June 1, 2022

Staff Analysis of Proposed Amendment to the *Dane County Water Quality Plan*, Revising the Sewer Service Area Boundary and Environmental Corridors in the Stoughton Urban Service Area

History of the Stoughton Urban Service Area

The Stoughton Urban Service Area was first delineated in the early-1970s when the Dane County Regional Planning Commission originally adopted its first Land Use Plan. The first amendment to the Stoughton Service Area occurred in 1985 to delineate Environmental Corridors and ensure the SSA boundaries reflected the City's adopted 1984 master plan. This amendment resulted in a net reduction of 450 acres. There has been a total of 10 amendments to this urban service area since its creation totaling 209 net acres of developable land and a net reduction of Environmental Corridor acres. Environmental Corridor in the SSA currently totals 940 acres. The most recent amendment of the service area by the City of Stoughton was recommended by the Commission and approved by the Wisconsin DNR in 2021.

Planning in Stoughton

The *Stoughton Comprehensive Plan* received its most recent major amendment in 2017. The Plan's "Peripheral Growth Analysis" map identifies the current amendment request as a "short-term growth area." The requested amendment area is recommended to be a mix of industrial/business. Additionally, the Comprehensive Plan talks about challenges to expansion of the existing business park/industrial locations in the City. Older areas are constrained due to adjacent non-commercial development. In 2017, Stoughton staff estimated that there were around 290 acres of development in its business parks and an additional 400 non-residential acres (exclusive of rights-of-way) needed through the year 2040.

Existing Conditions

Land Use

The City of Stoughton is requesting amendment to the Stoughton USA in the northeastern corner of the City, adjacent the Stoughton Industrial Park near the intersection of CTH-B and Williams Drive. The amendment area is contiguous to the south with the existing USA boundary. Existing land uses adjacent the requested amendment area include agriculture and residential to the north, west, and east and industrial/business park to the south. The surrounding area is envisioned as predominantly industrial and mixed-use (commercial) development in the City's planning documents. The requested amendment area is 18.6 acres.

Surrounding Planned Land Uses Include:

- North: Industrial and Mixed-use
- West: Industrial and Mixed-use
- South: Industrial
- East: Industrial

Table 1
Existing and Planned Land Use

Land Use Category	Existing Land Use Acres (see Map 3)	Proposed Land Use Acres (see Map 4)
Agriculture	18.0	
Industrial/Business		18.0
Transportation, Communication, Utilities	0.5	0.5
Total	**18.5**	**18.5**

Cultural and Historic Sites

The Wisconsin Historical Society (WHS) has been contacted regarding the presence of any known archaeological sites or cemeteries within the amendment area. This Stoughton Urban Service Area amendment is not in proximity to any known sites and WHS does not recommend any further investigation. (Attachment 1).

Natural Resources

The proposed amendment area is in the City of Stoughton-Yahara River (HUC 12: 070900020903) watershed (Map 5). There are no mapped wetlands or floodplains within the amendment area.

Wastewater from the amendment area will be treated at the Stoughton Wastewater Treatment Facility (Map 5). The treated effluent is discharged to the Yahara River.

Wetlands
DNR's Wisconsin Wetland Inventory (WWI) does not show any wetlands within or adjacent to the amendment area.

The wetland inventory includes forested, scrub / shrub and emergent / wet meadow wetlands associated with Yahara River approximately 0.4 miles to the east/southeast of the amendment area (Map 5).

Yahara River
The Yahara River (WBIC 798300 / WATERS ID 355202) is 63 miles long and originates in Columbia County, connecting Lakes Mendota, Monona, Kegonsa, and Waubesa. The Lower Yahara River subwatershed (the portion downstream of Lake Kegonsa) is approximately 44 square miles. A 22-mile segment of the Lower Yahara River from Lake Kegonsa downstream to its mouth at the Rock River has been listed as an impaired water per Section 303(d) of the Clean Water Act since 1998. Pollutants of concern are sediment/total suspended solids and total phosphorus, which have resulted in a degraded habitat and low dissolved oxygen. Total Maximum Daily Loads (TMDL) for total phosphorus and sediment were approved by the US EPA on September 28, 2011. The water was assessed during the 2018 listing cycle and based on the sample data the total phosphorus listing was removed. The Stoughton and Lake Kegonsa segment (from mile 16.33 to 22.08) is downstream of the amendment area and supports a Warmwater Sport Fishery (Map 5).

There has been a Rock River Coalition / Yahara WINs monitoring location on the Yahara River at Prospect Street (Station ID 10040742) since 2013. Field measurements from 2021 indicated dissolved oxygen levels of 6.7 to 10 mg/L, transparency of 52 to 120 cm, and macroinvertebrate index scores of 2.0 to 2.3. Chloride data is not collected at this monitoring

location. USGS baseflow monitoring on the Yahara River at Forton Street Bridge (Station 05429700) measures discharge and water level but does not collect water quality data.

Springs

The Wisconsin Geological and Natural History Survey (WGNHS) maintains an inventory of springs in Dane County and throughout the state. From 2014 – 2017, the WGNHS surveyed springs statewide that were expected to have flow rates of at least 0.25 cubic feet per second (cfs). There are no known springs in or near the proposed amendment area. Springs represent groundwater discharge visible to the casual observer. Generally, groundwater discharge occurs along the entire length of perennial streams and is the source of stream baseflow. The regional groundwater model is a useful tool for evaluating different configurations and scenarios of municipal groundwater well withdrawals on these stream systems.

Groundwater

Groundwater modeling, using the 2016 Groundwater Flow Model for Dane County developed by the WGNHS (link to website), shows that 2010 modeled baseflow in the Yahara River at Main Street (see Map 5), decreased compared to predevelopment flow conditions (202 to 152 cfs; Table 4). These reductions are due to the cumulative effects of well water withdrawals from multiple municipalities in the groundwatershed. Pre-development conditions represent no well pumping within the model.

In 2012, the WGNHS published a report, *Groundwater Recharge in Dane County, Wisconsin, Estimated by a GIS-Based Water-Balance Model,* (link to report) estimating the existing groundwater recharge rates in Dane County based on the soil water balance method. The study estimates that the existing groundwater recharge rate in the proposed amendment area ranges from approximately 9 to 10 inches per year.

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 Regional Planning Commission staff for species designated as endangered, threatened, or of special concern did not identify any within a one-mile radius of the amendment area. A 1-mile buffer was considered for terrestrial and wetland species and a 2-mile buffer for aquatic species. One state fish species of concern was identified within a two-mile radius. Additional review by the WDNR Bureau of Endangered Resources is not required.

The amendment area was reviewed against the High Potential Zone (area where species likely present) for the federally endangered Rusty Patched Bumble Bee (link to web map). None of the amendment area falls within the High Potential Zone.

Soils and Geology

The amendment area is located within the East Johnstown-Milton Moraines Land Type Associations of Wisconsin. The Association classifies the surficial geology of this area as undulating hummocky moraine and outwash plain complex with scattered lake plains.

Surface elevations within the amendment area range from around 877 feet to 892 feet. There are some small, isolated areas of steep (> 12%) and very steep (>20%) slopes associated with the road embankment along Williams Drive (Map 6). These small 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 soils in amendment area are in Batavia-Houghton-Dresden association. These soils are well drained and poorly drained, deep and moderately deep silt loams and mucks that are underlain by silt, sand, and gravel. Table 2 shows detailed classification for soils in the amendment area (Map 7) while Table 3 shows important soil characteristics for the amendment area.

There are no hydric soils within the amendment area (see Map 7). Hydric soils are good indicators of existing and former (drained) wetlands.

According to the Soil Survey Geographic data for Dane County developed by the USDA Natural Resources Conservation Service (link to web soil survey), all of the soils within the amendment area do not have a seasonal (April to June) zone of water saturation within 5 feet of the ground surface and they are all classified as well drained.

Table 2
Soils Classification

Soil	% of Area	General Characteristics
Kegonsa Silt Loam; KeB	57.8	Well drained, nearly level and gently sloping, moderately deep soils on benches on outwash plains. Soils have medium fertility, moderate to rapid permeability, and moderate hazard of erosion. Poses no limitations for development.
Plano Silt Loam; PoB	15.7	Deep, well drained and moderately well drained, nearly level to sloping soils on glaciated uplands. Soils have high fertility, moderate permeability, and a moderate hazard of erosion. Poses slight to moderate limitations for development due to low bearing capacity.
Dresden Silt Loam; DsB	13.5	Well drained, gently sloping to steep slopes on benches in stream valleys. Soils have medium fertility, low permeability, and a moderate to severe hazard of erosion. Poses slight to moderate limitations for development due to slope.
Batavia Silt Loam; BbA	9.2	Deep, well drained, nearly level to sloping soils on high benches. Soils have high fertility, moderate permeability, and no hazard of erosion. Poses moderate limitations for development due to shrink/swell potential.
Batavia Silt Loam; BbB	3.8	Deep, well drained, nearly level to sloping soils on high benches. Soils have high fertility, moderate permeability, and a moderate hazard of erosion. Poses moderate limitations for development due to shrink/swell potential.

Source: Soil Survey Geographic data for Dane County developed by the USDA Natural Resources Conservation Service

Table 3
Soils Characteristics

Characteristic	Soil Map Symbols (see Map 7)	% of Area
Prime Agricultural Soils	KeB, PoB, DsB, BbA, BbB	100
Hydric Soils (Indicates Potential / Restorable Wetlands)	None	0
Poorly Drained Soils with Seasonal High Water Table (< 5')	None	0
Soils Associated with Steep Slopes (> 12%)	None	0
Soils Associated with Shallow Bedrock (< 5')	None	0
Best Potential for Infiltration in Subsoils	KeB, PoB, DsB, BbA, BbB	100

Source: Soil Survey Geographic data for Dane County developed by the USDA Natural Resources Conservation Service

According to WGNHS data, bedrock within the southwest half of the amendment area is in the Wonewoc Formation. Bedrock in the Wonewoc Formation is quartz sandstone, medium grained, brownish yellow to white, with medium- to large-scale cross bedding commonly seen in outcrop and is part of the Elk Mound Group. This Formation reaches a maximum thickness off 165 feet in the subsurface. The bedrock in the northeastern half of the amendment area is in the Tunnel City Group. Bedrock in the Tunnel City Group is medium to very fine-grained quartz sandstone, locally very glauconitic, and consists of two formations including the Lone Rock and Mazomanie Formations. Thickness is up to 150 feet. According to WGNHS data, the depth to bedrock in the amendment area ranges from 331-352 feet, with the shallowest depths generally being in the southwestern corner and central portion and deepest depths being in the northeastern corner of the amendment area.

As is common throughout much of the upper Midwest, karst features such as enlarged bedrock fractures are prevalent in the local dolomite uplands. Karst features such as vertical fractures and conduits provide primary pathways for groundwater movement and can dramatically increase groundwater susceptibility when present. The location of karst features is difficult to predict, and the thickness and type of the overlying soil greatly affects how much water drains into them. Where clay soils are thick, infiltration rates are likely to be very low. However, where bedrock fractures are near the surface infiltration rates can be very high. Based on the WGNHS karst potential data, no karst features are present within the amendment area. The Wisconsin Department of Natural Resources Conservation Practice Standard 1002 - Site Evaluation for Stormwater Infiltration requires field verification for areas of the development site considered suitable for infiltration. This includes a site assessment for karst features in this area. If shallow karst features are found, adequate protection measures are required to address any potential for groundwater contamination.

There is no minimum separation distance for roofs draining to surface infiltration practices. However, the Dane County ordinance requires infiltration practices to be located so that the separation distance between the bottom of the infiltration system and the elevation of seasonal high groundwater or the top of bedrock is at least 5 feet for residential arterial roads and 3 feet for other impervious surfaces. 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

Parks and Open Space

There are no proposed parks as part of the amendment area. There is one stormwater management area, approximately one acre in size, proposed in the southwest portion of the amendment area (see Map 2).

Wastewater

Sanitary sewer service will be provided to the amendment area by connection to the City's sanitary sewer collection and treatment system. The entire amendment area will gravity drain via extension of two existing 8-inch sewer stubs connecting to an existing 10-inch sewer main located within Glacier Moraine Drive. This sewer connects to the existing 12-inch Industrial Park Interceptor located within Williams Drive, which then flows south to the Trail Interceptor/Division Street Interceptor, and ultimately to the City of Stoughton Wastewater Treatment Facility. Refer to Map 8A.

The proposed development within the amendment area contributing to wastewater flows consists of planned industrial uses, generally intended for indoor manufacturing, assembling and storage uses. The City estimates that the amendment area will generate an annual average of 29,600 gallons per day (gpd) of wastewater, or 21 gallons per minute (gpm). This is equal to an average of 1,558 gpd per acre (gpd/ac) for the planned industrial land uses. The City

estimates that the amendment area will generate a peak daily flow rate of 55,500 gpd, or 39 gpm, which corresponds to a peaking factor of 1.875.

The proposed 8-inch sanitary sewers connecting to the amendment area are each anticipated to have a minimum capacity of 332 gpm, based on a design slope of 0.40% (minimum allowable per NR 110), which will provide sufficient capacity for the anticipated peak flows from the amendment area. The existing 10-inch sewer in Glacier Moraine Drive was designed to be able to handle peak flows of 5,000 gpd/ac from the amendment area, assuming 2,000 gpd/ac and a peaking factor of 2.5. Assuming minimum allowable slopes, it has a capacity of approximately 510 gpm. It currently receives no flow. The existing 12-inch sewer in Williams Drive was also designed be able to handle peak flows of 5,000 gpd/ac from its sewershed drainage area. This sewer is reported to be laid at a slope of 0.22% and have a capacity of approximately 750 gpm. This sewer is estimated to receive current peak flows of approximately 500 gpm. Together with the proposed flows from the amendment area, the existing interceptor sewer is anticipated to receive a peak flow of approximately 539 gpm, which is approximately 70% of the pipe-full capacity. The interceptor sewers further downstream have been reported to have sufficient capacity. Stoughton Utilities requires that sanitary sewers operate at a maximum of approximately 80% capacity. Nonetheless, it is expected that the receiving sewers have sufficient capacity to handle the anticipated peak flow from the amendment area.

Wastewater Treatment Facility

The Stoughton Wastewater Treatment Facility (WWTF) will provide wastewater treatment for the amendment area. The WWTF is located on Mandt Parkway and discharges to the Yahara River within the City of Stoughton-Yahara River watershed. The rated monthly design flow capacity of the facility is 2.06 MGD and the maximum daily design flow capacity is 4.0 MGD. In the year 2020, the facility received an average monthly influent hydraulic loading of 1.13 MGD (55% of the design capacity), including infiltration and inflow, according to the 2020 Compliance Maintenance Annual Report (CMAR) (link to 2020 CMAR). The existing capacity of the WWTF is anticipated to support the additional wastewater flows from the proposed amendment area.

The City did not have any issues meeting its WPDES permit (effective May 2020, expires March 2025) limits for the quality of effluent discharged to Yahara River in the most recently reported calendar year. Below is a summary of the major effluents reported on in the 2020 CMAR:

- The biological oxygen demand (BOD) effluent quality for 2020 was well below the monthly average limit, with a monthly average of 2.4 mg/L (10% of the limit) and a maximum of 3 mg/L (12% of the limit) for the months of February through April, September, and October.
- The total suspended solids (TSS) effluent quality for 2020 was below the monthly average limit, with a monthly average of 6.4 mg/L (32% of the limit) and a maximum of 8 mg/L (40% of the limit) for the months of September and October.
- The ammonia (NH3) effluent quality for 2020 was below the monthly average limit (varies by month), with a monthly average of 4.92 mg/L (average of 12% of the respective limits) and a maximum of 13.83 mg/L (46% of the respective limit) for the month of September.
- The phosphorus (P) effluent quality for 2020 was below the monthly average limit, with a monthly average of 0.36 mg/L (average of 33% of the respective monthly limits) with a maximum of 0.51 mg/L (51% of the limit).

The WWTF discharges to a tributary to the Rock River, and thus the WPDES permit includes TSS and phosphorus limits to comply with the Total Maximum Daily Load (TMDL) developed for the Rock River Basin to protect and improve water quality. To meet the future water quality-based effluent limit (WQBEL) for phosphorous, the Stoughton WWTF has been approved by Wisconsin DNR to implement a watershed adaptive management approach (WAM). The adaptive management interim limitation for phosphorus is 0.6 mg/L, expressed as a six-month average (May through October and November through April), and goes into effect beginning the period from May 1, 2023, through October 31, 2023. Additionally, a 1.0 mg/L monthly average

has been required beginning May 2020 (previous limit was 1.3 mg/L). Stoughton WWTF will participate in the Yahara Watershed Improvement Network (Yahara WINs) to implement phosphorus reducing practices within the watershed (link to website).

Water System

Stoughton Water Utility provides municipal water through a public water distribution system which includes approximately 370,961 lineal feet of water main and four active high-capacity groundwater wells within the City. Three of the wells pump directly into the distribution system and one pumps into a reservoir, where two booster pumps are then used to pump into the distribution system. The active wells are at depths ranging from approximately 969 to 1,137 feet with an average capacity of 991 to 1,324 gallons per minute (gpm). In total, the gross capacity of the municipal wells is 4,543 gpm (6.54 million gallons per day, MGD). The firm capacity (with the largest well assumed to be out of service) is approximately 3,219 gpm (4.64 MGD), although the City also maintains two standby high-capacity groundwater wells. The City has one ground-level reservoir and two elevated tanks, with a combined storage capacity of 1.30 million gallons. According to the 2020 Annual Report to the Public Service Commission of Wisconsin (link to 2020 Annual Report), the City pumped an average of 958 gpm, or 1.38 MGD, approximately 30% of its firm pumping capacity. In 2020, the maximum amount pumped in any one day was 2.25 MGD.

Water losses in the City's distribution system were an average of 155,458 gpd (0.16 MGD) in 2020, which accounted for 11% of the net water supplied in 2020. Approximately 86% of this was due to unreported and background leakage, with the remaining due to reported leaks and other apparent losses. In 2020, there were 11 main breaks and 18 service break which were repaired. Water losses in the City's distribution system were 10% in 2018 and 8% in 2019. The Wisconsin Administrative Code PSC 185.85(4)(b) requires a utility with more than 1,000 customers to submit a water loss control plan to the Public Service Commission (PSC) if the utility reports its percentage of water losses exceeds 15%.

The City estimates the current average daily demand on the system is 1,050 gpm or 1.51 MGD, with an historical peak daily demand of 1,911 gpm or 2.75 MGD, occurring in 2019. This translates to a peak daily demand factor of 1.8. A historical peak hourly demand was not available; however, assuming a peak hourly demand factor of 2.5 (used by the City in estimating future demands from the amendment area), the current peak hourly demand on the system is estimated to be 2,625 gpm.

Water supply within the amendment area will be provided by existing 10-inch water main on Glacier Moraine Drive and Williams Drive. Within the amendment area, service to the lot is anticipated to be provided by extension of existing 6-inch and 8-inch water service stubs on Glacier Moraine Drive. Existing stubs are also available on Williams Drive. Refer to Map 8A.

The annual average daily water demand for the amendment area is anticipated to be 38,000 gallons per day (gpd), or 26 gpm. This assumes an average demand of 2,000 gpd/acre for the proposed industrial land uses. The estimated peak hourly demand is 3,960 gallons/hour, or 66 gpm, based on a peak hourly demand factor of 2.5. The estimated average daily water demand and peak hourly demand represent an increase of approximately 3% of the current demands on the system. It is anticipated that the existing water supply system will support the additional demand from the proposed amendment area.

Stormwater Management System

The City of Stoughton stormwater management and performance standards are contained within Chapter 10, Article IV of the City of Stoughton Code of Ordinances. Dane County Code of Ordinances, Chapter 14, contains stormwater management and performance standards which apply to all areas of Dane County, and which were recently updated at the end of 2021. The amendment area will be required to follow the more stringent standards contained within

the respective ordinances, as well as Wisconsin DNR requirements contained in NR 151 and 216.

The amendment area currently consists of agriculture lands and is within the City of Stoughton-Yahara River watershed. The site generally drains south/southwest, where runoff is then conveyed via existing 42- and 48-inch-diameter storms sewer within Glacier Moraine Drive and Williams Drive to an existing regional detention basin located south of the amendment area. Discharge from the regional basin generally drains southeast through existing development within the City, eventually draining to the Yahara River and adjacent wetlands approximately 0.6 miles southeast of the amendment area.

Development within the amendment area will meet current stormwater regulations for peak rate control and attenuation, water quality (TSS reduction), volume control (infiltration), and oil/grease control through proposed wet detention and infiltration facilities on-site and existing regional facilities. The City's application indicates that the existing regional detention basin south of the amendment area will provide water quality control and peak rate control for storm events up to and including the 100-year, 24-hour design storm event. Additional peak rate control will be provided on-site for the 200-year event. Infiltration facilities and oil/grease control will be provided on-site. Runoff from offsite lands north of the site will be routed around the site via open ditching along Williams Drive. Refer to Map 8B for a conceptual stormwater management plan. The existing storm sewer and regional basin are owned and maintained by the City of Stoughton. On-site stormwater devices will be owned and maintained privately by the property owner, subject to a stormwater management maintenance agreement which will be recorded with the Dane County Register of Deeds.

Detailed stormwater management design has not been completed for the amendment area; however, the southwestern corner of the site has been identified for potential stormwater management facilities. Based on general soil data from the NRCS Soil Survey, the site soils are classified as having a hydrologic soil group (HSG) of B and are all considered well-drained. An on-site soil investigation will be required prior to final design, but the site appears to have good potential for infiltration and karst is not a concern. Refer to the Natural Resources section of this report for additional information on soils.

A detailed stormwater management plan review and approval is required prior to beginning any development construction. The plan will be required to meet all stormwater management and performance standards of the City of Stoughton, as well as those of Dane County and Wisconsin DNR.

Performance Standards

The City of Stoughton proposes stormwater management performance measures to meet or exceed standards required by the State of Wisconsin (NR 151), Dane County (Chapter 14), and City of Stoughton (Chapter 10). The proposed stormwater standards for new development are as follows:

1. Require post-construction sediment control (reduce total suspended solids leaving the site by at least 80%, as compared to no runoff management controls; with a minimum of 60% of that control occurring in a detention pond prior to infiltration for residential land uses and a minimum of 80% occurring prior to infiltration for commercial, industrial, and institutional land uses) for the average annual rainfall period. This is consistent with the standards currently required by Dane County and City of Stoughton ordinances.

2. Require post-construction peak runoff rate control for the 1-, 2-, 10-, 100-, and 200-year, 24-hour design storms (using NRCS MSE4 storm distributions) to match predevelopment peak runoff rates. This is consistent with the standards currently required by Dane County and City of Stoughton ordinances.

3. Require post-development infiltration (stay-on) volume of at least 90% of the pre-development infiltration (stay-on) volume for the average annual rainfall period. This is consistent with the standards currently required by Dane County and City of Stoughton ordinances.

4. Maintain predevelopment groundwater annual recharge rates of approximately 9 to 10 inches per year, as estimated by the Wisconsin Geological and Natural History Survey in a 2012 report titled "Groundwater Recharge in Dane County, Wisconsin Estimated by a GIS-Based Water Balance Model." This is consistent with the standards currently required by Dane County and City of Stoughton ordinances.

5. Treat the first one-half inch of runoff to provide oil and grease control using the best available technology for commercial or industrial land uses and any other uses where the potential for pollution by oil or grease, or both, exists. This is consistent with the standards currently required by Dane County and City of Stoughton ordinances.

Impacts and Effects of Proposal

Environmental Corridors

There are no environmentally sensitive areas within or adjacent to the proposed amendment area. The proposed amendment area includes approximately one acre of environmental corridor for stormwater management areas in accordance with the Environmental Corridor Policies and Criteria (link to document) adopted in the *Dane County Water Quality Plan* (See Map 2).

Meeting Projected Demand

Stoughton is projected to grow by roughly 5,700 people and 2,300 households over the next 30 years. Employment is projected to increase by 1,300 jobs. The proposed amendment would add an estimated 130 new jobs.

Phasing

The proposed amendment area is smaller than 100 acres. A phasing plan is not required.

Surface Water Impacts

Development creates impervious surfaces (i.e., streets, parking areas, and roofs) and typically alters the natural drainage system (e.g., natural swales are replaced by storm sewers). Without structural best management practices (i.e., detention basins and infiltration basins) this would result in increased stormwater runoff rates and volumes, as well as reduced infiltration. Without structural best management practices for erosion control, development would also cause substantial short-term soil erosion and off-site siltation from construction activities. Scientific research has well documented that without effective mitigation measures, the potential impacts of development on receiving water bodies can include the following:

- Flashier stream flows (i.e., sudden higher peaks)
- Increased frequency and duration of bankfull flows
- Reduced groundwater recharge and stream base flow
- Greater fluctuations in water levels in wetlands
- Increased frequency, level (i.e., elevation), and duration of flooding
- Additional nutrients and urban contaminants entering the receiving water bodies
- Geomorphic changes in receiving streams and wetlands

Natural drainage systems attempt to adapt to the dominant flow conditions. In the absence of mitigation measures, the frequency of bank-full events often increases with urbanization, and

the stream attempts to enlarge its cross section to reach a new equilibrium with the increased channel forming flows. Higher flow velocities and volumes increase the erosive force in a channel, which alters streambed and bank stability. This can result in channel incision, bank undercutting, increased bank erosion, and increased sediment transport. The results are often wider, straighter, sediment laden streams, greater water level fluctuations, loss of riparian cover, and degradation of shoreland and aquatic habitat.

Since 2002, there have been stormwater management standards in effect at the state, county, and local level to require stormwater management and erosion control plans and structural best management practices designed to address the impacts of development on water quality, runoff volumes, peak flows, water temperature, and groundwater recharge. In 2011, county and local standards for runoff volume control were increased beyond state standards to further address the potential stormwater impacts of development. Since 2010 many communities adopted even higher standards for volume control through their own ordinances or as part of USA amendment agreements. In 2017, State statute 281.33(6)(a)(1) was changed to limit the ability of local governments to adopted higher standards for runoff volume through local ordinances. In response to climate change, the City of Madison adopted peak rate control for the 200-year storm event in their ordinance in June 2020. Dane County adopted this same peak rate control requirement as well as requirements for closed basins in November 2021, which made these requirements universal to all of the communities in Dane County.

The City of Stoughton proposes to mitigate the urban nonpoint source impacts of the proposed development by requiring the implementation of various stormwater best management practices that are designed and constructed to meet current Dane County standards for pollutant reduction, runoff volumes, peak flows, water temperature, and groundwater recharge to address the potential water quality impacts of stormwater runoff from the proposed development on the receiving waters.

Regional partners are actively working to address chlorides through the Wisconsin Salt Wise Partnership. Participation in the chloride reduction trainings provided by WI Salt Wise is open to any municipality and private winter maintenance professional in the region. City of Stoughton staff attended winter salt certification class for winter road maintenance in 2014.

Groundwater Impacts

Without effective mitigation practices, as natural areas are converted to urban development, the ground/surface water balance in streams and wetlands shifts from a groundwater-dominated system to one dominated more and more by surface water runoff. This can result in subsequent reductions in stream quality and transitions to more tolerant biological communities.

Groundwater modeling indicates that the cumulative effects of well withdrawals have resulted in a 52 cfs decrease in baseflow of the Yahara River at Main Street (location of modeling shown on Map 5) from predevelopment (no pumping) to 2010 (Table 4). An additional 8 cfs decline compared to 2010 conditions is anticipated for the year 2040, according to modeling.

Table 4
Modeled Baseflow Results
Due to Current and Anticipated Future Municipal Well Water Withdrawals (All Municipal Wells)

Stream	No Pumping	2010	2040
Yahara River	*202 cfs*	*150 cfs*	*142 cfs*

The loss of baseflow from the cumulative effects of well water pumping is a regional issue, beyond the boundaries of a single USA Amendment or even a single municipality. 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.

Comments at the Public Hearing

A public hearing was held on the proposed amendment at the May 12, 2022, meeting of the Capital Area Regional Planning Commission. Representatives from the City of Stoughton and the Emmi Roth development team spoke in favor of the amendment. There were no registrants opposed to the amendment. There were no questions or comments from Commissioners.

Conclusions and Staff Water Quality Recommendations

There is sufficient existing treatment plant system capacity at the Stoughton Wastewater Treatment Facility to serve the proposed amendment area. There is also sufficient existing or planned wastewater collection system capacity to serve the proposed amendment area.

Since 2002, there have been stormwater management standards in effect at the state, county, and local level to require stormwater management and erosion control plans and structural best management practices designed to address the impacts of development on water quality, runoff volumes, peak flows, water temperature, and groundwater recharge. In 2011, county and local standards for runoff volume control were increased beyond state standards to further address the potential stormwater impacts of development. Since 2010 many communities adopted even higher standards for volume control through their own ordinances or as part of urban service area amendment agreements. In 2017, State statute 281.33(6)(a)(1) was changed to limit the ability of local governments to adopted higher standards for runoff volume through local ordinances. In response to climate change, the City of Madison adopted peak rate control for the 200-year storm event in their ordinance in June 2020. Dane County adopted this same peak rate control requirement as well as requirements for closed basins in November 2021, which made these requirements universal to all of the communities in Dane County.

The City of Stoughton proposes to mitigate the urban nonpoint source impacts of the proposed development by requiring the implementation of stormwater best management practices that are designed and constructed to meet current Dane County standards for pollutant reduction, runoff volumes, peak flows, water temperature, and groundwater recharge to address the potential urban nonpoint source impacts of the proposed development on the receiving waters.

It is the Regional Planning Commission 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 Sewer Service Area Amendments to the *Dane County Water Quality Plan*, with the existing state and local requirements identified below. Additional actions have also been recommended below to further improve water quality and environmental resource management.

State and Local Requirements

Regional Planning Commission staff recommends approval of this amendment, based on the land uses and services proposed, and in recognition of the state and local requirements for the following:

1. State and local review and approval of stormwater management plan(s) is required, including Regional Planning Commission staff review and approval as part of the sewer extension review process.

a. Stormwater and erosion control practices are required to be installed prior to other land disturbing activities. Infiltration practices are required to be protected from compaction and sedimentation during land disturbing activities.

b. Peak rates of runoff are required to be controlled for the 1-, 2-, 10-, 100-, and 200-year 24-hour design storms to "pre-development" levels, in accordance with the City of Stoughton and Dane County Stormwater Ordinances.

c. Sediment control is required that achieves at least 80% sediment control for the amendment area based on the average annual rainfall period, with a minimum of 60% of that control occurring prior to infiltration, in accordance with the City of Stoughton and Dane County Stormwater Ordinances.

d. Runoff volume control is required that maintains the post development stay-on volume to at least 90% of the pre-development stay-on volume for the average annual rainfall period, in accordance with the City of Stoughton and Dane County Stormwater Ordinances.

e. Oil and grease control are required that treats the first one-half inch of run-off using best management practices at commercial and industrial sites, in accordance with the City of Stoughton and Dane County Stormwater Ordinances.

f. Maintaining pre-development groundwater recharge rates from the Wisconsin Geological and Natural History Survey's 2012 report, *Groundwater Recharge in Dane County, Wisconsin, Estimated by a GIS-Based Water-Balance Model* (a range of 9 to 10 inches/year for the amendment area or by a site specific analysis, when required by the City of Stoughton and Dane County Stormwater Ordinances.

2. Easements and perpetual legal maintenance agreements with the City, to allow the City to maintain stormwater management facilities if owners fail to do so, are required for any facilities located on private property.

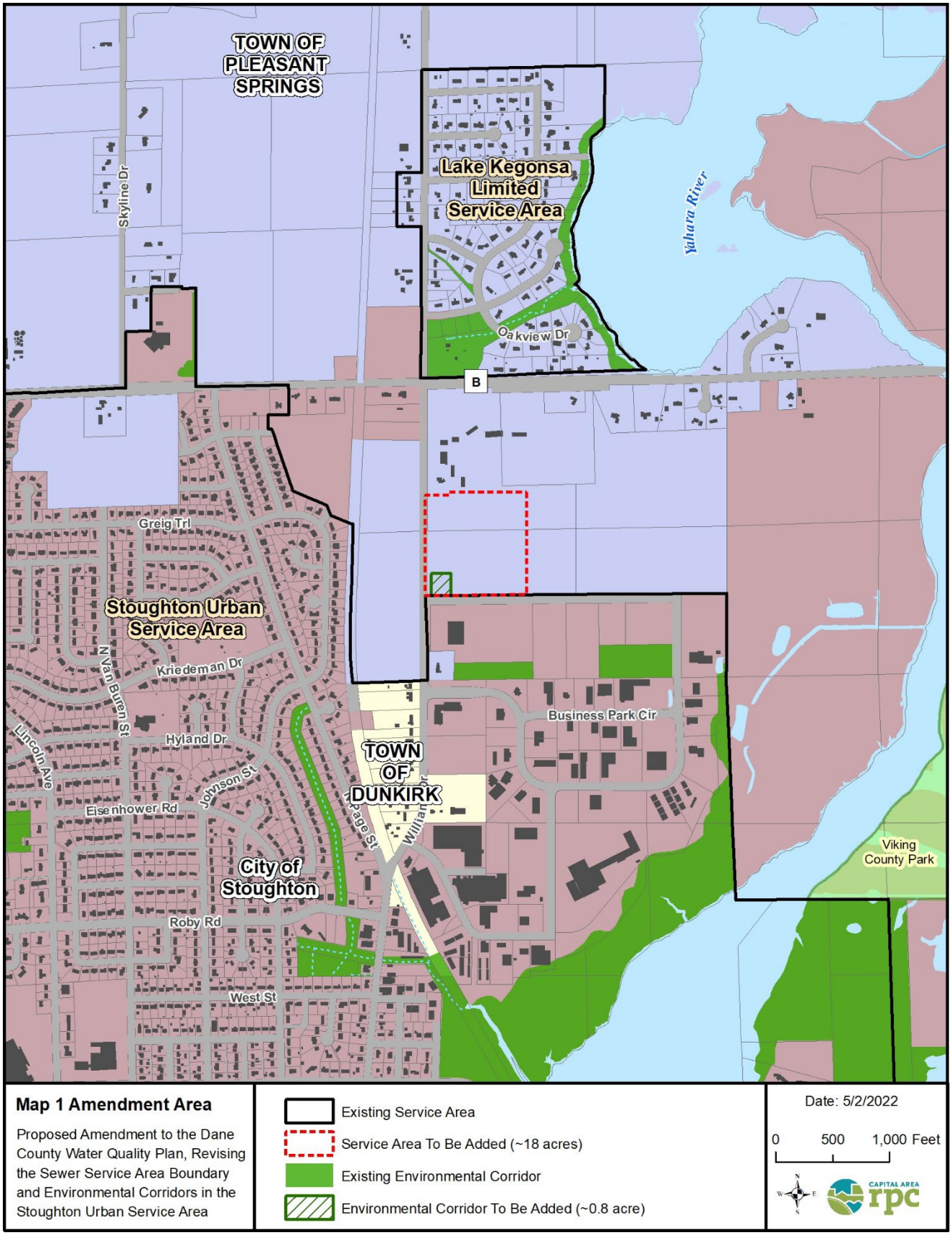
3. Environmental corridors are required to be delineated for stormwater management areas to meet the Environmental Corridor Policies and Criteria adopted in the *Dane County Water Quality Plan*.

Recommendations

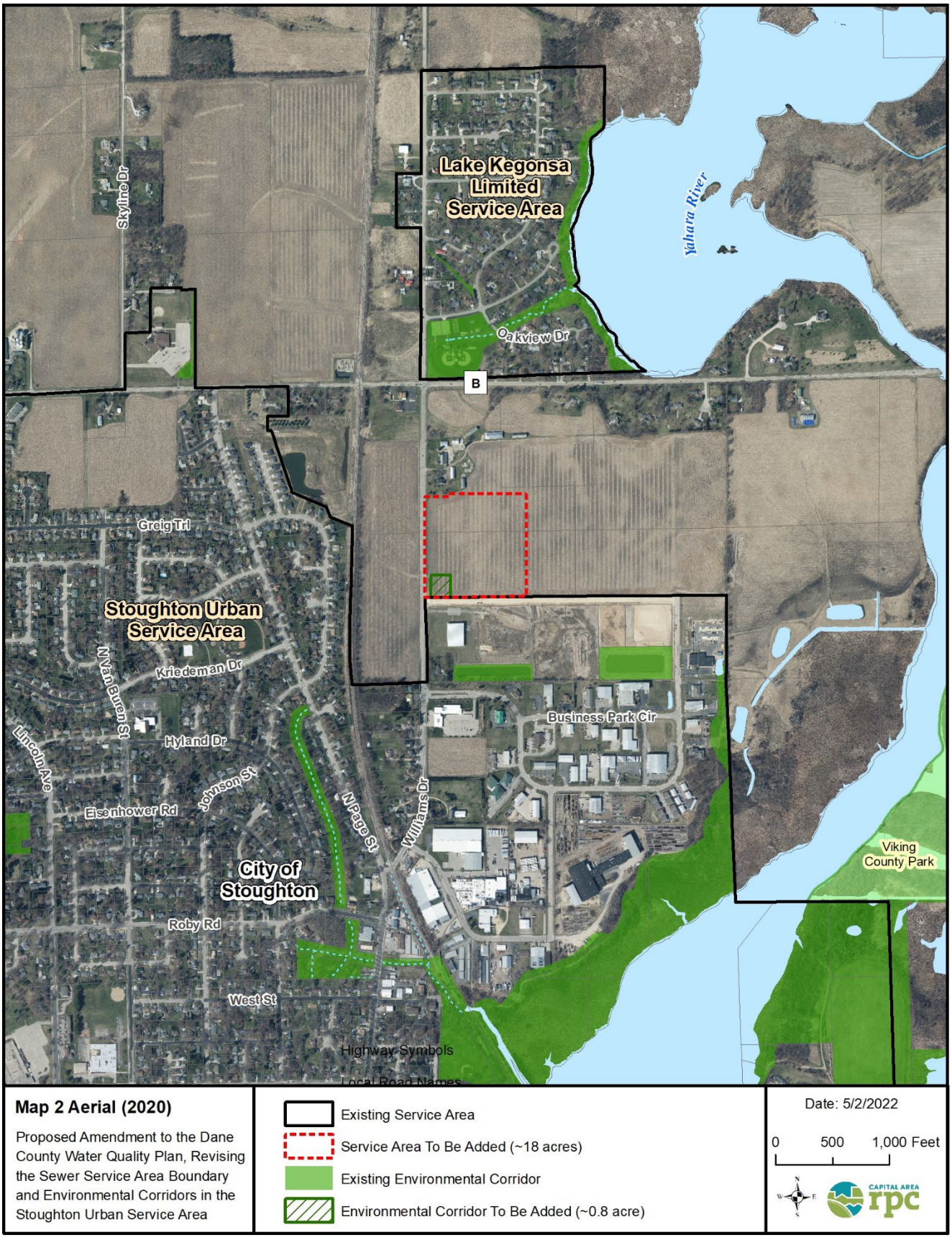
It is recommended that the City of Stoughton pursue the following to further improve water quality and environmental resource management:

1. Continue to foster the responsible use of chlorides by collaborating with Wisconsin Salt Wise.

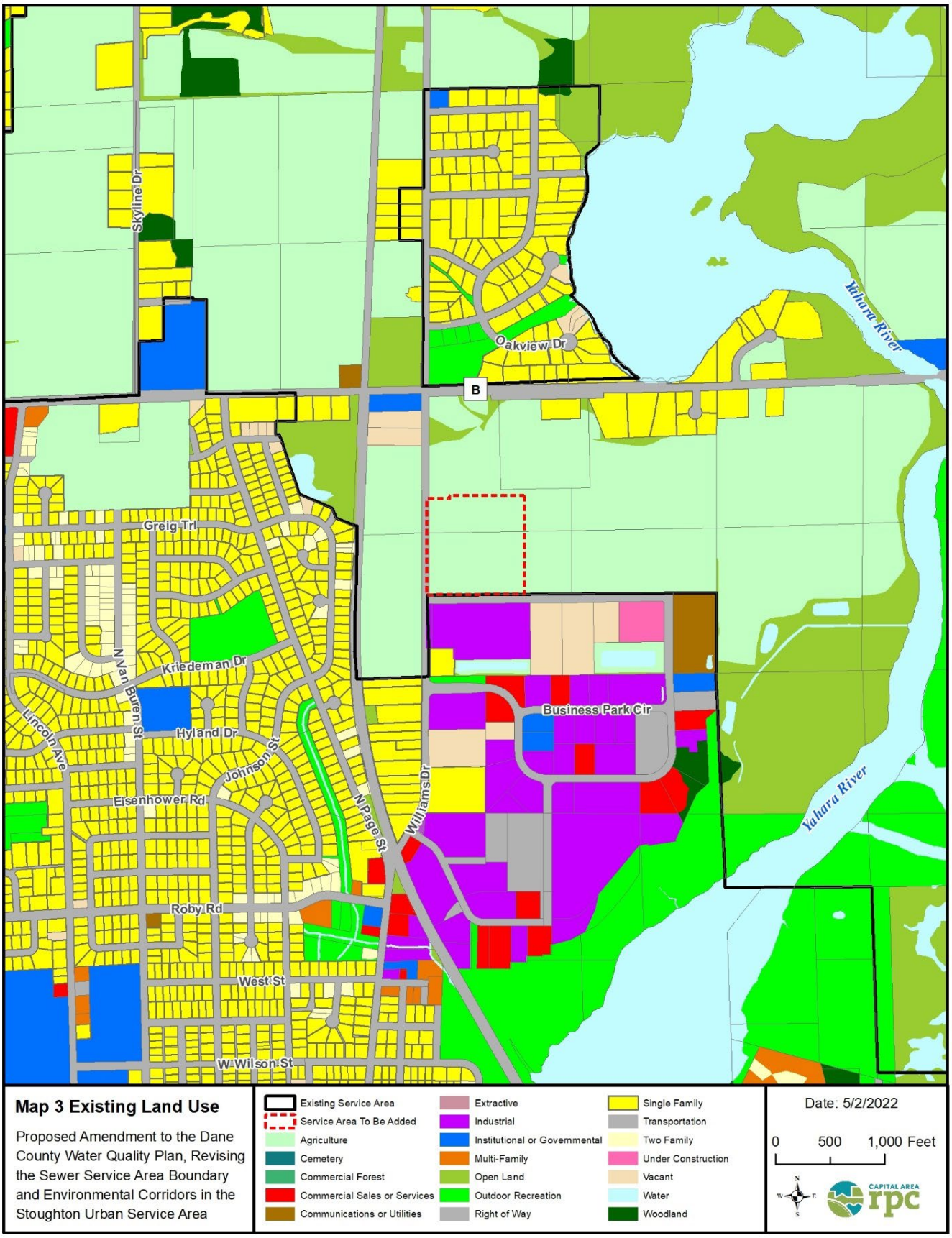
Map 1 - Amendment Area



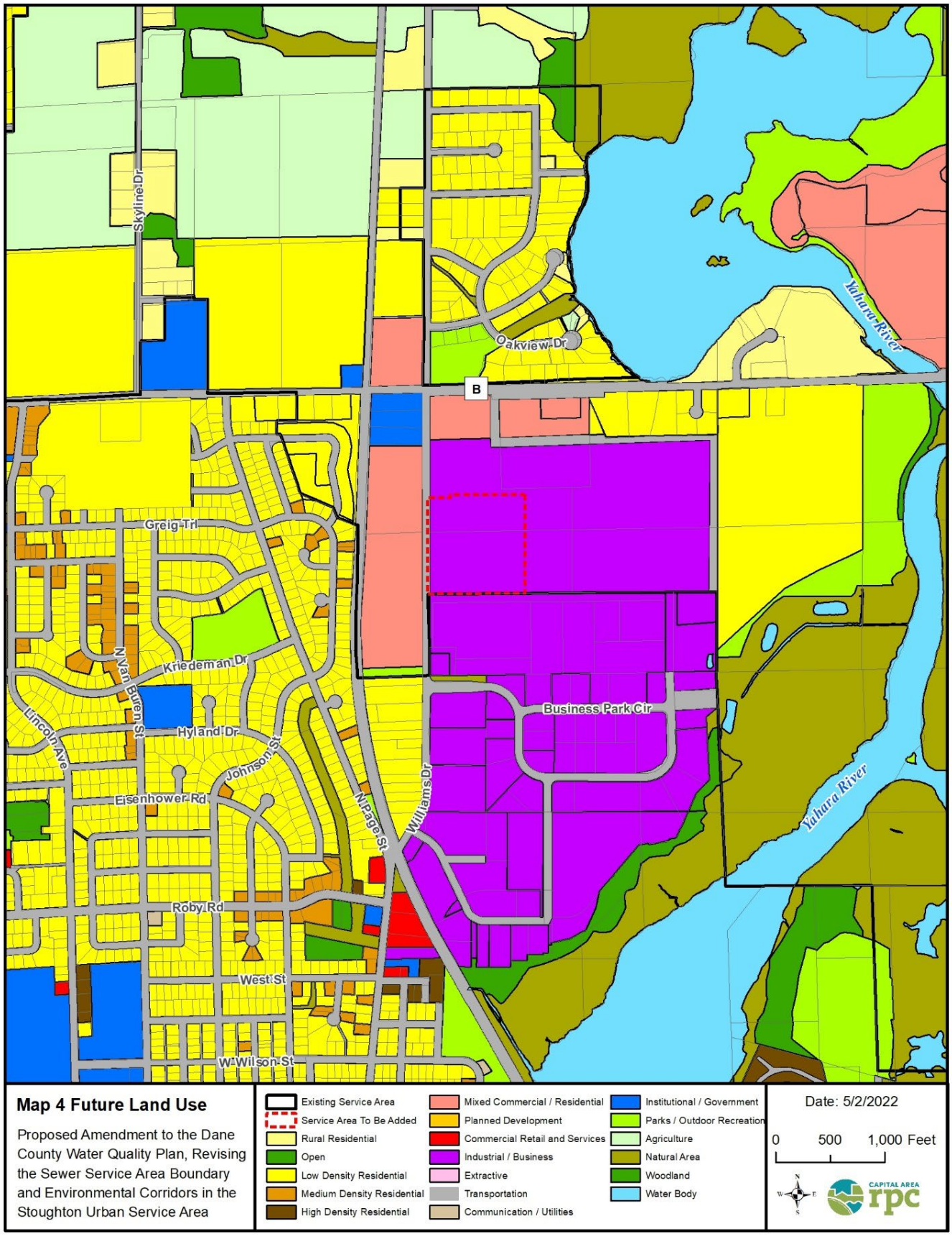
Map 2 – Aerial


Lake Kegonsa Limited Service Area
Yahara River
Skyline Dr
Oakview Dr
B
Greig Trl
Stoughton Urban Service Area
Kriedeman Dr
N Van Buren St
Lincoln Ave
Hyland Dr
Johnson St
Eisenhower Rd
N Page St
Williams Dr
Business Park Cir
Viking County Park
City of Stoughton
Roby Rd
West St
Highway Symbols
Local Road Names
Map 2 Aerial (2020)
Proposed Amendment to the Dane County Water Quality Plan, Revising the Sewer Service Area Boundary and Environmental Corridors in the Stoughton Urban Service Area
Existing Service Area
Service Area To Be Added (~18 acres)
Existing Environmental Corridor
Environmental Corridor To Be Added (~0.8 acre)
Date: 5/2/2022
0 500 1,000 Feet
CAPITAL AREA rpc

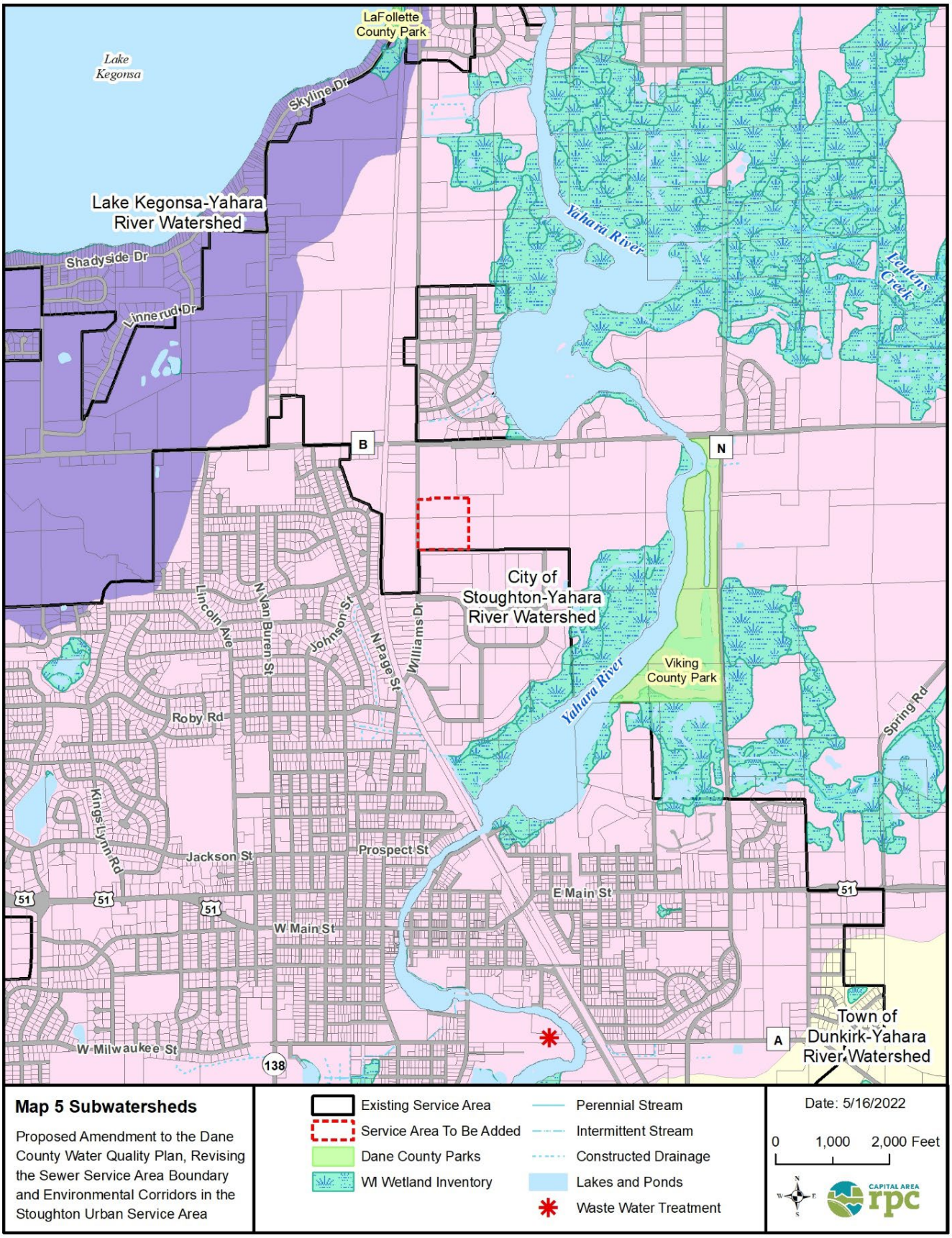
Map 3 – 2021 Land Use



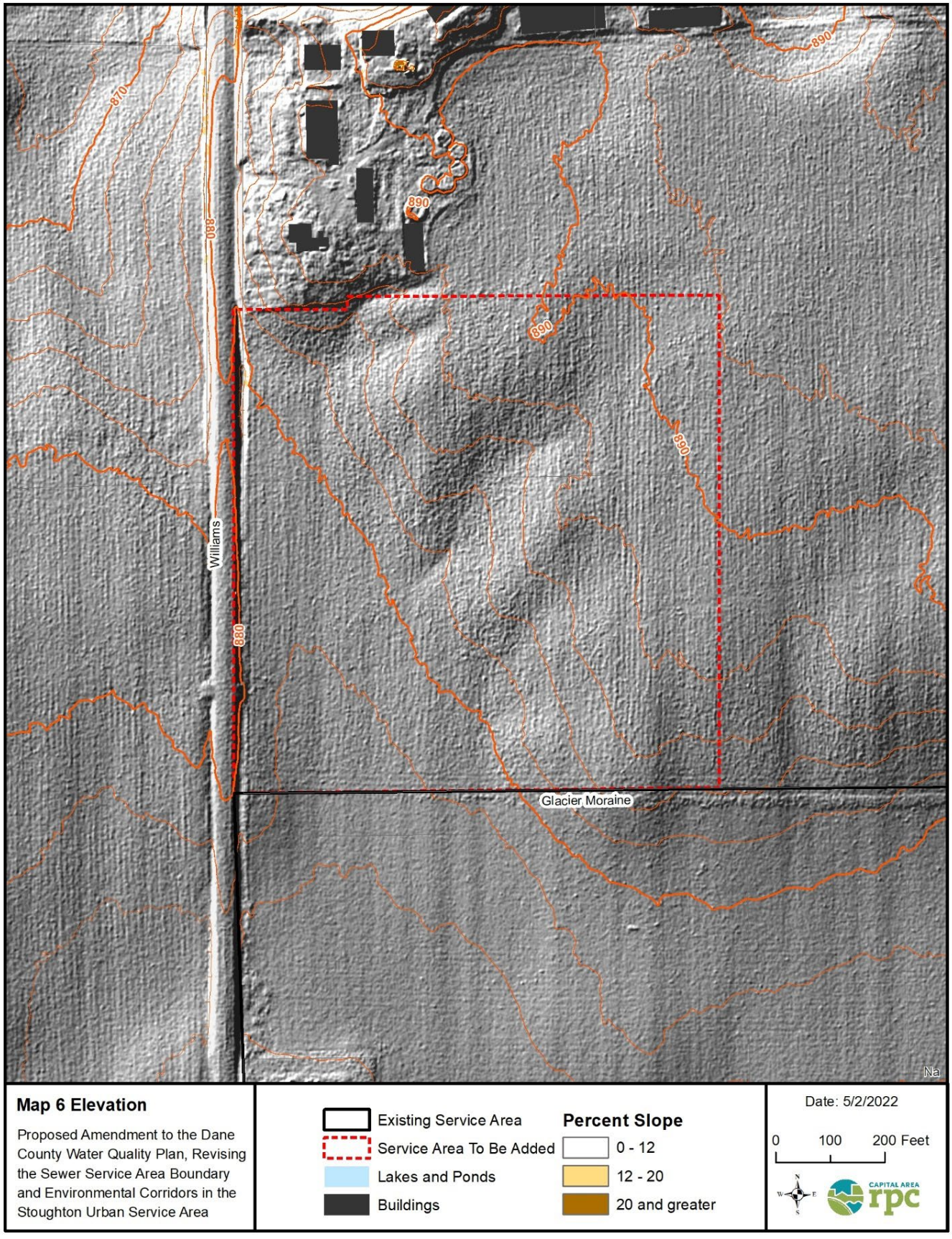
Map 4 – Planned Land Use



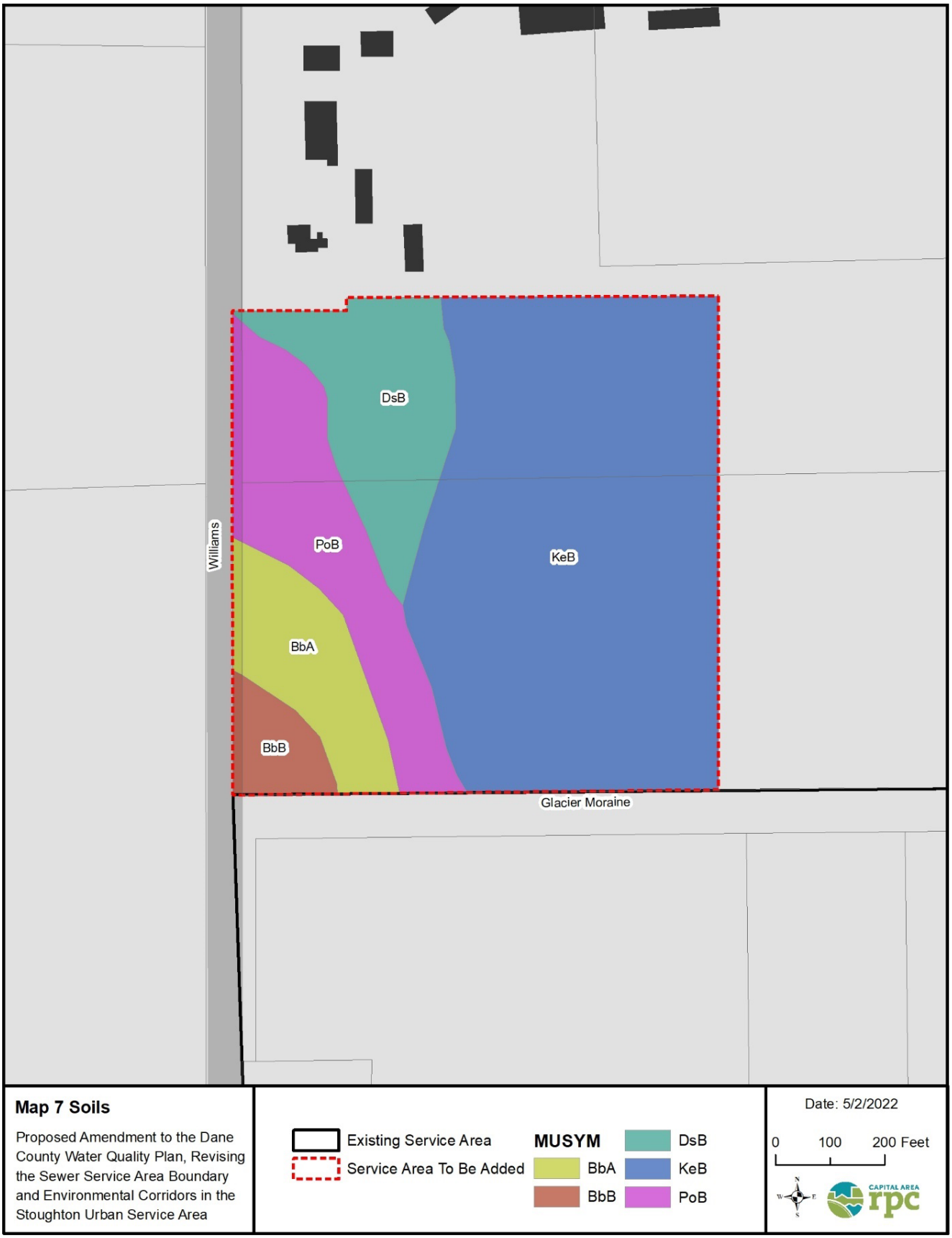
Map 5 – Subwatersheds



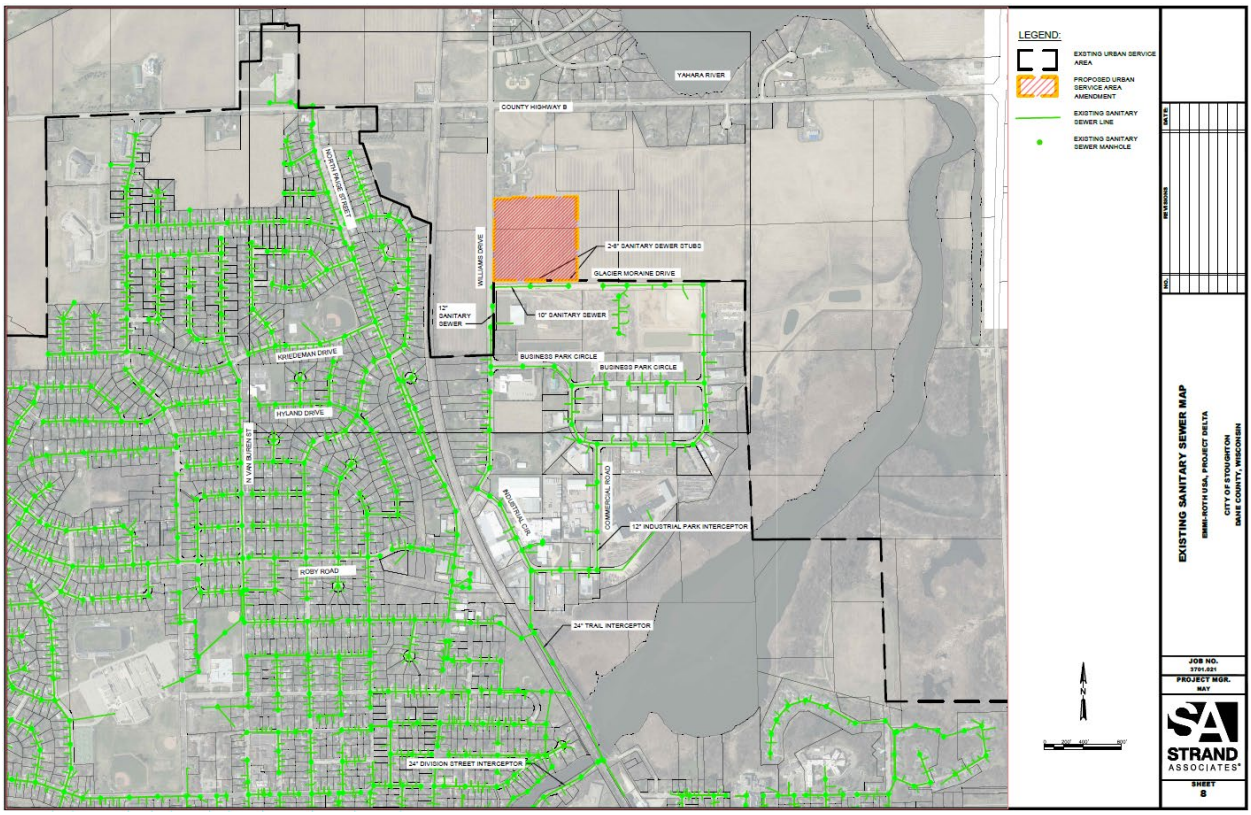
Map 6 – Elevations

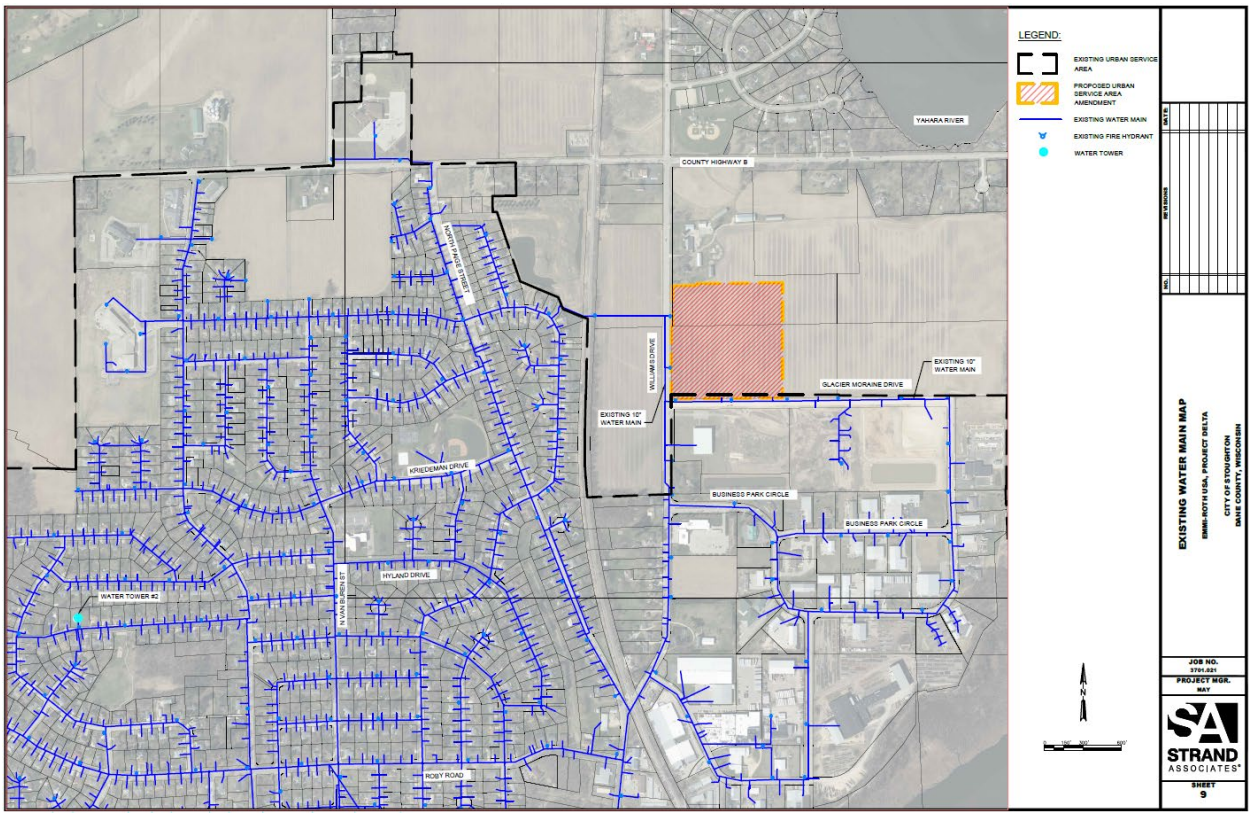


Map 7 - Soil Type

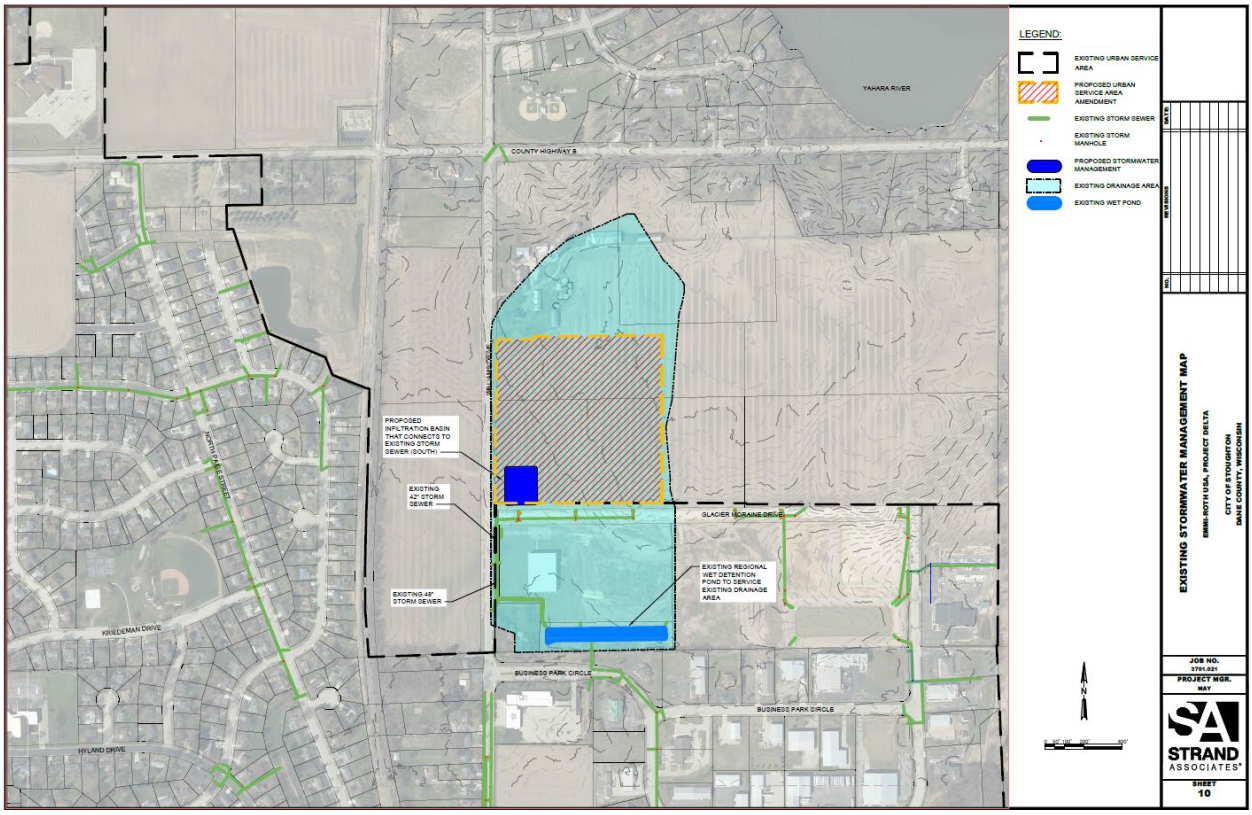


Map 8A – Proposed Sanitary Sewer and Water Main

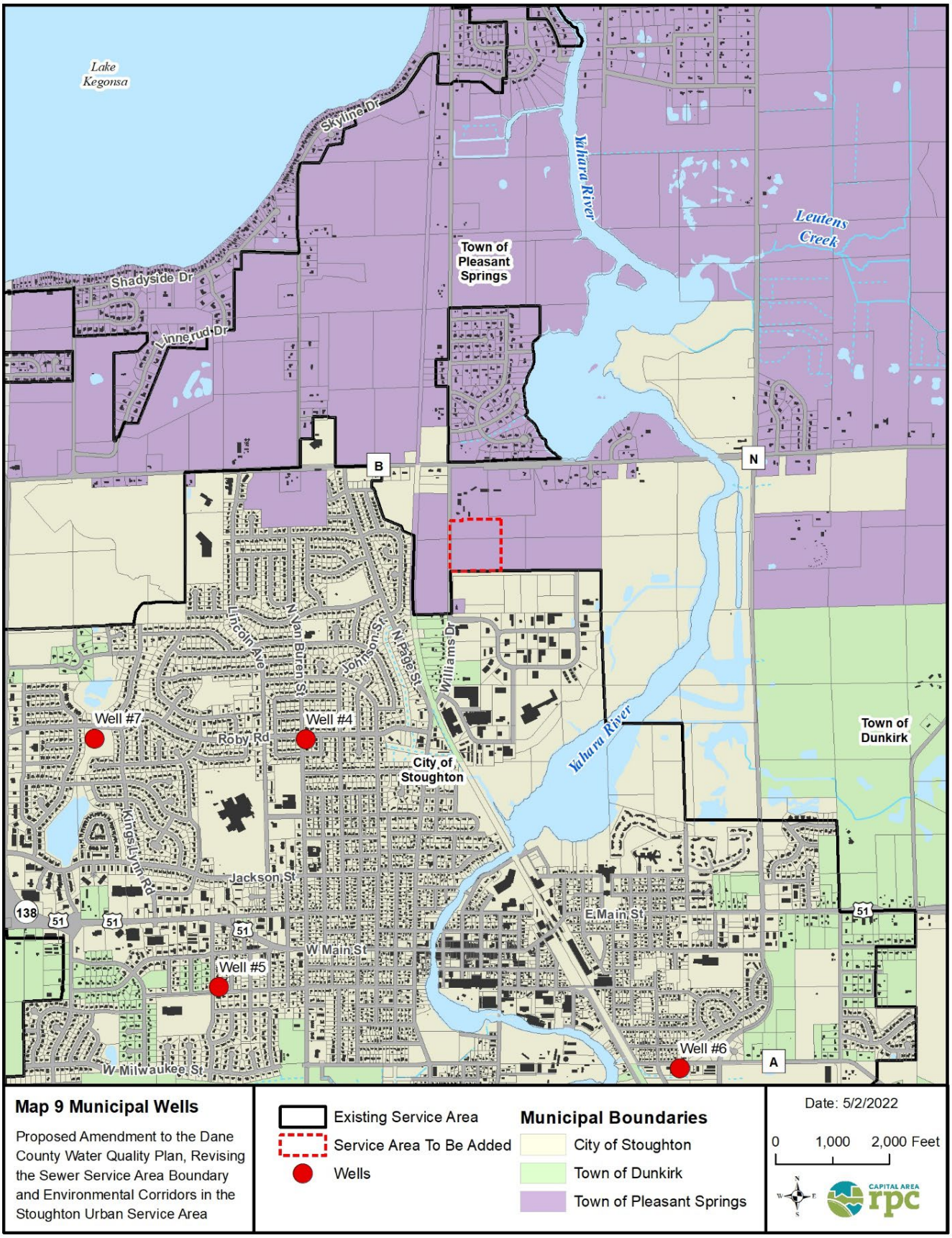




Map 8B – Proposed Stormwater Management



Map 9 – Municipal Wells



Attachment 1 – Wisconsin Historical Society Letter

From: Office of the State Archaeologist
To: Sean Higgins
Subject: RE: Upcoming Sewer Service Area Amendment
Date: Monday, May 16, 2022 8:03:32 AM

Hi Sean,

I was out of the office Thursday and Friday. We have no recorded sites in the area noted.

Jim

James M. Skibo, Ph.D.
State Archaeologist

Wisconsin Historical Society
816 State St
Madison WI 53706
608-264-6496(o)
Email: james.skibo@wisconsinhistory.org

From: Sean Higgins <seanh@capitalarearpc.org>
Sent: Thursday, May 12, 2022 9:44 AM
To: Office of the State Archaeologist <statearchaeologist@wisconsinhistory.org>
Subject: Upcoming Sewer Service Area Amendment

Hi Jim,

The following public hearing is coming up tonight:

https://www.capitalarearpc.org/wp-content/uploads/2022/04/PHN_2022_Stoughton_USAA_2022-5-12.pdf

Would you be able to check the area delineated against your records for historical resources?

Thank You,

Sean