Mill Creek is between 3.3 – 3.6 MGD, or 5 – 5.6 cfs. This represents varying amounts of the stream flow depending on the location of assessment. At Old PB (site BM5, see Figure 7) near the point of effluent discharge, the effluent flow is estimated to represent nearly all flow based on results of MMSD's flow study conducted in January and February of 2023. At Bruce Street (site BM7), the effluent represents approximately 40-50% of total flow, and at the point just upstream of the confluence with Sugar River, the effluent represents approximately 30-40% of total flow.[10]

The loss of effluent flow has the potential to drastically change the flow regime within Badger Mill Creek, particularly within the upper reaches which are more dominated by the volume of flow coming from the MMSD effluent. The return of treated effluent to the stream has effectively removed low baseflow as a limiting habitat condition for the propagation of cold water fish (e.g., trout)[iii]. By removing the effluent flow, it appears possible that baseflow conditions may no longer be such that they can sustain a Class II trout population in the upper sections of the stream, and therefore, may alter the FAL subcategory of Badger Mill Creek from being a cold water community to that of some lower subcategory. Nonetheless, the application materials indicate that water quality standards were maintained during the trial periods. However, each of these three trials were conducted in winter or late spring and represent a limited view into the possible full impacts of the loss of supplemental effluent flow across the range of conditions affecting water quality, notably the effect on dissolved oxygen during periods of warmer temperatures.

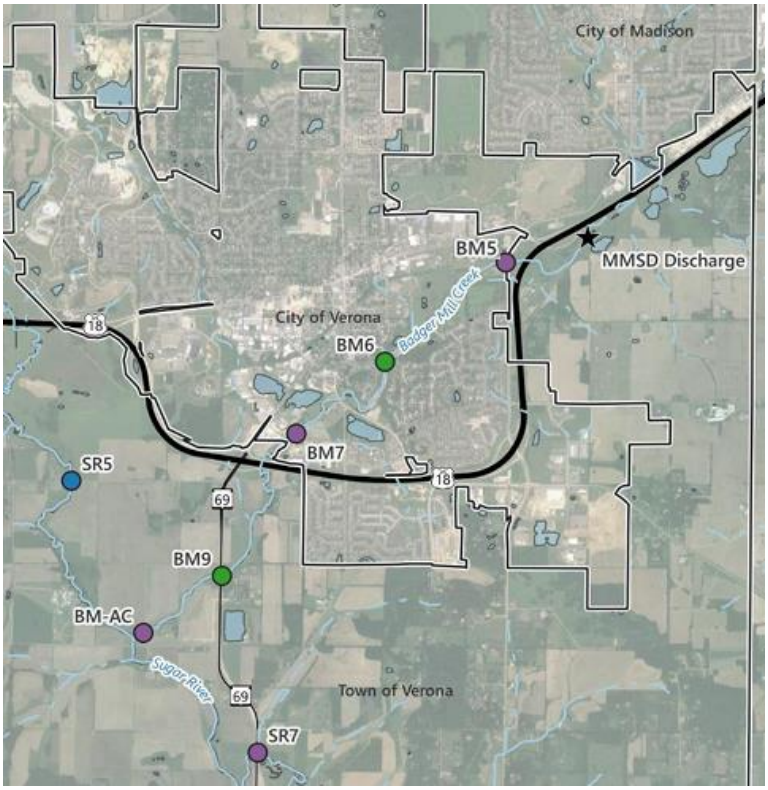

Figure 7. MMSD Monitoring Locations on Badger Mill Creek and Sugar River

[10] Based on Badger Mill Creek Stakeholder Group meeting on October 18, 2023, presentation by Steve Gaffield, EOR: https://www.madsewer.org/wp-content/uploads/2023/10/Hydrology-study.pdf

These aspects are described further below.

General Impacts to Oregon Branch of Badfish Creek

By definition, the Ditch to Oregon Branch of Badfish Creek is a constructed drainage ditch for the purpose of conveying effluent flow to the Oregon Branch of Badfish Creek and so has been omitted in this review of water quality criteria.

The existing WPDES permit regulating the Badfish Creek discharge calculates the effluent limits for the design flow (50 million gallons per day, MGD) based on these water quality criteria. DNR has stated this design flow will not be changing, and so even with the potential addition of the flow going to Badfish Creek, MMSD will be able to meet the current and future permit effluent limits[11].

Water Quality Criteria

Phosphorus

Phosphorus is an essential element for plant life, but when there is too much of it in water it can cause algal blooms. When the algae die, bacteria break it down, consuming oxygen and thereby causing a reduction in dissolved oxygen. This process can cause "dead zones", areas of low oxygen where fish can't survive[iv]. Small increases in phosphorus can fuel substantial increases in aquatic plant and algae growth, which in turn can reduce recreational use, property values, and public health. Since 2010, DNR-issued permits must be evaluated for phosphorus water quality-based effluent limits[12].

The water quality standard for phosphorus contained within NR 102.06 requires that all streams meet a total phosphorus concentration of no more than 0.075 mg/L. MMSD's permit limits for phosphorus in effluent discharge is based on these water quality criteria. Currently, the MMSD effluent to both receiving waterbodies does not meet this requirement.

<u>Badger Mill Creek</u>

Once effluent discharge to Badger Mill Creek has ceased, the District would no longer be contributing phosphorus to the stream, and therefore would comply with the water quality criteria for phosphorus.

<u>Oregon Branch of Badfish Creek</u>

No specific data was provided in the application; however, the Badfish Creek effluent discharge (Outfall 001) will continue to be regulated to meet water quality criteria through the District's WDPES permit. The District meets their permit requirements for phosphorus through adaptive management (Yahara WINS), described below.

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[11] Based on letter from DNR staff, dated July 23, 2024, sent to CARPC in response to inquiry. See Appendix B.

[12] Wisconsin DNR webpage on the Wisconsin's Phosphorus Rule for additional information: https://dnr.wisconsin.gov/topic/Wastewater/Phosphorus

The Yahara WINs initiative began in 2012 as an effort to reduce phosphorus loads and meet the new phosphorus targets established in 2010 for Wisconsin's waters. Yahara WINs started out as a four-year pilot program and transitioned to full-scale implementation in 2017, beginning a 20-year implementation period. In 2023 a total of 54,541 pounds of phosphorus reduction was reported throughout the watershed. With the additional flow and associated phosphorus that would be sent to Badfish Creek through this proposed amendment, the District will need to facilitate additional projects in the Yahara watershed to offset this loading. As described further in the District's FCAP report, the District acknowledges this responsibility and is prepared to budget additional resources to the Yahara WINs program.

Dissolved Oxygen

Dissolved Oxygen (DO) is the measure of how much oxygen is dissolved in the water and is critical to the survival of fish and other aquatic animals. Oxygen enters water mainly from the atmosphere, aquatic plants, as well as from groundwater discharge. DO is affected by flow, BOD, phosphorus, and temperature. Rapidly moving water tends to contain a lot of dissolved oxygen, whereas stagnant water contains less. The higher the BOD, the higher amount of oxygen consumed by bacteria and other microorganisms as they decompose organic matter under aerobic (oxygen is present) conditions at a specified temperature, and thus the lower the DO. Excessive phosphorus can cause a reduction in DO (see previous section for more discussion). Cold water can hold more dissolved oxygen than warm water[v]. Thus, in winter and spring when water temperature is low, DO is typically higher; meanwhile, in summer and fall when water temperature is high, DO is typically lower. DO levels can also fluctuate periodically, seasonally, and even as part of the natural daily ecology of the aquatic resource.

While each organism has its own DO tolerance range, generally, DO levels less than 5 mg/L are considered stressful for fish and levels less than 3 mg/L too low to support fish. DO levels below 1 mg/L are considered hypoxic and usually devoid of life[vi]. The water quality standard for DO contained within NR 102.04 varies by FAL subcategory.

Badger Mill Creek

A Class II trout stream, cold water community, shall attain a minimum DO concentration of 6.0 mg/L at all times, and a minimum of 7.0 mg/L when cold water fish are spawning (approximately mid-October through April). The application includes sampling taken during the three trials of discontinued or reduced effluent flow (June 2021, February-April 2023, Feb 2024 partial) with DO concentrations above the requirement (see Figure 8).

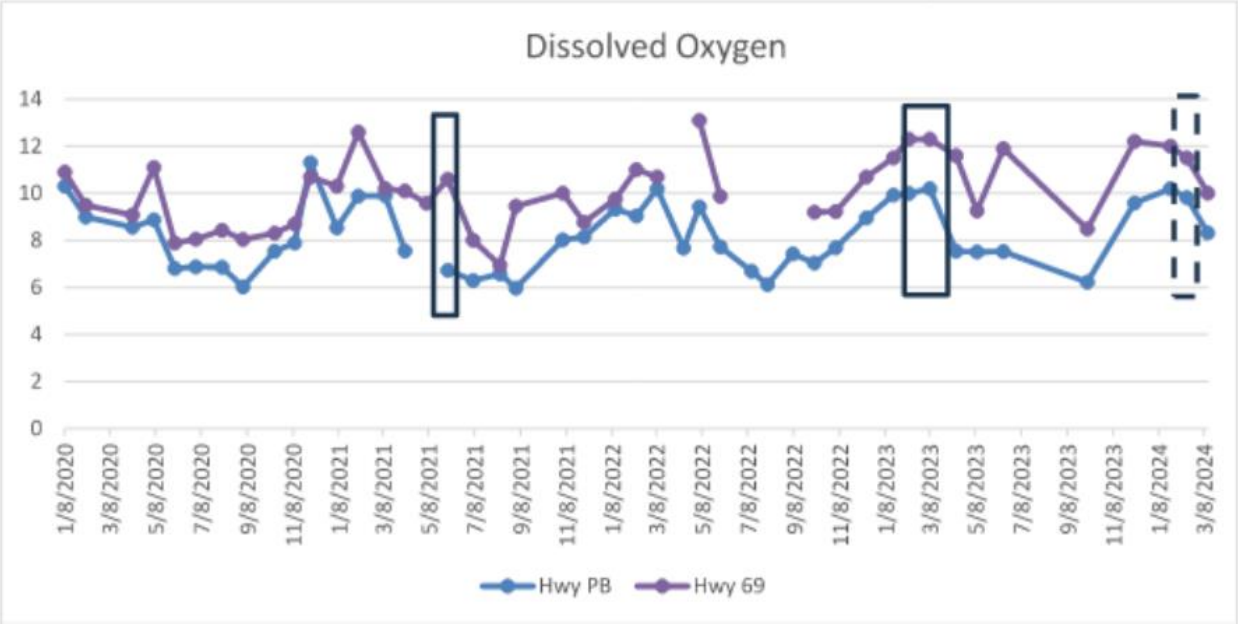


Figure 8. MMSD Sampling of Dissolved Oxygen (MMSD Application, 2024)

As Badger Mill Creek flows downstream, it generally gains DO. The timing of the temporary shutdowns occurred during winter and early-to-late spring, when DO is naturally higher (refer to USGS station data for Badger Mill Creek contained in the *Natural Resources* section of this report), making it difficult to predict what effect the proposed amendment will have on DO levels during periods of higher ambient temperatures when DO is generally lower, especially in the upper segments of the creek. However, the cessation of effluent will eliminate a source of BOD, which will have a positive impact on DO.

CARPC Staff performed a preliminary analysis using existing data from the USGS baseflow monitoring station (USGS 05435943) and found a statistically significant relationship between flow, DO, and temperature. It confirmed that an incremental flow decrease (5 cfs) would result in a small decrease in DO and that as temperature increases, DO decreases. These findings are not conclusive as to the impact of the proposed amendment but serve as a check against established literature findings.

Oregon Branch of Badfish Creek

A limited forage fish community (Oregon Brand of Badfish Creek) shall attain a minimum DO concentration of 3.0 mg/L at all times. A warm water sport fish community (Badfish Creek) shall attain a minimum DO concentration of 5.0 mg/L at all times. The application does not provide any information regarding current or anticipated DO within these receiving streams, however, the Badfish Creek effluent discharge (Outfall 001) will continue to be regulated to meet water quality criteria through the District's WDPES permit.

Temperature

Water temperature is affected by many things, including weather, stormwater runoff, shading from streambank vegetation, discharges, impoundments, groundwater inflow, evaporation rate, streamflow, turbidity, water depth, seasonality, and time-of-day. According to the EPA, excessively high temperatures can result in decreased DO available to aquatic life, increased solubility of metals and

other toxins in water, possible increased toxicity of some substances to aquatic organisms, and algal blooms; while excessively low temperatures can impact aquatic life by altering timing of migration, decreasing spawning for some fish species, and changing time of egg hatching. Water temperatures are generally highest in late summer and during periods of low flow.

Per NR 102.04, for the Public Health and Welfare designated use, temperature of a discharge may not exceed 120 degrees Fahrenheit. Regarding the FAL designated use, heated effluent shall not cause lethality, inside or outside of the mixing zone, to animal, plant or other aquatic life. Water quality criteria for temperature shall be determined and applied pursuant to NR 102, subchapter II. NR 102.26, Table 7, includes specific sub-lethal temperatures which vary by type of waterbody and month.

Because the effluent temperatures exceed sub-lethal standards, the District's WDPES wastewater permit includes alternative effluent limits for temperature. The following table provided in the application provides the MMSD monthly permit limit, the baseline water quality criteria, and indicates the months where the permitted effluent temperature is too warm to meet WDNR criteria (yellow shading in Figure 9).

	MMSD effluent daily mean maximum Temperature (deg F) current permit term	WDNR Thermal Criteria LFF & Effluent exceeds by (deg)	WDNR Thermal Criteria Small Warm & Effluent exceeds by (deg)	WDNR Thermal Criteria Cold & Effluent exceeds by (deg)
January	57.87	54 (3.9)	50 (7.9)	47 (10.9)
February	57.89	54(3.9)	50(7.9)	45(12.8)
March	56.5	54(2.5)	54 (2.5)	53(3.5
April	59.95	64	65	59(1)
May	64.69	75	70	59(5)
June	69.15	75	72	67(2.2)
July	72.23	75	74	68(4.2)
August	74.39	77	78	68(6.4)
September	72.71	92	87	52(20.7)
October	71.67	54 (17.5)	54(17.5)	52(19.5)
November	66.32	54 (12.3)	50(16.3)	50(16.3)
December	61.84	54 (7.8)	50(11.8)	46(15.8)

Figure 9. MMSD Effluent Temperature compared to WDNR criteria (MMSD Application, 2024)

Badger Mill Creek

MMSD effluent limits are higher than the requirements for a cold water community (Badger Mill Creek) in all months, by as much as 20 degrees, despite supporting a Class II trout fishery. In general, the proposed amendment would allow the stream to experience more natural fluctuations of temperature (refer to USGS baseflow monitoring station (USGS 05435943) for general cyclic nature of stream temperature). However, it is noted in multiple sources that the effluent water has provided a beneficial,

stabilizing effect on the temperature of the stream. The effluent discharge mimics a groundwater spring that contributes warmer water in the winter and colder water in the summer. More flow also means that the stream is more resistant to thermal changes due to air temperature. As stated previously a decrease in flow is likely to lead to higher water temperatures, which in turn can have a negative impact on DO. Nonetheless, once effluent discharge to Badger Mill Creek has ceased, the District would no longer be contributing water in excess of the water quality standards to the stream for its FAL use; and also would comply with the water quality criteria for its Public Health and Welfare use.

Oregon Branch of Badfish Creek

The temperature limits per NR 102.26 for Oregon Branch of Badfish Creek (limited forage fish community) and Badfish Creek (warm water sport fish community) are shown above. No specific data was provided in the application; however, the Badfish Creek effluent discharge (Outfall 001) will continue to be regulated to meet water quality criteria through the District's WDPES permit.

Bacteria

The bacteria criterion, as a water quality criterion for the Recreational use as well as other uses based on narrative criteria, is intended to protect humans from illness caused by fecal contamination due to contact with surface waters. NR 102.04(6) contains specific criteria for levels of E. coli. The District's monitoring and data provided in the application includes F. coli because that is what has historically been required in their WPDES permit based on current rule. In 2020, the standard changed to E. coli, and so future WPDES permits will require that.

Badger Mill Creek

Although a direct comparison between E. coli and F. coli quantitative thresholds is not clear, MMSD's monitoring data shows the bacteria in the stream was significantly lower during the periods of shutdown as compared to with the effluent flow. Therefore, once effluent discharge to Badger Mill Creek has ceased, the District would no longer be contributing any bacteria to the stream and therefore would comply with the water quality criteria.

Oregon Branch of Badfish Creek

No specific data was provided in the application; however, the Badfish Creek effluent discharge (Outfall 001) will continue to be regulated to meet water quality criteria through the District's WDPES permit.

pH

pH is an important indicator of chemical, physical, and biological changes in a waterbody. It influences water chemistry and toxicity, and aquatic health. pH is affected by water depth, seasonality, and time-of-day. The optimal pH range for most aquatic organisms is between 6.5 and 8[vii]. According to the EPA, pH that fluctuates or is sustained outside of this range causes physiological stress for many species and can result in decreased reproduction, decreased growth, disease of death.

NR 102.04 requires for the FAL use that pH be within the range of 6.0 to 9.0, with no change greater than 0.5 unites outside the estimated natural seasonal maximum and minimum.

Badger Mill Creek

The data provided in the application indicates pH levels in the effluent discharge, Badger Mill Creek, and Sugar River are within the normal range, with or without effluent (see Figure 10).

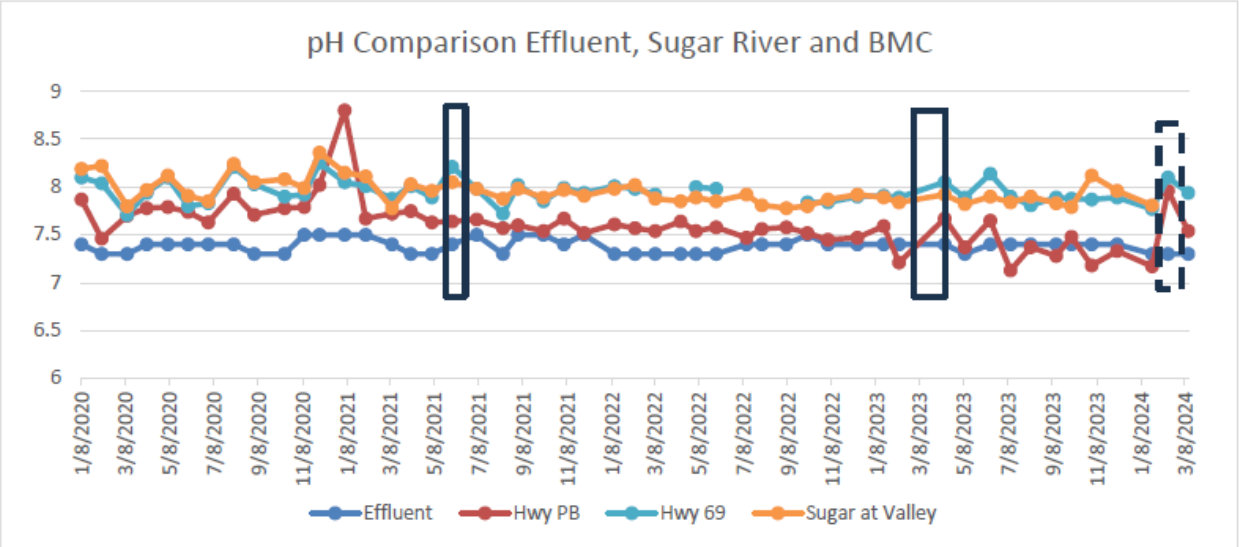


Figure 10. MMSD Sampling of pH (MMSD Application, 2024)

Oregon Branch of Badfish Creek

No specific data was provided in the application; however, the Badfish Creek effluent discharge (Outfall 001) will continue to be regulated to meet water quality criteria through the District's WDPES permit. Furthermore, the pH of the effluent should remain unchanged and is within the required range.

PFOS and PFOA

Poly- and perfluoroalkyl substances (PFAS), perfluorooctane sulfonate (PFOS), and perfluorooctanoic acid (PFOA) have been regulated by the DNR since 2022 through NR 102, 105, 106, and 216[13]. Per NR 102.04(7)(d), surface waters must meet the following criteria for the Public Health and Welfare use:

- 8 ppt in all surface waters to protect against consumption of fish taken from the waters (except waters and their downstream waters which cannot naturally support fish)
- 95 ppt in surface waters not classified as public water supplies to protect against incidental human consumption during recreational activities
- 20 ppt in public water supply surface waters to protect against consumption

[13] Refer to CARPC webpage on Water Quality PFAS Initiatives for additional information https://dnr.wisconsin.gov/topic/PFAS/WaterQuality.html

Badger Mill Creek

Once effluent discharge to Badger Mill Creek has ceased, the District would no longer be contributing PFOS and PFOA substances to the stream and therefore would comply with the water quality criteria.

Oregon Branch of Badfish Creek

No specific data was provided in the application; however, the Badfish Creek effluent discharge (Outfall 001) will continue to be regulated to meet water quality criteria through the District's WDPES permit.

Toxics

Through the toxic substances criterion for the Fish and Aquatic Life and Public Health and Welfare uses based on narrative criteria, substances must meet certain acute and chronic criteria pursuant to NR 105.05 and 105.06. Two such substances which are contained in the MMSD effluent are chloride and mercury, both for which MMSD currently has a variance through their WPDES wastewater permit.

Chloride is a permanent pollutant in waterways. It directly and indirectly impacts the health of organisms in aquatic ecosystems. High chloride concentrations are toxic to aquatic life. Exposure over the long-term (chronic) and short-term (acute) are both harmful. Chloride is not removed through wastewater treatment and not retained through biological cycles. Criteria for chloride in Wisconsin is 395 mg/L for chronic toxicity and 757 mg/L for acute toxicity (per NR 105.05 and NR 105.06). MMSD is an active participant in Wisconsin Salt Wise which seeks to reduce the use of chloride-based salts for road deicing and water softening.

Mercury is also a permanent pollutant. In water, mercury is converted to methyl mercury by bacteria or chemical reactions. It is then absorbed by tiny aquatic organisms and absorbed by fish that eat them. Through bioaccumulation, high concentrations of methyl mercury end up in fish people eat. No treatment method can completely remove mercury from wastewater. EPA criteria for mercury in Wisconsin is 0.44 µg/L for chronic toxicity and 0.83 µg/L for acute toxicity (per NR 105.05 and NR 105.06).

Badger Mill Creek

Once effluent discharge to Badger Mill Creek has ceased, any toxic substances (including chloride and mercury) coming from the effluent would be eliminated, and therefore, would comply with the water quality criteria. However, chloride levels will likely still be high due to past and present winter salting practices but should be lower without the influence of effluent (salt coming from water softeners).

Oregon Branch of Badfish Creek

No specific data was provided in the application; however, the Badfish Creek effluent discharge (Outfall 001) will continue to be regulated to meet water quality criteria through the District's WDPES permit.

Taste and Odor

The taste and odor criterion, as a water quality criterion for the Public Health and Welfare use as well as other uses based on narrative criteria, are derived to prevent substances from concentrating in surface waters or accumulating in aquatic organisms to a level which results in undesirable tastes or odors to human consumers. NR 102.14 establishes criteria for substances that impart tastes and odors to waters.

Badger Mill Creek

Once effluent discharge to Badger Mill Creek has ceased, the District would no longer be contributing anything to the stream and therefore would comply with the water quality criteria for taste and odor.

Oregon Branch of Badfish Creek

No specific data was provided in the application; however, the Badfish Creek effluent discharge (Outfall 001) will continue to be regulated to meet water quality criteria through the District's WDPES permit.

General Criteria for Public Health and Welfare

Human threshold (HTC) and human cancer criteria (HCC), as water quality criteria for the Public Health and Welfare use and pursuant to the general narrative criteria, are intended to protect humans from adverse effects or an unreasonable incremental risk of cancer resulting from contact with or ingestion of surface waters or from ingestion of aquatic organisms taken from surface waters. NR 105.08 and 105.09 establishes criteria for certain noncarcinogenic and carcinogenic substances.

Badger Mill Creek

Once effluent discharge to Badger Mill Creek has ceased, the District would no longer be contributing anything to the stream and therefore would comply with the water quality criteria for HTC and HCC.

Oregon Branch of Badfish Creek

No specific data was provided in the application; however, the Badfish Creek effluent discharge (Outfall 001) will continue to be regulated to meet water quality criteria through the District's WDPES permit.

General Criteria for Wildlife

General criteria for supporting wildlife, pursuant to the Wildlife use, are intended to protect Wisconsin's wildlife from adverse effects resulting from ingestion of surface waters or from ingestion of aquatic organisms taken from surface waters. NR 105.07 establishes criteria for certain substances.

Badger Mill Creek

Once effluent discharge to Badger Mill Creek has ceased, the District would no longer be contributing anything to the stream and therefore would comply with the general wildlife water quality criteria.

Oregon Branch of Badfish Creek

No specific data was provided in the application; however, the Badfish Creek effluent discharge (Outfall 001) will continue to be regulated to meet water quality criteria through the District's WDPES permit.

Badger Mill Creek Stakeholder Group

At its May 25, 2023, meeting, the District's Commission approved the discontinuance of effluent to the Badger Mill Creek to meet its permit requirement for phosphorus compliance in that waterway. A key aspect of that decision was a pledge of $1 million in funding to support the continued health and resiliency of Badger Mill Creek and its environmental corridor. The District has convened a stakeholder group that includes both governmental and nongovernmental organizations, which is tasked with developing a portfolio of projects it will recommend to the District's Commission in September 2024. It is anticipated that this portfolio could include flow augmentation, habitat restoration or enhancement,

watershed planning, or other improvements. More information about this process can be found at the District's Badger Mill Creek Stakeholder Group website.

Groundwater Impacts

The specific impacts to groundwater are not well defined. Based on WGHNS modeling, it is understood that Badger Mill Creek tends to lose baseflow to groundwater (i.e., water moves from the stream into the ground) in the upper sections near the MMSD effluent outfall, and gains baseflow further downstream (i.e., water moves from the ground into the stream). However, it is noted that the underlying data is not robust enough to create a very clear picture at the scale to which Badger Mill Creek is being looked at. Additional detailed information and modeling would be needed to evaluate and recalibrate the model to arrive at detailed conclusions regarding the impacts of the proposed amendment.

Comments at the Public Hearing

A public hearing was held on the proposed amendment at the July 11, 2024, meeting of the Capital Area Regional Planning Commission. Representatives from the Madison Metropolitan Sewerage District gave a presentation (Presentation Materials Link) of the proposed amendment and spoke in favor of the amendment. There was one (1) participant speaking in favor of the proposed amendment, and nine (9) participants speaking against it. A recording of the public hearing is available as part of the video recording of the full Commission meeting (Recording Link).

During the meeting, several Commissioners had questions seeking clarification on various topics, including: decision factors by MMSD; cost implications; details on the Stakeholder Group for Health and Resiliency of Badger Mill Creek; CARPC and DNR's authority; seemingly contradictory data on issues; classification of Badger Mill Creek; request for flow data; downstream flooding in Badfish Creek; adaptive management, including seemingly contradictory determinations of viability, point of compliance location, and proposals to further discuss this option; phosphorus regulations; impacts on water quality and overall health of Badger Mill Creek; timelines; WPDES discharge permit compliance and details; and interbasin water transfer. Representatives for MMSD and several public participants provided answers and response commentary.

Additionally, (37) comments were received prior to the public hearing meeting as part of the public participation process, including (4) in favor of the proposed amendment, (2) neutral/unknown, and (28) against it[14]. All written public comments, as well as a summary document of all public comments, are included in Appendix C.

[14] Counts of disposition represent individual parties and do not double count where a party submitted multiple, separate comments.

Conclusions and Staff Water Quality Recommendations

It is CARPC staff's opinion that the proposed amendment is *likely* consistent with water quality standards under Wis. Stat. § 281.15. The limited data provided in the application shows that during the three (3) temporary, short-term cessations of flow, compliance was maintained with the specific water quality criteria for the designated uses. However, the data presented do not seem to account for the interrelationship of water quality parameters in Badger Mill Creek which may be affected after the supplemental flow is discontinued (e.g., lower flow during periods of warm weather may result in a greater drop in dissolved oxygen than the sampling data from cooler parts of the year suggest). Furthermore, no analysis (e.g., forecast modeling, regression analysis, etc.) was provided to demonstrate that compliance with water quality standards would be expected under these varying conditions or, if existing water quality parameters are not already in compliance, to show that water quality would not be degraded further below water quality standards. Without a more robust analysis of the impacts to water quality criteria in Badger Mill Creek, staff can only determine with a low level of confidence that the proposed amendment for the elimination of effluent discharge to Badger Mill Creek (and increased discharge to Oregon Branch of Badfish Creek) will comply with water quality criteria necessary to protect its designated uses pursuant to s. 281.15 and that water quality parameters will not fall below numeric water quality standards without supplementary flow, or where already out of compliance, not fall further out of compliance. Therefore, it is recommended that this proposed amendment to the *Dane County Water Quality Plan* be *conditionally* accepted, subject to the condition identified below. Additional actions have also been recommended below to further improve water quality and environmental resource management.

Conditions of CARPC Recommendation

Regional Planning Commission staff recommends approval of this amendment, conditioned on the commitment of the Madison Metropolitan Sewerage District (District) to do the following:

1. The District shall do one of the following two items in order to more fully justify the stated conclusion that the proposed amendment will comply with water quality standards under Wis. Stat. § 281.15 and not result in degradation of the stream:

    a. Work with Wisconsin DNR to conduct additional trial periods of supplemental flow cessation to collect more data representing a wider range of conditions. This might be a single, longer-term period or a series of short-term periods during unrepresented seasons or conditions. The design of the trial(s) should be decided in consultation with DNR staff to avoid lasting damage to either the creek biota or MMSD infrastructure.

    b. Conduct a more thorough analysis using appropriate modeling or statistical techniques to predict dissolved oxygen and stream temperature without the supplemental flow. The results of this analysis shall be evaluated by DNR staff to determine if the more robust analysis is reliable enough to establish confidence in the predictions without the need for additional trial periods of supplemental flow cessation.

Additional Recommended Actions

In addition to the required actions above, it is recommended that the District pursue the following to further protect water quality and improve environmental resource management:

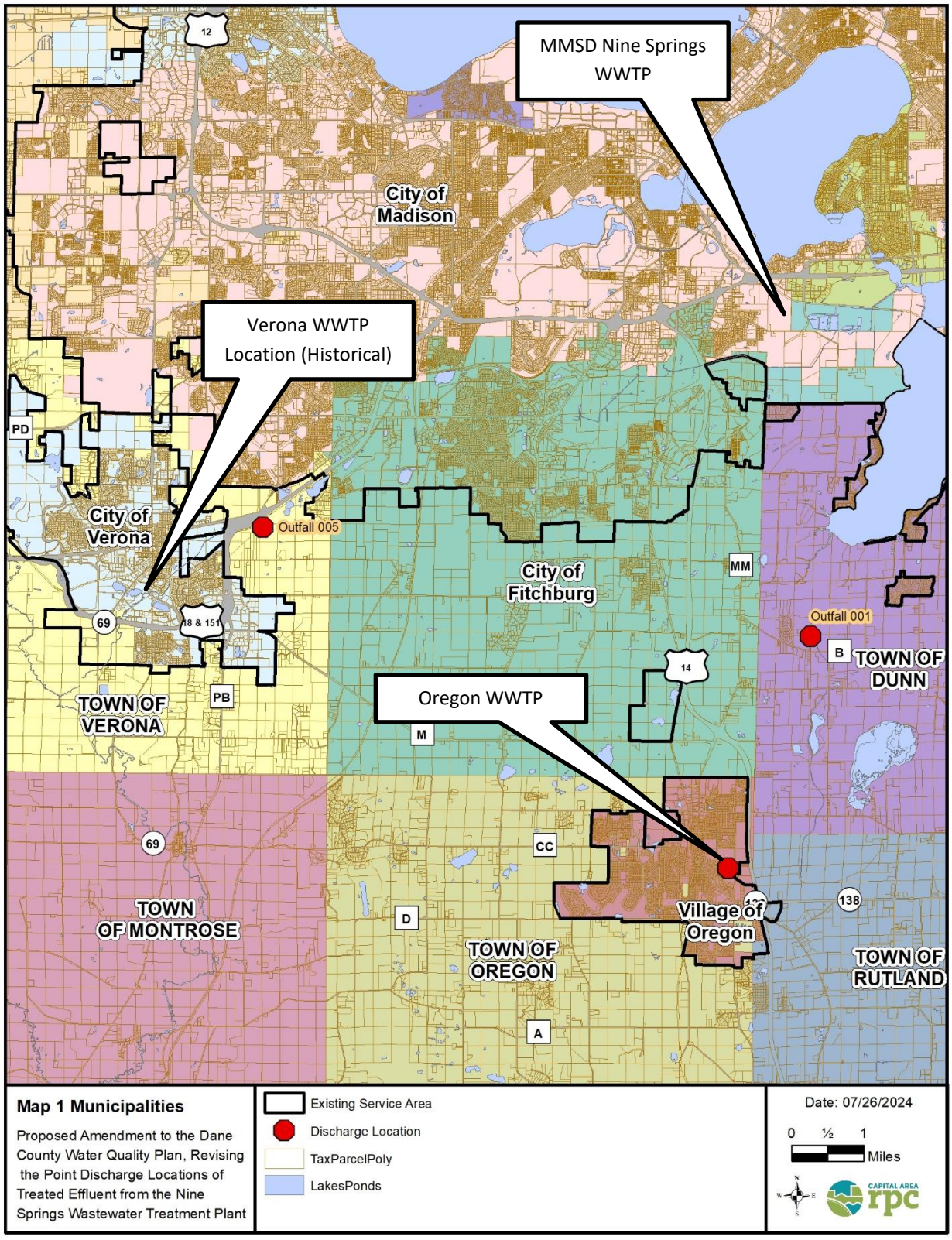
1. Work with the Wisconsin DNR, CARPC, and other interested governmental and non-governmental stakeholders to revisit adaptive management as a *preferred* alternative solution to meeting the phosphorus requirements (including the possibility of partial, or periodic, cessation of flow in combination with adaptive management).

2. If effluent cessation in Badger Mill Creek is implemented as the final solution, work with the Wisconsin Geological and Natural History Survey (WGNHS) to recalibrate the model of Badger Mill Creek utilizing additional detail on geology, hydrology (including the removal of the effluent contribution), and climate change, utilizing the *Groundwater Flow Model for Dane County,* to help identify opportunities for replacing lost baseflow.

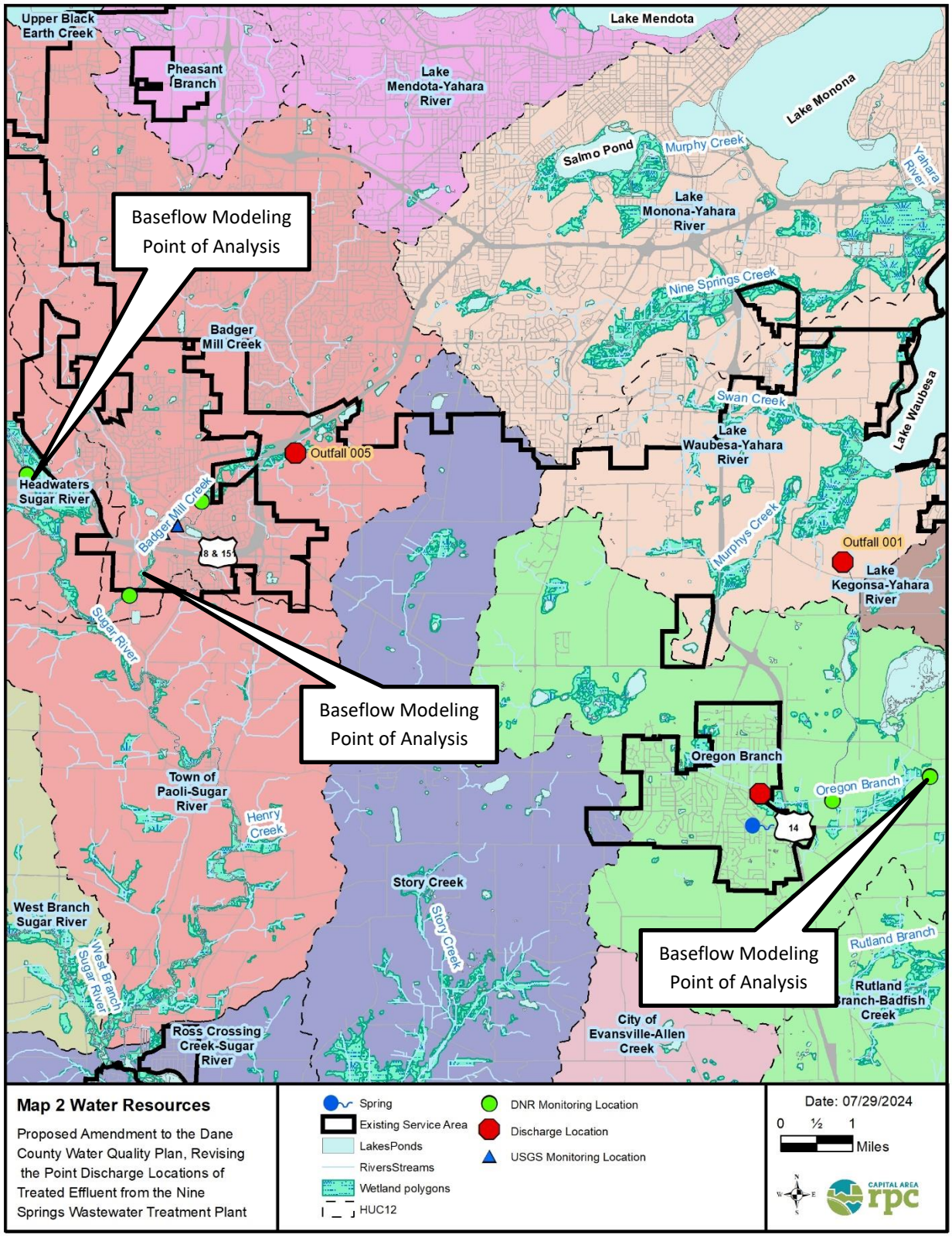
3. If effluent cessation in Badger Mill Creek is implemented as the final solution, continue working with the Badger Mill Creek Stakeholder Group to refine and advance projects that mitigate adverse effects caused by the loss of effluent flow.

4. If effluent cessation in Badger Mill Creek is implemented as the final solution, conduct additional public outreach and education regarding the anticipated effects of the additional effluent being added to the Badfish Creek discharge (Outfall 001).

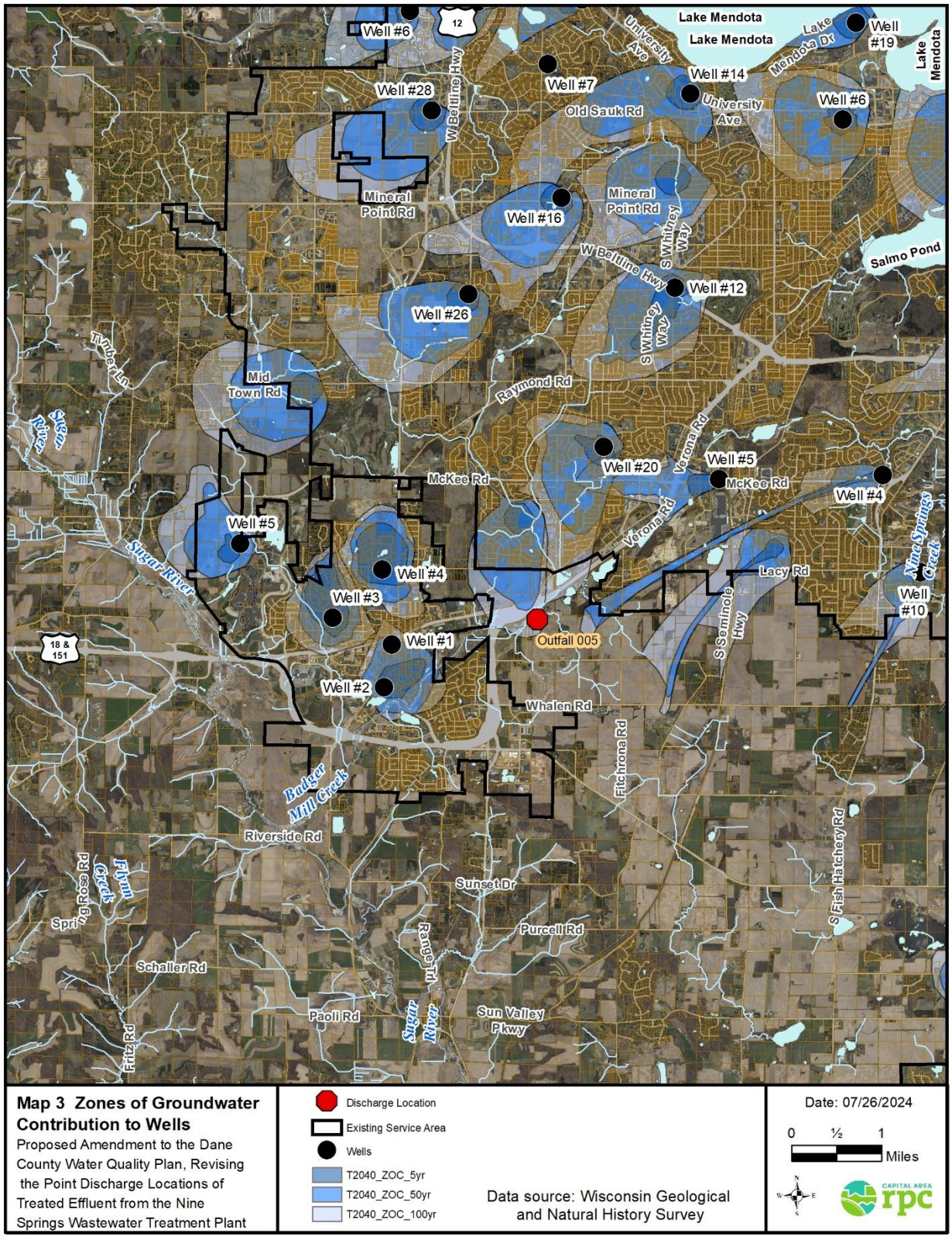
Map 1 – Municipalities



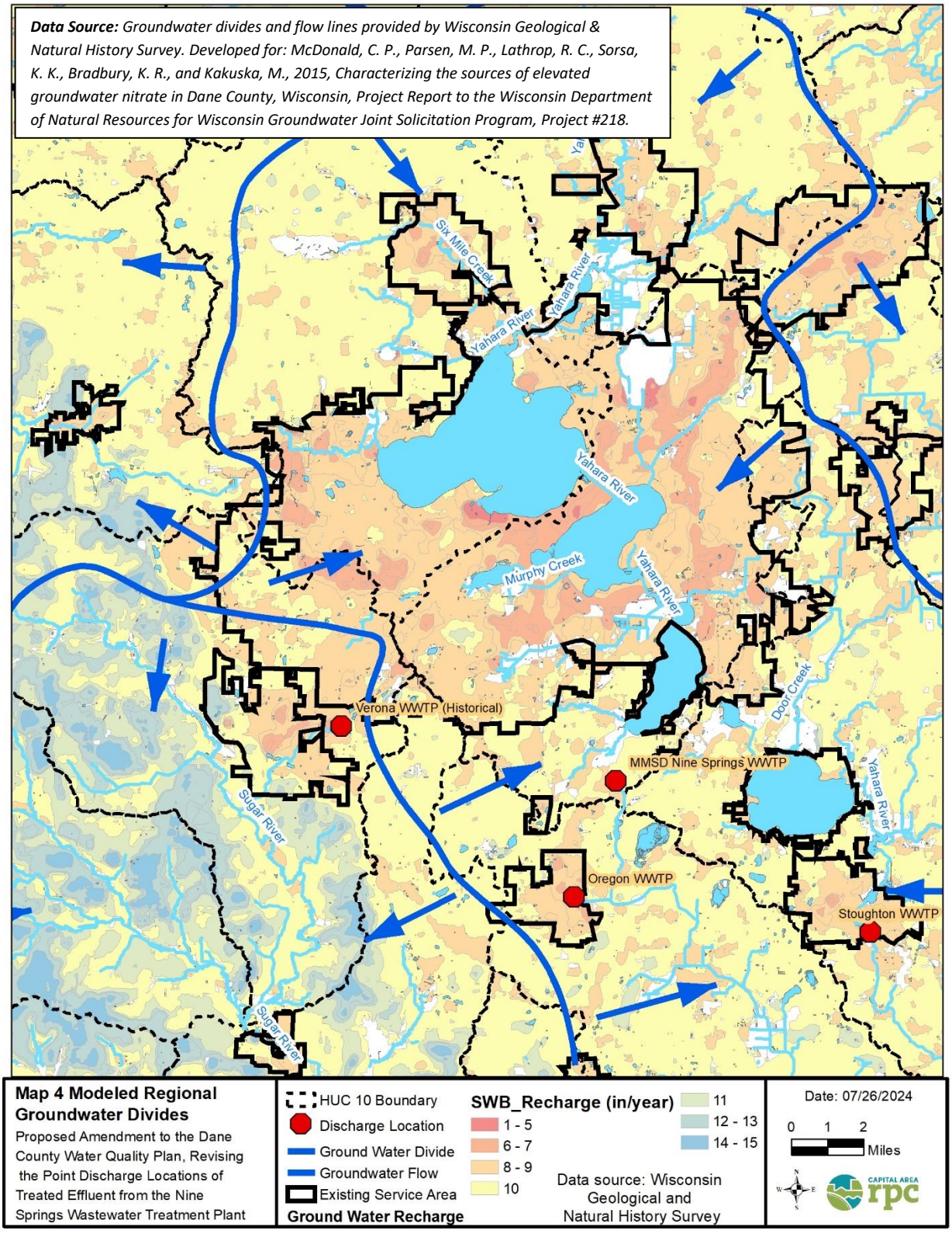
Map 2 – Water Resources



Map 3 – Zones of Groundwater Contribution to Wells



Map 4 – Modeled Regional Groundwater Divides



Appendix A – WPDES Permit

WPDES PERMIT

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

PERMIT TO DISCHARGE UNDER THE WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM

MADISON METROPOLITAN SEWERAGE DISTRICT

is permitted, under the authority of Chapter 283, Wisconsin Statutes, to discharge from a facility located at
1610 Moorland Road
to
BADFISH CREEK, FROM OUTFALL 001 (Lat: 42.97119° N / Lon: 89.35259° W) AND GROUNDWATER OF THE YAHARA RIVER AND LAKE MONONA WATERSHED, FROM OUTFALL 008, BOTH IN THE LOWER ROCK RIVER BASIN
AND TO
BADGER MILL CREEK, FROM OUTFALL 005, (Lat: 42.99414° N / Lon: 89.50400° W) IN THE SUGAR-PECATONICA RIVER BASIN,
ALL IN DANE COUNTY

in accordance with the effluent limitations, monitoring requirements and other conditions set forth in this permit.

The permittee shall not discharge after the date of expiration. If the permittee wishes to continue to discharge after this expiration date an application shall be filed for reissuance of this permit, according to Chapter NR 200, Wis. Adm. Code, at least 180 days prior to the expiration date given below.

State of Wisconsin Department of Natural Resources
For the Secretary

By _____
Thomas Bauman
Wastewater Field Supervisor

December 1, 2022
Date Permit Signed/Issued for Modification

PERMIT TERM: EFFECTIVE DATE - May 01, 2020 **EXPIRATION DATE - March 31, 2025**
EFFECTIVE DATE OF MODIFICATION: December 01, 2022

TABLE OF CONTENTS

1 Influent Requirements

1.1 Sampling Point(s)

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
701	Influent: 24-hour flow proportional composite samplers located prior to screening and grit removal at each of the five force mains at headworks building. Results are reported on a flow weighted basis.

1.2 Monitoring Requirements

The permittee shall comply with the following monitoring requirements.

1.2.1 Sampling Point 701 - INFLUENT TO PLANT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Continuous	Continuous	
BOD_5, Total		mg/L	Daily	24-Hr Flow Prop Comp	
$CBOD_5$		mg/L	Daily	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	Daily	24-Hr Flow Prop Comp	
Cadmium, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	
Chromium, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	
Copper, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	
Lead, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	
Nickel, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	
Zinc, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	
Mercury, Total Recoverable		ng/L	Monthly	24-Hr Flow Prop Comp	See mercury monitoring requirements at subsection 1.2.1.3.

1.2.1.1 Total Metals Analyses

Measurements of total metals and total recoverable metals shall be considered as equivalent.

1.2.1.2 Sample Analysis

Samples shall be analyzed using a method which provides adequate sensitivity so that results can be quantified, unless not possible using the most sensitive approved method.

1.2.1.3 Mercury Monitoring

The permittee shall collect and analyze all mercury samples according to the data quality requirements of ss. NR 106.145(9) and (10), Wisconsin Administrative Code. The limit of quantitation (LOQ) used for the effluent and field blank shall be less than 1.3 ng/L, unless the samples are quantified at levels above 1.3 ng/L. The permittee shall collect at least one mercury field blank for each set of mercury samples (a set of samples may include combinations of intake, influent, effluent or other samples all collected on the same day). The permittee shall report results of samples and field blanks to the Department on Discharge Monitoring Reports.

2 In-Plant Requirements

2.1 Sampling Point(s)

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
111	In-Plant Mercury: collect a mercury field blank at the effluent building using the Clean Hands/Dirty Hands sample collection procedure excerpted from EPA Method 1669.
112	Diversion Structure: during times of wet weather, treated flow prior to disinfection is conveyed out to storage lagoons and either discharged back to east plant primary channel or to Nine Springs Creek tributary.

2.2 Monitoring Requirements and Limitations

The permittee shall comply with the following monitoring requirements and limitations.

2.2.1 Sampling Point 111 - In-plant mercury monitoring

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Mercury, Total Recoverable		ng/L	Monthly	Blank	See mercury monitoring requirements at subsection 2.2.1.1.

2.2.1.1 Mercury Monitoring

The permittee shall collect and analyze all mercury samples according to the data quality requirements of ss. NR 106.145(9) and (10), Wisconsin Administrative Code. The limit of quantitation (LOQ) used for the effluent and field blank shall be less than 1.3 ng/L, unless the samples are quantified at levels above 1.3 ng/L. The permittee shall collect at least one mercury field blank for each set of mercury samples (a set of samples may include combinations of intake, influent, effluent or other samples all collected on the same day). The permittee shall report results of samples and field blanks to the Department on Discharge Monitoring Reports.

2.2.2 Sampling Point 112 - Diversion Structure Nine Springs Creek

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Volume		MGD	Per Occurrence	Estimated	
Fecal Coliform		#/100 ml	Per Occurrence	Grab	

2.2.2.1 Discharge Through In-plant Diversion Structure to Nine Springs Creek

Any discharge of wastewater through the in-plant diversion structure to Nine Springs Creek is deemed a Treatment Facility Overflow ('TFO') and is prohibited. In addition to the 'Volume' and 'Fecal Coliform' monitoring

requirements shown above, the permittee shall report any discharges through the in-plant diversion structure to Nine Springs Creek as required by subsection 7.3.1 ‘Sewage Treatment Facility Overflows’.

The ‘Volume’ of the diversion and results of ‘Fecal Coliform’ monitoring are to be reported on the Discharge Monitoring Reports.

3 Surface Water Requirements

3.1 Sampling Point(s)

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
001	Effluent: 24-hour flow proportional composite sampler intake located at effluent building after UV disinfection. Grab samples taken at effluent sampler prior to discharge to Badfish Creek.
005	Effluent: 24-hour flow proportional composite sampler intake located at effluent building after UV disinfection. Grab samples taken at effluent sampler prior to discharge to Badger Mill Creek.
016	Automatically-Activated Overflow: located in City of Madison at manhole 06-102 - Drainage ditch near PS6. During times of wet weather untreated flow could be discharged to Starkweather Creek near Atwood Ave.
017	Automatically-Activated Overflow: located in City of Monona at manhole PS7 - Entrance chamber behind PS7. During times of wet weather untreated flow could be discharged to the Yahara River between Lake Monona and Mud Lake.
018	Automatically-Activated Overflow: located in City of Madison at manhole 08-100 - North side of Wingra Creek across from PS8. During times of wet weather untreated flow could be discharged to Wingra Creek near Fish Hatchery Rd.
019	Automatically-Activated Overflow: located in Village of McFarland at manhole 09-108 - East side of Hwy. 51, north of Yahara River, south of Yahara Drive. During times of wet weather untreated flow could be discharged to the Yahara River below Lake Waubesa at Hwy 51.
020	Automatically-Activated Overflow: located in Town of Dunn at manhole PS11 near PS11 entrance chamber. During times of wet weather untreated flow could be discharged to Nine Springs Creek.
021	Automatically-Activated Overflow: located in City of Madison at manhole 13-105 upstream of PS13 - Along drainage ditch, west of Hwy 51 at Dane County Airport access road. Inside airport perimeter fence. During times of wet weather untreated flow could be discharged to Starkweather Creek East of airport near Hwy. 51.

3.2 Monitoring Requirements and Effluent Limitations

The permittee shall comply with the following monitoring requirements and limitations.

3.2.1 Sampling Point (Outfall) 001 - EFFL/BADFISH CREEK

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Continuous	Continuous	
$CBOD_5$	Monthly Avg	19 mg/L	Daily	24-Hr Flow Prop Comp	
$CBOD_5$	Weekly Avg	20 mg/L	Daily	24-Hr Flow Prop Comp	
$CBOD_5$	Monthly Avg	7,923 lbs/day	Daily	Calculated	
$CBOD_5$	Weekly Avg	8,340 lbs/day	Daily	Calculated	
Suspended Solids, Total	Monthly Avg	20 mg/L	Daily	24-Hr Flow Prop Comp	

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Suspended Solids, Total	Weekly Avg	23 mg/L	Daily	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	6,860 lbs/day	Daily	Calculated	Limit in effect January annually.
Suspended Solids, Total	Monthly Avg	8,340 lbs/day	Daily	Calculated	Limit in effect February, April, June and November annually.
Suspended Solids, Total	Monthly Avg	8,160 lbs/day	Daily	Calculated	Limit in effect March, May and July annually.
Suspended Solids, Total	Monthly Avg	7,080 lbs/day	Daily	Calculated	Limit in effect August annually.
Suspended Solids, Total	Monthly Avg	4,600 lbs/day	Daily	Calculated	Limit in effect September annually.
Suspended Solids, Total	Monthly Avg	7,180 lbs/day	Daily	Calculated	Limit in effect October annually.
Suspended Solids, Total	Monthly Avg	7,170 lbs/day	Daily	Calculated	Limit in effect December annually.
Suspended Solids, Total	Weekly Avg	9,591 lbs/day	Daily	Calculated	Limit in effect January through August and October through December annually.
Suspended Solids, Total	Weekly Avg	7,690 lbs/day	Daily	Calculated	Limit in effect September annually.
Dissolved Oxygen	Daily Min	5.0 mg/L	Daily	Continuous	See subsection 3.2.1.5 for Compliance with Dissolved Oxygen Limit.
pH Field	Daily Min	6.0 su	Daily	Grab	
pH Field	Daily Max	9.0 su	Daily	Grab	
Fecal Coliform	Geometric Mean - Monthly	400 #/100 ml	2/Week	Grab	Limit in effect April 15 through October 15 annually through October 15, 2022. Beginning March 1, 2023 limit is in effect March 1 through November 30 annually.
Fecal Coliform	Geometric Mean - Wkly	780 #/100 ml	2/Week	Grab	Limit in effect April 15 through October 15 annually through October 15, 2022. Beginning March 1, 2023 limit is in effect March 1 through November 30 annually.
Nitrogen, Ammonia (NH_3-N) Total	Daily Max	17 mg/L	Daily	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH_3-N) Total	Monthly Avg	4.1 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect October through April annually.

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Ammonia (NH_3-N) Total	Monthly Avg	1.8 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect May through September annually.
Nitrogen, Ammonia (NH_3-N) Total	Weekly Avg	10 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect October through April annually.
Nitrogen, Ammonia (NH_3-N) Total	Weekly Avg	4.4 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect May through September annually.
Phosphorus, Total	Monthly Avg	1.0 mg/L	Daily	24-Hr Flow Prop Comp	
Phosphorus, Total	6-Month Avg	0.6 mg/L	Daily	24-Hr Flow Prop Comp	This is the Adaptive Management interim limit effective starting May 1, 2020. See subsection 3.2.1.6 for averaging periods and compliance determination. Future interim limit of 0.5 mg/L may be effective upon reissuance per Schedule 6.1.
Phosphorus, Total		lbs/day	Daily	Calculated	Calculate the daily mass discharge of phosphorus in lbs/day on the same days phosphorus sampling occurs.
Chloride	Weekly Avg	465 mg/L	Daily	24-Hr Flow Prop Comp	This is an interim limit in effect November 1 through March 31 annually. See subsections 3.2.1.11 for chloride source reduction measures and 6.2 for the Chloride Target Value schedule.
Chloride	Weekly Avg	430 mg/L	Daily	24-Hr Flow Prop Comp	This is an interim limit in effect April 1 through October 31 annually. See subsections 3.2.1.11 for chloride source reduction measures and 6.2 for the Chloride Target Value schedule.
Chloride		lbs/day	Daily	Calculated	Calculate the mass discharge of chloride in lbs/day on the same days chloride sampling occurs.

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Mercury, Total Recoverable	Daily Max	3.4 ng/L	Monthly	Grab	This is an Alternative Mercury Effluent Limit. See subsections 3.2.1.12 for Mercury Variance information, 3.2.1.13 for Mercury Monitoring requirements and 6.3 for the mercury variance schedule.
Acute WET		TU_a	See Listed Qtr(s)	24-Hr Time Prop Comp	See subsection 3.2.1.14 for whole effluent toxicity (WET) testing monitoring dates and WET requirements.
Chronic WET		TUc	See Listed Qtr(s)	24-Hr Time Prop Comp	See subsection 3.2.1.14 for whole effluent toxicity (WET) testing monitoring dates and WET requirements.
Cadmium, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only
Chromium, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only
Copper, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only
Lead, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only
Nickel, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only
Zinc, Total Recoverable		µg/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only
Nitrogen, Total Kjeldahl		mg/L	Quarterly	24-Hr Flow Prop Comp	Monitoring Only
Nitrogen, Nitrite + Nitrate Total		mg/L	Quarterly	24-Hr Flow Prop Comp	Monitoring Only
Nitrogen, Total		mg/L	Quarterly	Calculated	Monitoring Only

3.2.1.1 Average Annual Design Flow

The average annual design flow of the permittee's Outfall 001 is 50 MGD.

3.2.1.2 Total Metals Analyses

Measurements of total metals and total recoverable metals shall be considered as equivalent.

3.2.1.3 Sample Analysis

Samples shall be analyzed using a method which provides adequate sensitivity so that results can be quantified, unless not possible using the most sensitive approved method.

3.2.1.4 TSS Limitations

The Rock River TMDL for Total Phosphorus (TP) and Total Suspended Solids (TSS) was approved by the Environmental Protection Agency (EPA) September 2011. The TMDL derived limits are expressed as weekly average and monthly average effluent limits, and are effective immediately. The approved total suspended solids TMDL limits for this permittee are included in the following table:

Total Suspended Solids Effluent Limitations

Month	Monthly Ave TSS Effluent Limit from TMDL (lbs/day)	Weekly Ave TSS Effluent Limit from TMDL (lbs/day)
Jan	6860	11500
Feb	8470	14100
March	8160	13600
April	8430	14100
May	8160	13600
June	8430	14100
July	8160	13600
Aug	7080	11800
Sept	4600	7690
Oct	7180	12000
Nov	8430	14100
Dec	7170	12000

3.2.1.5 Compliance with Dissolved Oxygen Limit

Dissolved Oxygen (DO) values of 4.5 mg/L or greater, as measured at sample point 001, will be deemed as compliant by the Department for outfall 001 based on the results of a previous study by the permittee sent to the Department on August 18, 1999 and approved September 22, 1999. This study documented that the minimum DO gain across the Badfish Creek aerator was 0.5 mg/L. If DO levels fall below 4.5 mg/L for more than an hour and are not attributable to equipment failure, per the study, the District shall take DO measurements at the discharge to Badfish Creek.

3.2.1.6 Total Phosphorus Interim Limit, Averaging Periods and Compliance Determination

The adaptive management total phosphorus interim limit of 0.6 mg/L goes into effect beginning the period from May 1, 2020 through October 31, 2020. The averaging periods are May through October and November through April. Compliance with the 6-month average limit is evaluated at the end of each 6-month period on April 30th and October 31st annually.

3.2.1.7 Phosphorus Limitation(s) and Adaptive Management Requirements

Madison Met has requested and the Department has approved a plan to implement a watershed adaptive management approach under Wis. Adm. Code s. NR 217.18 and Wis. Stat. s. 283.13(7), as a means for Madison Met to achieve compliance with the phosphorus water quality standard in s. NR 102.06, Wis. Adm. Code. The phosphorus limitations and conditions in this permit reflect the approved adaptive management plan WQT-2017-0003 (January 2017) and Amendment 1 (February 2018). Failure to implement terms and conditions of this section is a violation of this permit. In cooperation with the other signatories of the Intergovernmental Agreement for an Adaptive Management Plan in the Yahara Watershed, the permittee shall design and implement the actions identified in section 3 of the AM Plan No. WQT-2017-0003 (January 2017) and Amendment 1 (February 2018) in accordance with the goals and measures identified in the approved plan.

The goal for phosphorus load reductions for Madison Met for this permit term is equal to 40% of the total phosphorus load reduction goal from Madison Met to the watershed, according to the approved adaptive management plan. This load reduction is identified as 4,625 pounds of phosphorus per year for Madison Met. If Madison Met does not achieve its load reduction goal by March 31, 2025, the watershed adaptive management option may not be available to the permittee upon permit reissuance, or alternatively, the department may request appropriate modifications to the AM plan as a condition of permit reissuance.

Pursuant to s. NR 217.18(3)(e)2, Wis. Adm. Code, the adaptive management interim limitation is 0.6 mg/L, expressed as a six-month average. Additionally, a 1.0 mg/L limitation expressed as a monthly average is required. The final calculated water quality based effluent limitations for phosphorus are a six-month seasonal average limitation of 0.075 mg/L and a monthly average limitation of 0.225 mg/L based on current in-stream phosphorus data. These limitations may be recalculated based on changes in the in-stream data at the time of permit reissuance. There are also additional mass based limits from the Rock River TMDL and are listed in the table below. These limits will become effective at the end of three permit terms unless the adaptive management project is terminated per s. NR 217.18(3)(g), Wis. Adm. Code, in which case the limits may be imposed at an earlier date, or the phosphorus reductions specified in the adaptive management plan have been achieved.

Total Phosphorus Effluent Limitations

Month	Monthly Ave Total P Effluent Limit (lbs/day)
Jan	60.48
Feb	67.38
March	58.59
April	59.90
May	56.76
June	61.19
July	56.17
Aug	54.09
Sept	54.13
Oct	55.40
Nov	60.14
Dec	60.11

3.2.1.8 Additional Watershed Adaptive Management Project Requirements

Adaptive Management Plan No. WQT-2017-0003 (January 2017) and Amendment 1 (February 2018) is a partnership between several WPDES permittees and a diverse group of entities that are not WPDES permit holders. The WPDES permittees include three publicly owned treatment works (POTWs) – the Stoughton Utilities, Village of Oregon, and the Madison Metropolitan Sewerage District and WDNR Nevin Fish Hatchery and various Municipal Separate Storm Sewer Systems (MS4s) that have signed an intergovernmental agreement to guide implementation of the plan. The adaptive management plan is a means to achieve compliance with the phosphorus water quality standard in s. NR 102.06, Wis. Adm. Code and the Rock River TMDL. As the approved plan is written, Madison Metropolitan Sewerage District shall submit surface water samples as identified in AM Plan No. WQT-2017-0003 (January 2017) and Amendment 1 (February 2018) that shall be taken in accordance with subsection 3.2.2 and shall submit the results as part of the annual reports on the implementation of AM Plan No. WQT-2017-0003 (January 2017) and Amendment 1 (February 2018) (see section 6.1).

The goal for phosphorus load reductions for this permit term within the Yahara River action area, as identified in WQT-2017-0003 (January 2017) and Amendment 1 (February 2018), shall be 40% of the total phosphorus load reduction from the combination of all four point sources (Stoughton Utilities, Village of Oregon, Madison Metropolitan Sewerage District and WDNR Nevin Fish Hatchery). This load reduction goal is identified as 5,329

pounds of phosphorus per year from the contributing point sources in the adaptive management plan. If the load reduction goal is not met by March 31, 2025, the watershed adaptive management option may not be available to the participating permittees upon permit reissuance, or alternatively, the department may request appropriate modifications to the AM plan as a condition of permit reissuance.

3.2.1.9 Adaptive Management Reopener Clause

Per s. NR 217.18(3)(g), Wis. Adm. Code, the Department may terminate the adaptive management option for a permittee through permit modification or at permit reissuance and require compliance with a phosphorus effluent limitation calculated under s. NR 217.13, Wis. Adm. Code, or a US EPA approved TMDL based on any of the following reasons:

1. Failure to implement the adaptive management actions in accordance with the approved adaptive management plan and compliance schedule established in the permit.
2. New information becomes available that changes the Department's determinations made under s. NR 217.18(2), Wis. Adm. Code.
3. Circumstances beyond the permittee's control have made compliance with the applicable phosphorus criterion in s. NR 102.06, Wis. Adm. Code, pursuant to the plan's goals and measures infeasible.
4. A determination by the Department that sufficient reductions have not been achieved to timely reduce the amount of total phosphorus to meet the criteria in s. NR 102.06, Wis. Adm. Code.

3.2.1.10 Adaptive Management Requirements – Optimization

The permittee shall continue to optimize performance to control phosphorus discharges in accordance with s. NR 217.18(3)(c), Wis Adm. Code.

3.2.1.11 Chloride Variance – Implement Source Reduction Measures

This permit contains a variance to the water quality-based effluent limit (WQBEL) for chloride granted in accordance with s. NR 106.83(2), Wis. Adm. Code. As conditions of this variance the permittee shall (a) maintain effluent quality at or below the interim effluent limitation specified in the table above, (b) implement the chloride source reduction measures specified in the "Madison Metropolitan Sewerage District, Chloride Pollutant Minimization Program/Source Reduction Measures Plan, January 2019" and "Water Softening Source Reduction Initiatives" plan amendment and (c) perform the actions listed in the schedule. (See the Schedules section herein.):

3.2.1.12 Mercury Variance – Implement Pollutant Minimization Plan

This permit contains a variance to the water quality-based effluent limit (WQBEL) for mercury granted in accordance with s. 283.15, Stats. As conditions of this variance the permittee shall (a) maintain effluent quality at or below the interim effluent limitation specified in the table above, (b) implement the mercury pollutant minimization measures specified in the "Madison Metropolitan Sewerage District, Mercury Pollutant Minimization Program/Source Reduction Measures Plan, updated December 2018", and (c) perform the actions listed in the schedule. (See the Schedules section herein.)

3.2.1.13 Mercury Monitoring

The permittee shall collect and analyze all mercury samples according to the data quality requirements of ss. NR 106.145(9) and (10), Wisconsin Administrative Code. The limit of quantitation (LOQ) used for the effluent and field blank shall be less than 1.3 ng/L, unless the samples are quantified at levels above 1.3 ng/L. The permittee shall collect at least one mercury field blank for each set of mercury samples (a set of samples may include combinations of intake, influent, effluent or other samples all collected on the same day). The permittee shall report results of samples and field blanks to the Department on Discharge Monitoring Reports.

3.2.1.14 Whole Effluent Toxicity (WET) Testing

Primary Control Water: Control water shall be standard laboratory control water that has a hardness of +/- 10% of the hardness of the Yahara River above the confluence with "Badfish creek for Outfall 001. Different control water may be used if prior approval has been given by the Department.

Effluent Sample Point Location and Type: Effluent samples shall be taken using a 24-Hour Time Proportional Composite sampler set up to sample just below the step aerator at the Badfish Creek Outfall.

Instream Waste Concentration (IWC): 93%

Dilution series: At least five effluent concentrations and dual controls must be included in each test.

- **Acute:** 100, 50, 25, 12.5, 6.25% and any additional selected by the permittee.
- **Chronic:** 100, 75, 50, 25, 12.5% and any additional selected by the permittee.

WET Testing Frequency:

Acute tests shall be conducted once each year in rotating quarters in order to collect seasonal information about the discharge. Tests are required during the following quarters.

- **Acute:** *October 1–December 31, 2020; January 1–March 31, 2021; April 1–June 30, 2022; July 1–September 30, 2023; and January 1–March 31, 2024 (five tests total).*

Acute WET testing shall continue after the permit expiration date (until the permit is reissued) in accordance with the WET requirements specified for the last full calendar year of this permit. For example, the next test would be required in January 1–March 31, 2025.

Chronic tests shall be conducted twice each year, in rotating quarters in order to collect seasonal information about the discharge. Tests are required during the following quarters.

- **Chronic:** *April 1–June 30, 2020; October 1–December 31, 2020; January 1–March 31, 2021; April 1–June 30, 2021; April 1–June 30, 2022; July 1–September 30, 2022; July 1–September 30, 2023; October 1–December 31, 2023; January 1–March 31, 2024; and April 1 – June 30, 2024 (ten tests total)*

Chronic WET testing shall continue after the permit expiration date (until the permit is reissued) in accordance with the WET requirements specified for the last full calendar year of this permit. For example, the next tests would be required in January 1–March 31, 2025; and April 1 – June 30, 2025.

Testing: WET testing shall be performed during normal operating conditions. Permittees are not allowed to turn off or otherwise modify treatment systems, production processes, or change other operating or treatment conditions during WET tests.

Reporting: The permittee shall report test results on the Discharge Monitoring Report form, and also complete the "Whole Effluent Toxicity Test Report Form" (Section 6, "*State of Wisconsin Aquatic Life Toxicity Testing Methods Manual, 2nd Edition*"), for each test. The original, complete, signed version of the Whole Effluent Toxicity Test Report Form shall be sent to the Biomonitoring Coordinator, Bureau of Water Quality, 101 S. Webster St., P.O. Box 7921, Madison, WI 53707-7921, within 45 days of test completion. The Discharge Monitoring Report (DMR) form shall be submitted electronically by the required deadline.

Determination of Positive Results: An acute toxicity test shall be considered positive if the Toxic Unit - Acute (TU_a) is greater than 1.0 for either species. The TU_a shall be calculated as follows: $TU_a = 100 \div LC_{50}$. A chronic toxicity test shall be considered positive if the Toxic Unit - Chronic (TU_c) is greater than 1.1 for either species. The TU_c shall be calculated as follows: $TU_c = 100 \div IC_{25}$.

Additional Testing Requirements: Within 90 days of a test which showed positive results, the permittee shall submit the results of at least 2 retests to the Biomonitoring Coordinator on "Whole Effluent Toxicity Test Report Forms". The 90 day reporting period shall begin the day after the test which showed a positive result. The retests shall be completed using the same species and test methods specified for the original test (see the Standard Requirements section herein).

3.2.2 Surface Water Sampling

Surface water sampling shall be performed in accordance with Table 24 on page 1 of the approved Adaptive Management Plan Amendment #1, February 2018, at the locations specified in Table 25 on page 2 in the approved plan amendment.

3.2.2.1 Surface Water Sampling for Total Phosphorus and Total Suspended Solids

When sampling surface waters for total phosphorus and total suspended solids, sample collection and handling protocol as specified in Chapter 4 of the "Guidance for Implementing Wisconsin's Phosphorus Water Quality Standards for Point Source Discharges" shall be followed. (Available at dnr.wi.gov; search for "phosphorus guidance").

When testing for total phosphorus and total suspended solids in surface water samples, use the test procedures specified by Standard Requirement 7.1.2. Analytical methods used shall enable the laboratory to quantitate total phosphorus at levels below the water quality criterion of 0.075 mg/L. If the required level of quantitation cannot be met by any of the methods available in ch. NR 219, Wis. Adm. Code, then the method with the lowest limit of detection shall be selected.

When surface water samples are collected by Water Action Volunteers, the "The Volunteer Monitor's Guide To Quality Assurance Project Plans" shall be implemented. (Available at www.epa.gov; search for "The Volunteer Monitor's Guide To Quality Assurance Project Plans").

3.2.2.2 Reporting Surface Water Sampling Results for Total Phosphorus, Total Suspended Solids and Flow

The permittee shall report total phosphorus, total suspended solids and river flow measurement collected in the annual report included in Section 6.

In addition, all surface water samples shall be reported to the Department using the Department's Laboratory Data Entry System (LDES). Test results for the year shall be submitted by July 31, of the following year. (Available at dnr.wi.gov; search "Laboratory Data Entry System").

3.2.3 Sampling Point (Outfall) 005 - EFFL/BADGER MILL CREEK

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Continuous	Continuous	
$CBOD_5$	Monthly Avg	16 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect November through April annually.
$CBOD_5$	Monthly Avg	7.0 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect May through October annually.
$CBOD_5$	Weekly Avg	16 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect November through April annually.
$CBOD_5$	Weekly Avg	7.0 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect May through October annually.

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Suspended Solids, Total	Monthly Avg	16 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect November through April annually.
Suspended Solids, Total	Monthly Avg	10 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect May through October annually.
Suspended Solids, Total	Weekly Avg	27 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect November through April annually.
Suspended Solids, Total	Weekly Avg	17 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect May through October annually.
Dissolved Oxygen	Daily Min	5.0 mg/L	Daily	Continuous	See subsection 3.2.3.2 for Compliance with Dissolved Oxygen Limit.
pH Field	Daily Min	6.0 su	Daily	Grab	
pH Field	Daily Max	9.0 su	Daily	Grab	
Fecal Coliform	Geometric Mean - Monthly	400 #/100 ml	2/Week	Grab	Limit in effect May 1 through September 30 annually.
Fecal Coliform	Geometric Mean - Wkly	780 #/100 ml	2/Week	Grab	Limit in effect May 1 through September 30 annually.
Nitrogen, Ammonia (NH_3-N) Total	Daily Max	11 mg/L	Daily	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH_3-N) Total	Monthly Avg	3.8 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect October through April annually.
Nitrogen, Ammonia (NH_3-N) Total	Monthly Avg	1.1 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect May through September annually.
Nitrogen, Ammonia (NH_3-N) Total	Weekly Avg	8.7 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect October through April annually.
Nitrogen, Ammonia (NH_3-N) Total	Weekly Avg	2.6 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect May through September annually.
Phosphorus, Total	Monthly Avg	1.0 mg/L	Daily	24-Hr Flow Prop Comp	This is an interim limit. The final monthly average water quality based effluent limit is 0.225 mg/L. See subsections 3.2.3.3 through 3.2.3.5 for compliance options and 6.4 for the phosphorus compliance schedule.
Phosphorus, Total	6-Month Avg	0.6 mg/L	Daily	24-Hr Flow Prop Comp	This is an interim limit effective starting May 1, 2020. The final 6-month average water quality based effluent limit is 0.075 mg/L. See subsection 3.2.1.6 in the permit for averaging periods and compliance determination.

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Phosphorus, Total		lbs/day	Daily	Calculated	Calculate the mass discharge of phosphorus in lbs/day on the same days phosphorus sampling occurs. The final 6-month average water quality based mass limit is 2.25 lbs/day and goes into effect per the phosphorus compliance schedule at subsection 6.4.
Chloride	Weekly Avg	465 mg/L	Daily	24-Hr Flow Prop Comp	This is an interim limit in effect November 1 through March 31. See subsections 3.2.3.6 for chloride source reduction measures and 6.2 for the Chloride Target Value schedule.
Chloride	Weekly Avg	430 mg/L	Daily	24-Hr Flow Prop Comp	This is an interim limit in effect April 1 through October 31. See subsections 3.2.3.6 for chloride source reduction measures and 6.2 for the Chloride Target Value schedule.
Chloride		lbs/day	Daily	Calculated	Calculate the daily mass discharge of chloride in lbs/day on the same days chloride sampling occurs.
Mercury, Total Recoverable	Daily Max	3.4 ng/L	Monthly	Grab	This is an Alternative Mercury Effluent Limit. See subsections 3.2.3.7 for Mercury Variance information, 3.2.3.8 for Mercury Monitoring requirements and 6.3 for the mercury variance schedule.
Acute WET		TU_a	See Listed Qtr(s)	24-Hr Time Prop Comp	See subsection 3.2.3.9 for whole effluent toxicity (WET) testing monitoring dates and WET requirements.

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Chronic WET		TUc	See Listed Qtr(s)	24-Hr Time Prop Comp	See subsection 3.2.3.9 for whole effluent toxicity (WET) testing monitoring dates and WET requirements.
Temperature Maximum	Monthly Avg	57 deg F	3/Week	Continuous	Limit in effect January annually.
Temperature Maximum	Monthly Avg	69 deg F	3/Week	Continuous	Limit in effect October annually.
Temperature Maximum	Monthly Avg	65 deg F	3/Week	Continuous	Limit in effect November annually.
Temperature Maximum	Monthly Avg	62 deg F	3/Week	Continuous	Limit in effect December annually.
Nitrogen, Total Kjeldahl		mg/L	Quarterly	24-Hr Flow Prop Comp	Monitoring Only
Nitrogen, Nitrite + Nitrate Total		mg/L	Quarterly	24-Hr Flow Prop Comp	Monitoring Only
Nitrogen, Total		mg/L	Quarterly	Calculated	Monitoring Only

3.2.3.1 Average Annual Design Flow

The average annual design flow of the permittee's Outfall 005 is 3.6 MGD.

3.2.3.2 Compliance with Dissolved Oxygen Limit

Dissolved Oxygen (DO) values of 3.8 mg/L or greater, as measured at sample point 001, will be deemed as compliant by the Department for outfall 005 based on the results of a previous study by the permittee sent to the Department on August 18, 1999 and approved September 22, 1999. This study documented that the minimum D.O. gain across the Badger Mill Creek aerator was 1.2 mg/L. If DO levels fall below 3.8 mg/L for more than an hour and are not attributable to equipment failure, per the study, the District shall take DO measurements at the discharge to Badger Mill Creek.

3.2.3.3 Phosphorus Water Quality Based Effluent Limitation(s)

The final water quality based effluent limit for phosphorus are **0.075 mg/L as a 6-month average and 0.225 mg/L (2.25 lbs/day) as a monthly average** and will take effect per the Compliance Schedule unless:

A. As part of the application for the next reissuance, or prior to filing the application, the permittee submits either: 1.) a watershed adaptive management plan and a completed Watershed Adaptive Management Request Form 3200-139; or 2.) an application for water quality trading; or 3.) an application for a variance; or 4.) new information or additional data that supports a recalculation of the numeric limitation; and

B. The Department modifies, revokes and reissues, or reissues the permit to incorporate a revised limitation before the expiration of the compliance schedule*.

Note: The permittee may also submit an application for a variance within 60 days of this permit reissuance, as noted in the permit cover letter, in accordance with s. 283.15, Stats.

If Adaptive Management or Water Quality Trading is approved as part of the permit application for the next reissuance or as part of an application for a modification or revocation and reissuance, the plan and specifications submittal, construction, and final effective dates for compliance with the total phosphorus WQBEL may change in the reissued or modified permit. In addition, the numeric value of the water quality based effluent limit may change based

on new information (e.g. a TMDL) or additional data. If a variance is approved for the next reissuance, interim limits and conditions will be imposed in the reissued permit in accordance with s. 283.15, Stats., and applicable regulations. A permittee may apply for a variance to the phosphorus WQBEL at the next reissuance even if the permittee did not apply for a phosphorus variance as part of this permit reissuance.

Additional Requirements: If a water quality based effluent limit has taken effect in a permit, any increase in the limit is subject to s. NR 102.05(1) and ch. NR 207, Wis. Adm. Code. When a six-month average effluent limit is specified for Total Phosphorus the applicable averaging periods are May through October and November through April.

*Note: The Department will prioritize reissuances and revocations, modifications, and reissuances of permits to allow permittees the opportunity to implement adaptive management or nutrient trading in a timely and effective manner.

3.2.3.4 Alternative Approaches to Phosphorus WQBEL Compliance

Rather than upgrading its wastewater treatment facility to comply with WQBELs for total phosphorus, the permittee may use Water Quality Trading or the Watershed Adaptive Management Option, to achieve compliance under ch. NR 217, Wis. Adm. Code, provided that the permit is modified, revoked and reissued, or reissued to incorporate any such alternative approach. The permittee may also implement an upgrade to its wastewater treatment facility in combination with Water Quality Trading or the Watershed Adaptive Management Option to achieve compliance, provided that the permit is modified, revoked and reissued, or reissued to incorporate any such alternative approach. If the Final Compliance Alternatives Plan concludes that a variance will be pursued, the Plan shall provide information regarding the basis for the variance.

3.2.3.5 Submittal of Permit Application for Next Reissuance and Adaptive Management or Pollutant Trading Plan or Variance Application

The permittee shall submit the permit application for the next reissuance at least 6 months prior to expiration of this permit. If the permittee intends to pursue adaptive management to achieve compliance with the phosphorus water quality based effluent limitation, the permittee shall submit with the application for the next reissuance: a completed Watershed Adaptive Management Request Form 3200-139, the completed Adaptive Management Plan and final plans for any system upgrades necessary to meet interim limits pursuant to s. NR 217.18, Wis. Adm. Code. If the permittee intends to pursue pollutant trading to achieve compliance, the permittee shall submit an application for water quality trading with the application for the next reissuance. If system upgrades will be used in combination with pollutant trading to achieve compliance with the final water quality-based limit, the reissued permit will specify a schedule for the necessary upgrades. If the permittee intends to seek a variance, the permittee shall submit an application for a variance with the application for the next reissuance.

3.2.3.6 Chloride Variance – Implement Source Reduction Measures

This permit contains a variance to the water quality-based effluent limit (WQBEL) for chloride granted in accordance with s. NR 106.83(2), Wis. Adm. Code. As conditions of this variance the permittee shall (a) maintain effluent quality at or below the interim effluent limitation specified in the table above, (b) implement the chloride source reduction measures specified in the "Madison Metropolitan Sewerage District, Chloride Pollutant Minimization Program/Source Reduction Measures Plan, January 2019" and "Water Softening Source Reduction Initiatives" plan amendment and (c) perform the actions listed in the schedule. (See the Schedules section herein.):

3.2.3.7 Mercury Variance – Implement Pollutant Minimization Plan

This permit contains a variance to the water quality-based effluent limit (WQBEL) for mercury granted in accordance with s. 283.15, Stats. As conditions of this variance the permittee shall (a) maintain effluent quality at or below the interim effluent limitation specified in the table above, (b) implement the mercury pollutant minimization measures specified in the "Madison Metropolitan Sewerage District, Mercury Pollutant Minimization Program/Source Reduction Measures Plan, Updated December 2018", and (c) perform the actions listed in the schedule. (See the Schedules section herein.)

3.2.3.8 Mercury Monitoring

The permittee shall collect and analyze all mercury samples according to the data quality requirements of ss. NR 106.145(9) and (10), Wisconsin Administrative Code. The limit of quantitation (LOQ) used for the effluent and field blank shall be less than 1.3 ng/L, unless the samples are quantified at levels above 1.3 ng/L. The permittee shall collect at least one mercury field blank for each set of mercury samples (a set of samples may include combinations of intake, influent, effluent or other samples all collected on the same day). The permittee shall report results of samples and field blanks to the Department on Discharge Monitoring Reports.

3.2.3.9 Whole Effluent Toxicity (WET) Testing

Primary Control Water: Control water shall be standard laboratory control water that has a hardness of +/- 10% of the hardness of the Sugar River above the confluence with Badger Mill Creek for Outfall 005. Different control water may be used if prior approval has been given by the Department.

Effluent Sample Point Location and Type: Effluent samples shall be taken using a 24-Hour Time Proportional Composite sampler set up to sample just below the step aerator at the Badger Mill Creek Outfall.

Instream Waste Concentration (IWC): 97%

Dilution series: At least five effluent concentrations and dual controls must be included in each test.

- **Acute:** 100, 50, 25, 12.5, 6.25% and any additional selected by the permittee.
- **Chronic:** 100, 75, 50, 25, 12.5% and any additional selected by the permittee.

WET Testing Frequency:

Acute tests shall be conducted once each year in rotating quarters in order to collect seasonal information about the discharge. Tests are required during the following quarters.

- **Acute:** *October 1–December 31, 2020; January 1–March 31, 2021; April 1–June 30, 2022; July 1–September 30, 2023; and January 1–March 31, 2024 (five tests total).*

Acute WET testing shall continue after the permit expiration date (until the permit is reissued) in accordance with the WET requirements specified for the last full calendar year of this permit. For example, the next test would be required in January 1–March 31, 2025.

Chronic tests shall be conducted twice each year in rotating quarters in order to collect seasonal information about the discharge. Tests are required during the following quarters.

- **Chronic:** *April 1–June 30, 2020; October 1–December 31, 2020; January 1–March 31, 2021; April 1–June 30, 2021; April 1–June 30, 2022; July 1–September 30, 2022; July 1–September 30, 2023; October 1–December 31, 2023 and January 1–March 31, 2024; and April 1–June 30, 2024 (ten tests total)*

Chronic WET testing shall continue after the permit expiration date (until the permit is reissued) in accordance with the WET requirements specified for the last full calendar year of this permit. For example, the next tests would be required in January 1–March 31, 2025; and April 1–June 30, 2025.

Testing: WET testing shall be performed during normal operating conditions. Permittees are not allowed to turn off or otherwise modify treatment systems, production processes, or change other operating or treatment conditions during WET tests.

Reporting: The permittee shall report test results on the Discharge Monitoring Report form, and also complete the "Whole Effluent Toxicity Test Report Form" (Section 6, "*State of Wisconsin Aquatic Life Toxicity Testing Methods Manual, 2nd Edition*"), for each test. The original, complete, signed version of the Whole Effluent Toxicity Test Report Form shall be sent to the Biomonitoring Coordinator, Bureau of Water Quality, 101 S. Webster St., P.O. Box 7921, Madison, WI 53707-7921, within 45 days of test completion. The Discharge Monitoring Report (DMR) form shall be submitted electronically by the required deadline.

Determination of Positive Results: An acute toxicity test shall be considered positive if the Toxic Unit - Acute (TU_a) is greater than 1.0 for either species. The TU_a shall be calculated as follows: $TU_a = 100 \div LC_{50}$. A chronic toxicity test shall be considered positive if the Toxic Unit - Chronic (TU_c) is greater than 1.03 for either species. The TU_c shall be calculated as follows: $TU_c = 100 \div IC_{25}$.

Additional Testing Requirements: Within 90 days of a test which showed positive results, the permittee shall submit the results of at least 2 retests to the Biomonitoring Coordinator on "Whole Effluent Toxicity Test Report Forms". The 90 day reporting period shall begin the day after the test which showed a positive result. The retests shall be completed using the same species and test methods specified for the original test (see the Standard Requirements section herein).

3.2.3.10 Effluent Temperature Monitoring

For monitoring temperature continuously, collect measurements in accordance with s. NR 218.04(13). This means that discrete measurements shall be recorded at intervals of not more than 15 minutes during the 24-hour period. In either case, report the maximum temperature measured during the day on the DMR.

3.2.4 Sampling Point (Outfall) 016- PS6 Flapgate; 017- PS7 Stoplog; 018- PS8 Stoplog; 019- SEI Upstream of PS9; 020- PS11 Flapgate, and 021- Flapgate Upstream of PS13

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Volume		MGD	Per Occurrence	Estimated	
Fecal Coliform		#/100 ml	Per Occurrence	Grab	

3.2.4.1 Sanitary Sewage Overflow Structures

Sample points 016 through 021 are used to track potential sanitary sewage overflows (SSOs) from six automatic overflow structures located throughout the Madison Metropolitan Sewerage District's sanitary sewage collection system. Any discharge of untreated wastewater through any of the six overflow structures to surface water is deemed a Sanitary Sewer Overflow (SSO) and is prohibited. In addition to the 'Volume' and 'Fecal Coliform' monitoring requirements shown above, the permittee shall report any discharges through any of these six overflow structures to surface water as required by subsection 7.3.1 'Sanitary Sewage Overflows'.

The estimated 'Volume' of the overflow and results of 'Fecal Coliform' monitoring are to be reported on the Discharge Monitoring Reports.

4 Land Treatment Requirements

4.1 Sampling Point(s)

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, Waste Description/Sample Contents and Treatment Description (as applicable)**
008	Spray Irrigation: Demonstration project to divert final effluent to the Nine Springs Golf Course from April 15th through October 15th. Monitoring is only required while irrigation is occurring. Sample results are the same as sample point 005.

4.2 Monitoring Requirements and Limitations

The permittee shall comply with the following monitoring requirements and limitations.

4.2.1 Sampling Point (Outfall) 008 - Golf Course Spray Irrigation, Spray Irrigation

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		gal	Daily	Total Daily	
Hydraulic Application Rate	Monthly Avg	10,000 gal/ac/day	Monthly	Calculated	
$CBOD_5$	Monthly Avg	16 mg/L	Monthly	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	Monthly	24-Hr Flow Prop Comp	
pH Field		su	Monthly	Grab	
Nitrogen, Total Kjeldahl		mg/L	Monthly	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH_3-N) Total		mg/L	Monthly	24-Hr Flow Prop Comp	
Nitrogen, Organic Total		mg/L	Monthly	Calculated	
Nitrogen, Nitrite + Nitrate Total		mg/L	Monthly	24-Hr Flow Prop Comp	
Nitrogen, Total		mg/L	Monthly	Calculated	
Chloride		mg/L	Monthly	24-Hr Flow Prop Comp	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total Dissolved		mg/L	Monthly	24-Hr Flow Prop Comp	
Nitrogen, Max Applied On Any Zone		lbs/ac/yr	Annual	Total Annual	
Fecal Coliform		#/100 ml	2/Week	Grab	
Phosphorus, Total		mg/L	Daily	24-Hr Flow Prop Comp	

Daily Log – Monitoring Requirements and Limitations

All discharge and monitoring activity shall be documented on log sheets. Originals of the log sheets shall be kept by the permittee as described under "Records Retention" in the Standard Requirements section, and if requested, made available to the Department.

Parameters	**Limit**	**Units**	**Sample Frequency**	**Sample Type**
Zone or Location Being Sprayed	-	Number	Daily	Log
Acres Being Sprayed	-	Acres	Daily	Log
Start to End Time	-	Date, Hour	Daily	Log
Wastewater Loading Volume	-	Gallons	Daily	Log
Maximum Applied Volume	**1.4**	Inches/Load Cycle	Daily	Calculated

Annual Report – Monitoring Requirements and Limitations

The Annual Report is due by January 31st of each year for the previous calendar year.

Parameters	**Limit**	**Units**	**Sample Frequency**	**Sample Type**
Total Volume Per Zone	-	Gallons	Annual	Total Annual
Total Nitrogen per Zone	**217**	Pounds/Acre/Year	Annual	Calculated
Soil Analysis	-	-	Annual	Composite
Fertilizer Used	-	Pounds/Acre/Year	Annual	Total Annual

Note: Inches/load cycle = gallons/acre/load cycle divided by 27,154.

4.2.1.1 Monthly Avg Flow – LT Calculation

The monthly average discharge flow for Land Treatment systems is calculated by dividing the total wastewater volume discharged for the month by the total number of days in the month.

4.2.1.2 Spray Irrigation Site(s) - Soil Analysis

The soil at each spray irrigation site corresponding to each spray irrigation sample point (outfall) shall be tested annually for nitrate-nitrogen, available phosphorus, available potassium and pH. The soil tests shall be conducted by an approved testing facility. Before using the spray irrigation site each spring, the permittee shall submit to the Department a Soil Test Report and a Preplant Profile Nitrate Report. All nutrient applications shall be consistent with recommendations found in the University of Wisconsin – Extension pamphlet A2809: Nutrient Application Guidelines for Field, Vegetable, and Fruit Crops in Wisconsin, or as approved in the management plan. See the following Wisconsin Extension Service's pamphlets for more information: A2100 – Sampling for Soil Testing, A3512 – Wisconsin's Preplant Soil Nitrate Test, and A2519 – Soil and Applied Nitrogen.

4.2.1.3 Additional Demonstration Irrigation Project Requirements at Outfall 008

Irrigation may be conducted at Outfall 008 under the following conditions:

1. **Prior Approval Necessary for Equipment or Operational Changes:** The District shall provide written notice to the department in advance of substantive changes to equipment or operating procedures at this outfall. The written notice shall provide information on the proposed changes.

2. **Application of Effluent:** Effluent shall only be applied by direct irrigation and may not be applied during times of the day when the golf course is open for golfing or during times when wind conditions may be expected to cause significant drift.

3. **Irrigation Season:** Effluent may only be applied during the period of April 15th through October 15th.

4. **Irrigation Ponds:** Effluent storage in irrigation ponds shall only be done according to a department-approved management plan.

5. **Soil Samples:** A routine soil sample shall be collected from each spray field according to current UW Soils Dept. methods, and tested for the purpose of obtaining plant available nutrients and for making fertilizer and liming recommendations for the cover crop being grown.

6. **Golf Course Signage:** Adequate signage shall be placed in each area where effluent is used, advising the public that the test plot is being irrigated using non-potable treated effluent and that all golfers or other persons using the areas should practice good personal hygiene and hand washing before eating, drinking or smoking.

4.2.1.4 Additional Demonstration Irrigation Projects at Other Sites

The District may conduct other effluent reuse demonstration projects subject to prior review and approval by DNR and to terms/conditions specified by DNR.

5 Land Application Requirements

5.1 Sampling Point(s)

The discharge(s) shall be limited to land application of the waste type(s) designated for the listed sampling point(s) on Department approved land spreading sites or by hauling to another facility.

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
002	Class B, Liquid, Anaerobically (mesophilic) digested, gravity belt thickened liquid biosolids. Representative samples are taken from Metrogro loading pumps.
024	Class B, Cake, Anaerobically (mesophilic) digested, gravity belt thickened, centrifuged biosolids. Representative samples are taken from the cake storage building. Monitor for Lists 1, 2, 3 and 4. Department may allow monitoring of metals (List 1) at location providing similar results (See Section 5.2.1.3). Monitoring for List 3 (pathogens) shall include Treatment Process OR Pathogen Density for compliance purposes. Monitoring shall apply only when the outfall is active.
025	Class B, Cake, Composted, Anaerobically (mesophilic) digested, gravity belt thickened, centrifuged, composted biosolids. Representative samples are taken from the composted solids in the compost pile and from storage. Monitor for List 1, 2, 3 and 4. Department may allow monitoring of metals (List 1) at location providing similar results (See Section 5.2.1.3. However, if additional sludge feedstocks other than Madison Metropolitan Sewerage District Wastewater Treatment Facility sludge are used, Section 5.2.1.3 does not apply to this outfall.). Monitoring for List 3 (pathogens) shall include Treatment Process OR Pathogen Density for compliance purposes. Monitoring shall apply only when the outfall is active.
026	Land Application from Off-Site Storage Tank, above ground concrete manure storage unit, with an allowable capacity of 2.9 MG, located in the NW ¼, SE ¼, Section 24, T06N, R08E, consisting of class B, liquid, anaerobically (mesophilic) digested, gravity belt thickened liquid biosolids. Representative samples shall be collected from the dragline pump sampling port. The tank contents are mixed prior to land application.
011	Class A, Cake from Storage, Anaerobically (thermophilic treatment after mesophilic treatment) digested, Time-Temperature Batch, gravity belt thickened, centrifuged biosolids from storage. Monitor for Lists 1, 2, 3 and 4. Representative samples are taken at the distribution point at the Madison Metropolitan Sewerage District Wastewater Treatment Facility. Monitoring shall apply only when outfall is active.
013	Class A, Cake, Composted, Anaerobically (thermophilic treatment after mesophilic treatment) digested, Time-Temperature Batch, gravity belt thickened, centrifuged biosolids. A representative composite sample will be made up of grab samples taken at multiple depths and locations within the distribution pile. Monitor for Lists 1, 2, 3 and 4. This sample point currently covers the pilot composting operation that was approved for 35 cubic yards/yr. Distribution of additional compost will be subject to department review. As the pilot project progresses, metals monitoring may be waived with department approval where feedstocks are known.
022	Class A, Liquid, Anaerobically (thermophilic treatment after mesophilic treatment) digested, Time-Temperature Batch, gravity belt thickened, biosolids. Collection of pathogen density required immediately after Class A treatment process. Monitor for List 3 only. Note that the Class A Sludge: Composting Process requirements in Section 7.7 may not apply if all sludge feedstocks have been determined to meet Class A treatment requirements prior to the composting treatment process.

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
023	Class A, Cake, Composted, Anaerobically (thermophilic treatment after mesophilic treatment) digested, Time-Temperature Batch, gravity belt thickened, centrifuged biosolids. Collection of pathogen density required immediately after Composting and prior to storage. Monitor for List 3, except that if additional sludge feedstocks other than those already determined to meet exceptional quality requirements are used in the compost treatment process, then the permittee shall notify the department to activate Lists 1, 2 and 4 for this outfall. Monitoring shall apply only when outfall is active.
012	Struvite Harvesting Process: Tons of product produced must be reported on an annual basis.

5.2 Monitoring Requirements and Limitations

The permittee shall comply with the following monitoring requirements and limitations.

5.2.1 Sampling Point (Outfall) 002 - Class B Anaerobically Digested Liquid; 024 - Class B Anaerobically Digested Cake; 025 - Class B Composted Cake; 026 – Off-Site Storage

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	1/ 2 Months	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	1/ 2 Months	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	1/ 2 Months	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	1/ 2 Months	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	1/ 2 Months	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	1/ 2 Months	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	1/ 2 Months	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	1/ 2 Months	Composite	
Lead Dry Wt	High Quality	300 mg/kg	1/ 2 Months	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	1/ 2 Months	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	1/ 2 Months	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	1/ 2 Months	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	1/ 2 Months	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	1/ 2 Months	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	1/ 2 Months	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	1/ 2 Months	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	1/ 2 Months	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	1/ 2 Months	Composite	
Nitrogen, Total Kjeldahl		Percent	1/ 2 Months	Composite	
Nitrogen, Ammonium (NH_4-N) Total		Percent	1/ 2 Months	Composite	
Phosphorus, Total		Percent	1/ 2 Months	Composite	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Phosphorus, Water Extractable		% of Tot P	1/ 2 Months	Composite	
Potassium, Total Recoverable		Percent	1/ 2 Months	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	PCB monitoring requirements only apply to Sampling Point (Outfall) 002. Sample in 2021as part of Priority Pollutant Scan.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	PCB monitoring requirements only apply to Sampling Point (Outfall) 002. Sample in 2021as part of Priority Pollutant Scan.
Municipal Sludge Priority Pollutant Scan			Once	Composite	Priority Pollutant Scan monitoring requirements only apply to Sampling Point (Outfall 002). As specified in ch. NR 215.03 (1-4), Wis. Adm. Code. Sample in 2021.

Other Sludge Requirements	
Sludge Requirements	**Sample Frequency**
List 3 Requirements – Pathogen Control: The requirements in List 3 shall be met prior to land application of sludge.	**BiMonthly**
List 4 Requirements – Vector Attraction Reduction: The vector attraction reduction shall be satisfied prior to, or at the time of land application as specified in List 4.	**BiMonthly**

5.2.1.1 List 2 Analysis

If the monitoring frequency for List 2 parameters is more frequent than "Annual" then the sludge may be analyzed for the List 2 parameters just prior to each land application season rather than at the more frequent interval specified.

5.2.1.2 Changes in Feed Sludge Characteristics

If a change in feed sludge characteristics, treatment process, or operational procedures occurs which may result in a significant shift in sludge characteristics, the permittee shall reanalyze the sludge for List 1, 2, 3 and 4 parameters each time such change occurs.

5.2.1.3 Multiple Sludge Sample Points (Outfalls)

If there are multiple sludge sample points (outfalls), but the sludges are not subject to different sludge treatment processes, then a separate List 2 analysis shall be conducted for each sludge type which is land applied, just prior to

land application, and the application rate shall be calculated for each sludge type. In this case, List 1, 3, and 4 and PCBs need only be analyzed on a single sludge type, at the specified frequency. If there are multiple sludge sample points (outfalls), due to multiple treatment processes, List 1, 2, 3 and 4 and PCBs shall be analyzed for each sludge type at the specified frequency.

5.2.1.4 Sludge Which Exceeds the High Quality Limit

Cumulative pollutant loading records shall be kept for all bulk land application of sludge which does not meet the high quality limit for any parameter. This requirement applies for the entire calendar year in which any exceedance of Table 3 of s. NR 204.07(5)(c), is experienced. Such loading records shall be kept for all List 1 parameters for each site land applied in that calendar year. The formula to be used for calculating cumulative loading is as follows:

[(Pollutant concentration (mg/kg) x dry tons applied/ac) ÷ 500] + previous loading (lbs/acre) = cumulative lbs pollutant per acre

When a site reaches 90% of the allowable cumulative loading for any metal established in Table 2 of s. NR 204.07(5)(b), the Department shall be so notified through letter or in the comment section of the annual land application report (3400-55).

5.2.1.5 Sludge Analysis for PCBs

The permittee shall analyze the sludge for Total PCBs one time during **2021**. The results shall be reported as "PCB Total Dry Wt". Either congener-specific analysis or Aroclor analysis shall be used to determine the PCB concentration. The permittee may determine whether Aroclor or congener specific analysis is performed. Analyses shall be performed in accordance with Table EM in s. NR 219.04, Wis. Adm. Code and the conditions specified in Standard Requirements of this permit. PCB results shall be submitted by January 31, following the specified year of analysis.

5.2.1.6 Lists 1, 2, 3, and 4

List 1 **TOTAL SOLIDS AND METALS** See the Monitoring Requirements and Limitations table above for monitoring frequency and limitations for the List 1 parameters
Solids, Total (percent)
Arsenic, mg/kg (dry weight)
Cadmium, mg/kg (dry weight)
Copper, mg/kg (dry weight)
Lead, mg/kg (dry weight)
Mercury, mg/kg (dry weight)
Molybdenum, mg/kg (dry weight)
Nickel, mg/kg (dry weight)
Selenium, mg/kg (dry weight)
Zinc, mg/kg (dry weight)

List 2 **NUTRIENTS** See the Monitoring Requirements and Limitations table above for monitoring frequency for the List 2 parameters
Solids, Total (percent)
Nitrogen Total Kjeldahl (percent)
Nitrogen Ammonium (NH4-N) Total (percent)
Phosphorus Total as P (percent)

List 2 **NUTRIENTS** See the Monitoring Requirements and Limitations table above for monitoring frequency for the List 2 parameters
Phosphorus, Water Extractable (as percent of Total P)
Potassium Total Recoverable (percent)

List 3
PATHOGEN CONTROL FOR CLASS B SLUDGE

The permittee shall implement pathogen control as listed in List 3. The Department shall be notified of the pathogen control utilized and shall be notified when the permittee decides to utilize alternative pathogen control.

The following requirements shall be met prior to land application of sludge.

Parameter	**Unit**	**Limit**
Fecal Coliform*	MPN/gTS or CFU/gTS	2,000,000
OR, ONE OF THE FOLLOWING PROCESS OPTIONS		
Aerobic Digestion	Air Drying	
Anaerobic Digestion	Composting	
Alkaline Stabilization	PSRP Equivalent Process	
* The Fecal Coliform limit shall be reported as the geometric mean of 7 discrete samples on a dry weight basis.		

List 4
VECTOR ATTRACTION REDUCTION

The permittee shall implement any one of the vector attraction reduction options specified in List 4. The Department shall be notified of the option utilized and shall be notified when the permittee decides to utilize an alternative option.

One of the following shall be satisfied prior to, or at the time of land application as specified in List 4.

Option	**Limit**	**Where/When it Shall be Met**
Volatile Solids Reduction	≥38%	Across the process
Specific Oxygen Uptake Rate	≤1.5 mg O_2/hr/g TS	On aerobic stabilized sludge
Anaerobic bench-scale test	<17 % VS reduction	On anaerobic digested sludge
Aerobic bench-scale test	<15 % VS reduction	On aerobic digested sludge
Aerobic Process	>14 days, Temp >40°C and Avg. Temp > 45°C	On composted sludge
pH adjustment	>12 S.U. (for 2 hours) and >11.5 (for an additional 22 hours)	During the process
Drying without primary solids	>75 % TS	When applied or bagged
Drying with primary solids	>90 % TS	When applied or bagged
Equivalent Process	Approved by the Department	Varies with process
Injection	-	When applied
Incorporation	-	Within 6 hours of application

5.2.1.7 Daily Land Application Log

Daily Land Application Log		
Discharge Monitoring Requirements and Limitations The permittee shall maintain a daily land application log for biosolids land applied each day when land application occurs. The following minimum records must be kept, in addition to all analytical results for the biosolids land applied. The log book records shall form the basis for the annual land application report requirements**.**		
Parameters	**Units**	**Sample Frequency**
DNR Site Number(s)	Number	Daily as used
Outfall number applied	Number	Daily as used
Acres applied	Acres	Daily as used
Amount applied	As appropriate * /day	Daily as used
Application rate per acre	unit */acre	Daily as used
Nitrogen applied per acre	lb/acre	Daily as used
Method of Application	Injection, Incorporation, or surface applied	Daily as used

*gallons, cubic yards, dry US Tons or dry Metric Tons

5.2.2 Sampling Point (Outfall) 011- Class A Centrifuged Anaerobic Cake Storage

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	1/ 2 Months	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	1/ 2 Months	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	1/ 2 Months	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	1/ 2 Months	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	1/ 2 Months	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	1/ 2 Months	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	1/ 2 Months	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	1/ 2 Months	Composite	
Lead Dry Wt	High Quality	300 mg/kg	1/ 2 Months	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	1/ 2 Months	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	1/ 2 Months	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	1/ 2 Months	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	1/ 2 Months	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	1/ 2 Months	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	1/ 2 Months	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	1/ 2 Months	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	1/ 2 Months	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	1/ 2 Months	Composite	
Nitrogen, Total Kjeldahl		Percent	1/ 2 Months	Composite	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Ammonium (NH_4-N) Total		Percent	1/ 2 Months	Composite	
Phosphorus, Total		Percent	1/ 2 Months	Composite	
Phosphorus, Water Extractable		% of Tot P	1/ 2 Months	Composite	
Potassium, Total Recoverable		Percent	1/ 2 Months	Composite	

Other Sludge Requirements	
Sludge Requirements	**Sample Frequency**
List 3 Requirements – Pathogen Control: The requirements in List 3 shall be met prior to land application of sludge.	**BiMonthly**
List 4 Requirements – Vector Attraction Reduction: The vector attraction reduction shall be satisfied prior to, or at the time of land application as specified in List 4.	**BiMonthly**

5.2.3 Sampling Point (Outfall) 013 - Class A Composted Cake

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Fecal Coliform		MPN/g TS	Annual	Composite	
Solids, Total		Percent	Annual	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Ammonium (NH_4-N) Total		Percent	Annual	Composite	
Phosphorus, Total		Percent	Annual	Composite	
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	
Potassium, Total Recoverable		Percent	Annual	Composite	

Other Sludge Requirements	
Sludge Requirements	**Sample Frequency**
List 3 Requirements – Pathogen Control: The requirements in List 3 shall be met prior to land application of sludge.	**Annual**
List 4 Requirements – Vector Attraction Reduction: The vector attraction reduction shall be satisfied prior to, or at the time of land application as specified in List 4.	**Annual**

5.2.4 Sampling Point (Outfall) 023 - Class A Composted Cake

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	1/ 2 Months	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	1/ 2 Months	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	1/ 2 Months	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	1/ 2 Months	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	1/ 2 Months	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	1/ 2 Months	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	1/ 2 Months	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	1/ 2 Months	Composite	
Lead Dry Wt	High Quality	300 mg/kg	1/ 2 Months	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	1/ 2 Months	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	1/ 2 Months	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	1/ 2 Months	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	1/ 2 Months	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	1/ 2 Months	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	1/ 2 Months	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	1/ 2 Months	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	1/ 2 Months	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	1/ 2 Months	Composite	
Nitrogen, Total Kjeldahl		Percent	1/ 2 Months	Composite	
Nitrogen, Ammonium (NH_4-N) Total		Percent	1/ 2 Months	Composite	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Phosphorus, Total		Percent	1/ 2 Months	Composite	
Phosphorus, Water Extractable		% of Tot P	1/ 2 Months	Composite	
Potassium, Total Recoverable		Percent	1/ 2 Months	Composite	

Other Sludge Requirements	
Sludge Requirements	**Sample Frequency**
List 3 Requirements – Pathogen Control: The requirements in List 3 shall be met prior to land application of sludge.	**BiMonthly**
List 4 Requirements – Vector Attraction Reduction: The vector attraction reduction shall be satisfied prior to, or at the time of land application as specified in List 4.	**BiMonthly**

5.2.5 Class A Biosolids Requirements

The following conditions apply to the land application of biosolids from the following outfalls located at the indicated permit sections: 5.2.2 Sampling Point (Outfall) 011- Class A Centrifuged Anaerobic Cake Storage; 5.2.3 Sampling Point (Outfall) 013 - Class A Composted Cake; and 5.2.4 Sampling Point (Outfall) 023 - Class A Composted Cake.

5.2.5.1 List 2 Analysis

If the monitoring frequency for List 2 parameters is more frequent than "Annual" then the sludge may be analyzed for the List 2 parameters just prior to each land application season rather than at the more frequent interval specified.

5.2.5.2 Changes in Feed Sludge Characteristics

If a change in feed sludge characteristics, treatment process, or operational procedures occurs which may result in a significant shift in sludge characteristics, the permittee shall reanalyze the sludge for List 1, 2, 3 and 4 parameters each time such change occurs.

5.2.5.3 Multiple Sludge Sample Points (Outfalls)

If there are multiple sludge sample points (outfalls), but the sludges are not subject to different sludge treatment processes, then a separate List 2 analysis shall be conducted for each sludge type which is land applied, just prior to land application, and the application rate shall be calculated for each sludge type. In this case, List 1, 3, and 4 and PCBs need only be analyzed on a single sludge type, at the specified frequency. If there are multiple sludge sample points (outfalls), due to multiple treatment processes, List 1, 2, 3 and 4 and PCBs shall be analyzed for each sludge type at the specified frequency.

5.2.5.4 Sludge Which Exceeds the High Quality Limit

Cumulative pollutant loading records shall be kept for all bulk land application of sludge which does not meet the high quality limit for any parameter. This requirement applies for the entire calendar year in which any exceedance of Table 3 of s. NR 204.07(5)(c), is experienced. Such loading records shall be kept for all List 1 parameters for each site land applied in that calendar year. The formula to be used for calculating cumulative loading is as follows:

[(Pollutant concentration (mg/kg) x dry tons applied/ac) ÷ 500] + previous loading (lbs/acre) = cumulative lbs pollutant per acre

When a site reaches 90% of the allowable cumulative loading for any metal established in Table 2 of s. NR 204.07(5)(b), the Department shall be so notified through letter or in the comment section of the annual land application report (3400-55).

5.2.5.5 Lists 1, 2, 3, and 4

List 1 **TOTAL SOLIDS AND METALS** See the Monitoring Requirements and Limitations table above for monitoring frequency and limitations for the List 1 parameters
Solids, Total (percent)
Arsenic, mg/kg (dry weight)
Cadmium, mg/kg (dry weight)
Copper, mg/kg (dry weight)
Lead, mg/kg (dry weight)
Mercury, mg/kg (dry weight)
Molybdenum, mg/kg (dry weight)
Nickel, mg/kg (dry weight)
Selenium, mg/kg (dry weight)
Zinc, mg/kg (dry weight)

List 2 **NUTRIENTS** See the Monitoring Requirements and Limitations table above for monitoring frequency for the List 2 parameters
Solids, Total (percent)
Nitrogen Total Kjeldahl (percent)
Nitrogen Ammonium (NH4-N) Total (percent)
Phosphorus Total as P (percent)
Phosphorus, Water Extractable (as percent of Total P)
Potassium Total Recoverable (percent)

List 3
PATHOGEN CONTROL FOR CLASS A SLUDGE

The permittee shall implement pathogen control as listed in List 3. The Department shall be notified of the pathogen control utilized and shall be notified when the permittee decides to utilize alternative pathogen control.

The following requirements shall be met prior to land application of sludge.

Parameter	**Unit**	**Limit**
Fecal Coliform*	MPN/gTS	1000
OR		
Salmonella	MPN/4gTS	3
AND, ONE OF THE FOLLOWING PROCESS OPTIONS		
Temp/Time based on % Solids	Alkaline Treatment	
Prior test for Enteric Virus/Viable Helminth Ova	Post test for Enteric Virus/Viable Helminth Ova	

List 3
PATHOGEN CONTROL FOR CLASS A SLUDGE

The permittee shall implement pathogen control as listed in List 3. The Department shall be notified of the pathogen control utilized and shall be notified when the permittee decides to utilize alternative pathogen control.

The following requirements shall be met prior to land application of sludge.

Parameter	Unit	Limit
Fecal Coliform*	MPN/gTS	1000
Composting	Heat Drying	
Heat Treatment	Thermophilic Aerobic Digestion	
Beta Ray Irradiation	Gamma Ray Irradiation	
Pasteurization	PFRP Equivalent Process	

* The Fecal Coliform concentration shall be reported as discrete samples on a dry weight basis consistent with 40 CFR 503. Collect 7 samples each sampling period.

List 4
VECTOR ATTRACTION REDUCTION

The permittee shall implement any one of the vector attraction reduction options specified in List 4. The Department shall be notified of the option utilized and shall be notified when the permittee decides to utilize an alternative option.

One of the following shall be satisfied prior to, or at the time of land application as specified in List 4.

Option	Limit	Where/When it Shall be Met
Volatile Solids Reduction	≥38%	Across the process
Specific Oxygen Uptake Rate	≤1.5 mg O_2/hr/g TS	On aerobic stabilized sludge
Anaerobic bench-scale test	<17 % VS reduction	On anaerobic digested sludge
Aerobic bench-scale test	<15 % VS reduction	On aerobic digested sludge
Aerobic Process	>14 days, Temp >40°C and Avg. Temp > 45°C	On composted sludge
pH adjustment	>12 S.U. (for 2 hours) and >11.5 (for an additional 22 hours)	During the process
Drying without primary solids	>75 % TS	When applied or bagged
Drying with primary solids	>90 % TS	When applied or bagged
Equivalent Process	Approved by the Department	Varies with process
Injection	-	When applied
Incorporation	-	Within 6 hours of application

5.2.5.6 Daily Land Application Log

Daily Land Application Log		
Discharge Monitoring Requirements and Limitations The permittee shall maintain a daily land application log for biosolids land applied each day when land application occurs. The following minimum records must be kept, in addition to all analytical results for the biosolids land applied. The log book records shall form the basis for the annual land application report requirements**.**		
Parameters	**Units**	**Sample Frequency**
DNR Site Number(s)	Number	Daily as used
Outfall number applied	Number	Daily as used
Acres applied	Acres	Daily as used
Amount applied	As appropriate * /day	Daily as used
Application rate per acre	unit */acre	Daily as used
Nitrogen applied per acre	lb/acre	Daily as used
Method of Application	Injection, Incorporation, or surface applied	Daily as used

*gallons, cubic yards, dry US Tons or dry Metric Tons

5.2.6 Sampling Point (Outfall) 022 – Class A Thermophilic Digested Liquid

5.2.6.1 Monitoring Requirements

This sample point shall be monitored for Class A List 3 (Pathogens) once every two months. The purpose of this sample point is to meet the requirements of s. NR 204.07 (6)(1)1, Wis. Adm. Code, which requires that the fecal coliform density requirements are satisfied immediately after the treatment process is completed. This sample point is not intended to be an outfall for land application or distribution.

Other Sludge Requirements	
Sludge Requirements	**Sample Frequency**
List 3 Requirements – Pathogen Control: The requirements in List 3 shall be met prior to land application of sludge.	**BiMonthly**

PATHOGEN CONTROL FOR CLASS A SLUDGE The permittee shall implement pathogen control as listed in List 3. The Department shall be notified of the pathogen control utilized and shall be notified when the permittee decides to utilize alternative pathogen control. The following requirements shall be met prior to land application of sludge.		
Parameter	**Unit**	**Limit**
Fecal Coliform*	MPN/gTS	1000
OR		

PATHOGEN CONTROL FOR CLASS A SLUDGE The permittee shall implement pathogen control as listed in List 3. The Department shall be notified of the pathogen control utilized and shall be notified when the permittee decides to utilize alternative pathogen control. The following requirements shall be met prior to land application of sludge.		
Parameter	**Unit**	**Limit**
Fecal Coliform*	MPN/gTS	1000
Salmonella	MPN/4gTS	3
AND, ONE OF THE FOLLOWING PROCESS OPTIONS		
Temp/Time based on % Solids	Alkaline Treatment	
Prior test for Enteric Virus/Viable Helminth Ova	Post test for Enteric Virus/Viable Helminth Ova	
Composting	Heat Drying	
Heat Treatment	Thermophilic Aerobic Digestion	
Beta Ray Irradiation	Gamma Ray Irradiation	
Pasteurization	PFRP Equivalent Process	
* The Fecal Coliform concentration shall be reported as discrete samples on a dry weight basis consistent with 40 CFR 503. Collect 7 samples each sampling period.		

5.2.7 Sampling Point (Outfall) 012 - Struvite Harvesting

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Weight		tons/yr	Annual	Total Annual	

6 Schedules

6.1 Watershed Adaptive Management Option Annual Report Submittals

The permittee shall submit annual reports on the implementation of AM plan No. WQT-2017-0003 (January 2017) and Amendment 1 (February 2018) as specified in subsections 3.2.1.7 and 3.2.1.8 and the following schedule.

Required Action	Due Date
Annual Adaptive Management Report: Submit an annual adaptive management report. The annual adaptive management report shall: o Identify those actions from section 3 of the approved adaptive management plan that were completed during the previous calendar year and those actions that are in progress; o Evaluate collected monitoring data; o Document progress in achieving the goals and measures identified in the approved adaptive management plan; o Describe the outreach and education efforts that occurred during the past calendar year; o Identify any corrections or adjustments to the adaptive management plan that are needed to achieve compliance with the phosphorus water quality standards specified in s. NR 102.06, Wis. Adm. Code; o Describe any updates needed to Madison Metropolitan Sewerage District's approved phosphorus optimization plan; o Submit results from all sample points outlined in AM plan No. WQT-2017-0003 (January 2017) and Amendment 1 (February 2018) to the Department using the Department's Laboratory Data Entry System (LDES); and o Submit all biomonitoring results from all locations outlined in AM plan WQT-2017-0003 (January 2017) and Amendment 1 (February 2018) to the Department using the Department's Laboratory Data Entry System (LDES).	10/31/2020
Annual Adaptive Management Report #2: Submit an Adaptive Management progress report as defined above.	07/31/2021
Annual Adaptive Management Report #3: Submit an Adaptive Management progress report as defined above.	07/31/2022
Annual Adaptive Management Report #4: Submit an Adaptive Management report as defined above.	07/31/2023
Final Adaptive Management Report for 1st Permit Term: Submit the final Adaptive Management (AM) report documenting progress made during the first permit term under AM in meeting the watershed phosphorus reduction target of 52,648 lbs/yr, as well as the anticipated future reductions in phosphorus sources and phosphorus effluent concentrations, which shall be measured in accordance with the AM Plan modeling protocols. The report shall summarize AM activities that have been implemented during the current permit term and state which, if any, actions from the approved AM plan No. WQT-2017-0003 (January 2017) and Amendment 1 (February 2018) were not pursued and why. The report shall include an analysis of trends on both a monthly and six-month average basis for concentrations and mass effluent discharged. Additionally, for informational purposes, there shall be an analysis of any improvements to the quality of surface waters in the Adaptive Management Action Area focusing on phosphorus and flow results collected during the permit term. The surface water analysis shall evaluate how the in-stream loadings have changed over the permit term in comparison	07/31/2024

to implemented AM actions.	
Renewal of Adaptive Management Plan for Permit Reissuance: If the permittee intends to seek renewal of AM plan No. WQT-2017-003 (January 2017) and Amendment 1 (February 2018) per s. NR 217.18, Wis. Adm. Code, for the reissued permit term, proposed AM goals and actions based on an updated AM plan shall be submitted to the Department for review and approval. The permittee may propose to adjust load reductions required by AM plan No. WQT-2017-0003 (January 2017) and Amendment 1 (February 2018) either up or down at the beginning of each WPDES permit term to reflect changes in loads associated with point and non-point sources. This schedule may be modified to incorporate any changes in AM goals and actions, removed if the AM program is terminated per section 3.2.1.9, or removed if the adaptive management plan is has achieved water quality standards as determined by the Department within the AM action area.	09/30/2024
Comply with Adaptive Management Interim Limit: For the second permit term under Adaptive Management the permittee shall comply with an Adaptive Management total phosphorus interim limit no higher than 0.5 mg/L as a 6-month average, in addition to the 1.0 mg/L monthly avg already effective.	04/01/2025
Annual Adaptive Management Report #5: Submit an Adaptive Management progress report as defined above.	07/31/2025
Annual Adaptive Management Report #6: Submit an Adaptive Management progress report as defined above.	07/31/2026
Annual Adaptive Management Report #7: Submit an Adaptive Management report as defined above.	07/31/2027
Annual Adaptive Management Report #8: Submit an Adaptive Management report as defined above.	07/31/2028
Final Adaptive Management Report for 2nd Permit Term: Submit the final Adaptive Management (AM) report documenting progress made during the second permit term under AM in meeting the watershed phosphorus reduction target of 76,579 lbs/yr, as well as the anticipated future reductions in phosphorus sources and phosphorus effluent concentrations, which shall be measured in accordance with the AM Plan modeling protocols. The report shall summarize AM activities that have been implemented during the current permit term and state which, if any, actions from the approved AM plan No. WQT-2017-0003 (January 2017) and Amendment 1 (February 2018) were not pursued and why. The report shall include an analysis of trends on both a monthly and six-month average basis for concentrations and mass effluent discharged. Additionally, for informational purposes, there shall be an analysis of any improvements to the quality of surface waters in the Adaptive Management Action Area focusing on phosphorus and flow results collected during the permit term. The surface water analysis shall evaluate how the in-stream loadings have changed over the permit term in comparison to implemented AM actions.	07/31/2029
Renewal of Adaptive Management Plan for Permit Reissuance: If the permittee intends to seek renewal of AM plan No. WQT-2017-003 (January 2017) and Amendment 1 (February 2018) per s. NR 217.18, Wis. Adm. Code, for the reissued permit term, proposed AM goals and actions based on an updated AM plan shall be submitted to the Department for review and approval. The permittee may propose to adjust load reductions required by AM plan No. WQT-2017-0003 (January 2017) and Amendment 1 (February 2018) either up or down at the beginning of each WPDES permit term to reflect changes in loads associated with point and non-point sources. This schedule may be modified to incorporate any changes in AM goals and actions, removed if the AM program is terminated per section 3.2.1.9, or removed if the adaptive management plan is has achieved water quality standards as determined by the Department within the AM action area.	

Annual Adaptive Management Report #9: Submit an Adaptive Management report as defined above.	07/31/2030
Annual Adaptive Management Report #10: Submit an Adaptive Management report as defined above.	07/31/2031
Annual Adaptive Management Report #11: Submit an Adaptive Management report as defined above.	07/31/2032
Annual Adaptive Management Report #12: Submit an Adaptive Management report as defined above.	07/31/2033
Final Adaptive Management Report: Submit the final Adaptive Management (AM) report documenting progress made throughout the AM project in meeting the watershed phosphorus reduction target of 95,724 lbs/yr, and in stream water quality standards specified in s. NR 102.06, Wis. Adm. Code. The report shall summarize AM activities that have been implemented during the current permit term and state which, if any, actions from the approved AM plan No. WQT-2017-0003 (January 2017) and Amendment 1 (February 2018) were not pursued and why. The report shall include an analysis of trends on both a monthly and six-month average basis for concentrations and mass effluent discharged. Additionally, there should be an analysis of any improvements to the quality of surface waters in the Adaptive Management Action Area focusing on phosphorus and flow results collected during the permit term. The surface water analysis shall evaluate how the in-stream loadings have changed over the permit term in comparison to implemented AM actions.	07/31/2034
Achieve Water Quality Standards and Adaptive Management Plan Success: All the receiving waters identified within the AM plan WQT-2017-0003 (January 2017) and Amendment 1 (February 2018) shall be measured for success in accordance with part IV of the AM Plan. Compliance may be demonstrated using effluent data and watershed modeling that uses similar assumptions as the TMDL to demonstrate that the sum total of the allocations have been achieved for each reach. If some, but not all, reaches are complying with the allocations of the TMDL, only those point sources in the complying reaches will be considered in compliance at the end of the adaptive management period. The permittee shall continue to comply with applicable effluent limits (required under s. NR 217.18(3)(e)3, Wis. Adm. Code, expressed as a 6-month avg and 1.0 mg/L monthly avg) and continue monitoring of surface waters (stream reaches 62-69 per WQT-2017-0003 (January 2017) and Amendment 1 (February 2018)) at a minimum of monthly May through October for total phosphorus. If the allocations in the TMDL have been achieved but the applicable phosphorus water quality criterion in s. NR 102.06, Wis. Adm. Code has not been achieved in the reach for MMSD's outfall to Badfish Creek, consistent with s. 283.13(5), Wis. Stats. and Clean Water Act section 301(b)(1)(C), further evaluation and additional actions will be necessary in the next reissued permit as necessary to achieve phosphorus water quality criterion. (e.g., DNR reevaluation of TMDL allocations, imposition of more stringent limits, etc.)	03/31/2035

6.2 Chloride Target Value

As a condition of the variance to the water quality based effluent limitation(s) for chloride granted in accordance with s. NR 106.83(2), Wis. Adm. Code, the permittee shall perform the following actions.

Required Action	Due Date
Annual Chloride Progress Report: Submit an annual chloride progress report. The annual chloride progress report shall: Indicate which chloride source reduction measures or activities in the approved Source Reduction Plan have been implemented;	01/31/2021

Include an analysis of trends in weekly, monthly and annual average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data; and Include an analysis of how influent and effluent chloride varies with time and with significant loadings of chloride such as loads from industries or road salt intrusion into the collection system. Note that the interim limitations of 465 mg/L for November 1 through March 31 annually and 430 mg/L for April 1 through October 31 annually remain enforceable until new enforceable limits are established in the next permit issuance. The first annual chloride progress report is to be submitted by the Date Due.	
Annual Chloride Progress Report #2: Submit the chloride progress report as defined above.	01/31/2022
Annual Chloride Progress Report #3: Submit the chloride progress report as defined above.	01/31/2023
Annual Chloride Progress Report #4: Submit the chloride progress report as defined above.	01/31/2024
Final Chloride Report: Submit the final chloride report documenting the success in meeting the chloride target value of 419 mg/L, as well as the anticipated future reduction in chloride sources and chloride effluent concentrations. The report shall summarize chloride source reduction measures that have been implemented during the current permit term and state which, if any, source reduction measures from the approved Source Reduction Plan were not pursued and why. The report shall include an analysis of trends in weekly, monthly and annual average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data covering the current permit term. The report shall also include an analysis of how influent and effluent chloride varies with time and with significant loadings of chloride such as loads from industries or road salt intrusion into the collection system. Additionally the report shall include proposed target values and source reduction measures for negotiations with the department if the permittee intends to seek a renewed chloride variance per s. NR 106.83, Wis. Adm. Code, for the reissued permit. Note that the target value is the benchmark for evaluating the effectiveness of the chloride source reduction measures, but is not an enforceable limitation under the terms of this permit.	09/30/2024
Annual Chloride Reports After Permit Expiration: In the event that this permit is not reissued on time, the permittee shall continue to submit annual chloride reports each year covering source reduction measures implemented and chloride concentration and mass discharge trends.	

6.3 Mercury Pollutant Minimization Program

As a condition of the variance to the water quality based effluent limitation(s) for mercury granted in accordance with s. NR 106.145(6), Wis. Adm. Code, the permittee shall perform the following actions.

Required Action	Due Date
Annual Mercury Progress Reports: Submit an annual mercury progress report. The annual mercury progress report shall: Indicate which mercury pollutant minimization activities or activities outlined in the approved Pollutant Minimization Plan have been implemented; Include an analysis of trends in monthly and annual total effluent mercury concentrations based on mercury sampling; and Include an analysis of how influent and effluent mercury varies with time and with significant loading of mercury such as loads from industries into the collection system.	01/31/2021

The first annual mercury progress report is to be submitted by the Due Date.	
Annual Mercury Progress Report #2: Submit a mercury progress report as defined above.	01/31/2022
Annual Mercury Progress Report #3: Submit a mercury progress report as defined above.	01/31/2023
Annual Mercury Progress Report #4: Submit a mercury progress report as defined above.	01/31/2024
Final Mercury Report: Submit a final report documenting the success in reducing mercury concentrations in the effluent, as well as the anticipated future reduction in mercury sources and mercury effluent concentrations. The report shall summarize mercury pollutant minimization activities that have been implemented during the current permit term and state which, if any, pollutant minimization activities from the approved pollutant minimization plan were not pursued and why. The report shall include an analysis of trends in monthly and annual total effluent mercury concentrations based on mercury sampling during the current permit term. The report shall also include an analysis of how influent and effluent mercury varies with time and with significant loading of mercury such as loads from industries into the collection system. If the permittee intends to re-apply for a mercury variance per s. NR 106.145, Wis. Adm. Code, for the reissued permit, a detailed pollutant minimization plan outlining the pollutant minimization activities proposed for the upcoming permit term should be submitted along with the final report.	09/30/2024
Annual Mercury Reports After Permit Expiration: In the event that this permit is not reissued on time, the permittee shall continue to submit annual mercury reports each year covering pollutant minimization activities implemented and mercury concentration trends.	

6.4 Water Quality Based Effluent Limits (WQBELs) for Total Phosphorus (Outfall 005)

The permittee shall comply with the WQBELs for Phosphorus as specified. No later than 14 days following each compliance date, the permittee shall notify the Department in writing of its compliance or noncompliance. If a submittal is required, a timely submittal fulfills the notification requirement.

Required Action	Due Date
Compliance Alternatives, Source Reduction, Improvements and Modifications Status: The permittee shall submit a 'Compliance Alternatives, Source Reduction, Operational Improvements and Minor Facility Modification' status report to the Department. The report shall provide an update on the permittee's: (1) progress implementing source reduction measures, operational improvements, and minor facility modifications to optimize reductions in phosphorus discharges and, to the extent that such measures, improvements, and modifications will not enable compliance with the WQBELs, (2) status evaluating feasible alternatives for meeting phosphorus WQBELs.	03/31/2021
Preliminary Compliance Alternatives Plan: The permittee shall submit a preliminary compliance alternatives plan to the Department. If the plan concludes upgrading of the permittee's wastewater treatment facility is necessary to achieve final phosphorus WQBELs, the submittal shall include a preliminary engineering design report. If the plan concludes Adaptive Management will be used, the submittal shall include a completed Watershed Adaptive Management Request Form 3200-139 without the Adaptive Management Plan. If water quality trading will be undertaken, the plan must state that trading will be pursued.	03/31/2022
Final Compliance Alternatives Plan: The permittee shall submit a final compliance alternatives	05/31/2023

plan to the Department. If the plan concludes upgrading of the permittee's wastewater treatment is necessary to meet final phosphorus WQBELs, the submittal shall include a final engineering design report addressing the treatment plant upgrades, and a facility plan if required pursuant to ch. NR 110, Wis. Adm. Code. If the plan concludes Adaptive Management will be implemented, the submittal shall include a completed Watershed Adaptive Management Request Form 3200-139 and an engineering report addressing any treatment system upgrades necessary to meet interim limits pursuant to s. NR 217.18, Wis. Adm. Code. If the plan concludes water quality trading will be used, the submittal shall identify potential trading partners. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	
Progress Report on Plans & Specifications: Submit progress report regarding the progress of preparing final plans and specifications. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	03/31/2024
Final Plans and Specifications: Unless the permit has been modified, revoked and reissued, or reissued to include Adaptive Management or Water Quality Trading measures or to include a revised schedule based on factors in s. NR 217.17, Wis. Adm. Code, the permittee shall submit final construction plans to the Department for approval pursuant to s. 281.41, Stats., specifying treatment plant upgrades that must be constructed to achieve compliance with final phosphorus WQBELs, and a schedule for completing construction of the upgrades by the complete construction date specified below. (Note: Permit modification, revocation and reissuance, and reissuance are subject to s. 283.53(2), Stats.) Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	03/31/2025
Treatment Plant Upgrade to Meet WQBELs: The permittee shall initiate construction of the upgrades. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41. Stats. Upon approval of the final construction plans and schedule by the Department pursuant to s. 281.41, Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	09/30/2025
Construction Upgrade Progress Report #1: The permittee shall submit a progress report on construction upgrades. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	09/30/2026
Construction Upgrade Progress Report #2: The permittee shall submit a progress report on construction upgrades. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	09/30/2027
Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	08/31/2028
Achieve Compliance: The permittee shall achieve compliance with final phosphorus WQBELs. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	09/30/2028

6.5 Effluent Disinfection Season Requirements

The permittee shall take the following actions to extend the time period for effluent disinfection to March 1 through November 30 annually for outfall 001.

Required Action	Due Date
Initiate Disinfection: The permittee shall commence disinfecting effluent discharged via outfall 001 to Badfish Creek by the Due Date. Disinfection shall hereafter be initiated on March 1 of each year and commence through November 30 of each year. Fecal coliform monitoring is required and limits apply during periods of disinfection per the requirements in the surface water section of this permit for outfall 001 and the Standard Requirements section.	03/01/2023

7 Standard Requirements

NR 205, Wisconsin Administrative Code: The conditions in ss. NR 205.07(1) and NR 205.07(2), Wis. Adm. Code, are included by reference in this permit. The permittee shall comply with all of these requirements. Some of these requirements are outlined in the Standard Requirements section of this permit. Requirements not specifically outlined in the Standard Requirement section of this permit can be found in ss. NR 205.07(1) and NR 205.07(2).

7.1 Reporting and Monitoring Requirements

7.1.1 Monitoring Results

Monitoring results obtained during the previous month shall be summarized and reported on a Department Wastewater Discharge Monitoring Report. The report may require reporting of any or all of the information specified below under 'Recording of Results'. This report is to be returned to the Department no later than the date indicated on the form. A copy of the Wastewater Discharge Monitoring Report Form or an electronic file of the report shall be retained by the permittee.

Monitoring results shall be reported on an electronic discharge monitoring report (eDMR). The eDMR shall be certified electronically by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The 'eReport Certify' page certifies that the electronic report form is true, accurate and complete.

If the permittee monitors any pollutant more frequently than required by this permit, the results of such monitoring shall be included on the Wastewater Discharge Monitoring Report.

The permittee shall comply with all limits for each parameter regardless of monitoring frequency. For example, monthly, weekly, and/or daily limits shall be met even with monthly monitoring. The permittee may monitor more frequently than required for any parameter.

7.1.2 Sampling and Testing Procedures

Sampling and laboratory testing procedures shall be performed in accordance with Chapters NR 218 and NR 219, Wis. Adm. Code and shall be performed by a laboratory certified or registered in accordance with the requirements of ch. NR 149, Wis. Adm. Code. Groundwater sample collection and analysis shall be performed in accordance with ch. NR 140, Wis. Adm. Code. The analytical methodologies used shall enable the laboratory to quantitate all substances for which monitoring is required at levels below the effluent limitation. If the required level cannot be met by any of the methods available in NR 219, Wis. Adm. Code, then the method with the lowest limit of detection shall be selected. Additional test procedures may be specified in this permit.

7.1.3 Pretreatment Sampling Requirements

Sampling for pretreatment parameters (cadmium, chromium, copper, lead, nickel, zinc, and mercury) shall be done during a day each month when industrial discharges are occurring at normal to maximum levels. The sampling of the influent and effluent for these parameters shall be coordinated. All 24 hour composite samples shall be flow proportional.

7.1.4 Recording of Results

The permittee shall maintain records which provide the following information for each effluent measurement or sample taken:

- the date, exact place, method and time of sampling or measurements;
- the individual who performed the sampling or measurements;
- the date the analysis was performed;
- the individual who performed the analysis;

- the analytical techniques or methods used; and
- the results of the analysis.

7.1.5 Reporting of Monitoring Results

The permittee shall use the following conventions when reporting effluent monitoring results:

- Pollutant concentrations less than the limit of detection shall be reported as < (less than) the value of the limit of detection. For example, if a substance is not detected at a detection limit of 0.1 mg/L, report the pollutant concentration as < 0.1 mg/L.
- Pollutant concentrations equal to or greater than the limit of detection, but less than the limit of quantitation, shall be reported and the limit of quantitation shall be specified.
- For purposes of calculating NR 101 fees, the 2 mg/l lower reporting limits for BOD5 and Total Suspended Solids shall be considered to be limits of quantitation
- For the purposes of reporting a calculated result, average or a mass discharge value, the permittee may substitute a "0" (zero) for any pollutant concentration that is less than the limit of detection. However, if the effluent limitation is less than the limit of detection, the department may substitute a value other than zero for results less than the limit of detection, after considering the number of monitoring results that are greater than the limit of detection and if warranted when applying appropriate statistical techniques.

7.1.6 Compliance Maintenance Annual Reports

Compliance Maintenance Annual Reports (CMAR) shall be completed using information obtained over each calendar year regarding the wastewater conveyance and treatment system. The CMAR shall be submitted and certified by the permittee in accordance with ch. NR 208, Wis. Adm. Code, by June 30, each year on an electronic report form provided by the Department.

In the case of a publicly owned treatment works, a resolution shall be passed by the governing body and submitted as part of the CMAR, verifying its review of the report and providing responses as required. Private owners of wastewater treatment works are not required to pass a resolution; but they must provide an Owner Statement and responses as required, as part of the CMAR submittal.

The CMAR shall be certified electronically by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The certification verifies that the electronic report is true, accurate and complete.

7.1.7 Records Retention

The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings or electronic data records for continuous monitoring instrumentation, copies of all reports required by the permit, and records of all data used to complete the application for the permit for a period of at least 3 years from the date of the sample, measurement, report or application. All pertinent sludge information, including permit application information and other documents specified in this permit or s. NR 204.06(9), Wis. Adm. Code shall be retained for a minimum of 5 years.

7.1.8 Other Information

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or correct information to the Department.

7.1.9 Reporting Requirements – Alterations or Additions

The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is only required when:

- The alteration or addition to the permitted facility may meet one of the criteria for determining whether a facility is a new source.
- The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification requirement applies to pollutants which are not subject to effluent limitations in the existing permit.
- The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use of disposal sites not reported during the permit application process nor reported pursuant to an approved land application plan. Additional sites may not be used for the land application of sludge until department approval is received.

7.2 System Operating Requirements

7.2.1 Noncompliance Reporting

Sanitary sewer overflows and sewage treatment facility overflows shall be reported according to the 'Sanitary Sewer Overflows and Sewage Treatment Facility Overflows' section of this permit.
The permittee shall report the following types of noncompliance by a telephone call to the Department's regional office within 24 hours after becoming aware of the noncompliance:

- any noncompliance which may endanger health or the environment;
- any violation of an effluent limitation resulting from a bypass;
- any violation of an effluent limitation resulting from an upset; and
- any violation of a maximum discharge limitation for any of the pollutants listed by the Department in the permit, either for effluent or sludge.

A written report describing the noncompliance shall also be submitted to the Department's regional office within 5 days after the permittee becomes aware of the noncompliance. On a case-by-case basis, the Department may waive the requirement for submittal of a written report within 5 days and instruct the permittee to submit the written report with the next regularly scheduled monitoring report. In either case, the written report shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times; the steps taken or planned to reduce, eliminate and prevent reoccurrence of the noncompliance; and if the noncompliance has not been corrected, the length of time it is expected to continue.
A scheduled bypass approved by the Department under the 'Scheduled Bypass' section of this permit shall not be subject to the reporting required under this section.
NOTE: Section 292.11(2)(a), Wisconsin Statutes, requires any person who possesses or controls a hazardous substance or who causes the discharge of a hazardous substance to notify the Department of Natural Resources immediately of any discharge not authorized by the permit. **The discharge of a hazardous substance that is not authorized by this permit or that violates this permit may be a hazardous substance spill. To report a hazardous substance spill, call DNR's 24-hour HOTLINE at 1-800-943-0003.**

7.2.2 Flow Meters

Flow meters shall be calibrated annually, as per s. NR 218.06, Wis. Adm. Code.

7.2.3 Raw Grit and Screenings

All raw grit and screenings shall be disposed of at a properly licensed solid waste facility or picked up by a licensed waste hauler. If the facility or hauler are located in Wisconsin, then they shall be licensed under chs. NR 500-555, Wis. Adm. Code.

7.2.4 Sludge Management

All sludge management activities shall be conducted in compliance with ch. NR 204 "Domestic Sewage Sludge Management", Wis. Adm. Code.

7.2.5 Prohibited Wastes

Under no circumstances may the introduction of wastes prohibited by s. NR 211.10, Wis. Adm. Code, be allowed into the waste treatment system. Prohibited wastes include those:

- which create a fire or explosion hazard in the treatment work;
- which will cause corrosive structural damage to the treatment work;
- solid or viscous substances in amounts which cause obstructions to the flow in sewers or interference with the proper operation of the treatment work;
- wastewaters at a flow rate or pollutant loading which are excessive over relatively short time periods so as to cause a loss of treatment efficiency; and
- changes in discharge volume or composition from contributing industries which overload the treatment works or cause a loss of treatment efficiency.

7.2.6 Bypass

This condition applies only to bypassing at a sewage treatment facility that is not a scheduled bypass, approved blending as a specific condition of this permit, a sewage treatment facility overflow or a controlled diversion as provided in the sections titled ‘Scheduled Bypass’, ‘Blending’ (if approved), ‘SSO’s and Sewage Treatment Facility Overflows’ and ‘Controlled Diversions’ of this permit. Any other bypass at the sewage treatment facility is prohibited and the Department may take enforcement action against a permittee for such occurrences under s. 283.89, Wis. Stats. The Department may approve a bypass if the permittee demonstrates all the following conditions apply:

- The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
- There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities or adequate back-up equipment, retention of untreated wastes, reduction of inflow and infiltration, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance. When evaluating feasibility of alternatives, the department may consider factors such as technical achievability, costs and affordability of implementation and risks to public health, the environment and, where the permittee is a municipality, the welfare of the community served; and
- The bypass was reported in accordance with the Noncompliance Reporting section of this permit.

7.2.7 Scheduled Bypass

Whenever the permittee anticipates the need to bypass for purposes of efficient operations and maintenance and the permittee may not meet the conditions for controlled diversions in the ‘Controlled Diversions’ section of this permit, the permittee shall obtain prior written approval from the Department for the scheduled bypass. A permittee’s written request for Department approval of a scheduled bypass shall demonstrate that the conditions for bypassing specified in the above section titled ‘Bypass’ are met and include the proposed date and reason for the bypass, estimated volume and duration of the bypass, alternatives to bypassing and measures to mitigate environmental harm caused by the bypass. The department may require the permittee to provide public notification for a scheduled bypass if it is determined there is significant public interest in the proposed action and may recommend mitigation measures to minimize the impact of such bypass.

7.2.8 Controlled Diversions

Controlled diversions are allowed only when necessary for essential maintenance to assure efficient operation. Sewage treatment facilities that have multiple treatment units to treat variable or seasonal loading conditions may shut down redundant treatment units when necessary for efficient operation. The following requirements shall be met during controlled diversions:

- Effluent from the sewage treatment facility shall meet the effluent limitations established in the permit. Wastewater that is diverted around a treatment unit or treatment process during a controlled diversion shall be recombined with wastewater that is not diverted prior to the effluent sampling location and prior to effluent discharge;
- A controlled diversion does not include blending as defined in s. NR 210.03(2e), Wis. Adm. Code, and as may only be approved under s. NR 210.12. A controlled diversion may not occur during periods of excessive flow or other abnormal wastewater characteristics;
- A controlled diversion may not result in a wastewater treatment facility overflow; and
- All instances of controlled diversions shall be documented in sewage treatment facility records and such records shall be available to the department on request.

7.2.9 Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training as required in ch. NR 114, Wis. Adm. Code, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

7.2.10 Operator Certification

The wastewater treatment facility shall be under the direct supervision of a state certified operator. In accordance with s. NR 114.53, Wis. Adm. Code, every WPDES permitted treatment plant shall have a designated operator-in-charge holding a current and valid certificate. The designated operator-in-charge shall be certified at the level and in all subclasses of the treatment plant, except laboratory. Treatment plant owners shall notify the department of any changes in the operator-in-charge within 30 days. Note that s. NR 114.52(22), Wis. Adm. Code, lists types of facilities that are excluded from operator certification requirements (i.e. private sewage systems, pretreatment facilities discharging to public sewers, industrial wastewater treatment that consists solely of land disposal, agricultural digesters and concentrated aquatic production facilities with no biological treatment).

7.3 Sewage Collection Systems

7.3.1 Sanitary Sewage Overflows and Sewage Treatment Facility Overflows

7.3.1.1 Overflows Prohibited

Any overflow or discharge of wastewater from the sewage collection system or at the sewage treatment facility, other than from permitted outfalls, is prohibited. The permittee shall provide information on whether any of the following conditions existed when an overflow occurred:

- The sanitary sewer overflow or sewage treatment facility overflow was unavoidable to prevent loss of life, personal injury or severe property damage;
- There were no feasible alternatives to the sanitary sewer overflow or sewage treatment facility overflow such as the use of auxiliary treatment facilities or adequate back-up equipment, retention of untreated wastes, reduction of inflow and infiltration, or preventative maintenance activities;

- The sanitary sewer overflow or the sewage treatment facility overflow was caused by unusual or severe weather related conditions such as large or successive precipitation events, snowmelt, saturated soil conditions, or severe weather occurring in the area served by the sewage collection system or sewage treatment facility; and
- The sanitary sewer overflow or the sewage treatment facility overflow was unintentional, temporary, and caused by an accident or other factors beyond the reasonable control of the permittee.

7.3.1.2 Permittee Response to Overflows

Whenever a sanitary sewer overflow or sewage treatment facility overflow occurs, the permittee shall take all feasible steps to control or limit the volume of untreated or partially treated wastewater discharged, and terminate the discharge as soon as practicable. Remedial actions, including those in NR 210.21 (3), Wis. Adm. Code, shall be implemented consistent with an emergency response plan developed under the CMOM program.

7.3.1.3 Permittee Reporting

Permittees shall report all sanitary sewer overflows and sewage treatment overflows as follows:

- The permittee shall notify the department by telephone, fax or email as soon as practicable, but no later than 24 hours from the time the permittee becomes aware of the overflow;
- The permittee shall, no later than five days from the time the permittee becomes aware of the overflow, provide to the department the information identified in this paragraph using department form number 3400-184. If an overflow lasts for more than five days, an initial report shall be submitted within 5 days as required in this paragraph and an updated report submitted following cessation of the overflow. At a minimum, the following information shall be included in the report:
    - The date and location of the overflow;
    - The surface water to which the discharge occurred, if any;
    - The duration of the overflow and an estimate of the volume of the overflow;
    - A description of the sewer system or treatment facility component from which the discharge occurred such as manhole, lift station, constructed overflow pipe, or crack or other opening in a pipe;
    - The estimated date and time when the overflow began and stopped or will be stopped;
    - The cause or suspected cause of the overflow including, if appropriate, precipitation, runoff conditions, areas of flooding, soil moisture and other relevant information;
    - Steps taken or planned to reduce, eliminate and prevent reoccurrence of the overflow and a schedule of major milestones for those steps;
    - A description of the actual or potential for human exposure and contact with the wastewater from the overflow;
    - Steps taken or planned to mitigate the impacts of the overflow and a schedule of major milestones for those steps;
    - To the extent known at the time of reporting, the number and location of building backups caused by excessive flow or other hydraulic constraints in the sewage collection system that occurred concurrently with the sanitary sewer overflow and that were within the same area of the sewage collection system as the sanitary sewer overflow; and
    - The reason the overflow occurred or explanation of other contributing circumstances that resulted in the overflow event. This includes any information available including whether the overflow was unavoidable to prevent loss of life, personal injury, or severe property damage and whether there were feasible alternatives to the overflow.

  NOTE: A copy of form 3400-184 for reporting sanitary sewer overflows and sewage treatment facility overflows may be obtained from the department or accessed on the department's web site at

http://dnr.wi.gov/topic/wastewater/SSOreport.html. As indicated on the form, additional information may be submitted to supplement the information required by the form.

- The permittee shall identify each specific location and each day on which a sanitary sewer overflow or sewage treatment facility overflow occurs as a discrete sanitary sewer overflow or sewage treatment facility overflow occurrence. An occurrence may be more than one day if the circumstances causing the sanitary sewer overflow or sewage treatment facility overflow results in a discharge duration of greater than 24 hours. If there is a stop and restart of the overflow at the same location within 24 hours and the overflow is caused by the same circumstance, it may be reported as one occurrence. Sanitary sewer overflow occurrences at a specific location that are separated by more than 24 hours shall be reported as separate occurrences; and
- A permittee that is required to submit wastewater discharge monitoring reports under NR 205.07 (1) (r) shall also report all sanitary sewer overflows and sewage treatment facility overflows on that report.

7.3.1.4 Public Notification

The permittee shall notify the public of any sanitary sewer and sewage treatment facility overflows consistent with its emergency response plan required under the CMOM (Capacity, Management, Operation and Maintenance) section of this permit and s. NR 210.23 (4) (f), Wis. Adm. Code. Such public notification shall occur promptly following any overflow event using the most effective and efficient communications available in the community. At minimum, a daily newspaper of general circulation in the county(s) and municipality whose waters may be affected by the overflow shall be notified by written or electronic communication.

7.3.2 Capacity, Management, Operation and Maintenance (CMOM) Program

- The permittee shall have written documentation of the Capacity, Management, Operation and Maintenance (CMOM) program components in accordance with s. NR 210.23(4), Wis. Adm. Code. Such documentation shall be available for Department review upon request. The Department may request that the permittee provide this documentation or prepare a summary of the permittee's CMOM program at the time of application for reissuance of the WPDES permit.
- The permittee shall implement a CMOM program in accordance with s. NR 210.23, Wis. Adm. Code.
- The permittee shall at least annually conduct a self-audit of activities conducted under the permittee's CMOM program to ensure CMOM components are being implemented as necessary to meet the general standards of s. NR 210.23(3), Wis. Adm. Code.

7.3.3 Sewer Cleaning Debris and Materials

All debris and material removed from cleaning sanitary sewers shall be managed to prevent nuisances, run-off, ground infiltration or prohibited discharges.

- Debris and solid waste shall be dewatered, dried and then disposed of at a licensed solid waste facility.
- Liquid waste from the cleaning and dewatering operations shall be collected and disposed of at a permitted wastewater treatment facility.
- Combination waste including liquid waste along with debris and solid waste may be disposed of at a licensed solid waste facility or wastewater treatment facility willing to accept the waste.

7.4 Surface Water Requirements

7.4.1 Permittee-Determined Limit of Quantitation Incorporated into this Permit

For pollutants with water quality-based effluent limits below the Limit of Quantitation (LOQ) in this permit, the LOQ calculated by the permittee and reported on the Discharge Monitoring Reports (DMRs) is incorporated by reference into this permit. The LOQ shall be reported on the DMRs, shall be the lowest quantifiable level practicable, and shall be no greater than the minimum level (ML) specified in or approved under 40 CFR Part 136 for the pollutant at the time this permit was issued, unless this permit specifies a higher LOQ.

7.4.2 Appropriate Formulas for Effluent Calculations

The permittee shall use the following formulas for calculating effluent results to determine compliance with average concentration limits and mass limits and total load limits:

Weekly/Monthly/Six-Month/Annual Average Concentration = the sum of all daily results for that week/month/six-month/year, divided by the number of results during that time period. [Note: When a six-month average effluent limit is specified for Total Phosphorus the applicable periods are May through October and November through April.]

Weekly Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the week.

Monthly Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the month.

Six-Month Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the six-month period. [Note: When a six-month average effluent limit is specified for Total Phosphorus the applicable periods are May through October and November through April.]

Annual Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the entire year.

Total Monthly Discharge: = monthly average concentration (mg/L) x total flow for the month (MG/month) x 8.34.

Total Annual Discharge: = sum of total monthly discharges for the calendar year.

12-Month Rolling Sum of Total Monthly Discharge: = the sum of the most recent 12 consecutive months of Total Monthly Discharges.

7.4.3 Effluent Temperature Requirements

Weekly Average Temperature – If temperature limits are included in this permit, Weekly Average Temperature shall be calculated as the sum of all daily maximum results for that week divided by the number of daily maximum results during that time period.

Cold Shock Standard – Water temperatures of the discharge shall be controlled in a manner as to protect fish and aquatic life uses from the deleterious effects of cold shock pursuant to Wis. Adm. Code, s. NR 102.28. 'Cold Shock' means exposure of aquatic organisms to a rapid decrease in temperature and a sustained exposure to low temperature that induces abnormal behavior or physiological performance and may lead to death.

Rate of Temperature Change Standard – Temperature of a water of the state or discharge to a water of the state may not be artificially raised or lowered at such a rate that it causes detrimental health or reproductive effects to fish or aquatic life of the water of the state pursuant to Wis. Adm. Code, s. NR 102.29.

7.4.4 Visible Foam or Floating Solids

There shall be no discharge of floating solids or visible foam in other than trace amounts.

7.4.5 Surface Water Uses and Criteria

In accordance with NR 102.04, Wis. Adm. Code, surface water uses and criteria are established to govern water management decisions. Practices attributable to municipal, industrial, commercial, domestic, agricultural, land development or other activities shall be controlled so that all surface waters including the mixing zone meet the following conditions at all times and under all flow and water level conditions:

a) Substances that will cause objectionable deposits on the shore or in the bed of a body of water, shall not be present in such amounts as to interfere with public rights in waters of the state.

b) Floating or submerged debris, oil, scum or other material shall not be present in such amounts as to interfere with public rights in waters of the state.

c) Materials producing color, odor, taste or unsightliness shall not be present in such amounts as to interfere with public rights in waters of the state.

d) Substances in concentrations or in combinations which are toxic or harmful to humans shall not be present in amounts found to be of public health significance, nor shall substances be present in amounts which are acutely harmful to animal, plant or aquatic life.

7.4.6 Percent Removal

During any 30 consecutive days, the average effluent concentrations of BOD_5 and of total suspended solids shall not exceed 15% of the average influent concentrations, respectively. This requirement does not apply to removal of total suspended solids if the permittee operates a lagoon system and has received a variance for suspended solids granted under NR 210.07(2), Wis. Adm. Code.

7.4.7 Fecal Coliform

The monthly limit for fecal coliform shall be expressed as a geometric mean.

7.4.8 Seasonal Disinfection

Disinfection shall be provided from May 1 through September 30 of each year for the Badger Mill Creek Outfall (005).
Disinfection shall be provided from April 15 through October 15 of each year for the Badfish Creek Outfall (001). Beginning March 1, 2023 and thereafter, disinfection shall be provided for the Badfish Creek Outfall from March 1 through November 30 of each year.
Monitoring requirements and the limitation for fecal coliforms apply only during the period in which disinfection is required.

7.4.9 Whole Effluent Toxicity (WET) Monitoring Requirements

In order to determine the potential impact of the discharge on aquatic organisms, static-renewal toxicity tests shall be performed on the effluent in accordance with the procedures specified in the *"State of Wisconsin Aquatic Life Toxicity Testing Methods Manual, 2nd Edition" (PUB-WT-797*, November 2004) as required by NR 219.04, Table A, Wis. Adm. Code). All of the WET tests required in this permit, including any required retests, shall be conducted on the *Ceriodaphnia dubia* and fathead minnow species. Receiving water samples shall not be collected from any point in contact with the permittee's mixing zone and every attempt shall be made to avoid contact with any other discharge's mixing zone.

7.4.10 Whole Effluent Toxicity (WET) Identification and Reduction

Within 60 days of a retest which showed positive results, the permittee shall submit a written report to the Biomonitoring Coordinator, Bureau of Water Quality, 101 S. Webster St., PO Box 7921, Madison, WI 53707-7921, which details the following:

- A description of actions the permittee has taken or will take to remove toxicity and to prevent the recurrence of toxicity;
- A description of toxicity reduction evaluation (TRE) investigations that have been or will be done to identify potential sources of toxicity, including the following actions:
    a) Evaluate the performance of the treatment system to identify deficiencies contributing to effluent toxicity (e.g., operational problems, chemical additives, incomplete treatment)
    b) Identify the compound(s) causing toxicity.
    c) Trace the compound(s) causing toxicity to their sources (e.g., industrial, commercial, domestic)
    d) Evaluate, select, and implement methods or technologies to control effluent toxicity (e.g., in-plant or pretreatment controls, source reduction or removal)

- Where corrective actions including a TRE have not been completed, an expeditious schedule under which corrective actions will be implemented;
- If no actions have been taken, the reason for not taking action.

The permittee may also request approval from the Department to postpone additional retests in order to investigate the source(s) of toxicity. Postponed retests must be completed after toxicity is believed to have been removed.

7.4.11 Reopener Clause

Pursuant to s. 283.15(11), Wis. Stat. and 40 CFR 131.20, the Department may modify or revoke and reissue this permit if, through the triennial standard review process, the Department determines that the terms and conditions of this permit need to be updated to reflect the highest attainable condition of the receiving water.

7.5 Pretreatment Program Requirements

The permittee is required to operate an industrial pretreatment program as described in the program initially approved by the Department of Natural Resources including any subsequent program modifications approved by the Department, and including commitments to program implementation activities provided in the permittee's annual pretreatment program report, and that complies with the requirements set forth in 40 CFR Part 403 and ch. NR 211, Wis. Adm. Code. To ensure that the program is operated in accordance with these requirements, the following general conditions and requirements are hereby established:

7.5.1 Inventories

The permittee shall implement methods to maintain a current inventory of the general character and volume of wastewater that industrial users discharge to the treatment works and shall provide an updated industrial user listing annually and report any changes in the listing to the Department by March 31 of each year as part of the annual pretreatment program report required herein.

7.5.2 Regulation of Industrial Users

7.5.2.1 Limitations for Industrial Users:

The permittee shall develop, maintain, enforce and revise as necessary local limits to implement the general and specific prohibitions of the state and federal General Pretreatment Regulations.

7.5.2.2 Control Documents for Industrial Users (IUs)

The permittee shall control the discharge from each significant industrial user through individual discharge permits as required by s. NR 211.235, Wis. Adm. Code and in accordance with the approved pretreatment program procedures and the permittee's sewer use ordinance. The discharge permits shall be modified in a timely manner during the stated term of the discharge permits according to the sewer use ordinance as conditions warrant. The discharge permits shall include at a minimum the elements found in s. NR 211.235(1), Wis. Adm. Code and references to the approved pretreatment program procedures and the sewer use ordinance.

7.5.2.3 Review of Industrial User Reports, Inspections and Compliance Monitoring

The permittee shall require the submission of, receive, and review self-monitoring reports and other notices from industrial users in accordance with the approved pretreatment program procedures. The permittee shall randomly sample and analyze industrial user discharges and conduct surveillance activities to determine independent of information supplied by the industrial users, whether the industrial users are in compliance with pretreatment standards and requirements. The inspections and monitoring shall also be conducted to maintain accurate knowledge of local industrial processes, including changes in the discharge, pretreatment equipment operation, spill prevention control plans, slug control plans, and implementation of solvent management plans.

The permittee shall inspect and sample the discharge from each significant industrial user as specified in the permittee's approved pretreatment program or as specified in NR 211.235(3). The permittee shall evaluate whether industrial users identified as significant need a slug control plan according to the requirements of NR 211.235(4). If a slug control plan is needed, the plan shall contain at a minimum the elements specified in s. NR 211.235(4)(b), Wis. Adm. Code.

7.5.2.4 Enforcement and Industrial User Compliance Evaluation & Violation Reports

The permittee shall enforce the industrial pretreatment requirements including the industrial user discharge limitations of the permittee's sewer use ordinance. The permittee shall investigate instances of noncompliance by collecting and analyzing samples and collecting other information with sufficient care to produce evidence admissible in enforcement proceedings or in judicial actions. Investigation and response to instances of noncompliance shall be in accordance with the permittee's sewer use ordinance and approved Enforcement Response Plan.

The permittee shall make a semiannual report on forms provided or approved by the Department. The semiannual report shall include an analysis of industrial user significant noncompliance (i.e. the Industrial User Compliance Evaluation, also known as the SNC Analysis) as outlined in s.NR 211.23(1)(j), Wis. Adm. Code, and a summary of the permittee's response to all industrial noncompliance (i.e. the Industrial User Violation Report). The Industrial User Compliance Evaluation Report shall include monitoring results received from industrial users pursuant to s. NR 211.15(1)-(5), Wis. Adm. Code. The Industrial User Violation Report shall include copies of all notices of noncompliance, notices of violation and other enforcement correspondence sent by the permittee to industrial users, together with the industrial user's response. The Industrial User Compliance Evaluation and Violation Reports for the period January through June shall be provided to the Department by September 30 of each year and for the period July through December shall be provided to the Department by March 31 of the succeeding year, unless alternate submittal dates are approved.

7.5.2.5 Publication of Violations

The permittee shall publish a list of industrial users that have significantly violated the municipal sewer use ordinance during the calendar year, in the largest daily newspaper in the area by March 31 of the following year pursuant to s. NR 211.23(1)(j), Wis. Adm. Code. A copy of the newspaper publication shall be provided as part of the annual pretreatment report specified herein.

7.5.2.6 Multijurisdictional Agreements

The permittee shall establish agreements with all contributing jurisdictions as necessary to ensure compliance with pretreatment standards and requirements by all industrial users discharging to the permittee's wastewater treatment system. Any such agreement shall identify who will be responsible for maintaining the industrial user inventory, issuance of industrial user control mechanisms, inspections and sampling, pretreatment program implementation, and enforcement.

7.5.3 Annual Pretreatment Program Report

The permittee shall evaluate the pretreatment program, and submit the Pretreatment Program Report to the Department on forms provided or approved by the Department by March 31 annually, unless an alternate submittal date is approved. The report shall include a brief summary of the work performed during the preceding calendar year, including the numbers of discharge permits issued and in effect, pollution prevention activities, number of inspections and monitoring surveys conducted, budget and personnel assigned to the program, a general discussion of program progress in meeting the objectives of the permittee's pretreatment program together with summary comments and recommendations.

7.5.4 Pretreatment Program Modifications

- Future Modifications: The permittee shall within one year of any revisions to federal or state General Pretreatment Regulations submit an application to the Department in duplicate to modify and update its approved pretreatment program to incorporate such regulatory changes as applicable to the permittee.

Additionally, the Department or the permittee may request an application for program modification at any time where necessary to improve program effectiveness based on program experience to date.

- Modifications Subject to Department Approval: The permittee shall submit all proposed pretreatment program modifications to the Department for determination of significance and opportunity for comment in accordance with the requirements and conditions of s. NR 211.27, Wis. Adm. Code. Any substantial proposed program modification shall be subject to Department public noticing and formal approval prior to implementation. A substantial program modification includes, but is not limited to, changes in enabling legal authority to administer and enforce pretreatment conditions and requirements; significant changes in program administrative or operational procedures; significant reductions in monitoring frequencies; significant reductions in program resources including personnel commitments, equipment, and funding levels; changes (including any relaxation) in the local limitations for substances enforced and applied to users of the sewerage treatment works; changes in treatment works sludge disposal or management practices which impact the pretreatment program; or program modifications which increase pollutant loadings to the treatment works. The Department shall use the procedures outlined in s. NR 211.30, Wis. Adm. Code for review and approval/denial of proposed pretreatment program modifications. The permittee shall comply with local public participation requirements when implementing the pretreatment program.

7.5.5 Program Resources

The permittee shall have sufficient resources and qualified personnel to carry out the pretreatment program responsibilities as listed in ss. NR 211.22 and NR 211.23, Wis. Adm. Code.

7.6 Land Treatment (Land Disposal) Requirements

7.6.1 Application of NR 140 to Substances Discharged

This permit does not authorize the permittee to discharge any substance in a concentration which would cause an applicable groundwater standard of ch. NR 140, Wis. Adm. Code, to be exceeded. The Department may seek a response under NR 140 if the permittee's discharge causes exceedance of an applicable groundwater standard for any substance, including substances not specifically limited or monitored under this permit

7.6.2 Appropriate Formulas for Land Treatment Calculations – Nitrogen & Chloride

The permittee shall use the following formulas for nitrogen and chloride calculations.

7.6.2.1 Nitrogen Formulas

Total Nitrogen = Total Kjeldahl Nitrogen (mg/L) + [NO_2 + NO_3] Nitrogen (mg/L)

Organic Nitrogen (mg/L) = Total Kjeldahl Nitrogen (mg/L) - Ammonia Nitrogen (mg/L)

7.6.2.2 Annual Total Nitrogen per Cell or per Zone

$$\frac{\text{(annual ave. concentration in mg/L) (tot. annual flow in million gallons per cell or zone) (8.34)}}{\text{acreage of cell or zone}} = \text{lbs/ac/yr}$$

7.6.2.3 Annual Total Chloride per Cell or per Zone

$$\frac{\text{(annual ave. concentration in mg/L) (tot. annual flow in million gallons per cell or zone) (8.34)}}{\text{acreage of cell or zone}} = \text{lbs/ac/yr}$$

7.6.3 Toxic or Hazardous Pollutants

The discharge of toxic or hazardous pollutants to land treatment systems is prohibited unless the applicant can demonstrate and the department determines that the discharge of such pollutants will be in such small quantities that

no detrimental effect on groundwater or surface water will result pursuant to s. NR 206.07(2)(c), Wis. Adm. Code. The criteria used shall include but not be limited to the toxicity of the pollutant, capacity of the soil to remove the pollutant, degradability, usual or potential presence of the pollutant in the existing environment, method of application and all other relevant factors.

7.6.4 Industrial Waste - Pretreatment Requirements

Industrial waste discharges tributary to municipal land treatment systems shall be in compliance with the applicable pretreatment standards under ch. NR 211 Wis. Adm. Code pursuant to s. NR 206.07(2)(e), Wis. Adm. Code.

7.6.5 Overflow

Discharge to a land treatment system shall be limited so that the discharge and any precipitation which falls within the boundary of the disposal system during such discharge does not overflow the boundary of the system unless the WPDES permit authorizes collection and discharge of runoff to surface water pursuant to s. NR 206.07(2)(g), Wis. Adm. Code.

7.6.6 Management Plan Requirements

All land treatment systems shall be operated in accordance with an approved management plan. The management plan shall conform to the requirements of s. NR 110.25(3m), Wis. Adm. Code, per s. NR 206.07(2)(h), Wis. Adm. Code

7.6.7 Monthly Average Hydraulic Application Rate

When reporting of the Hydraulic Application Rate is required by this permit, determine the monthly average hydraulic application rate (in gal/acre/day) for each outfall by calculating the total gallons of wastewater applied onto the site for the month, dividing that total by the number of wetted acres loaded during the month, and then dividing this resulting value by the number of days in the month. Enter this calculated monthly average value on the Discharge Monitoring Report form in the box for the last day of the month, in the "Hydraulic Application Rate" column.

7.6.8 Nitrogen Loading Requirements for Spray Irrigation

The total annual nitrogen loading (pounds/acre/year) to the wastewater irrigation acreage shall not exceed the limitation contained in the land treatment annual report table of this permit, except that the Department may approve (in writing) an alternative nitrogen loading limit in a spray irrigation management plan based on the annual nitrogen needs of the cover crop and the permittee's demonstration of nitrogen losses for the site as specified in s. NR 206.06, Wis. Adm. Code.

7.6.9 Runoff

Discharge shall be limited to prevent any runoff of effluent from the spray irrigation site. Wastewater may not be sprayed during any rainfall event that causes runoff from the site, pursuant to s. NR 206.08(2)(b)1,Wis. Adm. Code.

7.6.10 Ponding

The volume of discharge to a spray irrigation system shall be limited to prevent ponding, except for temporary conditions following rainfall events, pursuant to s. NR 206.08(2)(b)2, Wis. Adm. Code.

7.6.11 Frozen Ground

Spray irrigation onto frozen ground is prohibited, pursuant to s. NR 110.255(2)(a)2, Wis. Adm. Code.

7.6.12 Land Treatment Annual Report

Annual Land Treatment Reports are due by January 31st of each year for the previous calendar year.

7.7 Land Application Requirements

7.7.1 Sludge Management Program Standards And Requirements Based Upon Federally Promulgated Regulations

In the event that new federal sludge standards or regulations are promulgated, the permittee shall comply with the new sludge requirements by the dates established in the regulations, if required by federal law, even if the permit has not yet been modified to incorporate the new federal regulations.

7.7.2 General Sludge Management Information

The General Sludge Management Form 3400-48 shall be completed and submitted prior to any significant sludge management changes.

7.7.3 Sludge Samples

All sludge samples shall be collected at a point and in a manner which will yield sample results which are representative of the sludge being tested, and collected at the time which is appropriate for the specific test.

7.7.4 Land Application Characteristic Report

Each report shall consist of a Characteristic Form 3400-49 and Lab Report. The Characteristic Report Form 3400-49 shall be submitted electronically by January 31 following each year of analysis.

Following submittal of the electronic Characteristic Report Form 3400-49, this form shall be certified electronically via the 'eReport Certify' page by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The 'eReport Certify' page certifies that the electronic report is true, accurate and complete. The Lab Report must be sent directly to the facility's DNR sludge representative or basin engineer unless approval for not submitting the lab reports has been given.

The permittee shall use the following convention when reporting sludge monitoring results: Pollutant concentrations less than the limit of detection shall be reported as < (less than) the value of the limit of detection. For example, if a substance is not detected at a detection limit of 1.0 mg/kg, report the pollutant concentration as < 1.0 mg/kg .

All results shall be reported on a dry weight basis.

7.7.5 Calculation of Water Extractable Phosphorus

When sludge analysis for Water Extractable Phosphorus is required by this permit, the permittee shall use the following formula to calculate and report Water Extractable Phosphorus:
Water Extractable Phosphorus (% of Total P) =
[Water Extractable Phosphorus (mg/kg, dry wt) ÷ Total Phosphorus (mg/kg, dry wt)] x 100

7.7.6 Monitoring and Calculating PCB Concentrations in Sludge

When sludge analysis for "PCB, Total Dry Wt" is required by this permit, the PCB concentration in the sludge shall be determined as follows.
Either congener-specific analysis or Aroclor analysis shall be used to determine the PCB concentration. The permittee may determine whether Aroclor or congener specific analysis is performed. Analyses shall be performed in accordance with the following provisions and Table EM in s. NR 219.04, Wis. Adm. Code.

- EPA Method 1668 may be used to test for all PCB congeners. If this method is employed, all PCB congeners shall be delineated. Non-detects shall be treated as zero. The values that are between the limit of detection and the limit of quantitation shall be used when calculating the total value of all congeners. All results shall be added together and the total PCB concentration by dry weight reported. Note: It is recognized that a number of the congeners will co-elute with others, so there will not be 209 results to sum.

- EPA Method 8082A shall be used for PCB-Aroclor analysis and may be used for congener specific analysis as well. If congener specific analysis is performed using Method 8082A, the list of congeners tested shall include at least congener numbers 5, 18, 31, 44, 52, 66, 87, 101, 110, 138, 141, 151, 153, 170, 180, 183, 187, and 206 plus any other additional congeners which might be reasonably expected to occur in the particular sample. For either type of analysis, the sample shall be extracted using the Soxhlet extraction (EPA Method 3540C) (or the Soxhlet Dean-Stark modification) or the pressurized fluid extraction (EPA Method 3545A). If Aroclor analysis is performed using Method 8082A, clean up steps of the extract shall be performed as necessary to remove interference and to achieve as close to a limit of detection of 0.11 mg/kg as possible. Reporting protocol, consistent with s. NR 106.07(6)(e), should be as follows: If all Aroclors are less than the LOD, then the Total PCB Dry Wt result should be reported as less than the highest LOD. If a single Aroclor is detected then that is what should be reported for the Total PCB result. If multiple Aroclors are detected, they should be summed and reported as Total PCBs. If congener specific analysis is done using Method 8082A, clean up steps of the extract shall be performed as necessary to remove interference and to achieve as close to a limit of detection of 0.003 mg/kg as possible for each congener. If the aforementioned limits of detection cannot be achieved after using the appropriate clean up techniques, a reporting limit that is achievable for the Aroclors or each congener for the sample shall be determined. This reporting limit shall be reported and qualified indicating the presence of an interference. The lab conducting the analysis shall perform as many of the following methods as necessary to remove interference:

3620C – Florisil	3611B - Alumina
3640A - Gel Permeation	3660B - Sulfur Clean Up (using copper shot instead of powder)
3630C - Silica Gel	3665A - Sulfuric Acid Clean Up

7.7.7 Annual Land Application Report

Land Application Report Form 3400-55 shall be submitted electronically by January 31, each year whether or not non-exceptional quality sludge is land applied. Non-exceptional quality sludge is defined in s. NR 204.07(4), Wis. Adm. Code. Following submittal of the electronic Annual Land Application Report Form 3400-55, this form shall be certified electronically via the 'eReport Certify' page by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The 'eReport Certify' page certifies that the electronic report form is true, accurate and complete.

7.7.8 Other Methods of Disposal or Distribution Report

The permittee shall submit electronically the Other Methods of Disposal or Distribution Report Form 3400-52 by January 31, each year whether or not sludge is hauled, landfilled, incinerated, or exceptional quality sludge is distributed or land applied. Following submittal of the electronic Report Form 3400-52, this form shall be certified electronically via the 'eReport Certify' page by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The 'eReport Certify' page certifies that the electronic report form is true, accurate and complete.

7.7.9 Approval to Land Apply

Bulk non-exceptional quality sludge as defined in s. NR 204.07(4), Wis. Adm. Code, may not be applied to land without a written approval letter or Form 3400-122 from the Department unless the Permittee has obtained permission from the Department to self approve sites in accordance with s. NR 204.06 (6), Wis. Adm. Code. Analysis of sludge characteristics is required prior to land application. Application on frozen or snow covered ground is restricted to the extent specified in s. NR 204.07(3) (l), Wis. Adm. Code.

7.7.10 Soil Analysis Requirements

Each site requested for approval for land application must have the soil tested prior to use. Each approved site used for land application must subsequently be soil tested such that there is at least one valid soil test in the four years prior

to land application. All soil sampling and submittal of information to the testing laboratory shall be done in accordance with UW Extension Bulletin A-2100. The testing shall be done by the UW Soils Lab in Madison or Marshfield, WI or at a lab approved by UW. The test results including the crop recommendations shall be submitted to the DNR contact listed for this permit, as they are available. Application rates shall be determined based on the crop nitrogen recommendations and with consideration for other sources of nitrogen applied to the site.

7.7.11 Land Application Site Evaluation

For non-exceptional quality sludge, as defined in s. NR 204.07(4), Wis. Adm. Code, a Land Application Site Request Form 3400-053 shall be submitted to the Department for the proposed land application site. The Department will evaluate the proposed site for acceptability and will either approve or deny use of the proposed site. The permittee may obtain permission to approve their own sites in accordance with s. NR 204.06(6), Wis. Adm. Code.

7.7.12 Class A Sludge: Fecal Coliform Density Requirement

The fecal coliform density which must be < 1000 MPN/g TS as required in s. NR 204.07, Wis. Adm. Code, shall be satisfied immediately after the treatment process is completed. If the material is bagged or distributed at that time, no re-testing is required. If the material is bagged, distributed or land applied at a later time, the sludge shall be re-tested and this requirement satisfied at that time also, to ensure that regrowth of bacteria has not occurred. See Municipal Wastewater Sludge Guidance Memo #3 (Fecal Coliform Monitoring - Sampling and Analytical Procedures).

7.7.13 Class A Sludge: Temperature/Time Process

An increased sewage sludge temperature shall be maintained for a prescribed period of time according to the following guidelines:

TOTAL SOLIDS	TEMP	TIME	EQUATION Where: D = time in days t = temp in °C	NOTES
≥7%	≥50° C	≥20 min.	$D = \frac{131{,}700{,}000}{10^{0.14t}}$	No heating of small particles by warmed gases or immiscible liquid.
≥7%	≥50° C	≥15 sec.	$D = \frac{131{,}700{,}000}{10^{0.14t}}$	Small particles heated by warmed gases or immiscible liquid.
<7%	>50° C	≥15 sec. To <30 min.	$D = \frac{131{,}700{,}000}{10^{0.14t}}$	
<7%	≥50° C	≥30 min.	$D = \frac{50{,}070{,}000}{10^{0.14t}}$	

In no case shall temperatures calculated using the appropriate equation be less than 50°C.

7.7.14 Class B Sludge: Fecal Coliform Limitation

Compliance with the fecal coliform limitation for Class B sludge shall be demonstrated by calculating the geometric mean of at least 7 separate samples. (Note that a Total Solids analysis must be done on each sample). The geometric mean shall be less than 2,000,000 MPN or CFU/g TS. Calculation of the geometric mean can be done using one of the following 2 methods.

Method 1:

Geometric Mean = $(X_1 \times X_2 \times X_3 \ldots \times X_n)^{1/n}$

Where X = Coliform Density value of the sludge sample, and where n = number of samples (at least 7)

Method 2:

Geometric Mean = $\text{antilog}[(X_1 + X_2 + X_3 \ldots + X_n) \div n]$

Where X = $\log_{10}$ of Coliform Density value of the sludge sample, and where n = number of samples (at least 7)

Example for Method 2

Sample Number	Coliform Density of Sludge Sample	$\log_{10}$
1	6.0×10^5	5.78
2	4.2×10^6	6.62
3	1.6×10^6	6.20
4	9.0×10^5	5.95
5	4.0×10^5	5.60
6	1.0×10^6	6.00
7	5.1×10^5	5.71

The geometric mean for the seven samples is determined by averaging the $\log_{10}$ values of the coliform density and taking the antilog of that value.

$(5.78 + 6.62 + 6.20 + 5.95 + 5.60 + 6.00 + 5.71) \div 7 = 5.98$

The antilog of $5.98 = 9.5 \times 10^5$

7.7.15 Class B Sludge: Composting

Compost the sludge using either within-vessel, static aerated pile or windrow composting methods and raise the temperature of the sludge to 40° C or higher for 5 days. For 4 hours at some point during each of the 5 days, the temperature in the compost pile shall exceed 55°C.

7.7.16 Class A Sludge: Composting Process

Compost the sludge using either within-vessel or static aerated pile composting methods and maintain the temperature of the sludge at 55° C or higher for 3 days, or compost the sludge using windrow composting methods and maintain the temperature of the sewage sludge at 55° C or higher for 15 days or longer. During this period, a minimum of 5 windrow turnings are required.

7.7.17 Vector Control: Volatile Solids Reduction

The mass of volatile solids in the sludge shall be reduced by a minimum of 38% between the time the sludge enters the digestion process and the time it either exits the digester or a storage facility. For calculation of volatile solids reduction, the permittee shall use the Van Kleeck equation or one of the other methods described in "Determination of Volatile Solids Reduction in Digestion" by J.B. Farrell, which is Appendix C of EPA's *Control of Pathogens in Municipal Wastewater Sludge* (EPA/625/R-92/013). The Van Kleeck equation is:

$$VSR\% = \frac{VS_{IN} - VS_{OUT}}{VS_{IN} - (VS_{OUT} \times VS_{IN})} \times 100$$

Where: VS_{IN} = Volatile Solids in Feed Sludge (g VS/g TS)
VS_{OUT} = Volatile Solids in Final Sludge (g VS/g TS)
VSR% = Volatile Solids Reduction, (Percent)

7.7.18 Class B Sludge - Vector Control: Injection

No significant amount of the sewage sludge shall be present on the land surface within one hour after the sludge is injected.

7.7.19 Class B Sludge - Vector Control: Incorporation

Class B sludge shall be incorporated within 6 hours of surface application, or as approved by the Department.

7.7.20 Class A Sludge - Vector Control: Incorporation

Class A sludge shall be surface applied within 8 hours after being discharged from a pathogen treatment process and then be incorporated within 6 hours of surface application.

8 Summary of Reports Due

FOR INFORMATIONAL PURPOSES ONLY

Description	Date	Page
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report	October 31, 2020	36
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #2	July 31, 2021	36
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #3	July 31, 2022	36
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #4	July 31, 2023	36
Watershed Adaptive Management Option Annual Report Submittals -Final Adaptive Management Report for 1st Permit Term	July 31, 2024	37
Watershed Adaptive Management Option Annual Report Submittals - Renewal of Adaptive Management Plan for Permit Reissuance	September 30, 2024	37
Watershed Adaptive Management Option Annual Report Submittals - Comply with Adaptive Management Interim Limit	April 1, 2025	37
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #5	July 31, 2025	37
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #6	July 31, 2026	37
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #7	July 31, 2027	37
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #8	July 31, 2028	37
Watershed Adaptive Management Option Annual Report Submittals -Final Adaptive Management Report for 2nd Permit Term	July 31, 2029	37
Watershed Adaptive Management Option Annual Report Submittals - Renewal of Adaptive Management Plan for Permit Reissuance	See Permit	37
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #9	July 31, 2030	38
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #10	July 31, 2031	38
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #11	July 31, 2032	38
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #12	July 31, 2033	38
Watershed Adaptive Management Option Annual Report Submittals -Final Adaptive Management Report	July 31, 2034	38
Watershed Adaptive Management Option Annual Report Submittals - Achieve Water Quality Standards and Adaptive Management Plan Success	March 31, 2035	38

Annual Chloride Progress Report	January 31, 2021	38
Annual Chloride Progress Report #2	January 31, 2022	39
Annual Chloride Progress Report #3	January 31, 2023	39
Annual Chloride Progress Report #4	January 31, 2024	39
Final Chloride Report	September 30, 2024	39
Annual Chloride Reports After Permit Expiration	See Permit	39
Mercury Pollutant Minimization Program -Annual Mercury Progress Reports	January 31, 2021	39
Mercury Pollutant Minimization Program -Annual Mercury Progress Report #2	January 31, 2022	40
Mercury Pollutant Minimization Program -Annual Mercury Progress Report #3	January 31, 2023	40
Mercury Pollutant Minimization Program -Annual Mercury Progress Report #4	January 31, 2024	40
Mercury Pollutant Minimization Program -Final Mercury Report	September 30, 2024	40
Mercury Pollutant Minimization Program -Annual Mercury Reports After Permit Expiration	See Permit	40
Water Quality Based Effluent Limits (WQBELs) for Total Phosphorus (Outfall 005) -Compliance Alternatives, Source Reduction, Improvements and Modifications Status	March 31, 2021	40
Water Quality Based Effluent Limits (WQBELs) for Total Phosphorus (Outfall 005) -Preliminary Compliance Alternatives Plan	March 31, 2022	40
Water Quality Based Effluent Limits (WQBELs) for Total Phosphorus (Outfall 005) -Final Compliance Alternatives Plan	May 31, 2023	41
Water Quality Based Effluent Limits (WQBELs) for Total Phosphorus (Outfall 005) -Progress Report on Plans & Specifications	March 31, 2024	41
Water Quality Based Effluent Limits (WQBELs) for Total Phosphorus (Outfall 005) -Final Plans and Specifications	March 31, 2025	41
Water Quality Based Effluent Limits (WQBELs) for Total Phosphorus (Outfall 005) -Treatment Plant Upgrade to Meet WQBELs	September 30, 2025	41
Water Quality Based Effluent Limits (WQBELs) for Total Phosphorus (Outfall 005) -Construction Upgrade Progress Report #1	September 30, 2026	41
Water Quality Based Effluent Limits (WQBELs) for Total Phosphorus (Outfall 005) -Construction Upgrade Progress Report #2	September 30, 2027	41
Water Quality Based Effluent Limits (WQBELs) for Total Phosphorus (Outfall 005) -Complete Construction	August 31, 2028	41
Water Quality Based Effluent Limits (WQBELs) for Total Phosphorus (Outfall 005) -Achieve Compliance	September 30, 2028	41
Effluent Disinfection Season Requirements -Initiate Disinfection	March 1, 2023	42
Compliance Maintenance Annual Reports (CMAR)	by June 30, each year	44

Industrial User Compliance Evaluation and Violation Reports	Semiannual	53
Pretreatment Program Report	Annually	53
General Sludge Management Form 3400-48	prior to any significant sludge management changes	56
Characteristic Form 3400-49 and Lab Report	by January 31 following each year of analysis	56
Land Application Report Form 3400-55	by January 31, each year whether or not non-exceptional quality sludge is land applied	57
Other Methods of Disposal or Distribution Report Form 3400-52	by January 31, each year whether or not sludge is hauled, landfilled, incinerated, or exceptional quality sludge is distributed or land applied	57
Annual Land Treatment Reports	by January 31st of each year for the previous calendar year	55
Wastewater Discharge Monitoring Report	no later than the date indicated on the form	43

Report forms shall be submitted electronically in accordance with the reporting requirements herein. Any facility plans or plans and specifications for municipal, industrial, industrial pretreatment and non industrial wastewater systems shall be submitted to the Bureau of Water Quality, P.O. Box 7921, Madison, WI 53707-7921. All other submittals required by this permit shall be submitted to:
South Central Region, 3911 Fish Hatchery Road, Fitchburg, WI 53711-5397

Appendix B – DNR Letter

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
101 S. Webster Street
Box 7921
Madison WI 53707-7921

Tony Evers, Governor

Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

WISCONSIN
DEPT. OF NATURAL RESOURCES

July 23, 2024

Nicholas Bower, Senior Environmental Engineer
Capital Area Regional Planning Commission
100 State Street, Suite 400
Madison WI 53703

Subject: Wisconsin DNR's Response to CARPC Request for Additional Information.

Dear Mr. Bower:

This letter serves as the Department of Natural Resources (DNR's) response to the Capital Area Regional Planning Commission (CARPC) request for additional information sent on July 16, 2024 in regard to the proposed amendment to the Dane County Water Quality Plan being brought forward by the Madison Metropolitan Sewerage District (MMSD). Each outstanding item is addressed below:

1. **<u>Adaptive Management.</u> We understand there is a lot of interest from the public and Commissioners in continuing to pursue adaptive management as an alternative for MMSD to meet phosphorus requirements, however we are receiving conflicting information as to whether this has been determined to be feasible or not. Can DNR offer clarify as to whether this is still a feasible alternative? Are there adjustments possible in the location in which phosphorous is measured (e.g., move point of analysis downstream) or in how the loading from the MMSD effluent is calculated that enable the viability of adaptive management as a strategy to meet the uniform state standard on phosphorous?**

   Summary Statement: While MMSD has presented phosphorus reduction targets that seemingly rule out adaptive management as a feasible option, DNR would accept revised phosphorus reduction targets that are more likely to be feasible for Badger Mill Creek. As has been conveyed in the past, DNR does not see any eligibility or feasibility barriers for MMSD to undertake adaptive management. MMSD may consider the monetary costs, coordination complexity, availability of partners, and other factors when making a decision regarding preferability of adaptive management.

   MMSD's evaluation of adaptive management for Badger Mill Creek is included in their April 2023 Final Compliance Alternatives Plan (FCAP) document, and ultimately arrives at the determination that adaptive management is not feasible. Their determination is based primarily on a calculated in-stream load reduction needed to meet the phosphorus water quality standard for Badger Mill Creek at the Bruce Street crossing. MMSD's calculations show a minimum load reduction requirement of 7,617 lbs/year. After reviewing potential nonpoint source phosphorus reduction projects in the watershed, MMSD determined that the above load reduction goal is not possible to achieve with available projects. As is stated on the Project Plus webpage and in MMSD's presentations, there are simply "not enough pounds" within the Badger Mill Creek Watershed.

Excerpt table from the MMSD FCAP:

Location & Averaging Period	Flow (MGD)	Phosphorus Concentration	Water Quality Standard	Pounds to offset per half-year
Bruce Street, May-Oct	31.0	0.20	.075	5,940
Bruce Street, Nov-Apr	24.3	0.12	.075	1,676
Sugar River @ 69, May-Oct	59.2	0.15	.075	6,758
Sugar River @ 69, Nov-Apr	51.4	0.09	.075	1,174

Table 3 - Pounds to be offset based on averaging period and time

Further investigation by DNR staff of the load reduction target indicates the 7,617 lbs/year value may be unnecessarily high. The MMSD calculations assume a streamflow volume of 31.0 and 24.3 MGD (for growing season and winter season, respectively). Long-term average values for Badger Mill Creek at the Bruce Street crossing USGS gauge are 11.6 and 9.4 MGD. With a lower assumed flow value, the annual load reduction target is also lowered. With updated flows, the annual reduction target could be 2,851 lbs/year.

Location and Averaging Period	Flow (MGD)	Phosphorus Concentration	Water Quality Standard	Pounds to offset per half-year
Bruce Street, May - Oct	11.6	0.2	0.075	2207
Bruce Street, Nov - Apr	9.4	0.12	0.075	644
TOTAL				2851

DNR developed the Pollutant Load Ratio Estimation Tool (PRESTO) to assist WPDES permittees with this type of adaptive management feasibility/eligibility evaluation. The PRESTO report for Badger Mill Creek Watershed shows an estimated 6,534 lbs/year of nonpoint source phosphorus loading based on model results. While model results are imperfect, the PRESTO number being much higher than the required offset helps to demonstrate that enough pounds are available within the watershed.

Additional factors that could be considered for authoring a viable adaptive management plan:

- The FCAP mentions that Nesbitt Pond improvements could reduce phosphorus loading by 1,600 lbs/year. It is noted that this option is costly. It could be incorporated into the plan as a back-up strategy.
- Low-cost practices that curtail agricultural sources of phosphorus within Badger Mill Creek may be more meaningful than the FCAP suggests. The FCAP focuses on agricultural fields within designated environmental corridors – totaling to 125 acres. Despite the perception of an urbanizing watershed, there are currently thousands of acres of agriculture that present opportunities for cost-effective near-term phosphorus reduction within the watershed.
- MMSD's analysis for water quality trading mentions that agricultural sources of phosphorus in the watershed are likely to give way to urban development. DNR agrees that this could preclude the use of certain agricultural practices for trading. Under adaptive management, however, the long-term land use change to new urban development (that meets ch. NR 151, Wis. Adm. Code, stormwater standards) will likely reduce phosphorus loading on its own, without MMSD pursuing these sites as adaptive management actions.
- It seems that MMSD has built considerable partner support for adaptive management via the stakeholder and areawide water quality management plan amendment process.

- Some compliance risk could be mitigated by keeping effluent diversion as a back-up strategy if adaptive management is not successful.

Regarding geography and point of compliance, because MMSD's phosphorus limit is calculated based on Badger Mill Creek, there is limited ability (per state and federal law) to expand a watershed-based compliance option into the Upper Sugar River Watershed. EPA clearly indicated that trading with sources in the Upper Sugar River Watershed is not allowable. Adaptive management carries some additional flexibility, though s. NR 217.18, Wis. Adm. Code, mandates that a discharger's receiving water achieve the phosphorus standard. In DNR's 3/21/23 email communication to MMSD, it is acknowledged that while adaptive management efforts may combine the Upper Sugar and Badger Mill Creek watersheds, the adaptive management plan must define a path for meeting phosphorus standards within Badger Mill Creek before its confluence with the Upper Sugar. DNR's position on this has not changed.

DNR would be receptive to an adaptive management plan that includes a monitoring point in the Sugar River to gauge adaptive management progress across both watersheds. Final compliance would need to be demonstrated via standards attainment in Badger Mill Creek within the 10-20 year adaptive management timeframe. This is not unlike how Yahara WINS is set up, geographically, with regards to Badfish Creek and the larger Yahara River action area.

2. **<u>Inter-Basin Water Transfer.</u> What is DNR's position on inter-basin water transfer?**

Interbasin transfers or watershed to watershed transfers of water are not specified in ch. NR 121, Wis. Adm. Code, as a reason to approve or deny an areawide water quality management plan amendment request. There are situations, however, where an interbasin transfer of water is a consideration for DNR decisions. In chapter 281 of the Wisconsin Statutes, "interbasin transfers" are specifically identified as a consideration for reviewing new high-capacity water withdrawals and water withdrawals for the Great Lakes basin. The term is described in s. 281.344(1)(k), Wis. Stat. as "a transfer of water from the Great Lakes basin into a watershed outside of the Great Lakes basin or from the watershed of one of the Great Lakes into that of another."

In this case, MMSD is not proposing to transfer water out of or within the Great Lakes basin, nor is it proposing installation of a new high capacity well. As such, a proposal from MMSD that involves an interbasin water transfer may be an element of the amendment that is reviewed by the DNR but would not be a controlling factor in an approval or denial.

3. **<u>Coldwater v. LFF Subcategory Designation.</u> There remain questions and uncertainties about which of the various sources control (NR 102, NR 104, various DNR mapping datasets) when it comes to assigning Badger Mill Creek (or portions thereof) as being a Cold Water community or a Limited Fish Forage community, and ultimately whether the water quality criteria in NR 102.04(4(a)3. Or NR 102.04(4)(a)6. Apply. Can you offer any additional clarification?**

The current effluent limits for the Badger Mill Creek discharge were set at the point of discharge using chapters NR 102, 104, 105, 106, 207, 210, and 217 of the Wisconsin Administrative Code, as well as historical and current information about the fish and aquatic life residing in the stream. Designated uses for waterbodies are regulated under chs. NR 102 and 104, Wis. Adm. Code.

The current stream classifications for Badger Mill Creek are as follows:

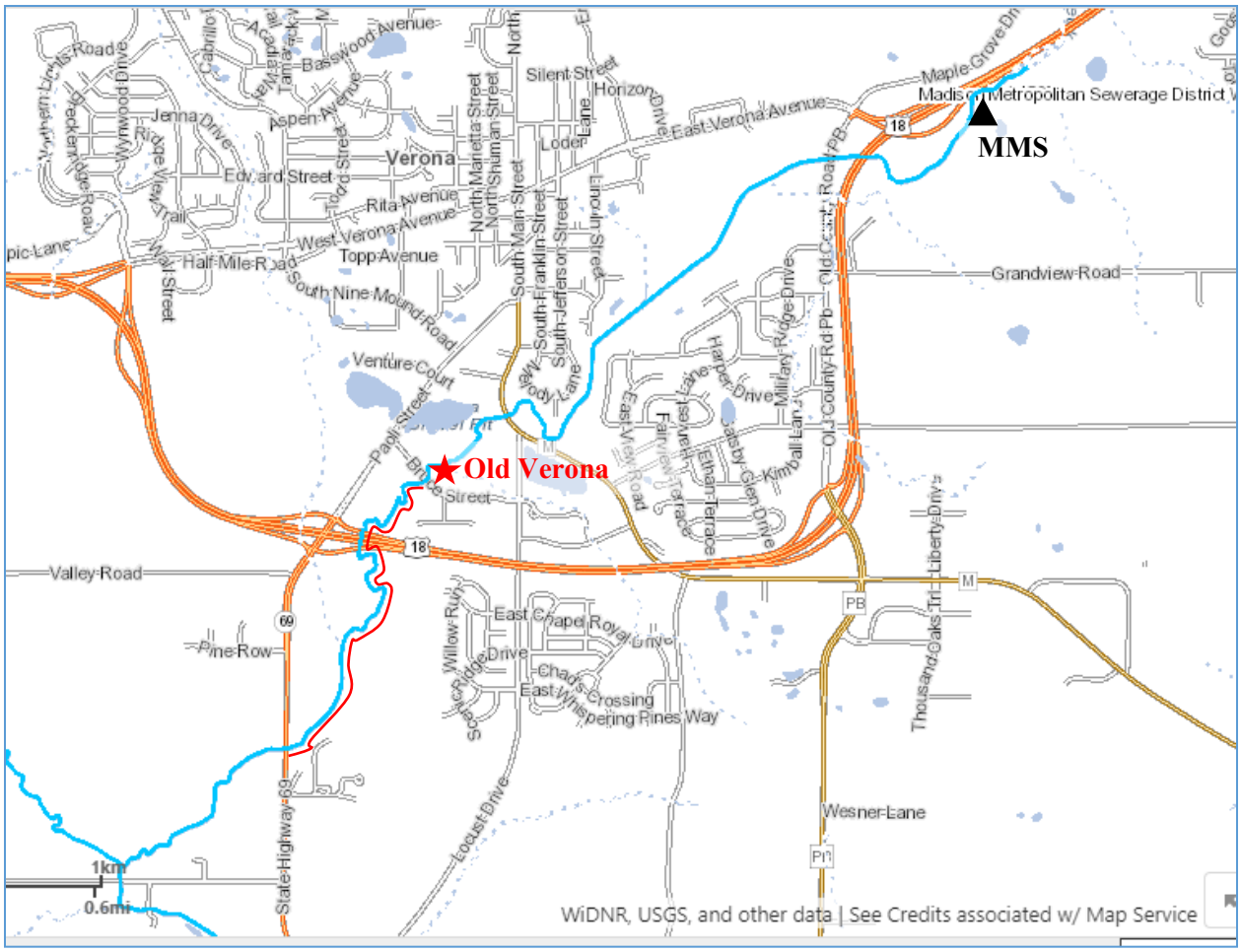
- Upstream from Bruce St. (old Verona treatment plant) is coldwater.

- Downstream of Bruce St. to State Highway 69 is Limited Forage Fish (LFF) per ch. NR 104, Wis. Adm. Code.
- Downstream of STH 69 to the Sugar River is coldwater.

Stream classification explanation:

- Badger Mill Creek qualifies as a "cold water community" fish and aquatic life designated use under s. NR 102.04(3)(a), Wis. Adm. Code, which states that the coldwater community subcategory "includes surface waters capable of supporting a community of coldwater fish and other aquatic life or serving as a spawning area for cold water fish species." Badger Mill Creek has an existing, documented trout (i.e. coldwater) community, and was classified as a Class II trout water in 2008 from the confluence with the Sugar River to just upstream of the MMSD outfall.
- Table 3 of ch. NR 104, Wis. Adm. Code, lists surface waters that are assigned to variance categories under s. NR 104.02(3), Wis. Adm. Code. Badger Mill Creek was listed in Table 3 as a Limited Forage Fishery (LFF) in 1977 "from road at Verona STP downstream to STH "69""; i.e. from Bruce Street to State Highway 69 (see map). Upstream of the old Verona treatment plant is not listed as LFF in code, and therefore the coldwater use is appropriate for the segment upstream from the old Verona plant.
- A 1996 memo from Duane Schuettpelz (DNR) stated the intention to remove the LFF designation from Badger Mill Creek. Removal of the historic LFF portion from the code would require revisions to ch. NR 104, Wis. Adm. Code. The DNR has been making efforts to update this chapter in recent years and continues to have that project on our "to-do" list. [Note: In various memos over time, there was discussion about whether coldwater or warmwater should apply to Badger Mill Creek. However, current conditions are documented as supporting a coldwater trout community.]

In light of the discrepancy between the appropriate designated use of coldwater and the historically assigned designated use of LFF for a portion of the stream, DNR and MMSD have worked over the years to negotiate permit limits that would be more protective than LFF for certain parameters. The 1999 Schuettpelz memo details QUAL2E modeling that was conducted to calculate effluent limits that would be protective of a downstream coldwater community in the Sugar River for certain parameters (BOD_5, dissolved oxygen (DO), ammonia, and TSS). This resulted in limits that were more stringent than LFF-based limits but less stringent than they would have been if they were calculated to protect for coldwater in Badger Mill Creek itself. However, MMSD's effluent quality is better than required in their permit. In later permits, thermal limits were based on an Alternative Effluent Limitation (AEL).



Map of Badger Mill Creek: On the map, the bright blue line shows the extent of the Class II Trout classification, from the Sugar River (also Class II Trout) to just above the MMSD outfall (black triangle). The red line shows the extent of the portion listed as Limited Forage Fish (LFF) in ch. NR 104, from the old Verona Sewage Treatment Plant (red star at Bruce Street) to Hwy 69.

4. **<u>Badfish Creek.</u> Can you clarify if the decision on this amendment request will have an impact on MMSD's ability to comply with water quality standards and their WPDES permit regulating the Badfish Creek discharge? Can you send us a copy of their current WPDES permit as well as a timeline for their permit renewal?**

   The Madison Metropolitan Sewerage District's (MMSD) WPDES permit expires on March 31, 2025 but is currently set for reissuance on October 1, 2025. MMSD will follow the current permit until the new permit is reissued.

   The Badfish Creek discharge (Outfall 001 in the WPDES permit) has a current design flow of 50 MGD. The DNR uses this design value to calculate effluent limits for wastewater dischargers. Since this design flow will not be changing, even with the potential addition of the Badger Mill Creek flow, MMSD will be able to meet the current and future permit effluent limits.

> From WQBEL Memo dated December 21, 2017, "*Antidegradation needs to be considered for all new or increased discharges of phosphorus consistent with ch. NR 217 Wis. Adm. Code. Since this is an existing discharge, the test for antidegradation is whether any of the effluent limitations is an increase discharge as defined in ch. NR 208 Wis. Adm. Code. "Increased discharge" means any change in concentration, level, or loading of a substance which would exceed an effluent limitation specified in a current WPDES permit. Except for ammonia, none of the effluent limitation outlined above, or in the attachment which addresses the proposed stream reclassification, would constitute an increased discharge as defined in ch. NR 207 Wis. Adm. Code as they are equal to or less than the existing permit limitation or are the first-time imposition of the limit."*

The Badfish Creek discharge is required to meet a Total Phosphorus limit of 0.075 mg/L 6-month average, and 0.225 mg/L monthly average. MMSD has chosen to implement an Adaptive Management Plan for this discharge to meet these limits. This is a long-term plan with a final compliance date of March 31, 2035 as reflected in the WPDES permit. An update to the Yahara WINS Adaptive Management Plan demonstrating that compliance with water quality standards can still be achieved with the inclusion of the Badger Mill Creek will need to be submitted with the permit application due on October 1, 2024. The DNR will review the plan for approval.

MMSD will need to document that the waste load allocations contained in the EPA approved "Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Rock River Basin" are sufficient to offset the increased mass loads of total phosphorus (TP) and total suspended solids (TSS) associated with returning the Badger Mill Creek discharge to Badfish Creek.

MMSD currently has a WQS Variance for both Mercury and Chloride. If it is determined that there is reasonable potential to exceed either the mercury or chloride WQBEL calculated limits with the addition of the Badger Mill Creek flow, MMSD will need to show that additional flow would not result in lowering of ambient water quality in Badfish Creek and the Yahara River to continue the WQS Variances.

A copy of MMSD's current WPDES permit is attached to this letter.

5. **<u>Wetlands.</u> It has been suggested that the impact of the proposed amendment on the wetlands along Badger Mill Creek, and their functional values as outlines in NR 103, must be considered in the decision. Can DNR weigh in on the applicability of water quality standards for wetlands contained in NR 103 as it relates to this proposed amendment?**

   In general, DNR's authority to regulate activities impacting wetlands is prompted by a discharge of a pollutant or discharge of dredged or fill material into wetlands. Section NR 103.06(1), Wis. Adm. Code, provides a non-exhaustive list of activities that are subject to the wetland water quality standards under ch. NR 103, Wis. Adm. Code. Where there is no proposed discharge to wetlands, or in this case the removal of a discharge, DNR does not have authority to impose requirements under the ch. NR 103 wetland water quality standards.

If you have further questions, please let us know.

Sincerely,

Timothy R. Asplund
Monitoring Section Manager
Bureau of Water Quality

Cc: Alixandra J. Burke, Attorney, Wisconsin DNR (email)
Tim M. Ryan, Field Operations Director, Wisconsin DNR (email)
Ashley J. Brechlin, Wastewater Engineer, Wisconsin DNR (email)

Attachments:

1. Madison Metropolitan Sewerage District WPDES Permit

Appendix C – Public Comments

MMSD Amendment to DCWQP: Nine Springs WWTP Effluent (#2308)

Summary of Public Comments (through July 26, 2024)

Name – Organization	Date Received	Disposition[i]	Summary of Comments[ii]	Staff Notes
Larson, JJ / Rogers, Charlie – Village of Cottage Grove Utility Commission	7/10/2024	For	Commend MMSD for analyzing various potential solutions; data supports the proposed solution; stream no longer relies on District effluent to survive and will be more natural and healthier once effluent removed; cites reasons by MMSD for approval and urges to consider entire District service area and communities	
Szot, Shaun	7/10/2024	Against	Qualities as a trout fishery per DNR report; potential impacts on DO and temperature; climate change mitigation should not only focus on emissions but also on protecting coldwater resources	
Lane, William	7/10/2024	Neutral	Suggests that reduction in base flow is a legitimate concern for the Water Quality Plan; refers to Section 208 of Federal Water Pollution Control Act of 1972 which directs to consider adverse impacts on water use and aquatic life	Comment made in follow-up to previous commentary
Hutchinson, John	7/10/2024	Against	Impacts to trout population; improvement efforts by SWTU	
Fries, Greg / Mayor Rhodes-Conway, Satya – City of Madison	7/10/2024	For	Between tertiary treatment and diverting flow from BMC, support the proposal; adaptive management previously determined to be not viable; cost implications; suggest the stream due to reasons beyond effluent and is viable on its own; effect on Badfish Creek within permit limits	
Ramseier, Lizbeth	7/10/2024	Against	Personal account of creek and nature	
Johncox, Jennifer	7/10/2024	Against	Personal account of wildlife	
Miller, Richard and Sally	7/10/2024	Against	Describes qualities and investments of BMC corridor; suggest that much will be lost if effluent stopped	

Jimenez, Heidi – Pines Bach LLP, on behalf of City of Verona	7/10/2024	Against	(See letter for full commentary) Identifies 3 main deficiencies with MMSD proposal, including ignoring DNR's public trust doctrine, ignoring presence of wetlands, and ignores climate change impacts	
Johnson, Kathy	7/10/2024	Against	Describes existing qualities of stream corridor, aided by effluent; loss of flow will render public funds wasted; concern for loss of flow and impacts to stream; personal account of loss of flow and wildlife during trial shutdowns; urges to consider adaptive management	
Wells, Topf	7/10/2024	Against	Response to assertions made in Tom Wilson comments, addressing cost of tertiary treatment, viability of adaptive management, relative impact on flow and ecology, historical conditions in BMC prior to effluent return	
Bohanan, Robert – Upper Sugar River Watershed Assoc	7/10/2024	Against	BMC is a ecological asset; concern for shift in water balance between watersheds; Stakeholder group projects don't have potential to counteract the loss of effluent flow; BMC will be more susceptible to climate impacts; interaction of base flow, discharge, and dissolved oxygen will be disrupted; effluent crucial to improvements of BMC and resiliency to weather; urges further assessment	
Perry, Ernie	7/10/2024	Against	Fishing and other ecosystems will be negatively impacted by stopping flows	
Nehls-Lowe, Henry	7/10/2024	Against	BMC is an improving Class II trout stream with chance to become Class I; the selected alternative is the easy way out and will harm stream; urges other alternatives	
Hess, Jim	7/10/2024	Against	Loss of effluent will negate significant investments made in the creek; MMSD has other options	

Wilson, Tom – MMSD Commission	7/9/2024	For	District's mission and regulatory requirements can be in conflict at times; financial constraints were a significant factor in decision-making; discussion of alternatives considered by MMSD, adaptive management preferred; acknowledges possible detrimental impacts to BMC and Badfish Creek, but only feasible and financially responsible option was cessation of flow; MMSD committed to stream health through Stakeholder Group and $1M investment of projects	
Musser, Steve – Southern WI Trout Unlimited	7/9/2024	Against	Success in efforts to improve stream over 25 years (since effluent return began) with effluent being vital to that; suggests alternatives to comply with phosphorus requirements; likely to only support warmwater fishery after cessation of effluent; temperature benefits of effluent; suggests stated natural increase in baseflow is overstated by MMSD and negates to consider climate change (more droughts / intense rainfall); Stakeholder group projects unlikely to mitigate loss of flow	
Krauskopf, Thomas	7/9/2024	Against	Loss of effluent will negate significant public and volunteer investments; local and regional resource; maintain water balance	
Lane, Bill	7/9/2024	Neutral	Historical background on the hydrologic impacts of diverting Verona wastewater to MMSD and the decision to return effluent flow to Sugar River (via BMC); urges to consider hydrologic implications of the amendment	Mr. Lane is the former Director of Environmental Resource Planning for DCRPC (during time of original amendments in 90s)

Christian, Brian	7/9/2024	Against	(See letter for full commentary) Overview of stream corridor and investments made; impacts of effluent on the stream health (both positive from current effluent discharge and negative impacts on flow, fishery, and temps by removal of effluent); investments made in and along the stream; unique condition and reference to principal purposes of water quality regulations; adaptive management approach	
Falk, Kathleen	7/9/2024	Against	Reference to widespread, long-term collaboration to improve BMC to the coldwater fishery that it is, with effluent being critical piece to that; surprise to many that MMSD selected this approach despite widespread lack of support; suggests CARPC conduct Environmental Impact Statement on topic of effluent withdrawal (for this and future such occurrences)	Ms. Falk is the former Dane County Executive (1997 – 2011)
Williams, Paul	7/9/2024	Unknown	Urges to not support rules enabling discharge of effluent to BMC, referencing high quality of stream flows	Apparent error text in as written, or a misunderstanding of proposed amendment
Wells, Topf	7/8/2024	Against	Suggests that basis of MMSD argument relies on narrow view of law and classification of BMC as a warm water forage fish system per wastewater standards, despite the presence of coldwater fish (and as supported by DNR biologists); implied charge of CARPC based on historical accounts	Designated Uses and subcategories of the Fish and Aquatic Life Use are contained in NR 102
Eskrich, Sara – MMSD Commission	7/8/2024	For	Reference to Compliance Alternatives considered and decision by MMSD to select this option (effluent discontinuation) as the best alternative; outline of CARPC's scope	Analysis of phosphorus compliance options are discussed in the FCAP report.
Sonzogni, William	7/7/2024	Against	Urges to keep effluent flow, based on successful human intervention to address problem.	References original 1990's amendment to return water to BMC

Norsetter, Jan	7/7/2024	Against	Describes existing qualities of BMC corridor and concern for lost of recreation due to loss of effluent flow; inquires on cost of phosphorus mitigation and project details; refers to Badfish Creek resident concerns.	
Martens, Kara	7/7/2024	Against	Suggests removing flow would harm fishery; urges to consider other options.	
Kose, Brad	7/7/2024	Against	Describes negative impacts to BMC if effluent removed; suggests adaptive management as preferred alternative.	
Cook, Walt	7/7/2024	Against	Describes negative impacts to BMC if effluent removed, citing WDNR and MMSD studies; suggests adaptive management as preferred alternative.	
Hyer, Greg	7/6/2024	Against	Suggests removing flow would harm fishery; suggests adaptive management as preferred alternative.	
Rayment, Ivan	7/6/2024	Against	Suggests removing flow would harm fishery.	
Bergen, Pat – Friends of Badger Mill Creek Env Corridor; Ice Age Trail member	7/5/2024	Against	Provides letter describing qualities of BMC, other water sources and possible related water quality impacts, and Stakeholder Group focused on replacing lost volume; proposes adaptive management as an alternative, management through EWRs, and enhanced phosphorus removal treatment; cites communication from MMSD and WDNR regarding effects to BMC; provides pictures.	Badger Mill Creek Stakeholder Group Website
Beecher, James	7/5/2024	Against	Describes qualities of BMC as a coldwater stream and significant conservations efforts in recent decades to improve stream corridor; suggests alternatives to reaching phosphorus requirements.	Analysis of phosphorus compliance options are discussed in the FCAP report.
Dutilly, Henri & Kathy – Friends of Badfish Creek Watershed	7/1/2024	Against	Described efforts Friends of Badfish Creek have undertaken to improve the creek corridor. Against amendment due to concern for additional phosphorus loading and additional volume.	
Frank-Loron, Rhonda & Andrew	6/25/2024	Against	Supports implementing additional treatment practices to remove phosphorus (and other contaminants); refers to concern during 1990's amendments for inter-basin water transfer.	

Danky, James – Friends of Badfish Creek Watershed	6/13/2024	Against	Against adding additional phosphorus to Badfish Creek, suggesting that approach to remove P from effluent is preferred.	
Wells, Topf – Southern Wisconsin Chapter of Trout Unlimited (SWTU)	6/12/2024	Against	Questions on CARPC process; references to historical decisions; reference to various sources suggesting detrimental impact to health of stream and fishery; commentary on the quality of the MMSD process to engage the public during their analysis of phosphorus compliance options.	Analysis of phosphorus compliance options are discussed in the FCAP report.

Notes:

[i] Disposition, unless expressly stated in correspondence, is based on CARPC Staff's interpretation of the correspondence.
[ii] Summary of comments represents CARPC Staff's interpretation of the correspondence and is intended to be very brief. The reader is encouraged to refer to the full correspondence to understand context and for additional detail.

Fwd: CARPC, Badger Mill Creek, and MMSD

Topf Wells <topfwells@gmail.com>
Wed 6/12/2024 8:47 PM
To:Nick Bower <nickb@capitalarearpc.org>

I'm trying to send this letter to Mr. Valerius and through him to the Commission. I'm not sure I have his correct email. Would you please send it to him and if appropriate and possible to the Commission? Sorry to bother you; hope you are well, Topf Wells

---------- Forwarded message ---------
From: **Topf Wells** <topfwells@gmail.com>
Date: Wed, Jun 12, 2024 at 8:36 PM
Subject: CARPC, Badger Mill Creek, and MMSD
To: <jasonv@capitalarearpc.org>, Caryl Terrell <carylterrell@charter.net>

Dear Mr. Valerius,

Welcome to CARPC and the challenges and opportunities you and your colleagues face. You'll work in interesting times.

By way of introduction, I'm most concerned about Badger Mill Creek (BMC), MMSD, and CARPC's role in protecting (I hope) the creek for several reasons.

I'm the vice-president of the Southern Wisconsin Chapter of Trout Unlimited (SWTU). SWTU has devoted 30 years of support for and volunteer efforts on behalf of Badger Mill Creek and thinks that MMSD's decision to stop the flow of effluent to the creek will substantially harm it. I represented SWTU during MMSD's public outreach and decision making process and currently serve as its representative on the MMSD stakeholder effort.

I served for three years on the MMSD Commission. I know MMSD's functions, mission, and governance well. The health of Badger Mill Creek was always one of my concerns as a Commissioner, one which I frequently championed.

I was County Executive Kathleen Falk's Chief of Staff, when she led the negotiations to create CARPC and staffed her in that effort. One of the principal reasons for the replacement of the Dane County Regional Planning Commission with CARPC was to have a regional planning commision better able to make the tough recommendations and decisions needed if Dane County was to preserve its natural resources in the face of continued and high growth. The review of MMSD's decision will test how successful those reforms were.

1. Questions.

In the latter stages of MMSD's deliberations re: BMC, several advocates for the creek, myself included, reviewed DNR letters and met with DNR attorneys and staff and CARPC staff regarding CARPC's and the DNR's review of MMSD's decision. The review will occur because MMSD's decision to stop the discharge of its water to BMC requires an amendment to the Area- Water Quality plan. We were

explicitly assured that this review would be public, meaningful, transparent, and not a pro forma exercise. MMSD was not guaranteed approval of its decision.

We were also informed that the review could include more study of the issue. Is this how the review will occur? What details can you now provide regarding the timing of the review and the means by which the public will participate? Will the review be substantial and meaningful-- that is, will CARPC have the option of recommending that the DNR not approve MMSD's decision? Will CARPC be able to seek more information if staff, you, and the Commission believe it's needed?

The MMSD mitigation process has brought to light new information, analysis and conclusions concerning the loss of water in BMC. The MMSD staff report and recommendation suggested that discontinuing the effluent would not hurt the creek and might even benefit it. The DNR Fish Management and Water Quality presentations demonstrated a high probability that that assertion was wrong and that the creek would almost certainly be harmed. The current DNR assessment of BMC shows that it is an improving Class 2 trout stream. The DNR's extensive review of BMC's history demonstrated that the treated effluent was a major factor in the improvement of the creek. One example of the possible effects of the loss of that water occurs downstream of old PB and above Lincoln Street. That segment holds trout and Dane County spent at least $200,000 in trout habitat restoration. In the future, that might only support a warmwater forage fish community. Will CARPC be able to consider such new information in its discussions and decision?

Will CARPC have the current health of the creek as an important consideration? That might seem like a stupid question with the answer being yes. Lately however the notion that perhaps having the creek revert to its pre-effluent stage is okay or preferable.

That is wrong because it ignores one of the reasons for the transfer of water to BMC and the current value of the stream. The value of the stream is extraordinary. Healthy, improving Class 2 trout streams, in particular those with a decent chance of improving to Class 1, are rare in rapidly growing metropolitan areas. The creek is a convenient source of many forms of high quality outdoor recreation to folks of different ages, economic levels, and ethnicities. I participated in the original discussion regarding BMC and MMSD effluent. One reason the discharge was approved was the hope that it would benefit the creek, which was vulnerable to many of the effects of urbanization. Experts were divided on the likelihood of benefits but those have been clearly realized. Had the policymakers then decided that it was okay to keep BMC in its then current and vulnerable state, the transfer of water would never have been approved. Shutting off the MMSD water will return BMC to that vulnerability, probably made worse by the accelerating growth of the metro area.

To what extent is MMSD's process in making its decision relevant to CARPC's review? In my judgment that process was as bad as I've encountered in 30 years of public service at the state and local levels. The MMSD Commision was not involved in the process as it had been when it approved Adaptive Management for the Yahara watershed. Staff misrepresented or did not report the DNR Fish Biologists' concerns about withdrawing the MMSD water from BMC. MMSD management stated that Adaptive Management was not possible in the BMC/Upper Sugar River watershed, which is not what advocates for the creek (including me) and local officials heard directly from DNR staff who run that program. MMSD staff failed to note the work of their own consultant, whose report stated that the loss of effluent would possibly harm trout spawning in BMC, one of the most critical factors in a healthy trout stream.

I'll cite a couple more critical flaws but one could fairly note that a bad process does not necessarily produce a bad result. With all the budgetary, energy-using, and conservation factors the MMSD Commission had to consider, perhaps shutting the water off is the responsible choice. The problem with the flawed process is that it did not present the Commission with the information to make that difficult decision responsibly. The Commission believed it could stop the water and not hurt and probably improve the creek. The $1 million to maintain or improve the creek was insurance that the creek would not be harmed. I attended the public hearing and Commission meeting during which the Commission deliberated and then voted on its recommendation. The Commission would not have decided to stop the water to BMC if the staff report had indicated the loss of water would hurt the creek.

Critical flaws enabled the report to erroneously provide those assurances to the Commission. The staff asserted that increased baseflow from increased precipitation and increased infiltration was the reason for the creek's improvement. Climate change would produce more precipitation and thus more infiltration, more baseflow, and a stable or improving BMC. The effluent brings more water to BMC than the increased precipitation and infiltration. As noted, the DNR analysis shows that the effluent has been critical to BMC's improvement. As the staff report reached the Commission, this region was in the midst of a 2.5 year drought. That illustrates how climate change is really occurring. Our region will have years of increased precipitation but also years of heat waves and drought. In some years the precipitation will largely infiltrate and increase baseflow. In other years the precipitation will occur in downpours or other extreme events. Not much infiltration and some destructive floods will occur during those years. Advocates for BMC begged MMSD staff to include a more thoughtful and nuanced analysis of the effects of climate change on the creek to no avail.

The stakeholders have spent much of our time on flow augmentation and increased groundwater recharge because many of us are convinced that the loss of water will hurt the creek. Unfortunately, it doesn't appear that any option or combination of options will offset the water MMSD will withhold.

2. Public Trust.

At the first session of the stakeholder process, Laura Hicklin, Director of the Dane County Land and Water Department, Mike Sorge, Water Quality Supervisor for the Southern District of the DNR, and I spoke of the extreme damage MMSD's process and decision did to the public's trust in MMSD (we spoke independently without any prior discussions with one another), Miichael Mucha acknowledged and apologized for that damage at the next meeting. However, he did not recognize how MMSD failed. One problem was the flawed process MMSD staff, management, and Commission followed. Another was the incredible lack of response to the public during MMSD's outreach. Many questions in many settings were ignored. At one meeting with BMC advocates and local government officials, including the Mayor of Verona, MMSD completely ignored that group's offer to help MMSD explore the possibility of Adaptive Management. At meeting after meeting MMSD staff promised they had not yet decided what option to recommend to the Commission. After each of those meetings advocates would discuss the proceedings and what they heard from other attendees. I've never heard anything like those responses and reports-- absolutely no one believed MMSD staff. Everyone believed that MMSD staff and management had decided to recommend stopping the discharge.

All that may seem to be MMSD's problem. It also creates a challenge for CARPC. Many folks now look to CARPC for a fair and meaningful review of the phosphorus compliance options MMSD has. We hope and expect CARPC will give BMC a fair shake after MMSD has failed to do so. We don't think MMSD has justified its request for an amendment to the Area-wide Water Quality Plan The reasons

for approving the transfer of water back to the Sugar River basin via the discharge of treated effluent to Badger Mill Creek are still valid today.

For its own credibility CARPC has to learn from MMSD's mistakes. It should offer a fair and transparent process with ample opportunity for public input and more study of BMC if that's needed. CARPC must show a genuine concern for the health of BMC and value it as one of Dane County's important natural resources. Any CARPC process that strikes the public as pro forma or pre-determined in MMSD's favor will hurt CARPC badly.

Thank you for your patience in reading this and for your consideration of my concerns. Will you please share this with the CARPC Commissioners early in their deliberations about MMSD and Badger Mill Creek?

Thank you,

Topf Wells

Fw: CARPC Badfish Creek

Tanya Sime <tanyas@capitalarearpc.org>
Thu 6/13/2024 3:37 PM
To:Nick Bower <nickb@capitalarearpc.org>

Tanya Sime
608-474-6017

From: JAMES P DANKY <jpdanky@wisc.edu>
Sent: Thursday, June 13, 2024 3:35 PM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: CARPC Badfish Creek

The Badfish has been the effluent ditch for Madison and Oregon since the 1950s when the small creek was sacrificed in order to save Madison's lakes. Adding to the already considerable phosphorus load in the Badfish is a poor idea and once again rooted in expediency. MMSD can do a fine job of treating waste but needs to radically enhance its removal of phosphorus rather than dumping it into our Creek and shortly thereafter into the Yahara and Rock Rivers. Treating our neighbors in Rock County in such a fashion is most short sighted.

Respectively,

James P. Danky
Member
Friends of Badfish Creek Watershed
and
Adjunct Curator of Comics
Museum of Wisconsin Art
https://wisconsinart.org/exhibitions/comics-and-politics/
Future of Print Project
School of Journalism & Mass Communication
University of Wisconsin-Madison
Cell: (608)239-7587
jpdanky@wisc.edu
https://www.facebook.com/futureofprintproject

Fwd: Delivery Status Notification (Failure)

Rhonda Frank-Loron <rhondafrankloron@gmail.com>

Tue 6/25/2024 9:43 AM

To:Info <info@capitalarearpc.org>;Nick Bower <nickb@capitalarearpc.org>;Tanya Sime <tanyas@capitalarearpc.org>
Cc:Andrew Frank-Loron <frankloron@gmail.com>

Hello -

I am unable to attend the July 11 hearing to voice my opposition to redirecting the water currently discharged into Badger Mill Creek.

Rather, I support Madison Metropolitan Sewage District (MMSD) build a treatment plant to remove phosphorus and other chemicals causing harm to our environment and communities. I understand there are also recommendations to alter farming practices and access to lawn chemicals contributing to these issues. I agree this should also be pursued.

However, additional water filtration is going to be important as we become more aware of PFAS and other hazards. Not building a treatment plant and spreading the harm to another creek is a penny wise and a pound foolish. Invest in our future instead of kicking the can down the road for our children and grandchildren to deal with it.

Do better. Set an example for others. Be brave. The silent majority support water treatment. The flora and fauna that have made this creek home support water treatment.

Additionally, the purpose to use Badger Mill Creek in the first place was to return water from where it came from. How will the water displaced to MMSD through our sewers be replaced to Verona if water is redirected?

Thank you for the opportunity to share my and my family's position against the redirection of water to BadRiver Creek.

Respectfully,
Rhonda and Andrew Frank-Loron
Verona, WI

Fw: Comments for July 11 Public Hearing

Tanya Sime <tanyas@capitalarearpc.org>

Mon 7/1/2024 10:47 AM

To:Nick Bower <nickb@capitalarearpc.org>

Tanya Sime
608-474-6017

From: Kathy and Henri Dutilly <henriandkathydutilly@yahoo.com>
Sent: Monday, July 1, 2024 9:13 AM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: Comments for July 11 Public Hearing

Please share the below comments at the July 11th Public Hearing on the proposed amendment to revise the discharge locations of effluent from Nine Springs Wastewater Treatment Plant. Thank you:

We are writing as members of Friends of Badfish Creek and as enthusiastic kayakers on the creek. The Badfish is a great paddle—it's clear, cool, fast in spots with a variety of scenery. Over the years, members of this group have put in many hours to make this creek easier and safer to access. Members clear obstructions all year long and have improved landings in a number of spots by clearing brush to create safe parking, building kiosks with info, adding signage on nearby roads and spreading mulch to create easy put-ins and take-outs. They've also spent hours meeting and writing grants to help fund these projects, and the result has been a big increase in the numbers of users. Parking lots often have quite a few cars with racks of kayaks and canoes, even paddle boards. The creek has become a great asset for this part of Dane County, and its quality should NOT be compromised by additional phosphorus and the additional volume of effluent which will further erode the banks.
Henri and Kathy Dutilly

Fwd: Save Badger Mill Creek

Tanya Sime <tanyas@capitalarearpc.org>

Sat 7/6/2024 7:33 AM

To:Nick Bower <nickb@capitalarearpc.org>

Get Outlook for iOS

From: James Beecher <jamesfbeecher@gmail.com>
Sent: Friday, July 5, 2024 4:29:16 PM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: Save Badger Mill Creek

I urge you to require the Madison Metropolitan Sewer District to discharge treated wastewater into Badger Mill Creek.

The creek is a high quality cold water stream supporting trout. There are few such cold water streams in Dane County and this one is conveniently close to the large population. It also adds beauty to the Ice Age Trail. The Sugar River also benefits from the cold water.

In recent decades, Badger Mill Creek has benefited from restoration and preservation efforts. A large amount of volunteer and hired manpower and money has been provided by local conservation organizations, Dane County and the City of Verona.

The cost of phosphorus removal in sewer water is an insult to these efforts and expenses. There are other and possibly better means of reducing phosphorus in wastewater.

James F. Beecher, PhD

Fwd: Save Badger Mill Creek

Tanya Sime <tanyas@capitalarearpc.org>
Sat 7/6/2024 7:34 AM
To:Nick Bower <nickb@capitalarearpc.org>

1 attachments (809 KB)
Solutions for Badger Mill Creek and Badfish Creek.docx;

Get Outlook for iOS

From: pat bergen <bergen_pat@yahoo.com>
Sent: Friday, July 5, 2024 10:45:06 AM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: Save Badger Mill Creek

Solutions for Badger Mill Creek and Bad Fish Creek

Pat Bergen – Stakeholder Representative, Friends of Badger Mill Creek Environmental Corridor, Ice Age Trail member, Dane County Parks Certified Land Steward, City of Verona Parks Volunteer

Please do not approve the shut off of our return water to Badger Mill Creek.

Friends of Badger Mill Creek Environmental Corridor definition of Health and Resilience

A **Class 2 trout steam** with robust natural reproduction (as characterized by WDNR) **from County Old PB to the Sugar River**, as a baseline standard, able to withstand short term disturbances and long-term changes, with **water quality and quantity** throughout the year able to support and maintain BMC's aquatic, riparian and **watershed ecosystem status**, **animal ecological communities**, comparable to current conditions, for the enjoyment of **natural and scenic beauty by the people**.

Madison Metropolitan Sewer District (MMSD) has promised to "do no harm to the Badger Mill Creek."

WDNR - Department fishery staff have told MMSD staff that permanently eliminating the affluent stream to the badger Mill Creek will likely have deleterious impacts to the brown trout population and brown trout natural reproduction and recruitment. Historical data shows the increase in flow and stabilization of temperature have been beneficial to the trout population and its abundance in the Badger Mill Creek. The effluent stream mimics a groundwater spring that contributes warmer stable water in the winter and colder water in the summer."

We cannot allow Badger Mill Creek, a Class 2 Trout Steam, to be converted into a street sewer.

If MMSD is allowed to shut off our water, the predominate source of water at the headwater would be from Badger Mill Creek Pond, a street sewer pond, that joins the ***Upper Badger Mill Creek***.

If Badger Mill Creek Pond is the only initial source of water for the ***Upper Badger Mill Creek***, the temperature of the very thin stream water layer will rise dramatically as the sun's rays heat the brown clay bottom underneath, with very

little shade, and will take the already much warmer pond water, and multiply it with the sun's effect which will impact the quality of water to sustain Brown Trout.

Our return water, and Badger Mill Creek Pond water, each have unique characteristics. The mixing of our return water with Badger Mill Creek Pond water has symbiotically produced beneficial water for our Nature Area, for animals and people, using otherwise waste water. Using "grey" water for a good purpose.

The **Stakeholder Group**, *(which has been limited to only discussions assuming that our return water will be turned off),* has identified baseflow augmentation and groundwater recharge, to replace the possible loss of our return water from MMSD, as our primary focus. In our opinion, **we have been unable to find any significant, steady, and reliable sources of replacement water for our return water from MMSD**

Bad Fish Creek already has a fish eating advisory for MERCURY and PCB. 10% more detoured phosphorus and chloride water from BMC will leave more legacy phosphorous and chloride in the creek. MMSD has no plans to improve the treatment of phosphorus in Bad Fish Creek, and will apply for a chloride variance in 2025, again, with no improved treatment in sight.

per WDNR – to choose the option of sending all water down Bad fish Creek, "MMSD will need to provide more documentation to demonstrate that the addition of Badger Mill Creek discharge to the Bad Fish Creek will not result in a lowering of water quality in either Badger Mill Creek or Badfish Creek."

It is now time to talk about solutions keeping our return water flowing.

Perhaps a mix of multiple ideas can be used to meet compliance.

To continue the return of treated water to Badger Mill Creek, we encourage the WDNR and MMSD working together to find a way to use **adaptive management** in Sugar River watershed.

The process will most likely require creating a TMDL for upper Sugar River.

If the measurement of compliance can be moved downstream from the convergence of the BMC and Sugar River, we may be able to obtain the needed farmland for the reduction of phosphorus.

Perhaps a mix of available farm land can be obtained by using farms, both to the north and south, to meet compliance.

The Upper Sugar River Watershed has been a huge source of development for the west side of Madison and Town of Verona. That growth will continue in the future.

Dane County has recently acquired the Durst Farm (625 acres) along the Sugar River and will create a watershed park with wetlands. This land is expensive, and required the resources of Dane County to complete. Many of the property purchases in the Sugar River corridor are recent acquisitions from the county, according to the release. These include 156 acres for the Sugar River Wildlife Area Rhiner Unit, 60 acres for the Sugar River Wildlife Area Davidson Unit, 102 acres of Public Hunting Easement next to Davidson, 378 acres for the Falk Wells Sugar River Wildlife Area and 95 acres for the Conservation Easement next to Falk Wells.

https://www.veronapress.com/news/parisi-announces-largest-conservation-purchase-in-county-history/article_8d53d8d4-412c-11ee-97c9-33dd02042a85.html

Fortunately, there is the already established Upper Sugar River Farmers group employing ecological farming practices now, that may be available to spring board the project.

https://uppersugar.org/Farmers_for_the_Upper_Sugar_River

Employ **Ecological Water Requirements** (EWRs) which refers to the flow regimen (quantity and timing of flows) as well as the water levels and water quality required to sustain water-dependent ecosystems. Supporting ecological water requirements is a key component of *environmental water planning,* which is

where the department manages water to enable economic and social uses while protecting environmental values. Understanding the requirements of species to complete their life cycle (or life history requirements) is one of the central components of determining EWRs**. In its simplest form this means protecting habitat - both ensuring that habitat of sufficient quality exists and that species have access to it at the right time**.

Long Run - Create a plan to fund a **state-of-the-art treatment plant** for all phosphorus, and possibly future mitigation of nitrogen and chloride (if required).

Coordinating phosphorus treatment integrated with the new waste treatment building should provide economies of scale, saving money in the long run.

Perhaps we could form a new stakeholder group to work with MMSD, to acquire funding for plant and equipment from governmental sources to treat **All** phosphorus, and possibly chloride and nitrogen.

Some say let's just make BMC be the same as it was 30 years ago. We cannot go back in time. The growth of homes and people in West Madison's BMC watershed area over the past 30 years has been gigantic. Stream water from the Madison section of Badger Mill Creek has been replaced with street sewer water stored in Badger Mill Creek Pond. Badger Mill Creek Pond will cost taxpayers $10.5 million to clean legacy phosphorus from the clay lined bottom that has accumulated. Madison just spent $17 million dollars to upgrade culverts to carry more water, quicker, to Badger Mill Creek Pond. Town of Verona and City of Fitchburg have grown 60%, and Verona has doubled in size. Future growth is imminent.

Some say let's just turn the water off and see what happens. We have pictures of what happens (see below) with our water shut off, and it is not pretty!

To detour our Badger Mill Creek return water to Bad Fish Creek would be bad for both Badger Mill Creek and Bad Fish Creek.

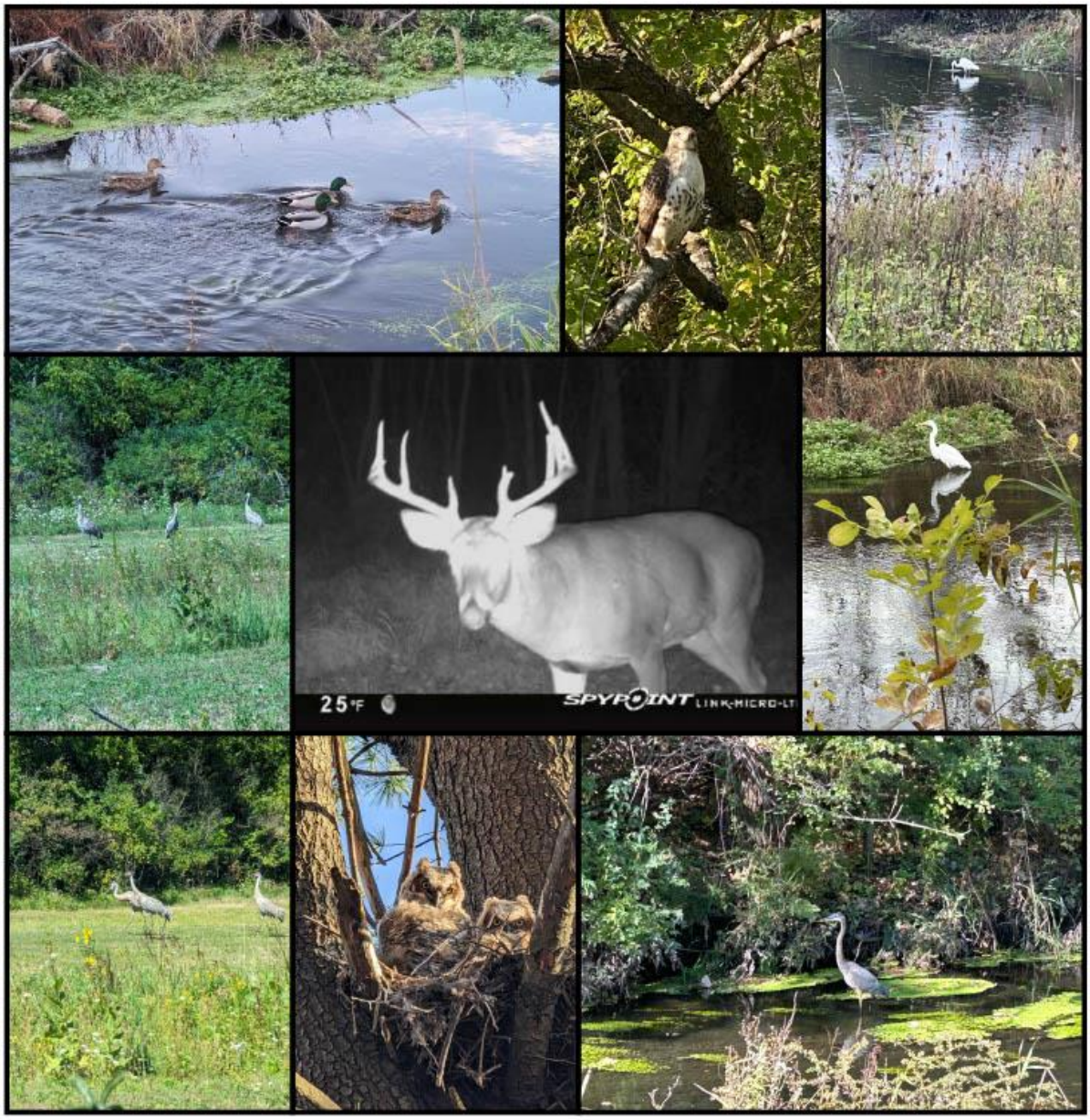
Let's work together to formulate a long-term solution.

We NEED to solve the problem. The real question is, "What will our quality of water be for us, and our children, for the next 30 to 50 years?"

Badger Mill Creek

Healthy and Resilient

Animals Depend on Badger Mill Creek



Badger Mill Creek
Unhealthy Water Levels

Fwd: Badger Mill Creek and MMSD

Tanya Sime <tanyas@capitalarearpc.org>
Sun 7/7/2024 9:43 AM
To:Nick Bower <nickb@capitalarearpc.org>

Get Outlook for iOS

From: Greg Hyer <greghyer@me.com>
Sent: Saturday, July 6, 2024 7:16:27 PM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: Badger Mill Creek and MMSD

CARPC Board

Please maintain existing discharges/ flows from MMSD in Badger Mill Creek in order to maintain and expand trout populations. There are adaptive management alternatives that have been used in other areas or phosphorous treatment options. The loss of the flows modeling document that trout habitat will be lost.

Thank you

Greg Hyer
Cross Plains

Magically sent through thin air

Fwd: maintain discharge into Badger Mill Creek.

Tanya Sime <tanyas@capitalarearpc.org>
Sun 7/7/2024 9:43 AM
To:Nick Bower <nickb@capitalarearpc.org>

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From: Ivan Rayment <ivan.rayment@gmail.com>
Sent: Saturday, July 6, 2024 6:17:08 PM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: maintain discharge into Badger Mill Creek.

Dear Members of Dane County's Regional Planning Commission:

I would like to encourage you to support continued discharge water into Badger Mill Creek. I am an avid fisherman and have long admired the efforts to improve this creek for fishing. It is one of the closest trout waters to Madison and is continually improving. It would be a tragedy to lose what has been gained. It is important to maintain this water as a way of encouraging our younger community to invest in the future of fishing. A decision to reduce the water flow will essentially kill this stream for high quality fishing and remove this resource from the community. Once lost this will be hard to regain.

yours sincerely

Ivan Rayment

Fwd: CARPC SHOULD REJECT MMSDs Badger Mill Creek Proposal

Tanya Sime <tanyas@capitalarearpc.org>

Sun 7/7/2024 2:44 PM

To:Nick Bower <nickb@capitalarearpc.org>

From: Walt Cook <walt.21@icloud.com>
Sent: Sunday, July 7, 2024 12:01:16 PM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: CARPC SHOULD REJECT MMSDs Badger Mill Creek Proposal

My name is Walt Cook, and I live near Verona, and I spend a lot of time hiking, and just relaxing, around the Ice Age Trail and Badger Mill Creek area in Verona.

It would be an absolute disaster to allow MMSD to move forward with their plans on Badger Mill Creek, as they are taking the easy way out in my opinion to try to deal with this phosphorus issue, and it will absolutely devastate Badger Mill Creek, as the loss of water and associated negative impact will be HUGE, based on studies by both the Wisconsin DNR, and also by MMSD's own consultant they used to evaluate this issue.

It is a "complete no-brainer" based on the FACTS that CARPC should reject MMSD's proposal to stop the discharge of water into Badger Mill Creek, as other affordable options exist that can be implemented to deal with the phosphorus issue, and/or MMSD can pursue Adaptive Management on Badger Mill Creek, similar to what they are doing on the Yahara watershed.

If CARPC does not reject this MMSD proposal, they are allowing MMSD to take the "easy way out" and destroy a beautiful trout stream full of wild fish, that feeds the spectacular upper Sugar River watershed (one of the great treasures in our state of Wisconsin), and provides solace to many, along with being a sanctuary for many other species of wildlife and birds.

One of the great legacies of Aldo Leopold is the many beautiful and protected public spaces we have in many of our more urban spaces in Madison and our surrounding areas, such as what presently exits in Verona with the Ice Age Trail and Badger Mill Creek, and also the many great partnerships that we have developed, and continue to develop, in our state between citizens, businesses, and public and private organizations, to positively impact our environment, and deal with issues such as we presently have with Badger Mill Creek.

I can GUARANTEE you that Aldo Leopold would be making many of the same points I have made, if he was alive today!

In summary, CARPC needs to reject this shortsighted proposal by MMSD, as the facts are abundantly clear that this will absolutely destroy Badger Mill Creek, and affordable alternatives exist that can be implemented.

Walt

Sent from my iPad

Fwd: Badger Mill Creek advocacy

Tanya Sime <tanyas@capitalarearpc.org>
Sun 7/7/2024 2:44 PM
To:Nick Bower <nickb@capitalarearpc.org>

Get Outlook for iOS

From: Brad Kose <bwkose@gmail.com>
Sent: Sunday, July 7, 2024 11:58:34 AM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: Badger Mill Creek advocacy

Hello -

I am a resident of Verona. I'm advocating to find another solution to MMSD shutting off the water to Badger Mill Creek, a class 2 trout stream and natural wildlife treasure that so many of us now enjoy, especially with the new accessible paths that have been built beside it the past 2 years. Shutting off this water will likely devastate this creek, the scenery, and the surrounding wildlife, which include deer, ducks, geese, coyotes, foxes, turtles, snakes, trout, and countless birds.

There are much better options such as Adaptive Management. Please let me know of any questions.

Thank you,
Brad Kose

--
The real safeguard of democracy is education.
FDR

Fwd: Badger Mill Creek request in front of CARPC

Tanya Sime <tanyas@capitalarearpc.org>
Sun 7/7/2024 2:44 PM
To:Nick Bower <nickb@capitalarearpc.org>

Get Outlook for iOS

From: Kara Martens <karalmartens@gmail.com>
Sent: Sunday, July 7, 2024 10:04:09 AM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: Badger Mill Creek request in front of CARPC

Hi,

Please consider not approving MMSD's plan to stop discharging water into Badger Mill Creek. Not only do we want to conserve recreational fly fishing in Dane Co, but more importantly we want to ensure our valuable trout population continues to thrive.

Please consider another option for MMSD to achieve its objectives.

Thank you!
Kara and Paul Martens
Residents of Madison

Fw: Badger Mill Creek comments

Tanya Sime <tanyas@capitalarearpc.org>

Mon 7/8/2024 7:10 AM

To:Nick Bower <nickb@capitalarearpc.org>

Tanya Sime
608-474-6017

From: Jan Norsetter <norsetter@gmail.com>
Sent: Sunday, July 7, 2024 3:05 PM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: Badger Mill Creek comments

Respectfully, I'd like to advocate for the continuation of water flowing into Badger Mill Creek. I'm not a scientist or engineer, just a pedestrian who values being able to walk along BMC and appreciate the wildlife that make their homes there. I walk along the creek 5 or 6 mornings a week. It's the perfect spot for getting my day off to a good start. There is a lot of wildlife around the creek: turtles, fish, ducks, geese, cranes, great blue herons, little green herons, foxes, and deer — and those are just the critters I can see. There are more birds and frogs I can hear but don't see. If the creek dries up these critters will lose their habitat and my friends and neighbors will lose an absolute gem of a recreation area.

I have not seen any explanation of costs concerning the phosphorus mitigation. I don't know if they exist and are or have been shared with the public. I'd be interested to know the particulars of this project. Also, I've read that the people living along the Badfish Creek are not thrilled with the idea of having so much more water heading their way.

I'd like to know what can be done to preserve our BMC. It's an important resource aesthetically, psychologically, and physically.

Thanks for reading,
...Jan

Jan Norsetter
Verona, WI 53593

www.jannorsetter.com

Fw: Badger Mill Creek

Tanya Sime <tanyas@capitalarearpc.org>

Mon 7/8/2024 7:10 AM

To:Nick Bower <nickb@capitalarearpc.org>

Tanya Sime
608-474-6017

From: William Sonzogni <sonzogni@gmail.com>
Sent: Sunday, July 7, 2024 3:09 PM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: Badger Mill Creek

Please DISAPPROVE MMSD's attempt to discontinue putting treated wastewater into Badger Mill Creek. The diversion was a great experiment and it worked. As a society we have destroyed so much of nature, and for once we did something to help nature. Please keep the flow in Badger Mill Creek.

Than you,

William Sonzogni
Emeritus Professor
Water Chemistry

Fw: CARPC Public Hearing Submitted Comments

Tanya Sime <tanyas@capitalarearpc.org>
Mon 7/8/2024 12:33 PM
To:Nick Bower <nickb@capitalarearpc.org>

1 attachments (78 KB)
20240708 Submitted Comments Eskrich CARPC.pdf;

Tanya Sime
608-474-6017

From: Sara Eskrich <sara.eskrich@gmail.com>
Sent: Monday, July 8, 2024 8:59 AM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: CARPC Public Hearing Submitted Comments

Good morning,

I'm sorry I will not be able to join you for the public hearing on Thursday. Please find comments attached for your consideration, from my purview as a MMSD Commissioner.

Best,
Sara

--
Sara Eskrich
608-669-6979

TO: Capitol Area Regional Planning Commission

FROM: Sara Eskrich, Madison Metropolitan Sewerage District Commissioner

DATE: 7/8/2024

RE: Amendment of the Dane County Water Quality Plan by Revising the Point Discharge Locations of Treated Effluent from the Nine Springs Wastewater Treatment Plant

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Dear CARPC Commission:

To comply with its Wisconsin Pollutant Discharge Elimination System (WPDES) permit, Madison Metropolitan Sewerage District (the District) must achieve phosphorus compliance in Badger Mill Creek, one of its two effluent discharge outfalls, as mandated by the Wisconsin Department of Natural Resources (WDNR) and U.S. Environmental Protection Agency. Over the past six years, the District did its job and evaluated numerous compliance options, but none were as viable or impactful as the solution we have today. Revisiting those past options won't change the outcome and we need to move forward on permit renewal. *This extensive work has left us with the best path forward for the health and compliance of Badger Mill Creek, and that is to discontinue the effluent*.

Additionally, more good things are to come for Badger Mill Creek thanks to the work of the Badger Mill Creek Stakeholder Group. For nearly a year, this group, which brings together representatives from municipalities, nonprofits, Dane County, the WDNR, and the District, has been working to develop a portfolio of projects to support the health and resiliency of the creek. The District has pledged $1 million for these projects, and I extend my appreciation to the stakeholder group participants for their work and commitment.

As a Madison Metropolitan Sewerage District Commissioner, I understand the tough choices that District staff and leadership must make, balancing regulatory requirements, community wishes, environmental health and financial considerations. Maintaining compliance with its permit is of the utmost and primary importance to all District stakeholders, and the decision to discontinue effluent return was the best option to meet the competing interests.

I also understand the challenging task before the CARPC Commission, as this request to modify a previous amendment to the Dane County Area Water Quality Plan is one of the first instances of a request to remove an effluent outfall from the plan. However, the CARPC Commission's purview in this recommendation, which was confirmed with the WDNR on May 15, 2024, is limited to water quality standards as outlined in Wis. Admin Code NR 102 to meet the requirements of Wis. Stat. S. 283.83, as they align with the waterbody's designated uses. Therefore, the water quality standards for consideration are limited to toxics, temperature, bacteria, phosphorus, dissolved oxygen, and pH —*water quantity is outside the scope of CARPC's consideration for this amendment*. As the District has outlined in its Final Compliance Alternatives Plan, its effluent impacts Badger Mill Creek in terms of toxics, temperature, phosphorus, bacteria, and dissolved oxygen, which has consequences for fish and aquatic life and human health. Eliminating the District's effluent return is a water quality win for Badger Mill Creek.

As a Commissioner, former elected official for the City of Madison, and professional in the policy world, I appreciate and understand the task presented to the District, CARPC, and the DNR. Based on the water quality standard data presented and the limited scope of this request, *I ask that the CARPC Commission approve and recommend this amendment to the Dane County Water Quality Plan to the Wisconsin Department of Natural Resources*.

Please let me know if you have any questions for me or our capable District staff. Thank you for your consideration and for your service to our community.

Best,

Sara Eskrich

Fw: the MMSD amendment to the area wide water quality plan and Badger Mill Creek

Tanya Sime <tanyas@capitalarearpc.org>
Mon 7/8/2024 6:52 PM
To:Nick Bower <nickb@capitalarearpc.org>

Tanya Sime
608-474-6017

From: Topf Wells <topfwells@gmail.com>
Sent: Monday, July 8, 2024 6:49 PM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: the MMSD amendment to the area wide water quality plan and Badger Mill Creek

Dear CARPC Commissioners,

Please recommend disapproval of the proposed Madison Metropolitan Sewerage District (MMSD) amendment to the area wide water quality plan which would allow MMSD to stop the discharge of its effluent to Badger Mill Creek (BMC).

This issue has a long, complex history. My assumption is that you have heard from residents, organizations, and local governments urging you to recommend disapproval . They probably include descriptions of the values of the creek, many of which are supported by the effluent, and the damage inflicted by stopping the water.

MMSD's request seems largely to rely on changes to state law. They argue that those laws mean that all of the information you might receive and consider about MMSD's process, alternatives fo phosphorus compliance, and the health and value of the creek are irrelevant. In the DNR's classification system for water quality as it applies to wastewater, BMC is a warm water forage fish system. MMSD only needs to meet the low water quality standards for such a system with regard to its actions affecting BMC.

That argument is fundamentally flawed.

In applying the law or administrative codes to a particular situation, two factors are in play: the law and the facts of that situation. In this case, BMC is objectively and indisputably not a warm water forage fish system. It is a cold or cool water community of fish. The DNR water quality biologist and the DNR fish biologist who have extensive experience with BMC have stated that clearly and publicly. CARPC must consider this basic biological and objective fact about BMC when it considers the MMSD request.

CARPC has two responsible options. It can recommend disapproval of the amendment because of the fundamental, factual mistake about BMC. Alternatively, it can find that the amendment is not properly before CARPC now and will be considered when the DNR had accurately classified BMC.

In taking either action, CARPC will protect Badger Mill Creek, an extremely important natural resource. You, the Commissioners, will also act as CARPC was created to act. As County Executive Kathleen Falk's Chief of Staff, I was attended the key meetings with the stakeholders who agreed to replace the Dane County Regional Planning Commission with CARPC (among those were the Mayor of Madison, the

President of the Cities and Villages Association, and the President of the Dane County Towns Association, their staff and attorneys). All hoped that CARPC would reach fair decisions without some of the acrimony and delays of the past. However, another key and critical point was clearly stated and unanimously agreed on. CARPC had to be willing to deny proposals that would hurt natural resources even if they were controversial and supported by powerful interests.

The MMSD request is such a case. Stopping that water will damage the creek substantially and has aroused concern, anger, and dread among many folks who cherish the creek. MMSD's legal argument is a relatively new and obscure addition to the process which MMSD has foisted on the folks who care about the creek. I think many Dane County residents will be aghast if CARPC accepts that argument and the characterization of the creek on which it relies.

Thank you for your consideration of this request.

Sincerely,

Topf Wells

Fw: Comments for CARPC commission consideration

Tanya Sime <tanyas@capitalarearpc.org>
Tue 7/9/2024 1:53 PM
To:Nick Bower <nickb@capitalarearpc.org>

1 attachments (29 KB)
CARPC meeting 11 July fin.docx;

Tanya Sime
608-474-6017

From: Brian Christian <bchristi490@gmail.com>
Sent: Tuesday, July 9, 2024 1:33 PM
To: Tanya Sime <tanyas@capitalarearpc.org>; Brian Christian <bchristi490@gmail.com>
Subject: Comments for CARPC commission consideration

Hi Tanya, Please find attached comments and a recommendation I have prepared for the proposed AWQMP amendment submitted by MMSD related to BMC Outfall 005.

As it is several pages, I don't expect it to be read in its entirety, unless that is desired. Perhaps the bullet points I provided and the summary.

I appreciate the commissioners' time in reviewing this.

Thanks
Brian Christian

Dear CARPC Commissioners,

Please consider my comments below and my request to NOT approve the MMSD's amendment to the Areawide Water Quality Management Plan related to phosphorus mitigation in Badger Mill Creek (BMC).

The BMC/IAT urban corridor

City of Verona and Dane County parklands located on the north and south sides of BMC comprise an urban environmental corridor extending from County Hwy PB and the Military Ridge State Bike Trail on the northeast to Bruce Street on the west. The Ice Age National Scenic Trail (IAT) traverses nearly the entire corridor with the majority of its route adjacent to BMC. The corridor also contains numerous City of Verona hiking trails and a new paved multiuse path also adjacent to BMC. There are 4 pedestrian bridges that cross BMC in this area including a significant, newly constructed bridge for the multiuse path.

This urban corridor is a pivotal environmental link connecting Badger Prairie Park natural area to the north, Goose Lake area wetlands to east with State and Dane county natural areas to the west and south extending to the Sugar River. The corridor provides habitat to various riparian and upland wildlife species.

The corridor is also an important means to connect people with nature for local residents and those drawn from the larger regional trail systems. The trails are heavily used for wildlife viewing, hiking and biking. Access to BMC, a Class II trout stream is a rare asset for anglers in an urban setting. The importance of the corridor has led to the formation of a very active Friends Group registered with the Dane County Parks Volunteer Program which is collaboratively stewarding the property with the City, County and IAT Alliance, and has contributed 1000's of volunteer work hours since its inception 2+ years ago.

- **Badger Mill Creek is the key cornerstone feature of the BMC/IAT corridor, a unique and valuable urban asset in Dane County.**
- **The corridor provides important wildlife habitat and is heavily used and highly valued.**

Effluent impact on BMC

Over the past 20+ years effluent discharged to BMC has had a "net positive" effect on BMC health as assessed by evaluating the biology of trout, a sensitive indicator species. This statement has been acknowledged by MMSD and most recently supported by a WDNR study entitled "*Trout Stream Management and Status Report of the Sugar River Watershed Dane and Green Counties, Wisconsin 2020-2021" (*D. Oele, March 2023), which confirms a Class II trout stream categorization, and recommends further stream investment.

The increase in stream volume provided by the effluent is considered by experts to be the most beneficial to improved stream health. While highly treated, a number of contaminants/attributes of effluent remain at unnatural levels (e.g. chloride, nitrogen, temperature and others). Notwithstanding the quality of the effluent, discharge to BMC has improved its capacity to support trout. The higher temperature of the effluent is actually considered by experts to be a beneficial buffer, stabilizing temperature in cold months. Well-qualified stream biology experts of the WDNR, Trout Unlimited and Upper Sugar River Watershed Association agree that discontinuing effluent discharge to BMC will be detrimental to the creek. The decision to divert effluent to Badfish Creek simply shifts the contaminant load to BFC (8% increase).

Because of its proximity to Outfall 005, effluent discharge represents a very significant fraction of stream flow in the BMC/IAT corridor segment used most by people. Under baseflow conditions, effluent contributes ~93% of

flow at Count Hwy PB and 50% at the Bruce Street USGS monitoring station, as determined in February of 2023 in a stream study conducted by EOR for MMSD. When discharge was stopped during the study, in-stream trout habitat improvements made by Dane County in 2021 where above the water surface, rendering this investment useless. The quantity of water provided by the effluent is important not only for aquatic habitat but also for maintaining a healthy riparian ecosystem. Anglers and wildlife viewers alike will have a diminished experience with stream flow reduced to very low levels once the effluent discharge is discontinued.

While annual precipitation has increased since discharge to BMC began, climate change also predicts more episodic rain events with extended dry periods and higher temperatures. Extended periods of low rainfall and high temperature were experienced in 2021 and 2023. During much of the late summer and fall of 2023 baseflow was estimated to be 30-40% lower than that determined in the EOR/MMSD study mentioned above and reversed baseflow gains made in the prior 15-year period. The BMC/IAT corridor will be particularly sensitive to drought without effluent discharge.

- **Discharge of effluent has a "net positive" effect on BMC health.**
- **Discontinuing effluent will be detrimental to BMC aquatic and riparian habitats, erasing 20+ years of progress.**
- **The portion of the BMC/IAT corridor most used by people will be the most impacted by stopping effluent discharge.**
- **Concern about non-phosphorus contaminants will simply shift to BFC**

Maintaining BMC health is consistent with County and City investments

Dane County and the City of Verona as well as a number of volunteer organizations have recognized the importance of environmental protection and urban recreational opportunities. Dane County, WDNR, Trout Unlimited, and the City of Verona implemented stream improvements in 2021 during sewer construction along BMC. These include installation of various structures to improve the stream channel morphology and increase habitat for trout. Dane County has invested heavily in property from the confluence of BMC and the Sugar River to Paoli and beyond (Rhiner, Duerst, Davidson, Falk-Wells) an area experiencing a marked increase in water recreation. The WDNR has invested in prairie restoration along the Sugar River and Sugar River State Natural Area. In addition, volunteer organizations including Trout Unlimited, Upper Sugar Watershed Association, Ice Age Trail Alliance and the Friends of Badger Mill Creek Environmental Corridor have contributed money and many thousands of hours on restoration activities in the area. Maintaining the current health status of BMC is consistent with and supports these initiatives.

- **Maintaining the current health status of BMC is consistent with and supports government and volunteer investments to conserve natural areas in the BMC/Sugar River watersheds which are under constant development pressure.**

Regulatory considerations for a unique situation

The BMC situation is unique in that the effluent's impact on the receiving stream is not negative, but rather "net-positive" for the health of BMC. This statement is justified by recent and relevant data, mentioned above, generated by well-qualified scientists from the same regulatory authority (WDNR) charged with making the decision on amendment approval.

According to water quality standards regulations (Wis. Stat. S. 283.83 and Code NR 102) their overarching purpose includes protecting public health and welfare as well as propagation of fish and aquatic life and wildlife. It is important that this purpose be met when applying the individual standards to the situation. Well-qualified stream biologists uniformly agree that the loss of effluent will damage stream health and reverse the progress which has been made. The benefits of flow volume and possible temperature effects of the effluent out-weigh possible impacts associated with contaminants as it pertains to BMC health.

Our unique situation also impacts thinking on how watershed approaches to phosphorus mitigation are applied. Regulatory requirements that limit mitigation to the receiving stream watershed appear to be based on the assumption that the effluent is harmful to the receiving stream. This however is not the case in our situation. So, expanding the area that can be used for watershed approaches beyond HUC 12, or moving a sampling point of compliance beyond the confluence of BMC and the Sugar River, seems rational and appropriate in our situation. This consideration helps address cost and risk challenges related to loss of land available for mitigation processes due to urbanization. Application of watershed approaches to the BMC/SR watersheds have the added value of supporting the tremendous investments described above by expanding phosphorus mitigation to these areas, can leverage experiences from Yahara WINS, and avoid impact to BFC.

Lastly, available information and correspondence between regulators and MMSD (e.g. contained in FCAP report) don't appear to include discussion or consideration of the benefits of the effluent return to BMC. Benefits to the environment and people should also be considered.

- **The unique positive impact of effluent should be considered in the application of regulations to both the amendment decision and to the applicability of watershed approaches to mitigate phosphorus**

Summary

The BMC/IAT corridor is a rare and valuable asset for an urban area, worthy of protection. It is highly valued, recently improved and currently being stewarded by groups dedicated to its restoration and preservation. It makes sense to take advantage of the excellent treatment capabilities of MMSD and consider the effluent as a proven resource that benefits BMC rather than disposing of it as a waste product.

With collaboration and consideration of our specific situation, application of watershed approaches to phosphorus mitigation in the BMC/SR can address regulatory requirements, maintain the current health of BMC and improve investments in the larger area. I support revisiting MMSD's decision to divert effluent to BFC in favor of considering the demonstrated benefits of the effluent to BMC health.

I request the commission vote NO to the amendment.

Thank you for considering my views.

Respectfully,

Brian Christian

Fw: Opposition to MMSD proposal for Badger Mill Creek

Tanya Sime <tanyas@capitalarearpc.org>
Tue 7/9/2024 11:35 AM
To:Nick Bower <nickb@capitalarearpc.org>

Tanya Sime
608-474-6017

From: Kathleen Falk <kathleenfalk@aol.com>
Sent: Tuesday, July 9, 2024 10:19 AM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: Opposition to MMSD proposal for Badger Mill Creek

Dear CARPC Commissioners,

For many years, Dane County, WI DNR, MMSD and important local organizations such as the Sugar River Watershed Restoration Association, Southwestern WI Trout Unlimited, Friends of Badger Mill Creek, and many individuals, have worked together collaboratively and in partnership to improve Badger Mill Creek -- so successfully that BMC is now a thriving cold water fishery. The discharge of clean effluent from MMSD into BMC is a key piece in this successful water quality improvement work.

So it is was a complete surprise when MMSD staff announced in 2023 that it recommended that MMSD discontinue discharging clean effluent. Given the immediate concerns raised by the WI DNR fish biologists and water quality experts, along with the almost unanimous input from almost 100 people and organizations (including me, former County Executive Parisi, the Verona and Madison mayors, the SRWRA, SWTU, Friends of BMC, it was a complete surprise and disappointment when the MMSD Commission adopted that recommendation.

I write as the former Dane County Executive who has been both proud and appreciative of the historic collaboration, and am chagrined about what the breakdown of this partnership means for the future on other potential work (or lack thereof) by all these leaders and organizations with MMSD.

I note also that it is very rare (perhaps never before?) that the *elimination* of a discharge to a creek has occurred,,,, a creek whose improvement *depends upon the discharge*. Given this novel situation, I urge CARPC to do an Environmental Impact Statement on the topic of *this* withdrawal and what the water quality issues are for any *future* such proposal and how they should best be addressed.

Consequently, for all these reasons, I respectfully and sincerely urge you to reject the MMSD proposal at this time.

Kathleen Falk
Dane County Executive (1997-2011)

Fw: Disapprove MMSD Proposed Amendment as it Affects Badger Mill Creek

Tanya Sime <tanyas@capitalarearpc.org>

Tue 7/9/2024 4:32 PM

To:Nick Bower <nickb@capitalarearpc.org>

Tanya Sime
608-474-6017

From: tmkrauskopf <tmkrauskopf@aol.com>
Sent: Tuesday, July 9, 2024 4:27 PM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: Disapprove MMSD Proposed Amendment as it Affects Badger Mill Creek

Dear Capital Area Regional Planning Commissioners:

I urge you to recommend disapproval of the proposed Madison Metropolitan Sewerage District area wide water quality plan amendments which would end discharge of treated effluent into Badger Mill Creek. Continuation of the discharge is critical to assuring that the substantial public investment and volunteer efforts to increase the stream's values are not wasted.

Along with many other volunteers, I have worked on improvements to Badger Mill Creek. The stream has become a valued local and regional recreational and economic resource. Hopefully the area water quality plan will recognize that maintaining flow to the creek is essential to maintenance of those values.

Like the project to inject runoff into the ground on Odana Golf Course helps maintain the water balance in that watershed, so should the effluent return be maintained in Badger Mill Creek.

Thank you for your consideration.

Sincerely,

Thomas Krauskopf

Thomas Krauskopf
657 Hilltop Dr.
Madison, WI 53711
608-271-3060
tmkrauskopf@aol.com

Fw: Badger Mill Creek Effluent Return

Tanya Sime <tanyas@capitalarearpc.org>

Tue 7/9/2024 2:42 PM

To:Nick Bower <nickb@capitalarearpc.org>

Tanya Sime
608-474-6017

From: William Lane <wlane1317@gmail.com>
Sent: Tuesday, July 9, 2024 2:23 PM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: Badger Mill Creek Effluent Return

I am not advocating for or against the proposal, just providing background on the reasons why this effluent return was originally implemented. At that time I was the Director of Environmental Resource Planning for the Dane County Regional Planning Commission and in charge of the Dane County Water Quality Plan. I had been working closely with the Madison Metropolitan Sewerage District even before the Water Quality Plan because of a statutory consistency requirement between plans of MMSD and the RPC. During our studies of the hydrology and groundwater in the County, it was discovered that there were problems associated with the diversion of wastewater out of the Yahara Lakes Watershed. The main problem was a significant decrease in stream base flow and shallow groundwater levels in the part of the basin affected. Mainly a reduction in groundwater levels, primarily affecting wetlands but also stream base flow. We agreed that further diversion should be avoided. When it was time to consider alternatives regarding the Verona wastewater treatment plant, we felt it necessary to include the hydrologic impact of inter basin transfer of water. The easy and cheapest option was to transfer the wastewater from Verona to MMSD, and abandon the Verona treatment plant, which discharged to the Sugar River watershed. This would have resulted in a significant reduction in stream base flow in the upper Sugar River and negatively affected the fishery. So, MMSD decided that the only way they would accept and treat the wastewater from Verona is if the treated wastewater was returned to the Sugar River basin. The RPC, as the designated Water Quality Planning Agency endorsed this decision. Hence, the decision to return the treated waste water to the Sugar River watershed and maintain the hydrologic balance in that watershed.

I have been retired for over twenty years and am not in a position to recommend the decision in this matter. I am simply providing history on the considerations that resulted in this effluent return. I do urgently recommend that you consider the hydrologic implications of this decision.

Bill Lane

Fw: Southern Wisconsin Chapter of Trout Unlimited letter to the CARPC Board Members

Tanya Sime <tanyas@capitalarearpc.org>

Tue 7/9/2024 5:44 PM

To:Nick Bower <nickb@capitalarearpc.org>

Tanya Sime
608-474-6017

From: STEVE MUSSER <stevemusser@msn.com>
Sent: Tuesday, July 9, 2024 5:43 PM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: Southern Wisconsin Chapter of Trout Unlimited letter to the CARPC Board Members

SWTU LETTERHEAD.docx

Attached is letter from the Southern Wisconsin Chapter of Trout Unlimited

TROUT UNLIMITED
SOUTHERN WISCONSIN CHAPTER
P.O. BOX 45555
MADISON, WI 53744-5555

July 8, 2024

David Pfeiffer, Chair

Capital Area Regional Planning Commission

Subject: Madison Metropolitan Sewerage District (MMSD) to stop the discharge of its effluent to Badger Mill Creek

Dear Chair Pfeiffer,

The Southern Wisconsin Chapter of Trout Unlimited (SWTU) respectfully requests the the Capital Area Planning Commission (CARPC) recommend that the Department of Natural Resources (DNR) disapprove of the amendment to the Area-wide Water Quality Plan requested by MMSD. This amendment would allow MMSD to discontinue the discharge of highly treated and aerated effluent to Badger Mill Creek (BMC).

Over the last 25 years SWTU has spent hundreds of volunteer hours and thousands of dollars to preserve and improve BMC. Those years of dedication in combination with the efforts of riparian landowners, other conservation organizations, and local governments. have transformed BMC into a healthy, improving trout stream. The stream anchors a corridor with other restored natural features, a variety of wildlife and opportunities for a variety of outdoor activities. Such a resource in Wisconsin's most rapidly growing metropolitan area should be cherished and not damaged.

MMSD's proposal would damage the creek. It is a) unnecessary and b) unjustified.

a) MMSD can comply with its phosphorus reduction requirement by tertiary treatment or adaptive management in the BCM and upper Sugar River watersheds.

b) The amendment authorizing the discharge was carefully studied and debated. The debate did not center in the return of water to the Sugar River watershed but on the effects on BMC. Local officials, public managers, and conservationists agreed this was a worthwhile experiment. The results are indisputably successful. A recent DNR assessment of BMC and a detailed review of its

history by DNR fish and water quality biologists demonstrate that BMC is a healthy, improving Class 2 trout stream and that the effluent plays a vital role in that sustained improvement (significantly more than the increased baseflow cited by MMSD). Stopping that water will almost certainly hurt the creek. The DNR noted that the upper portion of BMC which now supports trout and has had over $200,000 of stream improvement implemented, might well only support warmwater forage fish.

The amendment made one of the best water quality and fish habitat improvements in this part of Wisconsin possible. It should not be changed to degrade BMC.

One way to understand the purpose of the amendment and its success is to remember that the transfer of water was to address the possible depletion of groundwater because of development. One manifestation of groundwater is springs, the lifeblood of trout streams in southern Wisconsin. As the DNR biologists point out, the effluent has some of the key characteristics of a giant spring; the reason it has benefitted BMC to such a high degree. MMSD's analysis of the effects of its action on BMC misses this key point entirely. One benefit of large springs is that they mitigate the effects of extremely cold temperatures in the winter. The warmer spring water prevents anchor ice from forming, which can devastate trout redds. While the effluent's temperatures are not the same as a spring, they do not hurt BMC in the summer and help in the other three seasons.

As noted, MMSD has overstated the effects of increase baseflow on BMC and refuses to recognize the essential contribution its effluent makes to the improved and stable health of BMC. Moreover, it also fails to account for the varying and worsening effects of accelerating climate change. Climate change will not result in a benign increase in precipitation in this area. More droughts will occur as happened over most of the last two years. Some of the precipitation will occur in intense downpours or extended periods of heavy rain. This will cause destructive floods and massive amounts of runoff. Just think of our local weather events of the last two years as evidence of the changing effects of climate change. In such an environment the stability that the effluent provides to BMC is extraordinarily helpful

Finally, SWTU has fully participated in the stakeholder process convened by MMSD to recommend projects to sustain BMC. Regrettably, none of the projects under discussion will meaningfully mitigate the damage to the creek if the effluent is stopped.

Please protect Badger Mill Creek by recommending disapproval of MMSD's amendment. Thank you for your consideration of our request.

Sincerely,

Steve Musser, President
Southern Wisconsin Chapter of Trout Unlimite

Fwd: Preserving Badger Mill Creek

Tanya Sime <tanyas@capitalarearpc.org>
Tue 7/9/2024 10:08 AM
To:Nick Bower <nickb@capitalarearpc.org>

Get Outlook for iOS

From: Paul Williams <fastplantman@gmail.com>
Sent: Tuesday, July 9, 2024 9:55:12 AM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: Preserving Badger Mill Creek

Dear commissioners:

Thank you for all you do on behalf of the residents and visitors to our beautiful Dane county.

This note is to urge you **not** to support proposed rules that would enable the proposed discharge of effluent from MMSD into badger Mill Creek.

As a long time resident of Madison and Dane County, I highly value the pristine condition of the water that flows in this stream and hope that satisfactory solutions to MMSD's needs can be found.

Sincerely,

Paul H. Williams

This brief note is to strongly
Sent from my iPhone

Fwd: July 11 CARPC Public Hearing on MMSD Outfall at Badger Mill Creek, Tom Wilson Comments

Tanya Sime <tanyas@capitalarearpc.org>
Tue 7/9/2024 10:04 PM
To:Nick Bower <nickb@capitalarearpc.org>

Get Outlook for iOS

From: twilson348@tds.net <twilson348@tds.net>
Sent: Tuesday, July 9, 2024 8:38:54 PM
To: Tanya Sime <tanyas@capitalarearpc.org>
Cc: Amanda Wegner <amandaw@madsewer.org>; William Walker <WilliamW@madsewer.org>; Renee Lauber <lauberconsulting@gmail.com>; Martin Griffin <marting@madsewer.org>; twilson348 tds. net <twilson348@tds.net>; Info <info@capitalarearpc.org>
Subject: July 11 CARPC Public Hearing on MMSD Outfall at Badger Mill Creek, Tom Wilson Comments

To the Capital Area Regional Planning Commission:

My name is Thomas Wilson and I am writing as a Commissioner for the Madison Metropolitan Sewerage District. I am the lone appointee to the District Commission by the Towns in the District. I respectfully request that CARPC approve and recommend the proposed Dane County Water Quality Plan Amendment to the Wisconsin Department of Natural Resources Revising the Point Discharge Locations of Treated Effluent from MMSD's Nine Springs Wastewater Treatment Plant. The amendment would have the effect of removing the outfall for MMSD from Badger Mill Creek near Verona, and instead moving that small volume to the Badfish Creek outfall, so that MMSD would just have one outfall for its effluent.

As a District Commissioner, I have a view into staff and leadership's hard work and dedication to the District's mission to protect public health and the environment. Sometimes, however, that mission conflicts with regulatory requirements, public will, and fiscal responsibility, as is the case with phosphorus permit compliance in Badger Mill Creek and the Sugar River. As the former long-time Attorney/Administrator/Clerk-Treasurer for the Town of Westport, and former long-time Executive Board member for the Dane County Towns Association, I am acutely aware of the financial constraints local governments face. The District faces these same constraints, along with increasing capital costs due to increased permit requirements, aging infrastructure, and capacity upgrades needed to accommodate Dane County's growth. This is further complicated by the fact that low-cost loans to support wastewater infrastructure have been extremely hampered at the state and federal levels. As the District looks to additional funding sources, the cost of projects will undoubtedly increase, and these costs will be passed along to owner communities such as the towns that make up the District, and eventually individual homeowners, renters, and businesses. These constraints were a significant factor in the decision-making process, particularly when it came to the costly issue of phosphorus compliance in Badger Mill Creek due to permit requirements.

Discontinuance of MMSD's minor effluent discharge to Badger Mill Creek is the most fiscally responsible and sustainable option for permit compliance, and has little effect on both watersheds at issue. In its work on this issue, the District did consider other options. One such option was treatment technology, which totaled more than $24 million, with additional annual energy, materials, and staffing costs. This would increase annual service charges by 2.2% to 3.7% over baseline, with anticipated increases upward of 9% for several years. It would also delay other critical infrastructure projects benefiting larger portions of the District's service area. As a Commissioner, I could not justify this additional cost to the local governments I serve when there is a more fiscally responsible option that meets regulatory requirements. I also hoped a watershed approach option considered had been possible. The District considered a compliance option for Badger Mill Creek built on adaptive management. As a longtime member of the Yahara WINS Executive Board, I have seen how successful this approach can be when the elements align, as in the Yahara River Watershed. However, due to the lack of available land for phosphorous reduction projects and other compliance constraints as recognized and confirmed by the U.S. Environmental Protection Agency and Wisconsin Department of Natural Resources, these do not align for Badger Mill Creek.

In a nutshell, the issue here is essentially how to handle the new Clean Water Act Permit requirements MMSD is now required for the Sugar River Watershed. It is a very complicated issue as noted above, but also because in the 1990's the District took over the Verona plant at Verona's request, but due to some pressure by the County Executive and others, decided to spend money to discharge the effluent taken back into the Sugar River Watershed at Badger Mill Creek rather than Badfish Creek. The easiest and cleanest way for the District to comply with the new permit requirements would be to just shut off the flow back to Badger Mill Creek. Added to this is that Badger Mill Creek was barely a trickle back in the day but is now a Class 2 Trout Stream, and disrupting flow would probably damage that, especially in low flow times. Also, adding about 7% more discharge (which is what the flow back to Badger Mill is as a percentage of all of the District's effluent) would not arguably be insignificant. It would add flow and everything that goes with that to an already fragile and damaged Badfish Creek. Adaptive Management is really not an option because there is no TMDL needed to be met by all of the local governments in the watershed (yet), and also doing a satellite treatment plant or upgrading the plant for treating the Badger Mill Creek effluent could cost up to $20 million or more. The cost of the plant would be born by the District ratepayers as a whole, so for instance DeForest, Windsor, Waunakee, Westport, Middleton, and most Madison customers would be paying more in their rates to handle the project in another watershed, while those south of Verona in like Montrose and Belleville will not pay. Thus, this is like an Occam's razor situation: The simplest explanation is usually the best one. Here, discontinuing the flow to Badger Mill creek is the simplest answer to solve this difficult question. So then, to MMSD's request to amend the Water Quality Plan, the simplest answer is also the best...yes.

Despite the difficult decision to discontinue effluent return, the District remains committed to the health and resilience of Badger Mill Creek. The District is an active partner in the watershed through the Badger Mill Creek Stakeholder Group and have committed $1 million for projects that support the Creek's well-being. This ongoing commitment is a testament to the District's

dedication to the issue, and the commitment of the other stakeholder group participants is incredibly appreciated.

For additional information, I link here MMSD's Resolution approving this action, as well as the staff memo recommending the same:

May 25, 2023 CAR (staff memo): https://onbase.madsewer.com/OnBaseAgendaOnline/Documents/ViewDocument/%20Review%20and%20Approve%20Final%20Badger%20Mill%20Creek%20Phosphorus%20Compliance%20Solution_Commi.pdf?meetingId=208&documentType=Agenda&itemId=3474&publishId=4132&isSection=false

May 25, 2023 Resolution: https://onbase.madsewer.com/OnBaseAgendaOnline/Documents/ViewDocument/Review%20and%20Approve%20Final%20Badger%20Mill%20Creek%20Phosphorus%20Compliance%20Solution_Draft%20.pdf?meetingId=208&documentType=Agenda&itemId=3474&publishId=4133&isSection=false

I appreciate and understand the challenge presented to Madison Metropolitan Sewerage District, CARPC, local communities, and the DNR on this issue. However, based on the data presented through the District's review process and as will be shared by the District at the public hearing, I respectfully request that the Commission approve and recommend the proposed Dane County Water Quality Plan amendment to the Wisconsin Department of Natural Resources.

Thank you for your consideration. I would ask that this communication please be made part of the official public record on this matter.

Respectfully submitted,

Thomas G. Wilson, Commissioner
Madison Metropolitan Sewerage District

Home address:
2509 Dublin Way
Waunakee, WI 53597
608/444-3442

Fw: CARPC comment re: MMSD proposal to divert treated wastewater effluent from the Sugar River Watershed to the Rock River Watershed.

Tanya Sime <tanyas@capitalarearpc.org>

Wed 7/10/2024 9:58 AM

To:Nick Bower <nickb@capitalarearpc.org>

Tanya Sime
608-474-6017

From: Robert Bohanan <rbrtbohanan52@gmail.com>
Sent: Wednesday, July 10, 2024 9:45 AM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: CARPC comment re: MMSD proposal to divert treated wastewater effluent from the Sugar River Watershed to the Rock River Watershed.

CARPC comment re: MMSD proposal to divert treated wastewater effluent from the Sugar River Watershed to the Rock River Watershed.

Robert E. Bohanan, Ph.D.
UW Madison (retired)

10 July 2024

I am Robert Bohanan, a retired freshwater ecologist from UW Madison. Currently, I serve as the President of the Upper Sugar River Watershed Association. Over the past year, I have been involved in a stakeholder group examining various factors related to the proposal to redirect treated wastewater effluent from Madison Metropolitan Sewerage District solely to Badfish Creek instead of returning it to Badger Mill Creek. I share the concerns raised by the Friends of Badger Mill Creek Environmental Corridor and Southwest Trout Unlimited.

Based on my personal perspective and my own research on Badger Mill Creek since 2007, a range of studies, including assessments of dissolved oxygen, water temperature, macroinvertebrates, particularly aquatic insects, and habitats, have been conducted by both students and myself over several years. Recent habitat assessments were carried out in the fall of 2023 and early summer of 2024. Based on these studies and additional observations, it is evident that Badger Mill Creek is a distinct ecological asset in Dane County, southern Wisconsin, and the Midwest as a whole. This is attributed to the stream's passage through and connects to diverse habitat types, land uses, and the presence of reaches designated as Class II trout streams.

One aspect that has not received sufficient attention before you is the proposed shift of treated wastewater effluent return from Badger Mill Creek to Badfish Creek, seemingly shifts the water balance between the Sugar River Watershed and the Rock River Watershed. To date all of the potential projects under consideration to mitigate base flow do not consider the shift in water balance between watersheds. At minimum, this should be noted in your consideration of the proposal before you.

The stakeholder group has conducted a considerable evaluation, given the time and resources available, of different solutions with varying potential to address the potential loss of base flow if wastewater effluent is redirected from Badger Mill Creek to Badfish Creek as per the current MMSD proposal. As an ecologist, I have maintained a strong interest and cautiously optimistic perspective in assessing projects aimed at mitigating the loss of base flow. However, none of the individual projects or combinations of projects have shown both the feasibility within the next

few years and the effectiveness needed to counteract the expected impacts. The primary concern is the potential adverse effects on the stream's resilience and its ability to handle the inevitable variations in climate, particularly precipitation, due to the reduced base flow contribution from treated wastewater return. The interaction of base flow, discharge, and dissolved oxygen will be significantly disrupted, affecting fish and various aquatic insects, thereby impacting not only aquatic food webs but also terrestrial food webs.

The years 2023 and 2024 experienced significant weather events, including drought and increased precipitation leading to substantial water levels and local flooding. Similar fluctuations have been observed since 2000, with sustained periods of drought followed by heavy rains resulting in local flooding. The foreseeable future is expected to bring about even greater variability. The consistent and reliable contribution to base flow from treated wastewater return since the late 1990s has been crucial to improvements in several aspects of water quality and ecosystem services, as well as encouraging substantial investment in public and privately funded restoration projects, and the overall aesthetic value to the community.

It is conceivable that projects or combinations thereof aimed at reconnecting or connecting wetlands and other groundwater sources may be feasible. However, the timeline for their completion and the financial aspects remain pivotal concerns. The present MMSD proposal raises more questions than it provides answers, particularly regarding the lack of firm commitments to specific projects within a reasonable timeline that minimizes the anticipated negative impacts. Several proposals within the stakeholder group stress a minimum two-year planning phase to evaluate the efficacy of projects with implementation even farther removed from the decisions you're being asked to make today. Over the past year, the stakeholder group has benefitted from insightful presentations covering fisheries, hydrology, flood mitigation, and potential engineering opportunities. However, these presentations, to date, have also posed more questions than they have answered, underscoring the need for thorough and systematic consideration. The prudent and responsible approach is to devote the necessary time for addressing these questions, as this is fundamental to sound decision-making.

Respectfully submitted,
Robert Bohanan

Sent from my iPad

Fw: Comments on MMSD request to amend Dane County Water Quality Plan

Tanya Sime <tanyas@capitalarearpc.org>

Wed 7/10/2024 3:05 PM

To:Nick Bower <nickb@capitalarearpc.org>

1 attachments (138 KB)

City of Madison CARPC Comments 7.10.24.pdf;

Tanya Sime
608-474-6017

From: Fries, Gregory <GFries@cityofmadison.com>
Sent: Wednesday, July 10, 2024 2:43 PM
To: Tanya Sime <tanyas@capitalarearpc.org>; Jason Valerius <jasonv@capitalarearpc.org>
Cc: Ericd@madsewer.org <Ericd@madsewer.org>; Amanda Wegner <amandaw@madsewer.org>; Schmidt, Janet <jschmidt@cityofmadison.com>; Wolfe, James <JWolfe@cityofmadison.com>; Christie Baumel <cbaumel@cityofmadison.com>
Subject: Comments on MMSD request to amend Dane County Water Quality Plan

Hi Jason/Tanya,

Attached please find the City of Madison's comments on the MMSD request coming before CARPC tomorrow.

Thanks much.
Greg

Office of the Mayor
Satya Rhodes-Conway, Mayor
City-County Building, Room 403
210 Martin Luther King, Jr. Blvd.
Madison, WI 53703
Phone: (608) 266-4611 | Fax: (608) 267-8671
mayor@cityofmadison.com
cityofmadison.com

To: Capital Area Regional Planning Commission

Date: July 10, 2024

RE: Madison Metropolitan Sewerage District request to modify the Dane Co Water Quality Plan

Dear Commissioners,

Thank you for this opportunity to comment on the Madison Metropolitan Sewerage District (MMSD) request to modify the Dane County Water Quality Plan by discontinuing the return effluent discharge to Upper Badger Mill Creek. The City of Madison supported this decision at the MMSD Commission level and continues to support this action.

I am writing as a representative one of the District's ownership communities, representing approximately 66% of its customer base. The City works closely with MMSD, with attention to their service reliability and regulatory compliance, costs of services impact to our residents and businesses, and impacts to the environment, and have considered all of these factors in my recommendation.

We have reviewed the options available to MMSD to meet State water quality standards in its effluent discharge to Badger Mill Creek. After a careful review of the analysis and consultation with numerous stakeholders, I understand the pros and cons of each available option, and I understand there are regulatory conditions that shape both the options available to consider.

I want to clarify that I am primarily considering a choice between the options of diverting the effluent from Badger Mill Creek and tertiary treatment at the plant with continuation of the return to Badger Mill Creek. The City of Madison, like MMSD, looked at options for adaptive management in this watershed, and inquired about creative ways to achieve phosphorous compliance through adaptive management. Ultimately, we agree with MMSD that this is not a viable option.

The cost differential between the proposed alternative and building new tertiary treatment is approximately $24 million. There is an additional long-term cost of approximately $50 million (net present value) to replace the aging effluent main transporting the effluent to Badger Mill Creek. Residents and businesses from the City of Madison would bear 66% of these costs, given the proportional share of MMSD's customer base. The associated rate increase from this project would be in addition to the double-digit rate increases MMSD anticipates each year for the next 10 years. As Mayor of Madison, it is my responsibility to carefully consider the impacts primarily to Madison residents.

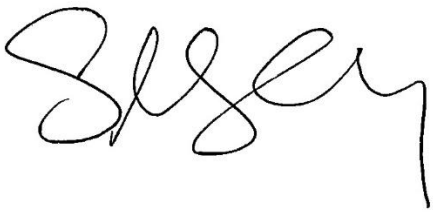
Given these limitations, Madison continues to believe the best option for MMSD, and its ownership communities, is to discontinue the return of effluent to Badger Mill Creek, and instead discharge it into Bad Fish Creek where adaptive management is a viable option for phosphorus management. I believe this

is the most fiscally responsible decision, given that the stream conditions in Badger Mill Creek have improved due to many other factors since the original effluent return started in the 1990's. The stream is now viable without the return effluent; however, we also recognize that improvements may still be necessary to ensure the long-term health of Badger Mill Creek, especially during dry years. MMSD has already made a commitment to participate in projects to help make improvements, and discussions are continuing to identify some potential improvements and additional solutions. We encourage all stakeholders, including MMSD, to continue that partnership, and Madison will remain a dedicated partner throughout those discussions.

Before closing, I will also briefly acknowledge other considerations that Commissioners may be weighing. Regarding the impact to Bad Fish Creek, based on data provided by MMSD, it's our understanding that the redirected effluent, in combination with the existing effluent to Bad Fish Creek, would be at a discharge level that is still lower than pre-pandemic conditions and would remain within MMSD's permitted discharge amount. Among many other factors when considering the impacts of climate change, Madison recognizes the importance of being mindful of energy consumption. With that in mind, it's also worth noting that a tertiary treatment option would also have some likely negative outcomes from an operational energy consumption perspective.

Thank you for considering these comments.

Sincerely,



Satya Rhodes-Conway
Mayor

Fw: Badger Mill Creek

Tanya Sime <tanyas@capitalarearpc.org>

Wed 7/10/2024 7:27 AM

To:Nick Bower <nickb@capitalarearpc.org>

Tanya Sime
608-474-6017

From: jim hess <jimhess5599@gmail.com>
Sent: Wednesday, July 10, 2024 7:11 AM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: Badger Mill Creek

Dear CARPC Commissioners,

Please do not approve the proposed Madison Metropolitan Sewerage District (MMSD) amendment to the area wide water quality plan, which would allow MMSD to stop the discharge of its effluent to Badger Mill Creek (BMC). Badger Mill Creek is a Class 2 trout stream, which our chapter, along with Dane County and other local governments, have spent hundreds of thousands of dollars and volunteer hours to help improve this stream. MMSD has other options that would be better for our environment.

Jim Hess
SWTU Conservation Chair

--
Driftless Prairies Website:
www.driftlessprairies.org

Fw: Badger Mill Creek

Tanya Sime <tanyas@capitalarearpc.org>

Wed 7/10/2024 3:37 PM

To:Nick Bower <nickb@capitalarearpc.org>

Tanya Sime
608-474-6017

From: John Hutchinson <jhutch@fontanasports.com>
Sent: Wednesday, July 10, 2024 3:32 PM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: Badger Mill Creek

I am writing to hope that you will consider not moving the water flow from Badger Mill Creek as it would be devastating to the trout population. As a member of Trout Unlimited we have put several years of restoration to Badger Mill Creek.
Please consider the impact and do not change the flow.
Sincerely,
John B. Hutchinson

Sent from Mail for Windows

John B. Hutchinson
3780 State Road 19
Sun Prairie, WI 53590
608-239-2093 cell

Fw: Comments 7-10-24

Tanya Sime <tanyas@capitalarearpc.org>
Wed 7/10/2024 2:07 PM
To:Nick Bower <nickb@capitalarearpc.org>

1 attachments (326 KB)
City of Verona Comments Letter 7-10-24.pdf;

Tanya Sime
608-474-6017

From: Heidi Jimenez <hjimenez@pinesbach.com>
Sent: Wednesday, July 10, 2024 1:41 PM
To: Tanya Sime <tanyas@capitalarearpc.org>
Cc: Christa Westerberg <cwesterberg@pinesbach.com>; Elizabeth Pierson <epierson@pinesbach.com>
Subject: Comments 7-10-24

Hello,

Attached is a letter regarding comments on the MMSD's Proposed Amendment to the Dane County Water Quality Plan.

Thank You.

Heidi Jimenez
Legal Assistant

608.251.0101 Phone
608.251.2883 Fax
hjimenez@pinesbach.com

Pines Bach LLP
122 W Washington Ave, Ste 900
Madison, WI 53703
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Attorney Christa O. Westerberg
cwesterberg@pinesbach.com
Attorney Elizabeth M. Pierson
epierson@pinesbach.com

July 10, 2024

Capital Area RPC
Attn: Tanya Sime
Via email: tanyas@capitalarearpc.org

Re: Comment on MMSD's Proposed Amendment to the Dane County Water Quality Plan

Dear Ms. Sime:

Please accept these comments submitted on behalf of the City of Verona, which opposes the Madison Metropolitan Sewerage District's proposal to amend the Dane County Water Quality Plan (in turn a modification to MMSD's WPDES permit) by cutting off the supply of treated wastewater effluent discharge to Badger Mill Creek. MMSD suggests the amendment as a means of complying with phosphorus standards, but as further explained below, MMSD's analysis and proposal contain several key deficiencies. The City urges CARPC and DNR to consider alternative phosphorus compliance solutions and keep the water flowing to Badger Mill Creek.

Background

As you know, Badger Mill Creek flows for most of its length through the City of Verona. Its residents use and enjoy the creek for fishing, boating, and other forms of recreation, including walking and biking on the trails on public lands around Badger Mill Creek.

The City has consistently raised concerns about how the loss of base flow to Badger Mill Creek would affect the Verona community. On January 23, 2023, the Common Council unanimously passed a resolution opposing the stoppage of flow to the creek, stating

that "diverting the water taken from the Upper Sugar River watershed to Badfish Creek … will permanently and significantly reduce the flow of the Badger Mill Creek in the City of Verona, harming the environment around the Badger Mill Creek." The resolution not only opposed the diversion of water, but also expressed the Council's support for "continuation of the current practice of the MMSD returning the Upper Sugar River waters to the Upper Sugar River watershed."

Moreover, Mayor Luke Diaz signed onto a letter to MMSD from the Badger Mill Creek Preservation Coalition opposing the proposal. Mayor Diaz also testified at the April 27, 2023 MMSD Commission Meeting regarding the plan.[1]

Comments

The City highlights three main deficiencies with MMSD's proposal. ***First,*** MMSD ignores the DNR's responsibilities under the public trust doctrine, which include preserving its recreational value as a class 2 trout stream. ***Second,*** MMSD ignores the presence of wetlands around the stream, which triggers the application of water quality standards for wetlands. ***Third,*** MMSD's proposal ignores the current and future impact of climate change, which as a science-driven agency, the DNR should consider as it considers the amendment. These deficiencies are further explained below.

1. CARPC must consider and preserve Badger Mill Creek's status as a Class 2 trout stream.

Badger Mill Creek is a navigable water which the state must protect in accordance with the public trust doctrine. MMSD's proposal ignores this requirement.

The public trust doctrine is grounded in the Wisconsin Constitution, which states:

> The state shall have concurrent jurisdiction on all rivers and lakes bordering on this state so far as such rivers or lakes shall form a common boundary to the state and any other state or territory now or hereafter to be formed, and bounded by the same; and the river Mississippi and *the navigable waters leading into the Mississippi and St. Lawrence, and the carrying places between the same, shall be common highways and forever free, as well to the inhabitants of the state as to the citizens of the United States*, without any tax, impost or duty therefor.

Wis. Const. Art. IX, § 1. Wisconsin courts "have long interpreted this provision broadly and consistent with its sweeping scope, explaining that it protects more than strictly

[1] Comments begin at 10:23, https://www.youtube.com/watch?v=qI2lj780aLc.

navigable waters or related commercial navigation rights." *Clean Wisconsin, Inc. v. Wisconsin Dep't of Nat. Res.*, 2021 WI 72, ¶ 12, 398 Wis. 2d 433, 961 N.W.2d 611. The doctrine applies to "all areas within the ordinary high water mark of the body of water in question." *Id.* (cleaned up). Put another way, the public trust doctrine applies to any waterway that is "*navigable in fact for any purpose*." *Rock-Koshkonong Lake Dist. v. State Dep't of Nat. Res.*, 2013 WI 74, ¶ 76, 350 Wis. 2d 45, 833 N.W.2d 800. (emphasis in original, citation omitted). This includes recreational watercraft like kayaks and canoes. *Id.* But the doctrine protects far more than navigation, extending to "safeguard the public's use of the state's waters for even purely recreational purposes." *Clean Wisconsin,* 2021 WI 72, ¶ 12. (cleaned up). Those purposes include "boating, swimming, fishing, hunting, and preserving scenic beauty." *Rock-Koshkonong Lake Dist.,* 2013 WI 74, ¶ 72. (cleaned up); *see also Movrich v. Lobermeier*, 2018 WI 9, ¶ 27, 379 Wis.2d 269, 905 N.W.2d 807. The legislature has delegated significant public trust responsibilities to the DNR. *Clean Wisconsin*, 2021 WI 72, ¶ 13.

Badger Mill Creek is a navigable water. Kayakers already paddle it,[2] and as the City of Verona continues to grow and attract young professionals, this use is only likely to increase.

The DNR's responsibilities under the public trust doctrine are additionally codified in Wis. Stat. Ch. 30, which governs navigable waters. Cutting off the flow of treated wastewater to the stream is functionally indistinguishable from withdrawing water from it, which is prohibited without a permit issued under Chapter 30. Wis. Stat. § 30.18(2)(a). MMSD has not indicated whether it will request such a permit.

Notably, CARPC seems to acknowledge its public trust duties in its characterization of its environmental protection strategy, as implemented through its Water Quality Plan: "This strategy encompasses waste treatment, best management practices, erosion control, vegetation management, stormwater management, and land use planning. Resource protection recognizes that land and natural resources perform critical environmental functions such as groundwater recharge and discharge, water quality improvement, erosion control, storage of floodwaters, wildlife habitat and scenic beauty."[3] This holistic view of resource protection is consistent with the public trust doctrine.

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[2] See one account of paddling Badger Mill Creek here: https://www.wisconsinrivertrips.com/segments/badger-mill-creek

[3] Capital Area RPC, *About*, https://www.carpcwaterqualityplan.org/dane-county-water-quality-plan/.

The public trust doctrine requires the DNR to consider Badger Mill Creek's status as a class 2 trout stream.

The public trust doctrine requires the DNR to protect Badger Mill Creek for recreation, which includes protecting its status as a popular fishing stream. The DNR classified the creek as a class 2 trout stream in 2008.[4] A class 2 trout stream classification has significant ecological and recreational value:

> 'Class II'. A class II trout stream is a stream or portion thereof that:
> **a.** Contains a population of trout made up of one or more age groups, above the age one year, in sufficient numbers to indicate substantial survival from one year to the next, and
> **b.** May or may not have natural reproduction of trout occurring; however, stocking is necessary to fully utilize the available trout habitat or to sustain the fishery.

Wis. Admin Code. § NR 1.02(7)(b)2. Badger Mill Creek has historically been stocked with Brown Trout, and a public-private partnership invested in habitat improvements along the creek. Badger Mill Creek hit another milestone when it began receiving fingerling trout, instead of yearlings, in 2014. In a recent survey, the catch rates for Brown Trout in Badger Mill Creek were above the state average. In addition, Mottled Culpin, a cold-water indicator species, were found to be present in Badger Mill Creek at relatively high rates, indicating "the stream temperatures are suitable and water quality sufficient to support increased trout abundances with habitat improvements." [5]

Although MMSD acknowledges that Badger Mill Creek is a class 2 trout stream, it does not analyze the impact its plan amendment would have on the trout population in the stream, or the recreational use of the trout stream. Instead, MMSD focuses on the water quality standards under the outdated water resources designation of the stream as a limited forage fishery, sometimes mentioning the cold-water (i.e., trout stream) standards, too. But the classification of Badger Mill Creek as a limited forage fishery dates to the 1970's, see Wis. Admin. Code. § NR 104.05, and conflicts with the more recent classification as a class 2 trout stream.

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[4] *Trout Stream Management and Status Report of the Sugar River Watershed*: *Dane and Green Counties, Wisconsin 2020–2021*, Wis. Dept. of Natural Resources, p. 6, available at https://dnr.wisconsin.gov/sites/default/files/topic/Fishing/DaneSugarRiver20202021Watershed.pdf.

[5] *Trout Stream Management and Status Report* at 3, 5–6, 10.

This outdated classification is overdue for amendment. It conflicts with the avowed purpose of the statute regulating pollution discharge elimination, the goal of which is fulfilling the state's policy "to restore and maintain the chemical, physical, and biological integrity of its waters to protect public health, safeguard fish and aquatic life and scenic and ecological values, and to enhance the domestic, municipal, recreational, industrial, agricultural, and other uses of water." Wis. Stat. § 283.001(1). The outdated classification also arguably violates the public trust doctrine by failing to account for the current reality of the stream's status and recreational uses.

As part of their public trust duties to the state, CARPC and the DNR must consider all scientific evidence of the classification of Badger Mill Creek in evaluating MMSD's proposal. When presented with "concrete, scientific evidence of potential harm to waters of the state," the DNR must consider that evidence before accepting the proposal that could cause the harm. *Lake Beulah Mgmt. Dist. v. State Dep't of Nat. Res.*, 2011 WI 54, ¶ 46, 335 Wis. 2d 47, 799 N.W.2d 73.[6] This responsibility to consider the evidence flows directly from the DNR's responsibility to fulfil the state's public trust duties. *Id.* ¶ 62. The DNR's own classification of Badger Mill Creek as a class 2 trout stream surely qualifies as concrete, scientific evidence of a significant trout population in need of protection.

As MMSD notes, the DNR is statutorily required to base its decision on proposed revisions to the water quality management plan for Dane County on compliance with the water quality standards in Wis. Stat. § 281.15. Wis. Stat. § 283.83(1m). A reading of the statute that prohibits the DNR from considering other information as required by its public trust duties, however, would violate the Wisconsin Constitution. The DNR can and must consider both the water quality standards, and the other values protected under the public trust doctrine.

Accordingly, CARPC and the DNR must look beyond water quality standards to preserve the use of the stream as a class 2 trout stream, including by meeting its fisheries and aquatic resources management standards in considering MMSD's proposal. DNR programs "shall be based on scientific management principles which emphasize the protection, perpetuation, development, and use of all desirable aquatic species." NR 1.01(1)." When MMSD began discharging its treated wastewater into Badger Mill Creek, the Creek's baseflow increased by 35%.[7] The MMSD baseflow has been part of the trout habitat since it began in 1998, through over two decades of the Creek's increasing viability as a trout stream. As the City and its co-signatories pointed

[6] The *Lake Beulah* case concerned an application for a high-capacity well permit, but its reasoning applies to other DNR actions.
[7] *Trout Stream Management and Status Report* at 6.

out in an earlier letter to MMSD, when the MMSD flow was shut off in 2023, the water level lowered so much that recently installed habitat improvements were left exposed, no longer helpful to the trout. This is not sound fisheries management.

Even looking at water quality standards alone, MMSD has not clearly shown that cutting off the flow would substantially improve the stream's water quality, as it sometimes suggests. Badger Mill Creek currently meets many of the criteria for a class 2 trout stream, according to MMSD's data. With regard to toxic substances, MMSD suggests that cutting off the flow will reduce the level of toxicity in the stream but does not cite evidence to this effect. The permit currently includes a variance for mercury and chloride, and even with this variance, Badger Mill Creek is a thriving trout stream. Keeping the variance thus appears to be a viable option, rather than cutting off flow entirely. MMSD has also not provided specific evidence of how the effluent affects e.coli levels in the creek, which are regulated under NR 104.04(6)(a).

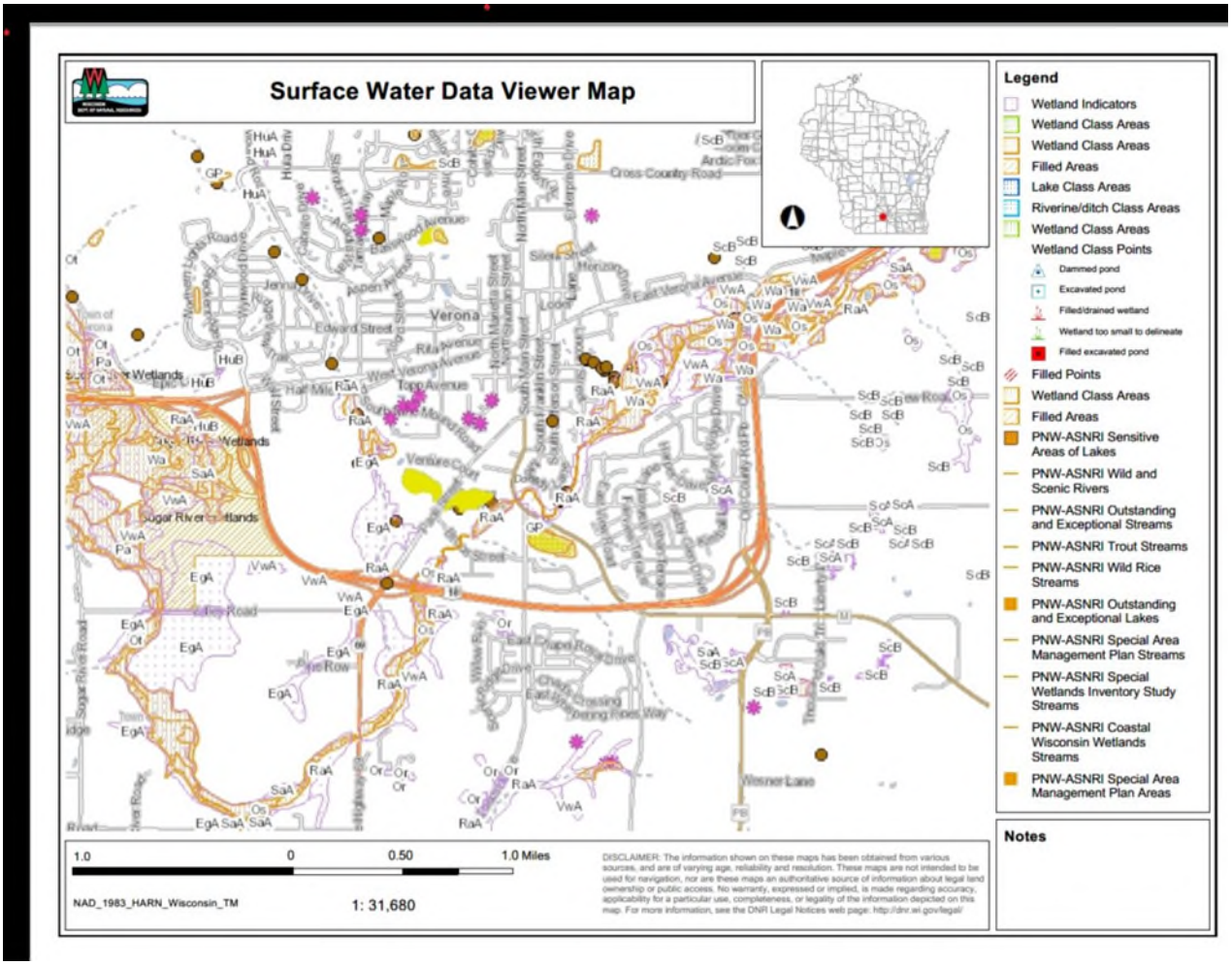
More likely, MMSD's proposal, if implemented, will harm Badger Mill Creek. For example, based on some sampling points, dissolved oxygen barely meets standards for a cold water fishery in its upper reaches, where flow is more limited, towards Highway PB. (MMSD Mod. At 6.) MMSD's limited data does not prove that dissolved oxygen levels will be improved by permanently reducing flow.

The DNR should ensure that MMSD's phosphorus compliance plan is consistent with its obligations under the public trust doctrine, including preserving the current recreational uses of the stream.

2. Wetlands are present surrounding Badger Mill Creek and require both consideration and protection.

Wisconsin's water quality standards include those intended to "protect, preserve, restore and enhance the quality of waters in wetlands and other waters of the state influenced by wetlands." Wis. Admin. Code § NR 103.03(1). These standards are applicable to MMSD's proposal, Wis. Admin. Code §§ NR 103.01, .05, .06(1)(b), yet MMSD's proposal does not address any of them. It should have.

The DNR's water surface viewer shows wetland class areas around much of Badger Mill Creek, and wetland indicators in additional areas:



Despite the presence of wetlands around Badger Mill Creek, MMSD has not discussed whether and how its proposal to reduce water levels would or would not comply with the wetland water quality standards in Wis. Admin. Code § NR 103.03. Several wetland functional values in NR 103.03 are implicated by MMSD's proposal, including:

> (a) Storm and flood water storage and retention and the moderation of water level fluctuation extremes;
> (b) Hydrologic functions including the maintenance of dry season streamflow, the discharge of groundwater to a wetland, the recharge of groundwater from a wetland to another area and the flow of groundwater through a wetland;
> …
> I Habitat for aquatic organisms in the food web including, but not limited to fish, crustaceans, mollusks, insects, annelids, planktonic organisms and

> the plants and animals upon which these aquatic organisms feed and depend upon for their needs in all life stages;
> (f) Habitat for resident and transient wildlife species, including mammals, birds, reptiles and amphibians for breeding, resting, nesting, escape cover, travel corridors and food; and
> (g) Recreational, cultural, educational, scientific and natural scenic beauty values and uses.

The wetlands around Badger Mill Creek have been influenced by water discharged by MMSD for 26 years. Cutting off that flow would have repercussions for "the moderation of water level fluctuation extremes," "the maintenance of dry season streamflow," flora and fauna, and of course, "recreational, cultural, educational, scientific and natural scenic beauty values and uses" for the Verona community and its visitors. DNR must protect these values as it considers MMSD's proposal.

Multiple criteria are in place to protect the wetland functional values identified above, which again MMSD does not address. These include protecting "[h]ydrological conditions necessary to support the biological and physical characteristics naturally present in wetlands… [from] significant adverse impacts on," among other things, "[w]ater temperature variations" and "[w]ater levels or elevations. NR 103.03(2)I. These factors are clearly implicated by MMSD's proposal. Even by MMSD's own account, cutting off the flow will lead to greater variation in water temperature in Badger Mill Creek. This could have adverse effects on the wetlands, which MMSD should have addressed.

The area is subject to additional wetland protections because Badger Mill Creek is a class 2 trout stream, and thus an "area of special natural resource interest." NR 103.04(1), 103.08(4). The DNR must consider "[a]ny potential adverse impacts to wetlands in areas of special natural resource interest as listed in s. NR 103.04." NR 103.08(3)(f). [8]

Cutting off the flow of treated MMSD wastewater to Badger Mill Creek would affect not only the Creek itself, but the surrounding wetlands. DNR must consider whether MMSD's proposal is compliant with NR 103.

[8] MMSD has not proposed any wetland mitigation project as a result of its proposal, but even if it had, the DNR "may not consider potential functional values provided by any mitigation project that is part of the subject application." NR 103.08(4)(b).

3. The DNR should consider the impact of climate change, which MMSD ignores.

Climate change is already affecting Badger Mill Creek, the City of Verona, and Wisconsin at large, and its impact will only grow over time—the DNR should consider this impact as it evaluates the available options for phosphorous compliance. Water level and temperature are two aspects of the stream that will most obviously be affected.

When it comes to water level, climate change models suggest that this area will become warmer, and in the summer months, drier. The University of Wisconsin Center for Climatic Research predicts that in 60 years, Madison will closely resemble present-day Pawnee, Oklahoma, with summers 11.9° F warmer and 5.6% drier, whereas winters will be 12.5° warmer and 22.5% wetter.[9] Because summer is the peak season for waterway recreation, a warmer and drier summer is cause for concern for Badger Mill Creek, but continuing the MMSD flow into the stream could help preserve the stream's current uses.

In addition, water temperatures in streams and lakes are expected to rise across the board in Wisconsin. MMSD's proposal offers conflicting notes on its impact on the temperature of the creek. On the one hand, MMSD points out that the creek's temperature in the summer months exceeds the limit for a cold water community like a trout stream, and that the effluent issued into the stream is warm enough that MMSD has been required to obtain alternate effluent limits for temperature from DNR. (MMSD Proposal at 7–8.) On the other hand, MMSD notes that removing the flow will cause Badger Mill Creek to "experience more natural fluctuation of temperature," because the constant flow of treated wastewater has a stabilizing effect on the creek's temperature. (MMSD Proposal at 8.) To the extent MMSD is suggesting that its proposal would lower the temperature of the creek, the DNR should consider how realistic it is to expect the creek's temperatures to drop significantly over time, given the overall warming of our climate.

The DNR should factor the available science on climate change into its decision on MMSD's proposal.

…

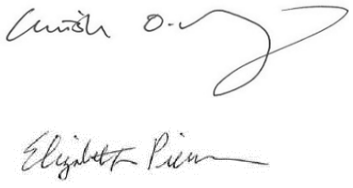
[9] *Wisconsin Initiative on Climate Change Impacts (WICCI): Analogs,* UW Center for Climatic Research, https://ccr.nelson.wisc.edu/visualization-and-tools/ (accessed July 2, 2024).

For at least the three above reasons, the City of Verona respectfully requests that CARPC advise the DNR to reject MMSD's proposal to amend the Dane County Water Quality Plan. MMSD and the DNR should instead consider alternatives to cutting off the flow of treated wastewater to Badger Mill Creek and find a way to comply with the phosphorus standards while still preserving this important resource for the Verona community, today and for generations to come.

Thank you.

Sincerely,

PINES BACH LLP



Christa O. Westerberg
Elizabeth M. Pierson

Fw: Vote no on stopping MMSD water to Badger Creek

Tanya Sime <tanyas@capitalarearpc.org>
Wed 7/10/2024 2:08 PM
To:Nick Bower <nickb@capitalarearpc.org>

Tanya Sime
608-474-6017

From: Jennifer Johncox <jenniferjohncox@gmail.com>
Sent: Wednesday, July 10, 2024 1:56 PM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: Vote no on stopping MMSD water to Badger Creek

As someone who witnesses first hand the wildlife that the Badger Mill Creek brings to our city, my backyard, please vote no.

DISAPPROVE MMSD's request to stop the discharge of water to Badger Mill Creek.

Please and sincerely,
Jennifer Johncox
Verona resident

Sent from my iPhone

Fw: Publiic Comments for Badger Mill Creek July 11 Meeting

Tanya Sime <tanyas@capitalarearpc.org>

Wed 7/10/2024 11:53 AM

To:Nick Bower <nickb@capitalarearpc.org>

1 attachments (227 KB)

Public Comments CARPC 2024 july 10 for BMC.pdf;

Tanya Sime
608-474-6017

From: Kathy Johnson <kljohnson63@yahoo.com>
Sent: Wednesday, July 10, 2024 11:38 AM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: Publiic Comments for Badger Mill Creek July 11 Meeting

See attchment. It also below in case the attachment doesn't go through your firewall:

It is our understanding that Madison Metropolitan Sewer District (MMSD) submitted to Capital Area Regional Planning Committee (CARPC) an amendment request to stop the flow of effluent into Badger Mill Creek (BMC) to meet its phosphorus requirements. We are writing to voice our concerns on the determinantal impact of discontinuing the return effluent into BMC because it will destroy this natural treasure. BMC flows south of Verona into the Sugar River and is one of the few designated Level II trout streams in the county and a Verona's treasured natural wildlife area. For the past 25 years, MMSD has been pumping 3.6 million gallons of effluent water into the creek per compact between the City of Verona and MMSD. As a result of this effluent water into the BMC, we have a Level II trout stream and a beautiful spot for people to walk along the north side of the Ice Age Trail. In addition, BMC has abundant wildlife and was also a place where folks once kayaked.
We are concerned that if the flow is shut off the public funds already spent on this area will have been wasted because in many sections BMC water level will be greatly reduced. Examples of public funds already spent are as follows. After the MMSD construction of the East Sewer Interceptor project in 2021, many dollars and volunteer hours have been spent to restore the BMC area. This included repopulating trees and planting prairies. Dane County spent at least $3 million in BMC land acquisition and $300,000 in restoration efforts in 2021-2022. In addition, the City of Verona contributed $100,000 in restoration costs. The Southern Chapter of Trout Unlimited has donated thousands of dollars and volunteered hundreds of hours to stabilize stream banks and improve access. Most recently, another bridge over Badger Mill Creek was built to connect walking and biking paths throughout the city. We view this area as our little woods in the middle of a city.
Residents, experts and officials are concerned that if the flow is shut off, the creek waterflow will be reduced by 50%, which will destroy the Level II trout stream and wildlife that benefits from the stream. We saw evidence of this when they turned the water off from January 2023 to April 2023. This resulted in low water levels as many of the ducks left as well as some other wildlife. After the water was restored, we saw some wildlife come back. For example, we have seen more ducks, Blue Heron, and even Great Egrets.

Again, from February to March 2023, the effluent was reduced to accommodate the MMSD sewer construction in the Badger Mill Creek area, and we saw much of the wildlife leave again.
MMSD should keep the effluent flow into BMC and adaptive management should be considered as a method to meet phosphorus requirements. MMSD dumping the return effluent into Bad Fish Creek is a bad idea because the folks in Rock County don't want it and it doesn't solve the long-term phosphorous problem. Please save our treasured creek by not turning off the return effluent and encourage the experts to look into adaptive management instead. We need to preserve this treasure for future generations. Thank you.

Sincerely,
Jeff and Kathy Johnson
102 Oak Court, Verona WI

Fw: Badger Mill Creek Effluent Return

Tanya Sime <tanyas@capitalarearpc.org>
Wed 7/10/2024 4:55 PM
To:Nick Bower <nickb@capitalarearpc.org>

Tanya Sime
608-474-6017

From: William Lane <wlane1317@gmail.com>
Sent: Wednesday, July 10, 2024 4:48 PM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: Re: Badger Mill Creek Effluent Return

I am aware that you are presently constrained to consider only “water quality” in your decisions on behalf of DNR. I would argue that any reduction in the base flow of a stream limits the ability to support aquatic life and is therefore a legitimate concern for the Water Quality Plan. DNR has always wanted a limited interpretation to avoid controversy. Section 208 of the Federal Water Pollution Control Act of 1972, which is the law that provides the framework for the official Water Quality Plan, clearly directs the plan to be based on existing land use plans and to consider any adverse impacts on water use and aquatic life. DNR did not want to consider either of those policies.
Bill Lane

> On Jul 9, 2024, at 2:25 PM, William Lane <wlane1317@gmail.com> wrote:
>
> I am not advocating for or against the proposal, just providing background on the reasons why this effluent return was originally implemented. At that time I was the Director of Environmental Resource Planning for the Dane County Regional Planning Commission and in charge of the Dane County Water Quality Plan. I had been working closely with the Madison Metropolitan Sewerage District even before the Water Quality Plan because of a statutory consistency requirement between plans of MMSD and the RPC. During our studies of the hydrology and groundwater in the County, it was discovered that there were problems associated with the diversion of wastewater out of the Yahara Lakes Watershed. The main problem was a significant decrease in stream base flow and shallow groundwater levels in the part of the basin affected. Mainly a reduction in groundwater levels, primarily affecting wetlands but also stream base flow. We agreed that further diversion should be avoided. When it was time to consider alternatives regarding the Verona wastewater treatment plant, we felt it necessary to include the hydrologic impact of inter basin transfer of water. The easy and cheapest option was to transfer the wastewater from Verona to MMSD, and abandon the Verona treatment plant, which discharged to the Sugar River watershed. This would have resulted in a significant reduction in stream base flow in the upper Sugar River and negatively affected the fishery. So, MMSD decided that the only way they would accept and treat the wastewater from Verona is if the treated wastewater was returned to the Sugar River basin. The RPC, as the designated Water Quality Planning Agency endorsed this decision. Hence, the decision to return the treated waste water to the Sugar River watershed and maintain the hydrologic balance in that watershed.
>
> I have been retired for over twenty years and am not in a position to recommend the decision in this matter. I am simply providing history on the considerations that resulted in this effluent return. I do

urgently recommend that you consider the hydrologic implications of this decision.
>
> Bill Lane

Fwd: Village of Cottage Grove Utility Commission Comment

Tanya Sime <tanyas@capitalarearpc.org>
Wed 7/10/2024 10:01 PM
To:Nick Bower <nickb@capitalarearpc.org>

1 attachments (1 MB)
Comment Letter to CARPC.pdf;

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From: JJ Larson <jlarson@village.cottage-grove.wi.us>
Sent: Wednesday, July 10, 2024 6:29:37 PM
To: Tanya Sime <tanyas@capitalarearpc.org>
Cc: Jason Valerius <jasonv@capitalarearpc.org>
Subject: Village of Cottage Grove Utility Commission Comment

Hello Tanya,
Please share with the Commission attached comment letter from the Village of Cottage Grove Utility Commission in support of the proposed amendment to the Dane County Water Quality Plan for the proposed Badger Mill Creek phosphorus compliance solution recommended by Madison Metropolitan Sewerage District.

Thank you,
JJ

JJ Larson
Deputy Administrator/Director of Administrative Services
Village of Cottage Grove, Wisconsin
210 Progress Dr. | Cottage Grove, WI 53527
https://www.vi.cottagegrove.wi.gov/ | (608) 209-8920

THE VILLAGE OF
COTTAGE GROVE

July 10th, 2024

Commission
Capital Area Regional Planning Commission

Re: Amendment of the Dane County Water Quality Plan - Badger Mill Creek Project

Dear Capital Area Regional Planning Commission Members,

I am writing on behalf of the Village of Cottage Grove Utility Commission in support of the proposed Badger Mill Creek phosphorus compliance solution recommended by Madison Metropolitan Sewerage District (District) staff and Commission.

We commend District staff on the work they have done in collecting and analyzing all potential solutions to the challenge over multiple years, including watershed adaptive management, modification of the flow, water quality trading, site-specific criterion, variance, diversion, and tertiary treatment.

The studies conducted and data collected support the District's solution as the best decision overall, not only for all customer communities, but for the stream itself as it no longer relies on District effluent to survive and will be returned to a more natural and healthy body of water once the line is eliminated.

Per the District's Staff and Commission:

- *The decision was based on assessments indicating that Badger Mill Creek no longer requires District discharge to maintain its flow.*
- *The transition to a single-point source for effluent discharge allows the District to better manage future regulatory requirements*
- *Aligns with the District's sustainability goals*
- *Commitment to safeguarding public health*
- *Protecting the environment*
- *Managing community resources responsibly and cost-effectively*

As one of your customer-communities these factors are significant as we all work to balance service levels, environmental stewardship, and rate impacts on the citizens in our communities.

I urge you to consider the overall health and service of the entire District service area and communities when making your decisions and to approve the proposed amendment to the Dane County Water Quality Plan revising the point discharge locations of treated effluent from the Nine Springs Wastewater Treatment Plant, requested by the Madison Metropolitan Sewerage District.

Regards,

Charlie Rogers - Chair
Village of Cottage Grove Utility Commission

Fw: Badger Mill Creek

Tanya Sime <tanyas@capitalarearpc.org>
Wed 7/10/2024 2:07 PM
To:Nick Bower <nickb@capitalarearpc.org>

Tanya Sime
608-474-6017

From: Richard Miller <rasamiller168@gmail.com>
Sent: Wednesday, July 10, 2024 1:54 PM
To: Tanya Sime <tanyas@capitalarearpc.org>
Cc: Kathy Johnson <kljohnson8475@gmail.com>
Subject: Badger Mill Creek

Dear CARPC members:

Badger Mill Creek is a gem. It is a trout stream in a residential area. It is right next to the Ice Age Trail.

Dane county, City of Verona and Trout Unlimited spent $3.4 million to acquire and restore it. Hard working volunteers
maintain it.

Water birds and mammals flourish in the creek. Walkers, runners and bikers occupy the trail. It is a busy place.

It will all disappear if the MMSD does not return the water to Badger Mill Creek. It will be Dane County's loss. We urge you to consider an alternative solution to the phosphorus problem so we can keep Badger Mill Creek as is.

Sincerely,

Richard and Sally Miller
406 Lincoln St
Verona, WI 53593

Fw: Badger Mill Creek

Tanya Sime <tanyas@capitalarearpc.org>

Wed 7/10/2024 7:28 AM

To:Nick Bower <nickb@capitalarearpc.org>

Tanya Sime
608-474-6017

From: Henry NL <henry.nehlslowe@gmail.com>
Sent: Wednesday, July 10, 2024 7:15 AM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: Badger Mill Creek

I am unable to attend the July 11th CARPC public hearing regarding Madison Metropolitan Sewerage District's (MMSD) proposal to halt their discharge of highly treated effluent to Badger Mill Creek (BMC).

I am writing to you to express my opposition to MMSD's proposal.

BMC is an improving Class 2 trout stream that runs through Verona and joins the Sugar River. BMC offers lots of public fishing, has a healthy population of wild brown trout, and, according to the latest DNR study, has an excellent chance of becoming a Class 1 stream if habitat is improved. This progress is now under attack and we need to protect Badger Mill Creek. MMSD's proposal is an easy and cheap way to comply with DNR phosphorus regulations and ignores that this discharge provides stable water flows and in some key aspects the water acts like a huge spring. MMSD has other affordable and practical alternatives such as treating the effluent to remove more phosphorus or pursuing Adaptive Management across the BMC and Upper Sugar watersheds.

I urge CARPC to disapprove MMSD's request to halt this important discharge to Badger Mill Creek.

Sincerely,

Henry Nehls-Lowe
1888 Briarwood Lane
Fitchburg, WI 53575

Fw: Support for continued water flows to Badger Mill Creek

Tanya Sime <tanyas@capitalarearpc.org>

Wed 7/10/2024 8:54 AM

To:Nick Bower <nickb@capitalarearpc.org>

Tanya Sime
608-474-6017

From: ernest perry <ebperry3@gmail.com>
Sent: Wednesday, July 10, 2024 8:29 AM
To: Tanya Sime <tanyas@capitalarearpc.org>; ebperry3@gmail.com <ebperry3@gmail.com>
Subject: Support for continued water flows to Badger Mill Creek

I am in support of continued flows to the badger mill creek from the Madison waste/sewer system. The flows ensure continuation of a beautiful resource so close to Madison. Trout fishing and other ecosystems dependent on the flows will also be negatively impacted if the flows are stopped.

Thank you.

Ernie Perry
Middleton Wi

Fw: Save Badger Mills Creek petition

Tanya Sime <tanyas@capitalarearpc.org>
Wed 7/10/2024 3:05 PM
To:Nick Bower <nickb@capitalarearpc.org>

Tanya Sime
608-474-6017

From: Lizbeth Ramseier <lzbthramseier2@gmail.com>
Sent: Wednesday, July 10, 2024 2:38 PM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: Save Badger Mills Creek petition

To whom might concern

My name is Lizbeth Ramseier. I live in Verona near the Badger Mills Creek. For years I had enjoyed the creek and the nature it has to offer. I am writing to ask you to disapprove MMSD's request to stop the discharge of water to Badger Mill Creek

I'm joining my support to all Verona's residents that has been advocating for a different plan.

Respectfully

Lizbeth Ramseier

Fwd: Please Disapprove MMSD's Water Discharge Plan

Tanya Sime <tanyas@capitalarearpc.org>
Wed 7/10/2024 10:00 PM
To:Nick Bower <nickb@capitalarearpc.org>

Get Outlook for iOS

From: Shaun Szot <szot.shaun@gmail.com>
Sent: Wednesday, July 10, 2024 5:39:09 PM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: Please Disapprove MMSD's Water Discharge Plan

Dear Members of the CARPC,

I am writing to express my strong opposition to MMSD's request to stop the discharge of water into Badger Mill Creek and urge you to vote against this proposal.

The DNR's 2020-2021 report titled "Trout Stream Management and Status Report of the Sugar River Watershed" on page three stated, "...this system has the potential to become a destination fishery in several reaches... The major threat to the watershed is a reduction of cold water inputs to the trout streams...".

Stopping the discharge into Badger Mill Creek would not only destroy it as a Class II trout stream and an urban recreation opportunity, but also negatively impact the downstream watersheds by decreasing levels of dissolved oxygen and increasing stream temperatures.

Fighting climate change is not only about reducing emissions; we must also act to protect our fragile cold water resources.

Thank you for your attention to this important matter.

Sincerely,

Shaun Szot
2552 Chesapeake Dr
Fitchbug, WI 53719

Fw: more on Badger Mill Creek

Tanya Sime <tanyas@capitalarearpc.org>
Wed 7/10/2024 11:53 AM
To:Nick Bower <nickb@capitalarearpc.org>

Tanya Sime
608-474-6017

From: Topf Wells <topfwells@gmail.com>
Sent: Wednesday, July 10, 2024 11:13 AM
To: Tanya Sime <tanyas@capitalarearpc.org>
Subject: more on Badger Mill Creek

MMSD Commissioner Wilson's comments on MMSD's amendment re: Badger Mill Creek warrant a response. I don't know if CARC wants the written responses to contain this sort of back and forth. Perhaps, though, it's better to have the discussion here than at the public hearing.

Mr. Wilson is a highly respected participant in local government and conservation but his advocacy for MMSD's position as an MMSD Commissioner repeats some of MMSD's more concerning assertions.

In my opinion, MMSD exaggerate the costs of tertiary treatment. The DNR estimated those costs at $7 million; MMSD;s own budget document had the costs at $13 million. $24 million appeared out of thin air late in the discussion of MMSD's options.

A continuing cause of frustration appears in the statements: that the DNR confirms that adaptive management is not possible in this case. Advocates for Badger Mill Creek, including me, have had and are continuing to have direct exchanges and conversations with the DNR staff in charge of trading and adaptive management in this area. They assure us that adaptive management is possible, that the DNR would welcome the opportunity to work with MMSD and local communities on such a project, that some variances for this effort are attainable, and that the lack of a TMDL is not decisive.

Frankly, we are sick and tired of MMSD's demonstrably false assertion that the loss of MMSD's effluent will be insignificant or not hurt Badger Mill Creek. The loss of that water, conservatively estimated at 30% of the creek's volume, will reduce and degrade habitat, hurt brown trout spawning, and possibly render a large part of the stream uninhabitable by trout and other cold/cool water species.

MMSD's $1 million will not significantly mitigate the effects of the de-waering.

Finally, the paragraph of the history of this transfer is inaccurate. DNR was beginning to manage Badger Mill Creek as a trout stream (not a mere trickle of water) before the transfer. MMSD's effluent did not re-create Badger Mill Creek as a trout stream. It accelerated that development and is a vital factor in sustaining the creek's current and improving health. The decision to transfer did not result from the pressure of whoever was County Executive and unknown folks. The process was public with input form many experts, including the technical staff of the Dane County RPC. The decision was a close call and, as has been noted, in other communications, an experiment. In this case, the experiment succeeded.

Occam was a philosopher, not a public official charged with discovering and enacting the public good in a complex situation. My guess is that all of you CARPC Commissioners with your years of experience in local government and environmental protection can think of instances where the simplest solution is not the best. MMSD should know that— it's Yahara Watershed/WINS program is a complex solution to phosphorus compliance. Much, much simpler options were available.

Topf Wells

Appendix D – References

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[iii] Oele, D. (2021). *Trout Stream Management and Status Report of the Sugar River Watershed.* Wisconsin DNR, Fisheries. Fitchburg, WI.

[iv] U.S. Geological Survey. (2016, August 9). *Phosphorus and water*. Accessed July 2024, from: https://www.usgs.gov/special-topics/water-science-school/science/phosphorus-and-water

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[vi] US EPA. (2023, September 8). *Indicators: Dissolved oxygen.* Accessed July 2024, from: https://www.epa.gov/national-aquatic-resource-surveys/indicators-dissolved-oxygen

[vii] US EPA. (2024, February 29). *Causal Analysis/Diagnosis Decision Information System (CADDIS): pH.* Accessed July 2024, from: https://www.epa.gov/caddis/ph