September 6, 2023

Staff Analysis of Proposed Minor Amendment to the *Dane County Water Quality Plan* **Revising the Sewer Service Area Boundary in the Central Urban Service Area**

History of the Central Urban Service Area

The Central Urban Service Area (USA) was first delineated in the early 1970s when the Dane County Regional Planning Commission adopted its first Land Use Plan. The first amendment to the Central Urban Service Area occurred in 1985. There has been a total of 117 amendments to this urban service area since its creation totaling 12,200 net acres of developable land and 4,900 acres designated as Environmental Corridor. The most recent amendment of the service area was by the City of Middleton and was recommended by the Commission in April 2023, adding approximately 128 acres.

Planning in Madison

The City of Madison updated their comprehensive plan in 2018 and is currently working on an interim update. The Comprehensive Plan is substantially consistent with the adopted 2050 Regional Development Framework (Framework).

Existing Conditions

Land Use

The City of Madison is requesting amendment to the Central USA to close a small hole in the service area 2.4 acres in size, known as the "Cottage Grove Road" amendment area. The amendment area is located on Madison's far east side at the intersection of Cottage Grove Road and Sprecher Road. The requested amendment area includes three residential properties and one commercial property located at 6401 through 6417 Cottage Grove Road (see Map 1 and 2). No change to the existing land uses is proposed. The existing bank will be reconfigured as offices.

Surrounding Land Uses

- **North**: Existing Single-Family Residential and Commercial
- **West**: Existing Single-Family Residential
- **South**: Existing Single-Family Residential
- **East**: Existing Single-Family Residential and "Neighborhood Mixed-Use" (Planned)

Table 1
Existing and Planned Land Use

Land Use Category	Existing Land Use Acres (see Map 3)	Proposed Land Use Acres (see Map 3)
Commercial Retail and Services	1.0	1.0
Residential	1.0	1.0
Transportation	0.4	0.4
	2.4	**2.4**

Cultural and Historic Sites

The area in question is already developed.

Natural Resources

The proposed amendment area is in the Door Creek (HUC 12: 070900020901) subwatershed (see Map 4). There are no riparian steep slopes (>12%), wetlands or floodplains within the amendment area.

Wastewater from the amendment area will be treated at the Madison Metropolitan Sewerage District (MMSD) Wastewater Treatment Facility. The treated effluent is discharged to the Badfish Creek and Badger Mil Creek, bypassing the Yahara chain of lakes.

Door Creek

Door Creek (WBIC 802800 / WATERSID 11644) is a tributary to Lake Kegonsa. It begins as a small stream in the southeast corner of the Town of Burke and flows generally south to the lake. Door Creek and its tributaries drain 29.5 square miles of land in the drumlin-marsh area of eastern Dane County. Much of Door Creek has been straightened and ditched to facilitate agricultural drainage. It is a relatively sluggish stream subject to low flows and high temperatures.

From its mouth at Lake Kegonsa (mile 0) upstream to its headwaters north of Interstate Highway 94 (mile 14.02), the DNR's current designated biological use of Door Creek is as a Limited Forage Fishery (the classification used to determine water quality criteria and effluent limits under NR 102 and NR 104). The current biological use of Door Creek is as warmwater forage fishery, and the attainable use is as a warmwater sport fishery (Map 5).

Since April 2012, all of Door Creek has been included on the state 303(d) list of impaired waters for total phosphorus from unknown sources of urban or rural nonpoint source pollution. The DNR's 2018 assessments showed continued impairment by phosphorus; however, available biological data do not indicate impairment. A Total Maximum Daily Load (TMDL) for phosphorus has been established for this segment of Door Creek associated with the greater Rock River TMDL project. There has been a Rock

River Coalition / Yahara WINs monitoring location on Door Creek at Jahnke Rd (Station ID 10010911) since 2016. Field measurements from 2022 indicated dissolved oxygen levels of 7.6 to 12.9 mg/L, transparency of 20.6 to 56.8 cm, and a macroinvertebrate index score of 1.3 to 2.2. Laboratory analysis of samples from 2022 showed total phosphorus (P) from 0.10 to 0.17 mg/L. Recent chloride monitoring has not been conducted for this watershed. There are no active USGS baseflow monitoring stations within this watershed.

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 did not identify any within a 1- to 2-mile radius of the amendment area. Additional review by the WDNR Bureau of Endangered Resources is not required.

The amendment area overlaps with the High Potential Zone (species likely present) for the federally endangered Rusty Patched Bumble Bee (link to web map). Section 7 of the Endangered Species Act requires consultation with the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service when any action that is carried out, funded, or permitted by a federal agency may affect a federally listed endangered or threatened species. The WDNR typically recommends that projects within the High Potential Zone include native trees, shrubs, and flowering plants; plants that bloom spring through fall; and the removal and control of invasive species in any habitat used for foraging, nesting, and overwintering. The USFWS developed a list of plants favored by Rusty Patched Bumble Bee (link to list). Implementing these conservation measures should be coordinated with the WDNR Endangered Resources Review Program as needed.

Soils and Geology

Surface elevations within the amendment area range from around 979 feet to 961 feet. There are very small areas of steep (> 12%) and very steep (>20%) slopes associated with the road embankments along Cottage Grove Road along the northern edge of the amendment area; however, these areas of steep slopes are not riparian and do not require inclusion in Environmental Corridors.

According to the Natural Resource Conservation Service (NRCS) Soil Survey of Dane County, the predominant soils in the amendment area consist of St. Charles silt loam (ScB) and Dodge silt loam (DnB) (see Map 5). St. Charles soils are deep, well-drained, sloping soils to moderately steep soils on glaciated uplands. Dodge soils are deep, well-drained, gently sloping and sloping soils on glaciated uplands. The soils have high fertility, moderate permeability, and a moderate to severe hazard of erosion. The suitability of these soils for septic tank absorption fields is considered very limited due to slow water movement, depth to saturated zone, and seepage, bottom layer. Therefore, sanitary sewer service is preferrable to an on-site system.

According to the NRCS Soil Survey of Dane County, the St. Charles and Dodge soils (ScB and DnB) are not hydric (hydric soils can be an indication of existing or drained wetlands), do not have seasonal (April to

June) zone of water saturation within 5 feet of the ground surface, and are classified as well drained. The St. Charles soils have a hydrologic soil group (HSG) rating of C, indicating moderately high runoff potential when thoroughly wet. The Dodge soils have a HSG rating of B, which indicates they have a moderate infiltration rate when thoroughly wet.

According to Wisconsin Geological and Natural History Survey (WGNHS) mapping, the bedrock in the amendment area is in the Prairie du Chien Group. Bedrock in the Prairie du Chien Group is dolomite, minor sandstone, cherty dolomite, vuggy, sandy, and oolitic, and consists of two formations including the Shakopee and Oneota Formations. Thickness is up to 145 feet in eastern Dane County. According to WGNHS data, the depth to bedrock in the amendment area ranges from 0-16 feet, with the shallowest depths generally being in the northeastern portion of the amendment area and deepest depths being in the southeastern portion.

Given the potential for shallow bedrock, additional considerations for stormwater management will be required should the proposed amendment area ever be redeveloped in the future. *WDNR Conservation Practice Standard 1001 – Wet Detention Pond* (2007) and *WDNR Conservation Practice Standard 1002 – Site Evaluation for Stormwater Infiltration* (2017) require field verification for areas of the development site considered suitable for stormwater management. This includes a site assessment for shallow bedrock and karst features. If shallow karst features are found, adequate protection measures are required to address any potential for groundwater contamination.

Per Dane County ordinance, infiltration practices receiving runoff from most source areas that contain impervious surfaces must be located to allow a separation distance of at least 5 feet between the bottom of the infiltration system and the elevation of seasonal high groundwater, or the top of bedrock, along with certain soil filtering characteristics. There is no minimum separation distance for roofs draining to surface infiltration practices. Soil test pits are required as part of the stormwater management plan to assure that infiltration practices are sited in locations that will not adversely affect groundwater quality.

Proposed Urban Services

Wastewater

Currently the four parcels within the amendment area are served by private septic systems. The existing commercial property is being renovated from a bank to an office, but the anticipated loading for each is not anticipated to be substantially different. No other development is planned at this time. The three existing single-family homes and one commercial property are anticipated to generate approximately 5,194 gallons per day (gpd) of wastewater. Assuming a peaking factor of 4, the amendment area is anticipated to generate a peak daily flow rate of approximately 20,776 gpd, or 14 gpm (0.03 cfs).

Sanitary sewer service will be provided to the parcels within the amendment area by lateral connections to the existing 10-inch sewer main in Cottage Grove Road. An alternative connection is also available through connection to an existing 8-inch sewer stub coming off South Sprecher Road to the east along the rear of the parcel to the east (see Map 6). The existing main in Cottage Grove Road has a design

capacity of 902,597 gpd, or 627 gpm (1.39 cfs), and the existing main in South Sprecher Road has a design capacity of 493,506 gpd, or 343 gpm (0.76 cfs). The anticipated additional loading from the amendment area is comparatively insignificant and there are no wastewater collection capacity concerns.

Wastewater Treatment Facility

Madison Metropolitan Sanitary District (MMSD) will provide wastewater treatment for the amendment area. The Nine Springs Wastewater Treatment Facility (WWTF) is located on Moorland Road, Madison, and discharges treated effluent to Badfish Creek within the Badfish Creek Watershed (Lower Rock River Basin) and Badger Mill Creek 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 2021, the facility received an average monthly influent hydraulic loading of 36.4 MGD (65% of the 56.0 MGD design capacity), including infiltration and inflow, according to the 2021 Compliance Maintenance Annual Report (CMAR) (link to 2021 CMAR). It is expected to reach 90% of current hydraulic design capacity around 2026 based on current projected growth rate assumptions. This already occurs on occasion, although average flows did not exceed 90% design capacity for any month in 2021. MMSD has completed a long-range plan that evaluates various options for expanded treatment capacity to serve its current and future service area. For the 20-year planning period, treatment for this area is expected to remain at the existing wastewater treatment facility location with expanded capacity of the system as the need is foreseen. MMSD staff have been made aware of the proposed amendment and have indicated support of the proposed amendment.

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 2021 CMAR. 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 Total Maximum Daily Load (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. To meet the WQBEL for phosphorous, 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).

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).

Water System

Currently the four parcels within the amendment area are served by private wells. Water service will be provided through connection to existing lateral stubs in the 12-inch main located in Cottage Grove Road. Madison Water Utility has confirmed that the existing water distribution system has sufficient capacity to serve these properties.

Stormwater Management System

The amendment area is within the Door Creek (HUC 12: 070900020901) subwatershed (see Map 4). The area is currently developed, and the predominant ground covers are pavement, rooftops, and turf grass. There are no existing engineered stormwater management controls within the amendment area. Runoff from the amendment area drains to the southeast, eventually making its way to an unnamed intermittent stream to the southeast, and then to Door Creek.

There is no development or redevelopment planned within the amendment area. If redevelopment does occur in the future, the site will be subject to all stormwater management and performance standards of the City of Madison, Dane County, and WDNR current at the time of development.

Impacts and Effects of Proposal

Environmental Corridors

There are no environmentally sensitive areas within or adjacent to the amendment area that would require designation as environmental corridor. There are also no parks, open space, or stormwater management facilities in the amendment area that would warrant placement in environmental corridors.

The 2050 Regional Development Framework (Framework) is designed to serve as a guide for local communities as they plan for future growth and development. One of the three goals of the Framework is to foster regional development that conserves water resources and natural areas. To achieve this goal, the Framework advocates for enhancing Stewardship and Natural Resource Areas. Stewardship Areas are advisory areas to consider for inclusion in Environmental Corridors above the minimum requirements. Stewardship Areas may include natural resource features such as the 0.2% annual chance floodplain, potentially restorable wetlands, internally drained areas, hydric soils, current/potential Ice Age Trail Corridor, and Natural Resource Area boundaries identified in the Dane County Parks and Open Space Plan. The proposed amendment area does not include mapped Stewardship Area.

Surface Water Impacts

The proposed amendment area is comprised of existing development built before current stormwater regulations. No redevelopment or new development is planned with this proposed amendment. No significant changes to stormwater runoff are anticipated due to the requested amendment and the proposed amendment will not have significant impacts on surface water. However, should the area ever redevelop in the future there is an opportunity to improve the quality of water leaving the site through appropriate best management practices and in accordance with current stormwater management regulations.

Additionally, aside from any major redevelopment work, the installation of rain gardens by the property owners, use of native plantings in lieu of turf grass, or use of water harvesting measures would help to promote infiltration onsite and limit the potential for stormwater runoff, thereby improving stormwater management on the property and mitigating existing surface water and groundwater impacts.

The City of Madison is a participant in the Madison Area Municipal Storm Water Partnership (MAMSWaP), which is a coalition of Dane County municipalities and organizations working together to promote practices that reduce and improve stormwater runoff into Dane County lakes, rivers, and streams. The MAMSWaP Information and Education (I&E) Committee works to develop and implement projects and plans through regional outreach and consistent messaging throughout the communities, including maintaining the www.ripple-effects.com website, distributing tools and articles to municipalities, community groups, and neighborhood associations, and providing presentations to focused audiences. Specific goals include promoting beneficial onsite reuse of leaves and grass clippings, proper use of lawn and garden fertilizers and pesticides, and promoting infiltration of residential stormwater runoff from rooftops, driveways, and sidewalks.

Regional partners are actively working to address chlorides through the Wisconsin Salt Wise Partnership. WI Salt Wise's chloride reduction training courses are open to all municipal and private winter maintenance professionals in the region. City of Madison staff have attended winter salt certification classes for winter road maintenance. The City, as well as private site winter maintenance professionals, are encouraged to stay current on the latest training and development offered by WI Salt Wise.

Groundwater Impacts

The four parcels will connect to the public water distribution system and cease pumping from private wells. This will reduce groundwater withdrawals locally; however, the total water demand is not anticipated to change substantially, and the amendment area is within the 100-year recharge zone of contribution for one of the City's nearby wells.

No new development or redevelopment is planned, but small improvements to the site, including use of green infrastructure to manage stormwater, can have a small but positive impact. Without effective mitigation practices such as this, conversion of natural areas to urban development over time has shifted the ground/surface water balance in streams and wetlands from a groundwater-dominated system to one dominated more and more by surface water runoff. This has resulted in subsequent reductions in stream quality and transitions to biological communities more tolerant to these poorer conditions. Maintaining groundwater recharge by infiltrating stormwater runoff helps to replenish groundwater, maintain baseflow, and mitigate this impact.

Public Commentary

A public hearing is scheduled for September 14, 2023, at a meeting of the Capital Area Regional Planning Commission. The City of Madison has sent notification letters to the Town of Blooming Grove and the four properties within the proposed amendment. No comments have been received and no controversies have been noted to date.

Conclusions and Staff Water Quality Recommendations

The requested amendment area is contiguous to the existing urban service area on all sides and will close a hole in the service area. The amendment will result in improved sewage collection and treatment. There is sufficient existing treatment plant system capacity at the Madison Wastewater Treatment Facility and sufficient existing wastewater collection system capacity to serve the proposed amendment area. There are minimal to no impacts on surface and groundwater anticipated.

There are no formal stormwater management measures on the existing site and the existing development predates current stormwater regulations. There is no new development or redevelopment planned at this time. Should the area ever redevelop in the future, the site will be subject to all stormwater management and performance standards of the City of Madison, Dane County, and WDNR current at the time of development. Additionally, improvements to the way stormwater is handled onsite could be realized through the use of green infrastructure and other best management practices, including the installation of rain gardens by the property owners, use of native plantings in lieu of turf grass, or use of water harvesting measures, and would help to promote infiltration onsite and limit the potential for stormwater runoff.

It is CARPC staff's opinion that the proposed amendment is consistent with water quality standards under Wis. Stat. § 281.15, and the adopted Policies and Criteria for the Review of Minor Sewer Service Area Amendments to the *Dane County Water Quality Plan*. Additional actions have also been recommended below to improve water quality and environmental resource management.

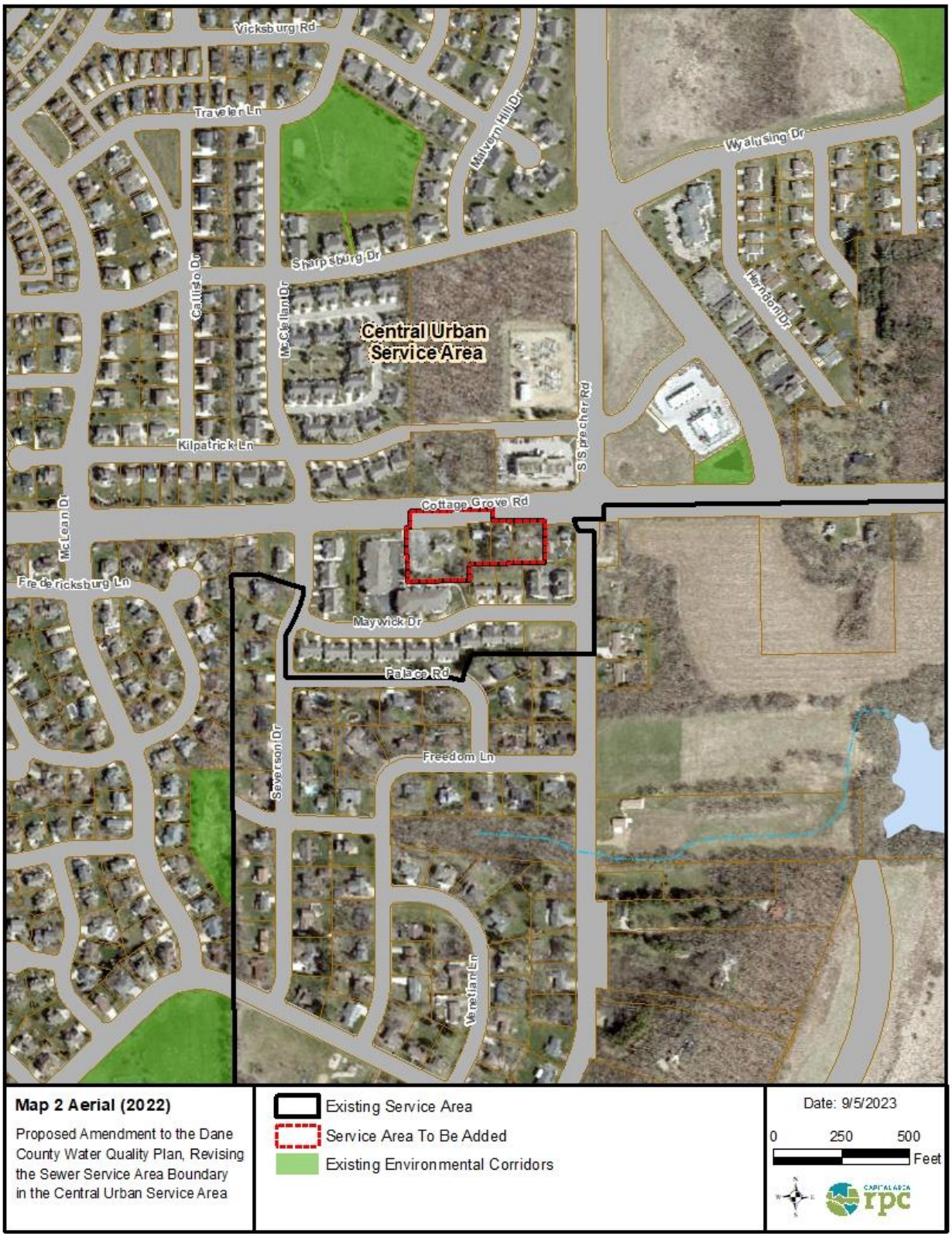
Recommendations

It is recommended that the City of Madison pursue the following to further improve water quality and environmental resource management:

1. Continue to participate in regional water quality initiatives including Wisconsin Salt Wise, the Madison Area Municipal Storm Water Partnership, and Yahara WINs.
2. Encourage the removal and control of invasives and the use of native flora favored by the Rusty Patched Bumble Bee in landscaping to provide suitable habitat for this pollinator, where appropriate, due to the proximity within the High Potential Zone for the federally endangered Rusty Patched Bumble Bee.
3. Encourage the implementation of various green stormwater management practices to effectively control stormwater runoff from the properties, which may include directing rooftop downspouts to pervious areas, use of permeable pavements, installation of a rain garden, use of native plantings in lieu of turf grass, and use of rainwater harvesting measures.

Map 1 - Amendment Area

Map 2 – Aerial


Vicksburg Rd
Traveler Ln
Malvern Hill Dr
Wyalusing Dr
Sharpsburg Dr
Callisto Dr
McClellan Dr
Central Urban Service Area
Herndon Dr
S Sprecher Rd
Kilpatrick Ln
McLean Dr
Cottage Grove Rd
Fredericksburg Ln
Maywick Dr
Palace Rd
Severson Dr
Freedom Ln
Venetian Ln
Map 2 Aerial (2022)
Proposed Amendment to the Dane County Water Quality Plan, Revising the Sewer Service Area Boundary in the Central Urban Service Area
Existing Service Area
Service Area To Be Added
Existing Environmental Corridors
Date: 9/5/2023
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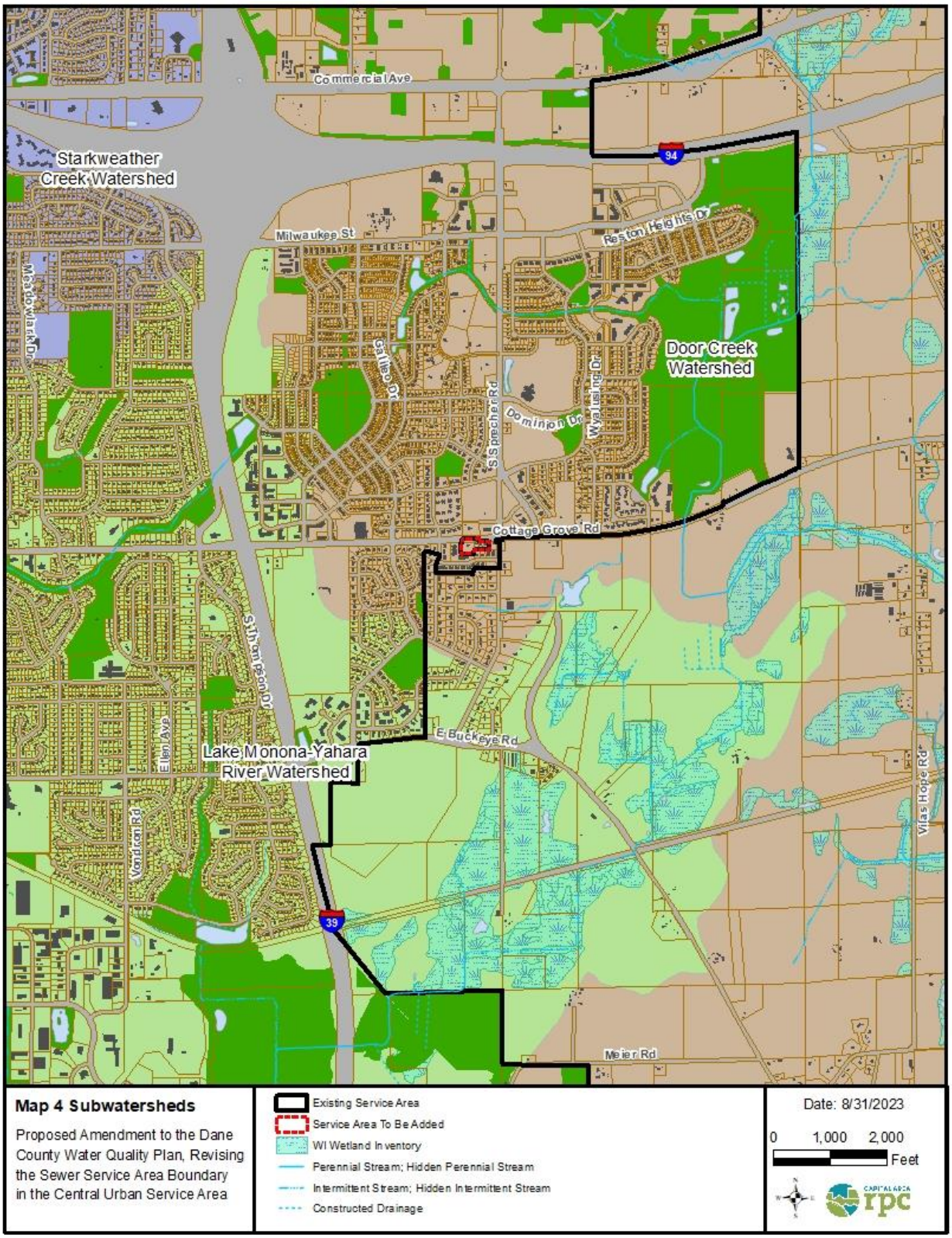
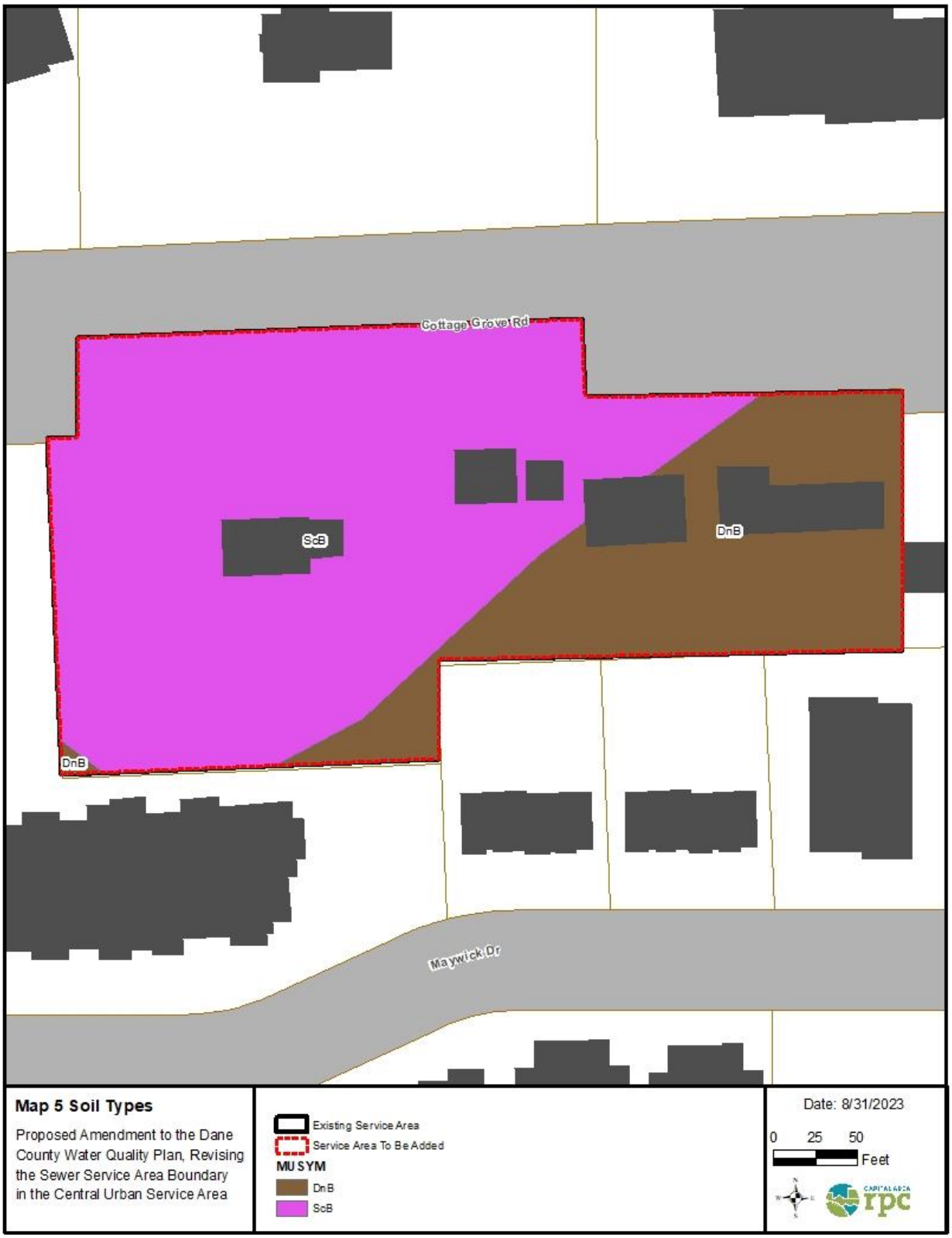
Map 3 – Land Use

Map 4 – Subwatersheds



Map 5 – Soil Types



Map 6 – Sanitary Sewer Service