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

History of the City of Fitchburg Amendments to the Central Urban Service Area

The Central Urban Service Area was established in 1971 with the adoption of the first sewer service plan and originally included about 29,000 acres. The first Fitchburg amendment to the Central Urban Service Area occurred in 1985. The Commission has approved a total of 8 amendments to this urban service area at the request of Fitchburg. The Commission has approved a net total of 1,033 acres of developable land and 470 acres of Environmental Corridor. Around 110 modifications have been made to the Central Urban Service Area dating back to the mid-1980s, most recently in 2020 by the Village of McFarland.

Existing Conditions

Land Use

The City of Fitchburg is requesting amendment to the Central USA on the south side of the City, south of Lacy Road and west of Syene Road. The requested amendment area is part of the City's 2009 *McGaw Park Neighborhood Plan* ([link to plan](#)) and the *Fitchburg Comprehensive Plan* ([link to website](#)). Planned land use is predominantly low- and medium-density residential anchored by a central school site. Open space/stormwater management is scattered throughout the neighborhood.

Surrounding Planned Land Uses Include:

- North: Mixed Residential and Commercial
- West: Low density residential, Mixed-use/Industrial
- South: Continuation of low density residential
- East: Mixed Residential and Commercial

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	89.5	
Institutional/Governmental		10.6
Low Density Residential		34.4
Medium Density Residential		20.1
Parks/Outdoor Recreation		5.8
Transportation, Utilities, Communication		18.6
Total	89.5	89.5

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. They have identified no previously recorded sites within the amendment area. In addition, there are no landscape features that are typical indicators of American Indian settlements present in the amendment areas. WHS does not recommend a survey at this time (Attachment 1).

Natural Resources

The proposed amendment is in the Lake Waubesa-Yahara River (HUC 12: 070900020703 watershed; Map 5). No wetlands or floodplains occur in the amendment area. The area ultimately drains to Swan Creek and the Waubesa Wetlands approximately 3.3 miles downstream.

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

Wetlands

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

The WWI includes emergent / wet meadow, forested, and scrub/shrub wetlands downstream of the amendment area that are associated with Swan Creek. Swan Creek flows to the Waubesa Wetlands, a 371-acre state natural area on the southwestern toe of Lake Waubesa. These high quality wetlands contain 11 rare wetland communities: southern sedge meadow, calcareous fen, southern tamarack swamp, lake (shallow, hard, drainage), floating-leaved marsh, wet-mesic prairie, emergent marsh, springs and spring runs, streams (slow, hard, warm), shrub-carr and southern dry-mesic forest (Zedler, 2018). Waubesa Wetlands serve numerous critical ecologic, hydrologic, and cultural functions (WRM, 2018). The 2008 *Dane County Wetlands Resource*

Management Guide ([link to report](#)) classifies Waubesa Wetlands as a Group I wetland. A Group I wetland is considered virtually intact and is to be of the highest priority for protection. Waubesa Wetlands was designated as a 'Wetland of Distinction' by the Society of Wetland Scientists due to its unique ecological and cultural significance and is listed by the Wisconsin Wetland Association as one of the *Wetland Gems*® - high quality habitats that represent the wetland riches in the state.

In 2018, graduate students in the Water Resources Management (WRM) program at UW-Madison completed a report for CARPC and the DNR to assess land use impacts in the Waubesa Wetlands watershed ([link to report](#)). The WRM report provided 8 management recommendations: restore wetlands along Swan Creek to enhance ecosystem services provided to Waubesa Wetlands; assess ecosystem services and preserve wetlands along Murphy's Creek; continue surface water monitoring and build a comprehensive watershed dataset; install a USGS long-term monitoring site at Swan Creek; design and build for a changing climate in the Waubesa Wetlands watershed, specifically increased precipitation/flow and more extreme storm events; investigate climate change and land use effects on groundwater; educate new watershed residents about water quality and wetlands; and sustain and build the Friends of Waubesa Wetlands.

In her 2018 book, *Waubesa Wetlands: A New Look at an Old Gem* ([link to book](#)) UW-Madison Professor Emeriti Joy Zedler presents four paths toward solutions with complementary actions. The solutions include helping regulators enforce existing protection for Waubesa Wetlands; monitoring key indicators to track important changes; acting green: minimize impacts and restore nature; and managing wetlands adaptively.

Swan Creek

The 4,600-acre Swan Creek watershed (Map 5) is dominated by agriculture (46%), natural land (30%) and developed land (24%). The creek (WBIC 803800), which is 4.4 miles long, is runoff-dominated, with only small inputs from groundwater. It is classified by WDNR as a "warmwater forage fishery" and was added to the 303(d) list of impaired waters in 2018 for elevated phosphorus concentrations. The creek is covered by the Rock River total maximum daily load (TMDL) for phosphorus and suspended solids, developed in 2011.

In 2018, graduate students in UW-Madison's WRM program assessed land use impacts within the Swan Creek watershed by modeling land use scenarios and monitoring water quality. Like many of the waterbodies in our region and the state, monitoring showed that Swan Creek's total phosphorus (TP) concentrations often exceeded the WDNR criteria of 0.075 mg/l, particularly during high flow events (Figure 1 A). Concentrations increased from the upstream to downstream monitoring locations (Map 5). The Fahey South amendment area is in the upper reaches of the Swan Creek watershed, with portions draining towards both branches of the creek. The two branches meet at the upstream monitoring location. Since high phosphorus concentrations already occur, future development should focus on minimizing phosphorus runoff. While WDNR does not currently have macroinvertebrate or fish indices of biotic integrity for Swan Creek, high phosphorus concentrations are a concern because of the associated risk of degraded biological communities in the creek and Waubesa Wetlands, downstream.

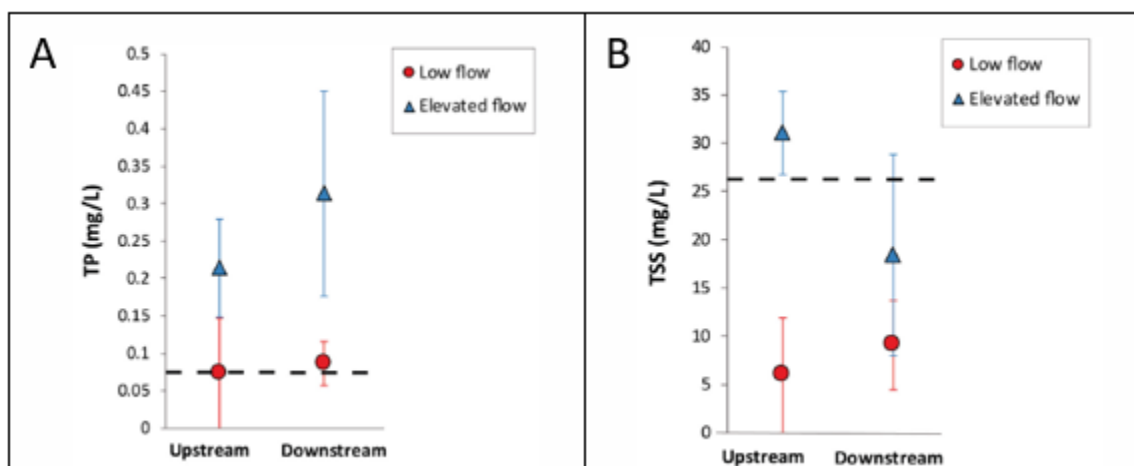


Figure 1: A) Total phosphorus (TP) and B) Total suspended solids (TSS) concentrations at upstream and downstream Swan Creek monitoring sites (Map 5). Elevated flow samples were collected within 48 hours of precipitation (May, June, and August) and low flow samples during dry conditions (April, July, September, and October). Bars show one standard deviation. The dotted line indicates the Rock River Basin TMDL of 0.075 mg/L for phosphorus in streams and 26 mg/L for total suspended solids. Samples collected by UW-WRM students in 2018. Figures are from the WRM report.

In 2018, total suspended solids (TSS) were above the Rock River TMDL limit of 26 mg/l at the upstream monitoring location during high flow events (Figure 1 B; Map 5). These high concentrations show the need for erosion control practices within the upper watershed. This is particularly relevant for active construction sites where soil is exposed. Development within the amendment area needs to ensure compliance with erosion control requirements during construction.

The WRM practicum also examined how new urban development would change runoff volume and TP loading at the watershed scale. According to the STEPL model, TP loading will decrease in the future as agricultural areas in the Swan Creek watershed convert to urban development. Water quantity modeling suggested that increased future precipitation, in addition to new urban development, could lead to larger peak flows within the watershed. These higher flows could lead to more erosion within the stream channel and increase TP and TSS reaching the Waubesa Wetlands downstream, potentially offsetting TP reductions associated with the decrease in agriculture. Consequently, a recommendation of the WRM study was to stabilize streambanks and restore riparian wetlands along the Swan Creek corridor, downstream of the confluence of the two branches. Since current stream bank erosion is expected to intensify, identifying opportunities and funding for restoration are a current priority for watershed stakeholders.

A long-term monitoring gage at the downstream location (Map 5), also recommended in the WRM report, could track TP and TSS loading over time. A stream gage would provide data for comparison to modeled predictions, document the impacts of watershed development and increased precipitation, and provide a record of TP and TSS reaching Waubesa Wetlands through Swan Creek. Since no long-term flow monitoring currently exists, several watershed stakeholders also support this recommendation.

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, based on field surveys conducted between 2014 and 2017. For the purposes of the inventory, a spring is defined as a discrete point of groundwater discharge flowing at approximately 0.25 cubic feet per second (cfs) or more at the time of the survey. No springs within the Swan Creek watershed were measured for this survey.

The Waubesa Wetlands, however, is fed by springs and seepages within an artesian basin, and groundwater inputs are key to maintaining the wetlands' high quality. Bogholt Deep Spring, located south of Swan Creek in the Waubesa Wetlands (Map 5), is approximately 30 feet wide. It was included in the WGNHS inventory but measuring its discharge has proven difficult. In 1974, fifteen other springs were also noted on a vegetation map of Waubesa Wetlands.

Groundwater

Groundwater modeling, using the 2016 Groundwater Flow Model for Dane County developed by the WGNHS ([link to website](#)), shows that baseflow in Swan Creek (upstream monitoring location on Map 5) has decreased from 0.41 cfs during pre-development conditions (no well pumping) to 0.25 cfs in 2010 (Table 4). This decrease is due to the combined impacts of high capacity well groundwater withdrawals contributing to reduced stream baseflow. By 2040 at the same location, flow is modeled to decrease to 0.15 cfs. This decrease is due to increased pumping to serve a growing population.

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 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 identified one threatened species (mammal) 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.

The northeastern portion of the amendment area is within the High Potential Zone (species likely present) for the federally endangered Rusty Patched Bumble Bee. 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. It is recommended that the City request a complete Endangered Resources Review by the WDNR for potential impacts to endangered resources like rare plants, animals and natural communities in the amendment areas. The WDNR will likely specify required and recommended actions for protecting the listed species, including Rusty Patched Bumble Bee, such as taking special care during project development to control erosion and minimized disturbance

to wetland, riparian, and stream habitats. If those habitats are disturbed, follow-up conservation measures are needed to comply with endangered species laws. These measures should include controlling invasive plants and using native flora in landscaping to provide suitable pollinator habitat. The USFWS developed a list of plants favored by Rusty Patched Bumble Bee ([link to list](#)). Site surveys could also be conducted to further determine the presence of these species. Implementing these conservation measures should be coordinated with the WDNR Endangered Resources Review Program, as needed.

Soils and Geology

The amendment area is located within the West Johnston-Milton Moraines Land Type Associations of Wisconsin. The Association classifies the surficial geology of this area as rolling hummocky moraine and outwash plain complex with scattered bedrock knolls.

Surface elevations within the amendment area range from around 911 feet to 1088 feet. The amendment area does not include any significant areas of steep (>12%) slopes (see Map 6). There are no steep slopes adjacent to riparian areas.

According to the Natural Resource Conservation Service (NRCS) Soil Survey of Dane County, the soils in amendment area are in Dodge – St. Charles - McHenry association. These soils are predominantly well drained and well drained, silt and loam. 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](#)), the Plano, St. Charles and Troxel soils (the PnB, ScB and TrB map unit) are not hydric, but they can have a seasonal (April to June) zone of water saturation within 5 feet of the ground surface. These soils are classified as moderately well drained or well drained. Soils with seasonal high-water tables that are also classified as well drained or moderately well drained generally do not pose limitations for buildings with basements.

Table 2
Soils Classification

Soil	% of Area	General Characteristics
<i>Ringwood Silt Loam; RnB</i>	73.2	Deep, well drained, gently sloping and sloping soils on glaciated uplands. Soils have high fertility, moderate permeability, and a moderate hazard of erosion. Poses moderate limitations for development due to low bearing capacity and erodibility.
<i>Griswold Loam; GwC</i>	10.2	Deep, well-drained gently sloping to moderate steep soils on glaciated uplands. Soils have medium fertility, moderate permeability, and a severe hazard of erosion. Poses moderate limitations for development due to bearing capacity and shrink/swell potential.
<i>Griswold Loam; GwB</i>	7.2	Deep, well-drained gently sloping to moderate steep soils on glaciated uplands. Soils have medium fertility, moderate permeability, and a moderate hazard of erosion. Poses slight limitations for development due to shrink/swell potential.
<i>St. Charles Silt Loam; ScB</i>	3.5	Deep, well drained, sloping soils to moderately steep soils on glaciated uplands. Soils have high fertility, moderate permeability, and a moderate to severe hazard of erosion. Poses moderate limitations for development due to slopes, shrink/swell potential and low bearing capacity.
<i>Dodge Silt Loam; DnB</i>	3.1	Deep, well drained, gently sloping and sloping soils on glaciated uplands. Soils have high fertility, moderate permeability, and a moderate to severe hazard of erosion. Poses moderate limitations for development due slope and shrink/swell potential.
<i>Plano Silt Loam; PnB</i>	1.5	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 limitations for development due to shrink/swell potential and low bearing capacity.
<i>Troxel Silt Loam; TrB</i>	1.3	Deep, well drained and moderately well drained, gently sloping soils in draws, on fans, and in drainageways. Soils have high fertility, moderate permeability, and a moderate hazard of erosion. Poses severe limitations for development due to low bearing capacity.

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	RnB, GwB, ScB, DnB, PnB, TrB	89.8
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	DnB, GwB, GwC, PnB, RnB, ScB	98.7

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

According to WGNHS data, bedrock within the amendment area is in the Ancell Group. Bedrock in the Ancell Group is medium-grained, mature quartz sandstone, and consists of two formations including the Glenwood and St. Peter Formations. Thickness is about 100 feet. According to WGNHS data, the depth to bedrock in the amendment area ranges from as little as 2 feet to up to 50 feet, with the shallowest depths generally being in the northeast part and deepest depths generally being in the southwest part of the amendment area (see Map 8).

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, karst features are not expected to be encountered in 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 is a total of approximately 5.8 acres of park and stormwater management areas proposed in the amendment area (see Map 4). Approximately 4.8 acres are planned for stormwater management in the southern half of the amendment area. A 1-acre addition and connection to McGaw Park is planned in the northeastern corner of the amendment area.

Water System

The Fitchburg Water Utility provides municipal water through six high capacity wells, defined as a well with a capacity to withdraw more than 100,000 gallons per day (Map 10). Well 4, which is 1,000 feet deep, has a capacity of 1,200 gallons per minute (gpm). Well 5 is 1,031 feet deep and has a capacity of 1,300 gpm. Well 7 is 434 feet deep and has a capacity of 350 gpm. Well 8 is 436 feet deep and has a capacity of 250 gpm. Well 10 is 1033 feet deep and has a capacity of 1,200 gpm. Well 11 is 1,003 feet deep and has a capacity of 1,500 gpm. The City has 2.25 million gallons of storage capacity, divided among one reservoir and three elevated tanks.

In 2019, the City pumped an average of 1.95 million gallons per day (MGD) and bought 0.02 MGD from the City of Madison. In 2019, water loss in the City's distribution system was 6%, and there were five main breaks. 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 if the utility reports its percentage of water losses exceed 15%.

The City currently has 4,700 gpm of well capacity. The maximum daily pumpage in the last 10 years was 4.097 MGD on July 16, 2012. The projected maximum daily demand for 2020 is approximately 4.75 MGD. With the City's largest well out of service, the City's well capacity (3,400 gpm) exceeds this projected maximum daily demand of 3,299 gpm.

The City has planned water system facility improvements to meet storage and well capacity needs for future growth. A one-million-gallon elevated water tower, planned to be in the high ground of the amendment area, and a 1,500 gpm high capacity well are in the City's Capital Improvements Plan and Budget for construction in 2021.

The Fahey South USAA will increase the average daily demand by 64,000 gpd (3% increase). Peak hour demand for Fahey South is estimated to be 4,350 gallons. With the current and future water system facilities, the City of Fitchburg has the supply and storage capacity needed for this amendment.

Fahey South will be served by both the West and East Water Zones, and existing water mains on Nobel Drive, Fahey Glen, and Notre Dame Drive will be extended into the amendment area (Map 9A). As the road network is established, water mains will be constructed too.

Wastewater

Sanitary sewer service will be provided to the proposed amendment area by the Madison Metropolitan Sewerage District's (MMSD) Nine Spring regional wastewater treatment plant. The amendment area flows to MMSD Pump Station 11. MMSD is currently analyzing how to increase sewer main capacity from Pump Station 11 to Pump Station 12.

Fahey South will be serviced by the Woods Hollow and Syene Interceptors (Map 9B). Approximately 28% of the western portion of the amendment area will be served by Woods Hollow Interceptor through a 10-inch sanitary sewer. The remaining area to the east will be serviced by the Syene Interceptor through an 8-inch sanitary sewer.

The City has an average 100 gpd per capita wastewater generation. Wastewater from the 10 acres of institutional land in the amendment area is estimated to be 2,230 gpd. In total, the average wastewater generation for Fahey South is estimated to be 87,230 gpd, which also includes 150 low density units each using 300 gpd and 200 high density units each using 200 gpd. With a peaking factor of 4, total peak usage is estimated to be 348,920 gpd (242 gpm) for Fahey South.

A City analysis identified several critical sections of sewer that will require replacement which would otherwise limit allowable flow from the amendment area (Map 9B). A 10-inch sewer at 0.4% on Fahey Glen would accommodate a maximum of 68 gpm to the Woods Hollow interceptor. Within the Syene interceptor system, the 8-inch sewer at 0.4% at the low end of the Crossings sewer system is the critical point, but it would still adequately accommodate the needed 174 gpm from Fahey South. The 12-inch sewer at 0.14% under Syene Road is at capacity and added flow from this amendment area would require a 15-inch replacement.

Wastewater Treatment Facility

Madison Metropolitan Sanitary District (MMSD) will provide wastewater treatment for the amendment area. The Nine Springs Treatment Facility has a design capacity of 56 million gallons per day (mgd) and received an average influent hydraulic loading of 44.8 mgd (80% of design capacity) in 2018, including infiltration and inflow. It is expected to reach 90 percent of current hydraulic design capacity around 2026 based on current projected growth rate assumptions. This already occasionally occurs, with flows exceeding 90 percent design capacity in August – October of 2018. MMSD has completed a long-range plan that evaluated various options for expanded treatment capacity to serve its current and future service area. For the 20-year planning period, service to this area is expected to remain at the existing wastewater treatment facility location with expanded capacity of the system as the need is foreseen.

Wastewater treatment at the district's Nine Springs Treatment Facility does not remove chloride and the concentration of chloride that arrives at the plant can exceed the water quality standard. In 2015, AECOM completed a study for MMSD which determined that while possible, treatment would be cost-prohibitive, energy intensive, and involve other environmental impacts ([link to report](#)). MMSD's Wisconsin Pollutant Discharge Elimination System (WPDES) permit requires pollution prevention and source reduction initiatives for chlorides, such as the Wisconsin Salt Wise Partnership ([link to website](#)).

MMSD has not had issues meeting its other WPDES permit limits for the quality of effluent discharged to Badfish Creek and Badger Mill Creek, according to their 2018 Annual Report ([link to report](#)). Effluent quality summarized here refer to Badfish Creek, where most of the discharge is released. The effluent biological oxygen demand quality for 2018 was excellent, averaging 5.7 mg/L (30% of the limit) with a maximum of 9.0 mg/L (47% of the limit) for the month of January. The effluent total suspended solids quality for 2018 was also excellent, averaging 4.8 mg/L (24% of the limit) with a maximum of 6.0 mg/L (30% of the limit). The effluent ammonia quality for 2018 was excellent, averaging 0.31 mg/L (17% of the limit) with a maximum of 0.42 mg/L (23% of the limit) for the month of January. The effluent phosphorus quality for 2018 was good, averaging 0.3 mg/L (20% of the limit) with a maximum of 0.37 mg/L (25% of the limit). This was below the current 1.5 mg/L permit limit but not low enough to meet future water quality-based effluent limits (WQBEL) for phosphorus. MMSD has implemented a Watershed Adaptive Management approach, leading a diverse group of partners called Yahara Watershed Improvement Network (Yahara WINs) in implementing phosphorus reducing practices in the watershed ([link to website](#)). This adaptive management approach is currently limited to the Yahara Watershed.

Stormwater Management System

The City of Fitchburg currently follows Dane County Code of Ordinance Chapter 14 for all stormwater performance standards within the City and contracts with Dane county for stormwater management plan review. Stormwater management facilities in the amendment area will be owned and maintained by the City.

The amendment area is at the top of a hill, with some runoff going to the north and some going to the south. High density and institutional areas will provide on-site stormwater management, and the medium density residential areas will have several stormwater basins. Preliminary conceptual stormwater management for the amendment area consists of stormwater basins in the southern portion of the site (Map 9C). These stormwater management areas are subject to change as plats go through City approval. Stormwater management facilities will meet performance

criteria for peak control, sediment reduction, infiltration, thermal protection, and oil/grease control. All stormwater management practices must meet the City's adopted stormwater management and erosion control ordinances and will be reviewed by the City Engineer.

Detailed stormwater management plans will need to be prepared for review and approval prior to beginning any development construction. These plans will be required to meet all stormwater management ordinance performance standards of the City of Fitchburg, as well as those of Dane County and the WDNR.

Performance Standards

The City of Fitchburg proposes stormwater management standards as required by the State of Wisconsin (NR 151), Dane County (Chapter 14), and City of Fitchburg (Chapter 30):

- 1) Require post-construction sediment control (reduce total suspended solids leaving the site by at least 80%, based on the average annual rainfall, as compared to no runoff management controls). This is consistent with the standards currently required by Dane County.
- 2) Require post-construction peak runoff rates for the 1-, 2-, 10-, and 100-year, 24-hour design storms to match predevelopment peak runoff rates. This is consistent with the range of design storms currently required by Dane County.
- 3) Require post-development stay-on volume of at least 90% of pre-development stay-on volume. This is consistent with the stay-on standard for new development currently required by Dane County regulations.
- 4) Maintain predevelopment groundwater annual recharge rate of 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.
- 5) Treat the first 0.5 inches of run-off using best management practices to provide oil and grease control at commercial and industrial sites. This is consistent with the standards currently required by Dane County.

Impacts and Effects of Proposal

Environmental Corridors

There are no environmentally sensitive areas within or adjacent to the amendment area. The proposed amendment area includes approximately 5.8 acres of environmental corridor for park and stormwater management areas (See Map 2). This includes approximately 4.8 acres of planned stormwater management areas and 1 acre of park space in the northeastern corner of the amendment area.

Meeting Projected Demand

Current projections suggest that an additional 61,000 residents and 38,000 housing units can be expected in the Central Urban Service Area between 2010 and 2040. Land demand projections in 2014 estimated that a total of 5,800 additional residential acres would be needed by 2040 to accommodate that growth. Department of Administration (DOA) population estimates for 2019 indicate that roughly 320,000

residents call the communities comprising the Central Urban Service Area home and that the population in those communities has increased by over 30,000 since 2010. The City of Fitchburg grew by almost 4,000 residents.

Phasing

The requested amendment is less 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.

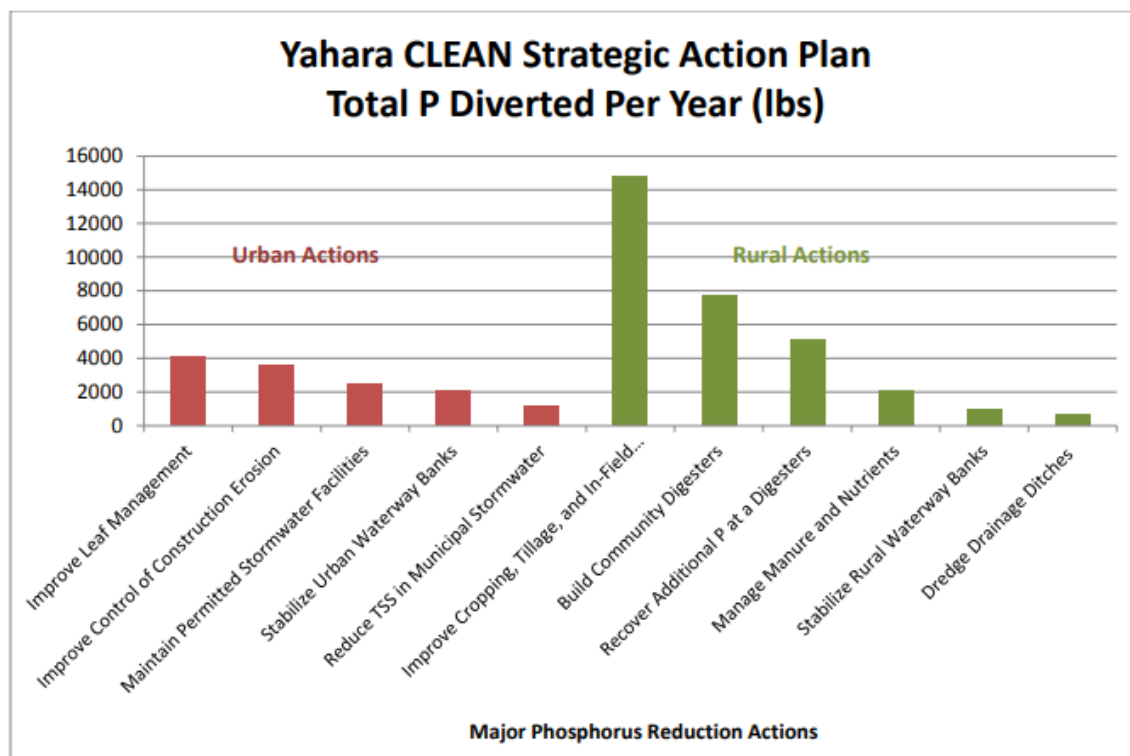
The City of Fitchburg proposes to mitigate the urban nonpoint source impacts of the proposed development by requiring the implementation of various stormwater best management practices that are designed and constructed to meet current Dane County standards for pollutant reduction, runoff volumes, peak flows, water

temperature, and groundwater recharge to address the potential water quality impacts of stormwater runoff from the proposed development on the receiving waters.

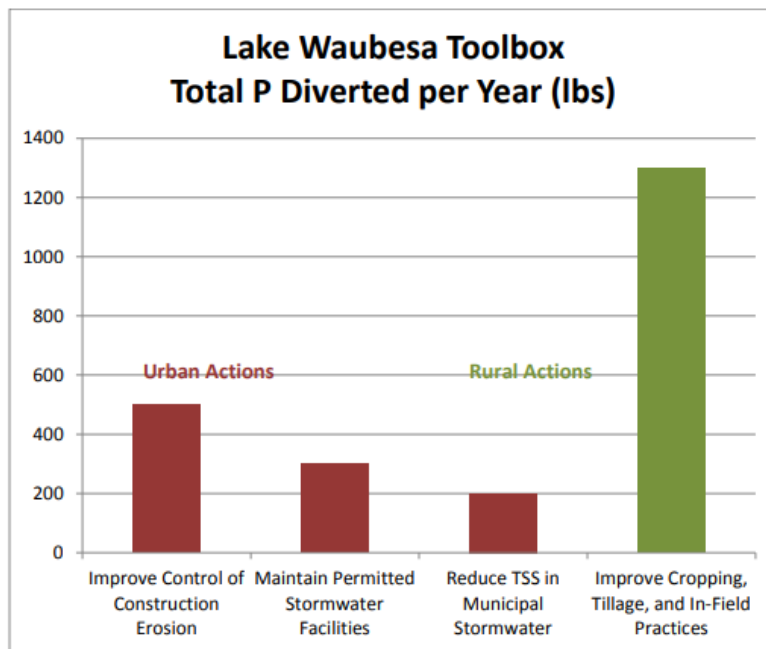
The City of Fitchburg has been actively participating with other regional partners in the Madison Area Municipal Stormwater Partnership ([link to website](#)), Yahara WINs ([link to website](#)), and the Wisconsin Salt Wise Partnership ([link to website](#)) who are actively working to address nonpoint source pollution in the region.

Phosphorus

The 2012 *Yahara CLEAN Strategic Action Plan for Reducing Phosphorus* ([link to report](#)) enumerates fourteen specific actions with clear achievable phosphorus reduction goals to clean the Yahara chain of lakes, including Lake Waubesa. The goal of the plan is to produce dramatic improvements in lake water quality by achieving a 50% reduction in the average annual phosphorus load from direct drainage sources in the Yahara chain of lakes.



Lake Waubesa has an average annual load of 29,060 pounds of phosphorus entering the lake from all sources according to Lathrop and Carpenter. The direct drainage load is 4,620 pounds from a mix of urban and rural sources. The largest load of phosphorus is 22,900 from upstream sources via the Yahara River.



The most important urban actions for phosphorus reduction are leaf management, construction erosion control, and maintenance of permitted stormwater facilities.

The USGS has conducted a study to determine if a municipal leaf collection and street cleaning program can reduce nutrients in stormwater runoff ([link to website](#)). The study concluded that nearly 60 percent of the annual urban phosphorus yield can come from leaf litter in the fall and that timely removal of leaf litter from streets can reduce phosphorus load by 80 percent. The City of Fitchburg provides four yardwaste collections throughout the year (two in the spring and two in the fall). Unlike most other communities, City of Fitchburg residents are required to place their yardwaste into compostable or reusable bags for collection to reduce the likelihood of leaves spilling into the street from the terrace, or creating a “leaf tea” of nutrients from water flowing through leaves before entering the storm sewer system. In addition, the City operates a street sweeper throughout the year and continuously during the fall when leaves are falling. The City has budgeted for a second street sweeper to be purchased in 2021 to improve their ability to sweep the streets in a timely fashion.

A robust construction site erosion control inspection and enforcement program is another important element of urban phosphorus control. This City of Fitchburg currently contracts with Dane County for erosion control plan review and inspection of commercial sites. City staff provide erosion control inspection review and enforcement for residential plats. Inspections are conducted weekly and after a rain event 0.5 inches or larger. Enforcement follows the City of Fitchburg Engineering Erosion Control and Stormwater Management Enforcement Standard Operating Procedures ([link to document](#)). The city requires all permittees to report erosion control inspections through a web-based system allowing active construction sites to be viewed easily on a map. The map provides markers showing all currently active construction sites in the city that require an erosion control permit and provides information on the site including erosion control inspections and the ability to provide a comment on the condition of the site ([link to website](#)). The City has agreed to further enhance its construction site erosion control program by implementing a system that allows concerned citizens to report an erosion control concern on the City website ([link to website](#)).

Maintenance of stormwater facilities is another important element of urban phosphorus control. City of Fitchburg ordinance requires long-term maintenance of private stormwater facilities and the submission of an annual inspection and maintenance reports. The City follows a Standard Operating Procedure ([link to document](#)) for the oversight of this requirement. In addition, any facility that has received a stormwater utility credit must submit an annual report in order to maintain the credit for having those facilities in place. Private stormwater facility maintenance agreements are recorded at the Dane County Register of Deeds for any private stormwater facilities installed such as rain gardens, storm pipes, swales, pervious pavement, and detention ponds. A legal description, map and list of measures being taken are included with the Maintenance Agreement.

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 at the confluence of the two branches of Swan Creek the cumulative effects of well withdrawals have resulted in a 0.16 cfs decrease in baseflow from predevelopment (no pumping) to 2010 (Table 4; upstream monitoring location on Map 5). By 2040, according to the modeling, baseflow will decline an additional 0.1 cfs compared to 2010 conditions, reaching 0.15 cfs. The model developed for the 2014 WDNR report *Ecological Limits of Hydrologic Alteration in Dane County Streams* ([link to report](#)) predicted the effect of this projected baseflow reduction on the Swan Creek fish community. The most sensitive fish species to reduced baseflow were predicted to be brook stickleback, central mudminnow, and fathead minnow.

Table 4 Modeled Baseflow Results Due to Current and Anticipated Future Municipal Well Water Withdrawals (All Municipal Wells)			
Stream	No Pumping	2010	2040
<i>Swan Creek</i>	<i>0.41 cfs</i>	<i>0.25 cfs</i>	<i>0.15 cfs</i>

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 *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

Comment letters were received from the Town of Dunn and Town of Dunn resident Steven Schooler in advance of the public hearing (Attachment 2). A public hearing was held on the proposed amendment at the July 9, 2020 meeting of the Capital Area Regional Planning Commission. Representatives of the City of Fitchburg and the

development team (Mr. Christianson and Mr. Fahey) registered in favor of the amendment. U.W. Madison Professor Emerita and Town of Dunn resident Joy Zedler registered in opposition to the amendment. Professor Zedler expressed concerns for protection of the Waubesa Wetlands. She urged that the City take a broader watershed view; take a longer-term view using the latest climate change predictions and address the interactions of more frequent more extreme storms with more hardscape, especially on Swan Creek; and take a more holistic view, including a new approach called gross ecosystem product. Commission discussion points included concerns about protection of the Waubesa Wetlands, options for providing sewer service to the amendment area given the capacity of the existing Syene Road interceptor, and discussion with the City of Fitchburg and development team to encourage the development to implement a higher standard for stormwater retention given the growth of this municipality and its proximity to the Waubesa Wetlands.

Conclusions and Staff Water Quality Recommendations

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

The City of Fitchburg 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.

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. However, 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.

CARPC Resolution 2009-15, which added the City of Fitchburg's McGaw USA Amendment in 2010 included a condition for maintaining 100% of the pre-development stay-on for the average annual rainfall series, in recognition of the sensitive downstream resources. The 2015 stormwater management plan for the Fahey Fields development was subsequently able to economically meet this condition with soils having an infiltration rate of 0.5 inches per hour. Following up on the discussion at the public hearing CARPC staff subsequently met with City of Fitchburg staff and the development team about voluntarily meeting this standard for the current amendment area. The property owner and development team are amenable to designing the stormwater infiltration practices to achieve greater than 90% of pre-development infiltration where economically feasible based on soil conditions.

A recommendation of the UW WRM report, *Assessing Land Use Impacts and Promoting Community Engagement in the Waubesa Wetlands Watershed*, is to design and build

for a changing climate – specifically, increased precipitation / flow and more extreme storm events. Climate change is increasing the frequency of wetter conditions, more severe storms, and threats to public health, safety and public and private property. Rainfall statistics research by UW Madison Professor Dan Wright has demonstrated that large rainfall events are occurring more frequently than accounted for by current stormwater management design standards. In response, the City of Madison has made several updates to their stormwater management ordinance, including adding peak rate control for the 200-year rainfall event (based on NOAA Atlas 14). In March 2020, CARPC adopted a resolution supporting the City of Madison ordinances changes and encouraging Dane County and the other cities, villages, and towns throughout the region to adopt comparable minimum standards. Similar updates to the Dane County stormwater ordinance are expected this year, based on communication with Dane County staff. When implemented this change would apply to all municipalities in the county, including this amendment area.

Another recommendation of the UW WRM report, is to install a long term USGS monitoring Station on Swan Creek at Lalor Road. A monitoring site will enable a robust dataset to be gathered that can be used to evaluate long-term trends connected with watershed land use change. This would also allow for adaptive management in the watershed based on continuous monitoring data. CARPC, USSG, and City of Fitchburg staff have had several conversations about the costs for installation and maintenance of the monitoring station. City staff have included the monitoring station as a request in their upcoming operating budget

A third recommendation of the UW WRM report, is to educate watershed residents and businesses about water quality and the Waubesa Wetlands. Following up on the discussion at the public hearing CARPC staff subsequently met with City of Fitchburg staff and Professor Zedler to discuss opportunities to provide added protection for the Waubesa Wetlands. One of the outcomes was the City's commitment to provide information and educational resources on an ongoing basis using a variety of outreach methods, beginning with publication of Professor Zedler's summary of her Waubesa Wetlands eBook ([link to document](#)) in the City's Green E-Newsletter.

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-, and 100-year 24-hour design storms to “pre-development” levels, in accordance with the City of Fitchburg 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, with a minimum of 60% of that control occurring prior to infiltration, in accordance with the City of Fitchburg 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 Fitchburg and Dane County Stormwater Ordinances.
 - e. Oil and grease control are required that treats the first 0.5 inches of run-off using best management practices at commercial and industrial sites, in accordance with the City of Fitchburg 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 Fitchburg 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. Stormwater management facilities shall be placed in public outlots whenever feasible and designated as environmental corridor.
 3. Environmental corridors are required to be delineated to include the park and open space, and stormwater management areas to meet the Environmental Corridor Policies and Criteria adopted in the *Dane County Water Quality Plan*.

Recommended Conditions of Approval

It is recommended that approval of this amendment is also conditioned on the continued commitment of the City of Fitchburg to pursue the following water quality measures:

1. Construct the sanitary sewer capacity improvements identified for the Woods Hollow and Syene Interceptors.
2. Encourage the responsible use of deicers and water softeners by continuing to participate in the trainings and outreach activities of the Wisconsin Salt Wise Partnership.
3. Implement a system that allows concerned citizens to report an erosion control concern on the City website.

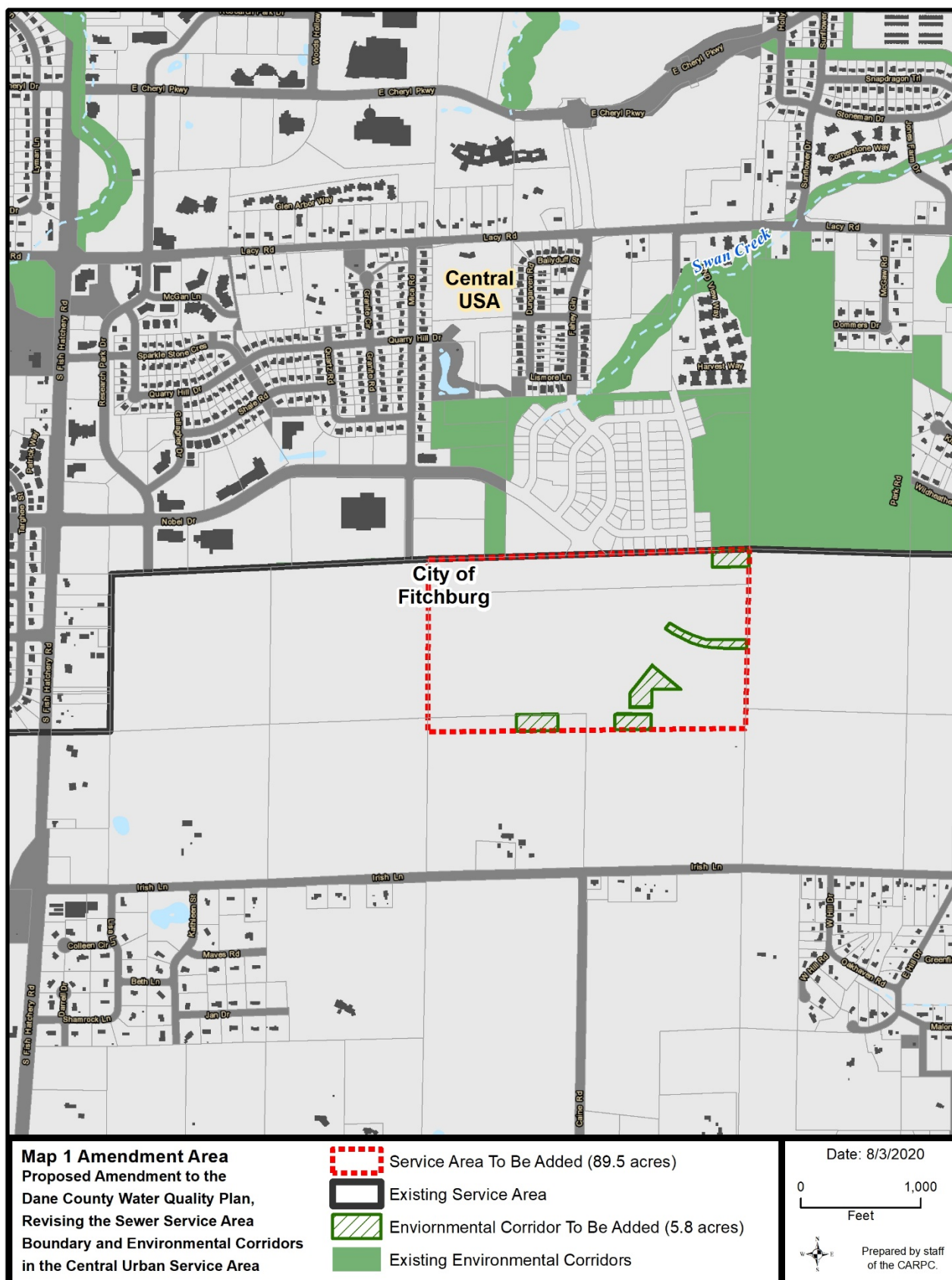
4. Provide information and educational resources on an ongoing basis using a variety of outreach methods to educate watershed residents and businesses about water quality and the Waubesa Wetlands.

Recommendations

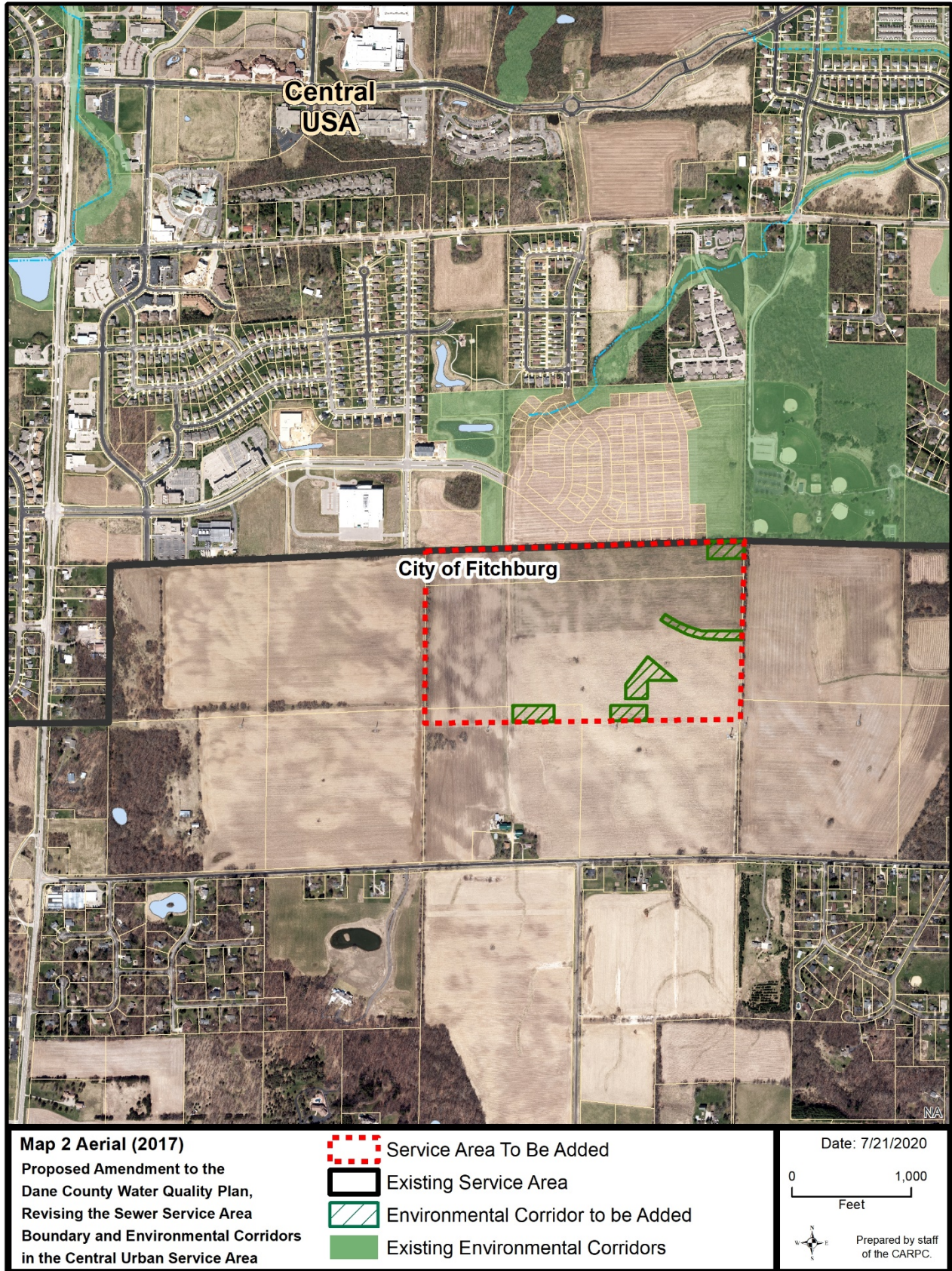
It is recommended that the City of Fitchburg pursue the following to further improve water quality and environmental resource management:

1. Work with the USGS to fund and implement a monitoring Station on Swan Creek at Lalor Road, as recommended by the UW WRM Waubesa Wetlands Study and discussed with USGS and CARPC staff.
2. Work with the development team to design stormwater infiltration practices to achieve greater than 90% of pre-development infiltration where economically feasible based on soil conditions.
3. Request a formal Endangered Resources Review by the WDNR or one of their certified reviewers for potential impacts to endangered resources like rare plants, animals and natural communities and take necessary habitat protection measures if species are found.
4. Encourage the use of native flora in landscaping to provide suitable pollinator habitat and increased infiltration, where appropriate.

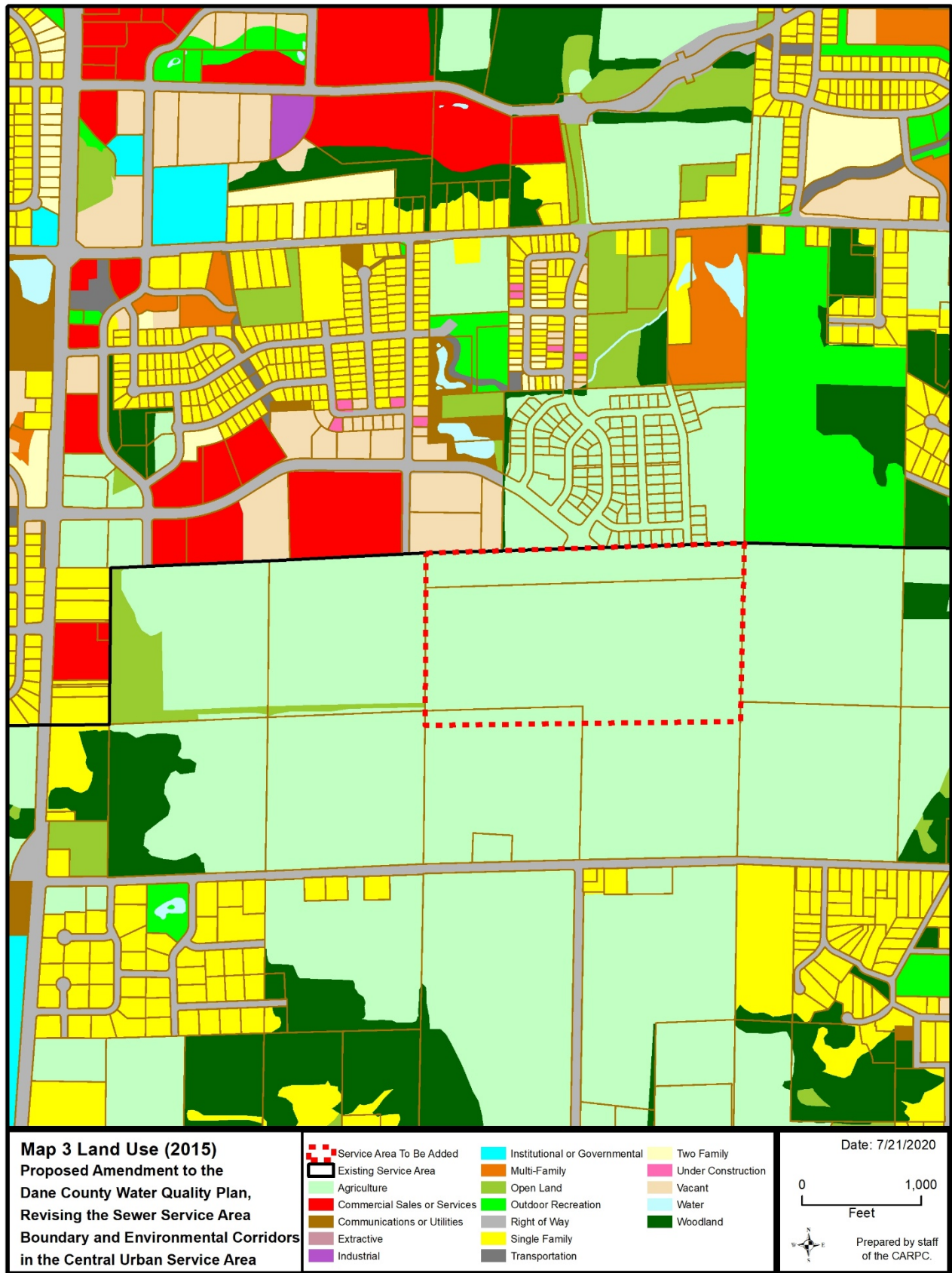
Map 1 - Amendment Area



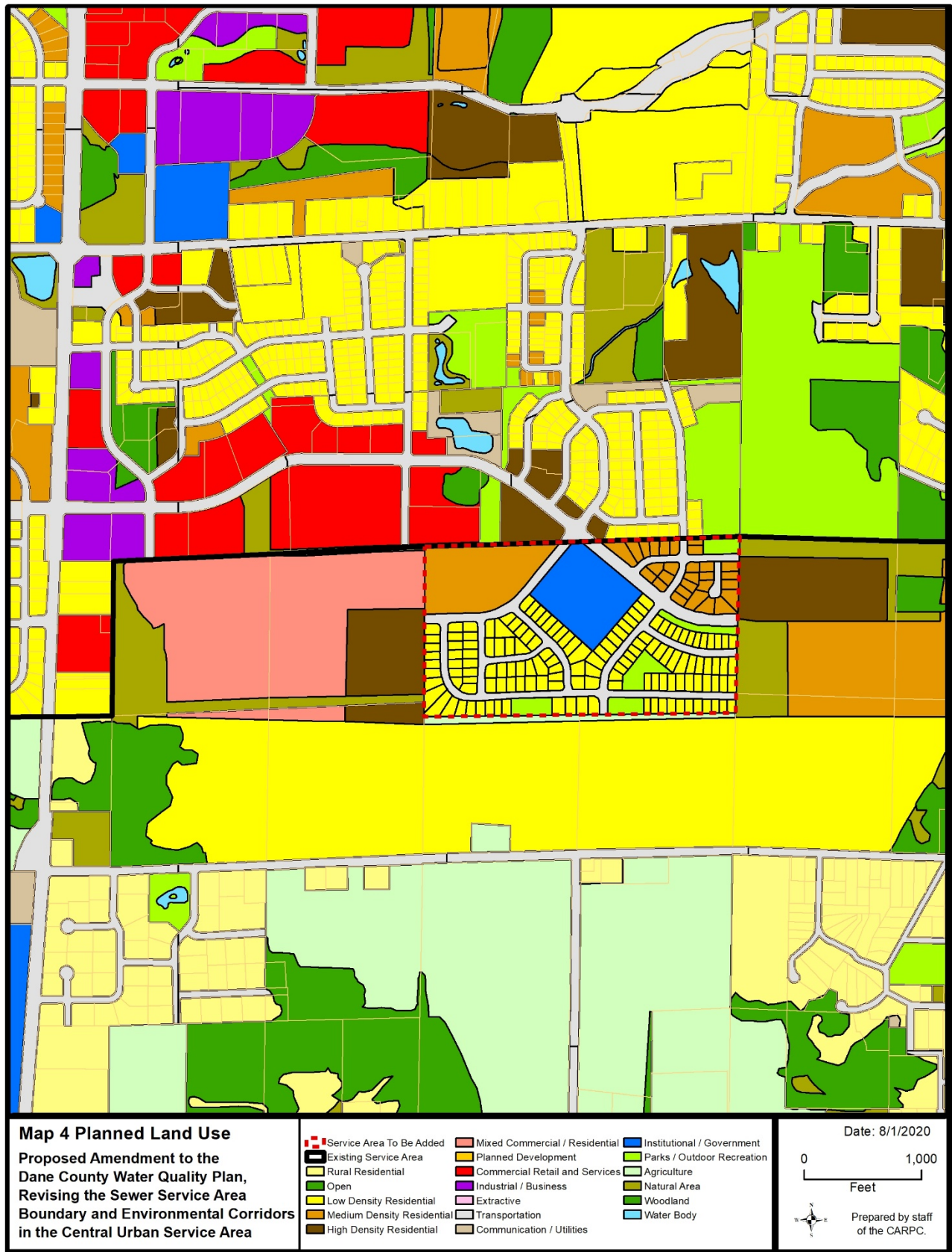
Map 2 – Aerial



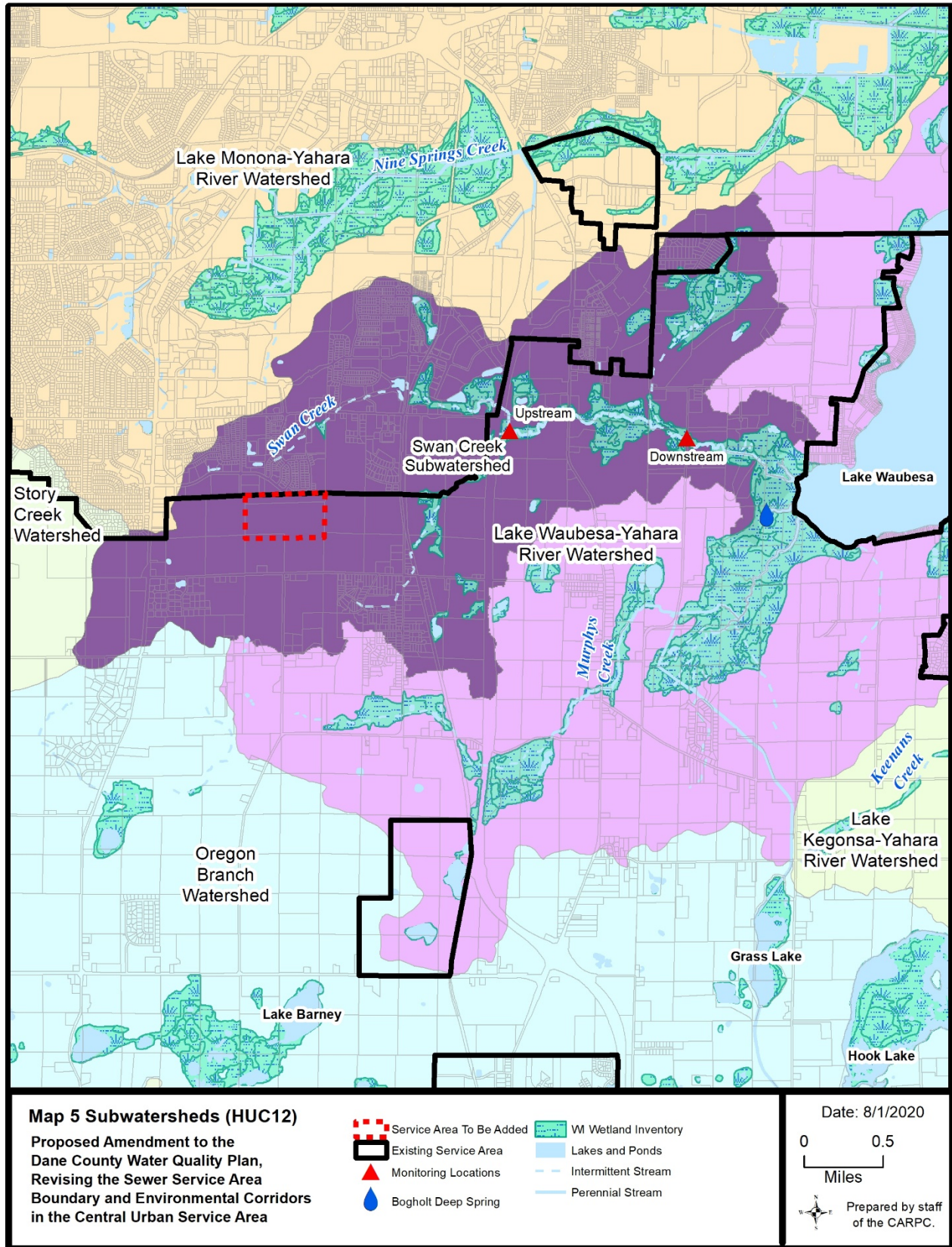
Map 3 – 2015 Land Use



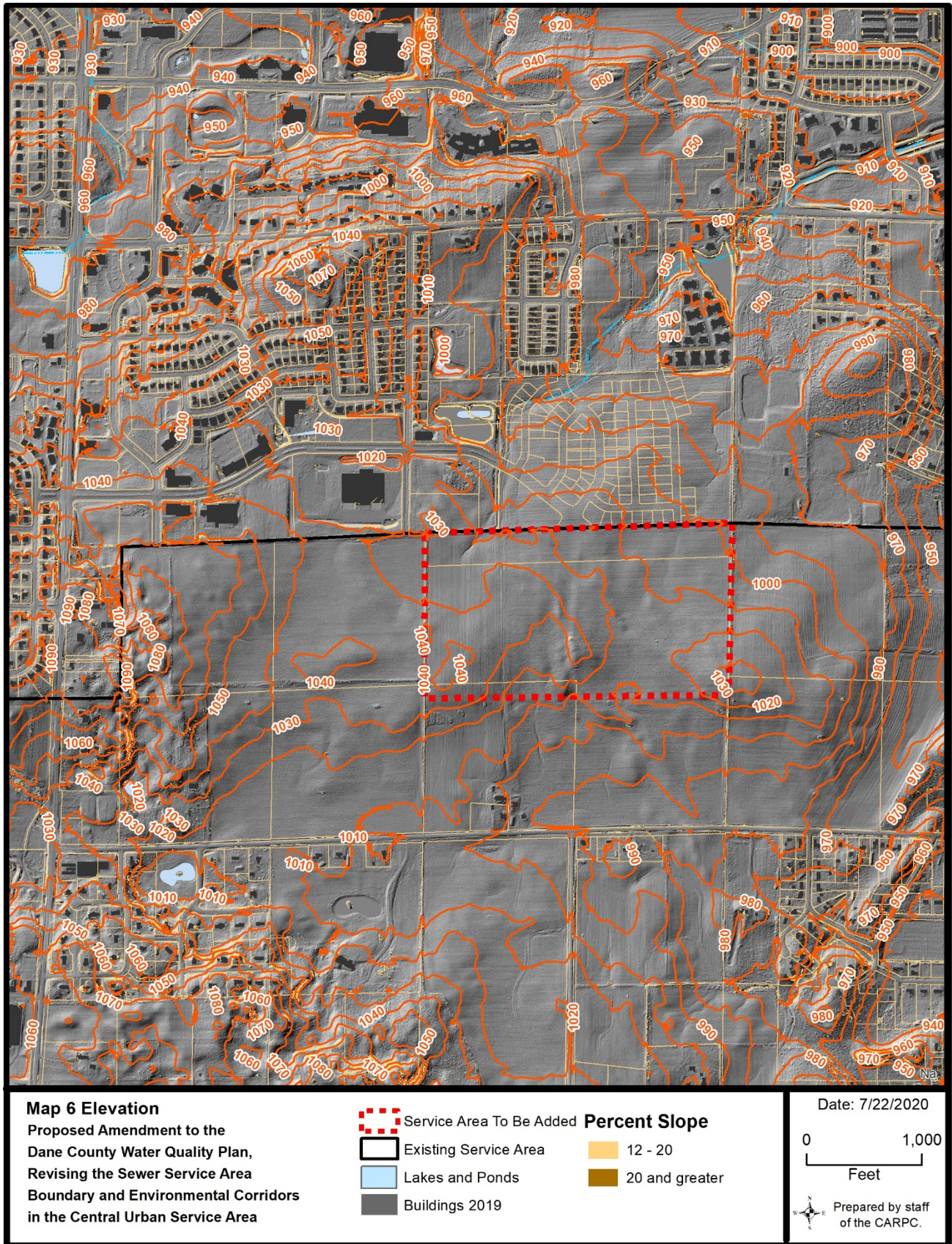
Map 4 – Planned Land Use



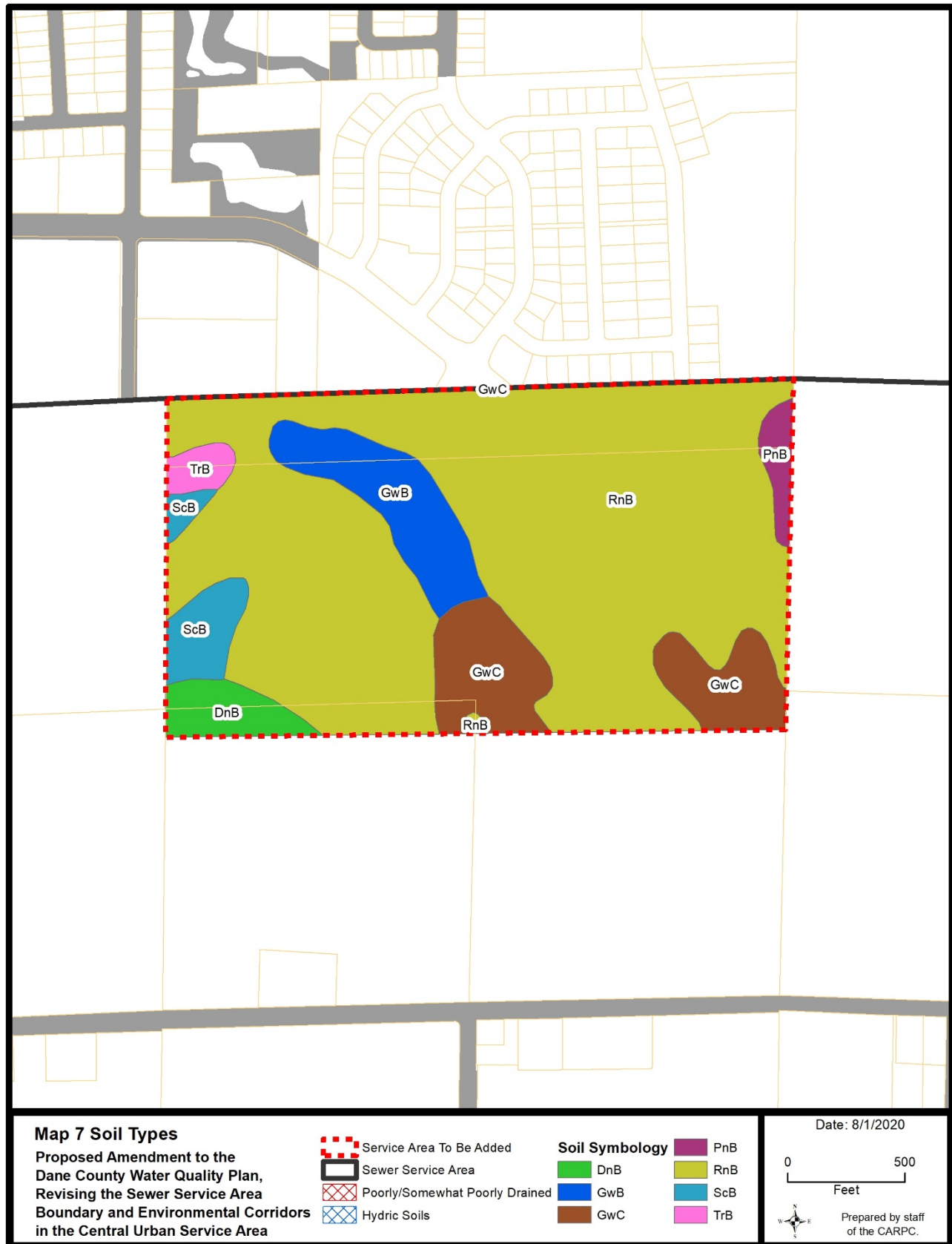
Map 5 – Subwatersheds



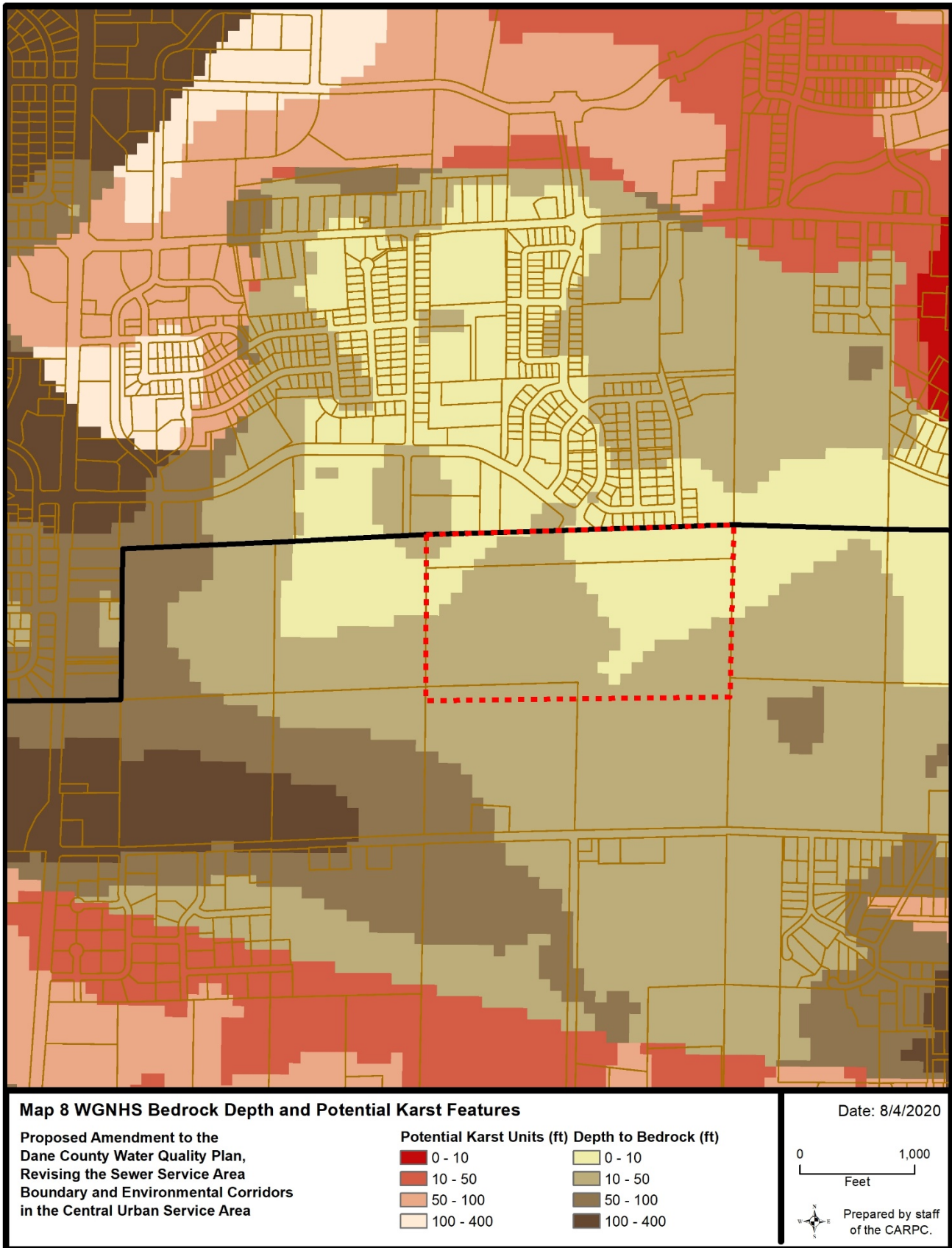
Map 6 - Elevations



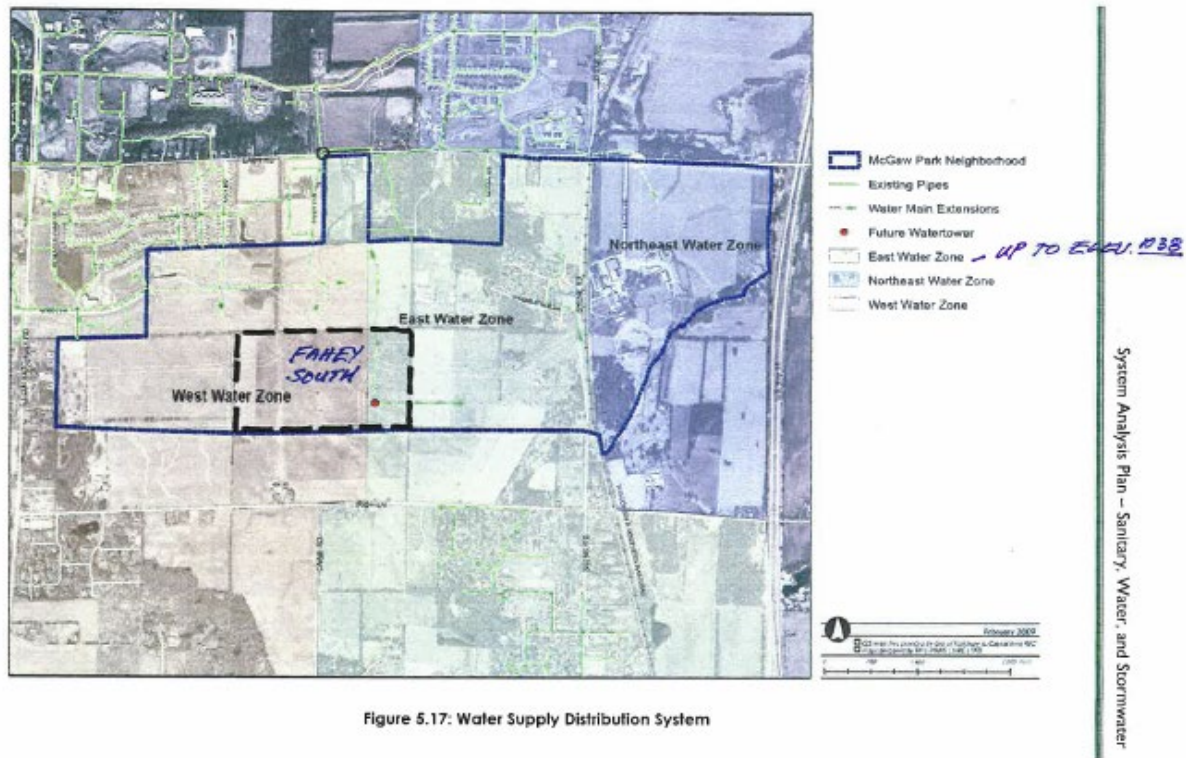
Map 7 - Soil Type



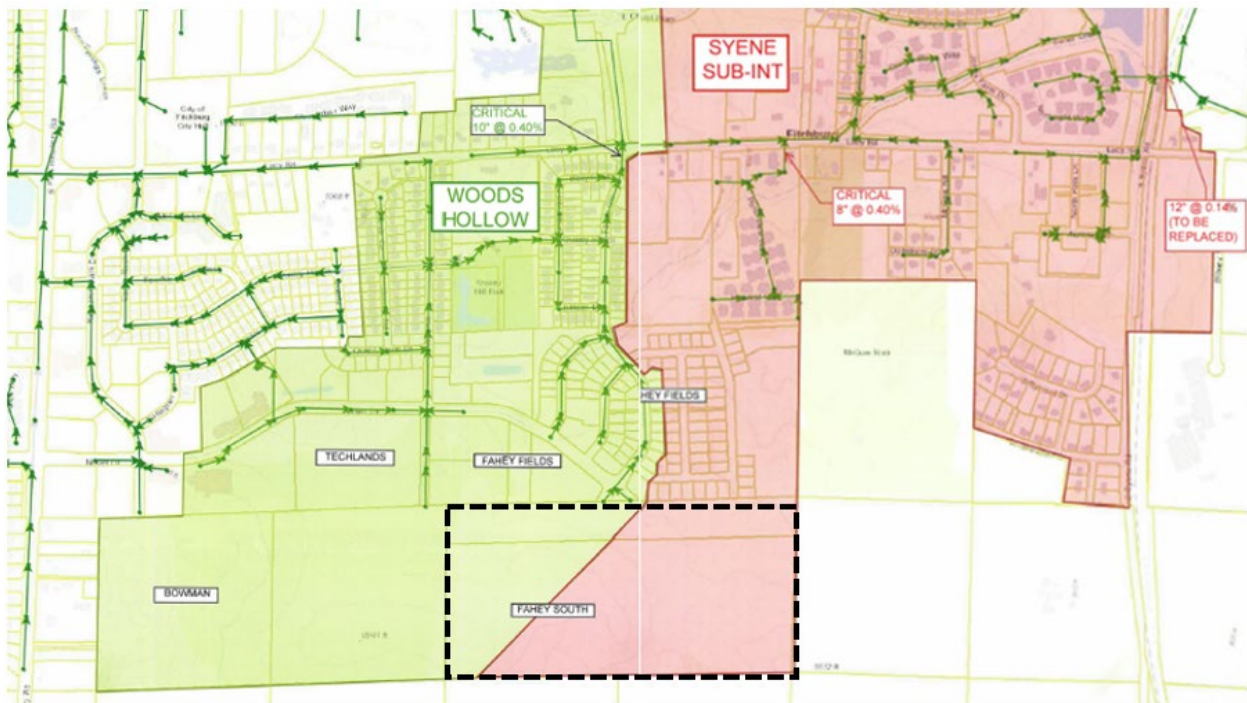
Map 8 – WGNHS Bedrock Depth and Potential Karst Features



Map 9A – Planned Water Supply Distribution System

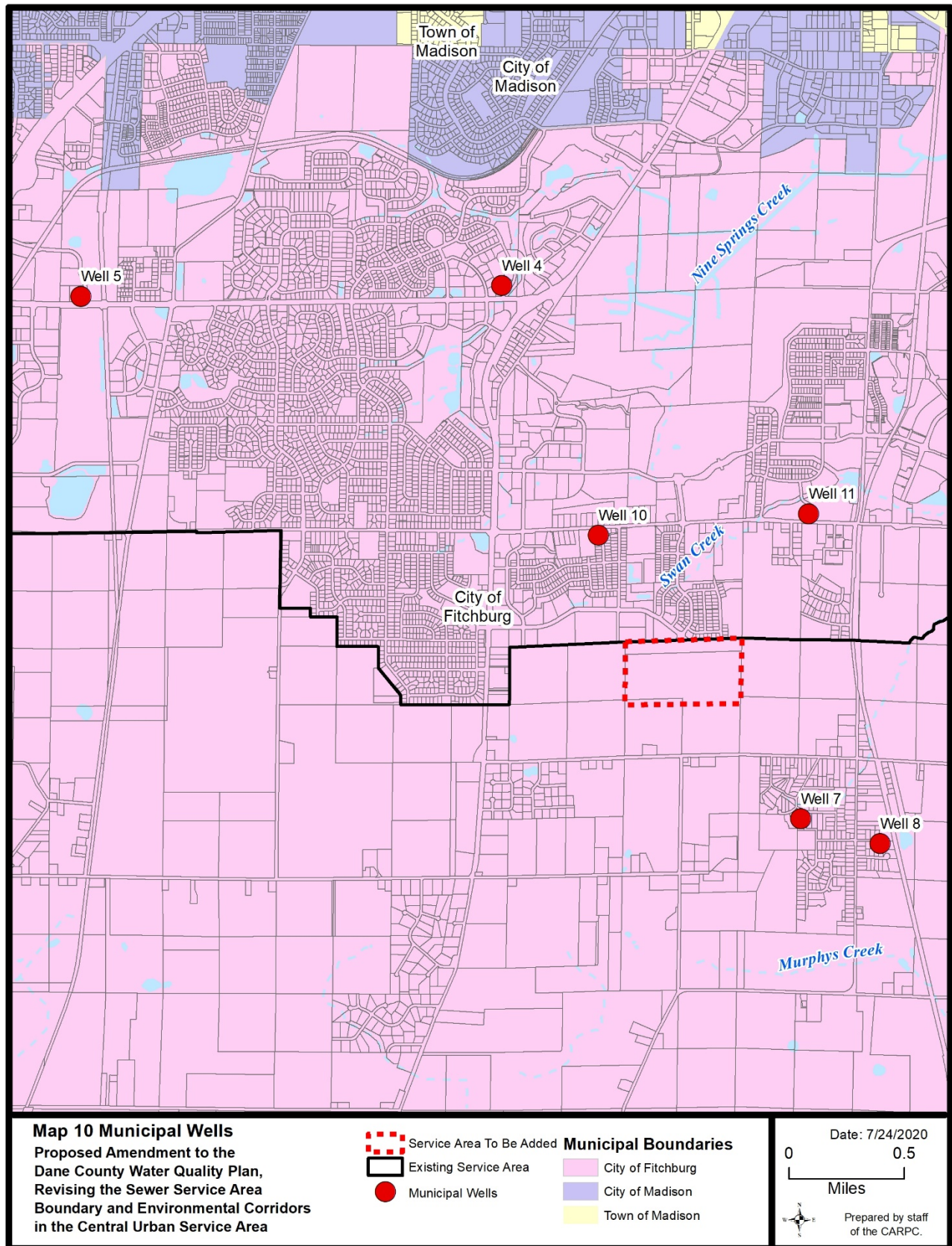


Map 9B – Planned Sanitary Sewer Service



A detailed topographic map of a residential development site. The map shows various streets including FAHEY GLEN, NOBEL, PARK, NOLAN ROAD, and EVIE CARPENTER STREET. It features contour lines at 2-foot and 10-foot intervals, tax parcels outlined in green, and specific areas labeled like "MOUNTAIN" (11.5 AC) and "INSTITUTIONAL" (10 AC). A scale bar indicates 1 inch = 200 feet.

Map 10 – Municipal Wells





24 July 2020

Mr. Sean Higgins
Capital Area Regional Planning Commission
City-County Building, Room 362
210 Martin Luther King Jr. Boulevard
Madison, WI 53703-2558

RE: The Proposed Amendment to the Dane County Water Quality Plan, Revising the Sewer Service Area Boundary and Environmental Corridors in the Central Urban Service Area, **Fitchburg, June 2020**, Dane County, Wisconsin

Dear Mr. Higgins:

Considering the landform, and previous landuse history, no archaeological survey is recommended for this sewer service revision.

Under Wisconsin law, Native American burial mounds, unmarked burials, and all marked and unmarked cemeteries are protected from intentional disturbance. If anyone suspects that a Native American burial mound or an unmarked or marked burial is present in an area, the Wisconsin Historical Society should be notified.

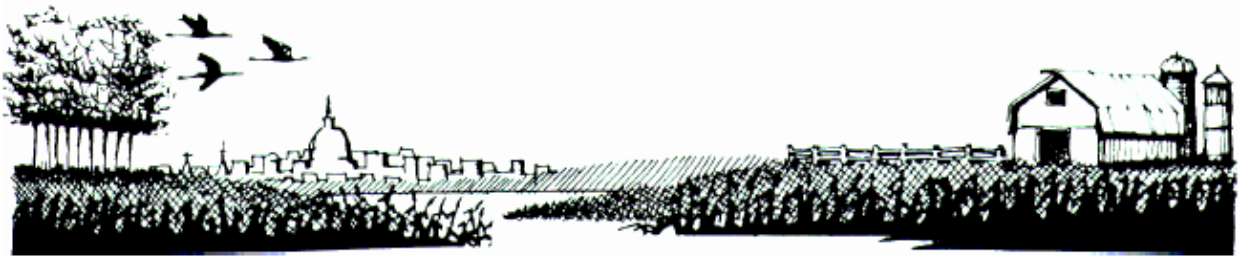
If human bone is unearthed during any phase of a project, **all work must cease**, and the **local authorities must be contacted**. The police or sheriff will determine if the burial is a criminal matter or if it should be referred to the Wisconsin Historical Society at 1-800-342-7834 to be in compliance with Wis. Stat. § 157.70 which provides for the protection of all human burial sites. If we are contacted, **work cannot resume until the Wisconsin Historical Society gives permission**. If you have any questions concerning the law, please contact the Wisconsin Historical Society at 1-800-342-7834.

This letter does not constitute a Wisconsin Historical Society review for any project that may be governed by Federal or State Compliance laws, e.g. Section 106, Wis Stat. §44.40, Wis Stat. §66.1111, or Wis Stat. §157.70

If you have any questions, or if you need additional information, please feel free to contact me.

Sincerely,

John H. Broihahn
State Archaeologist
State Archaeology and Maritime Preservation
608-219-6240, john.broihahn@wisconsinhistory.org



TOWN OF DUNN - 4156 COUNTY ROAD B, McFARLAND, WI 53558

Website: www.town.dunn.wi.us

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Phone: (608) 838-1081

FAX: (608) 838-1085

July 8, 2020

Linda Firestone
Capital Area Regional Planning Commission
100 State Street, Suite 400
Madison, WI 53703

Dear Linda,

The Town of Dunn would like to share its comments regarding the City of Fitchburg Urban Service Area Amendment application.

Foremost, while the proposed sewer service area would not be located on any land that is adjacent to the Town of Dunn, the proposal shows that stormwater runoff would reach Swan Creek, which eventually runs into the Waubesa Wetlands which are located in the Town of Dunn. The Town has worked tirelessly with landowners, conservation organizations, and other government agencies to protect these wetlands. Our hope is that if Fitchburg's proposed Urban Service Area amendment is approved, CARPC will require conditions that would ensure the continued protection of this wetland gem.

The Waubesa Wetlands are one of the highest quality and most diverse wetlands in southern Wisconsin and have been recognized by various organizations for the importance the wetlands play as an environmental resource and prime habitat area. The 2008 Dane County Wetlands Resource Management Guide categorizes the Waubesa Wetlands as a Group I wetland which, according to the guide, are "the best in the county" and "every effort should be made to protect them". Most recently, the Society of Wetland Scientists designated the Waubesa Wetlands as a "Wetland of Distinction" for being a rare wetland type within its own biogeographical region and for its ability to protect habitat for diverse flora and fauna.

The Town of Dunn's main concern with any development near Swan Creek is the potential for nutrient runoff, particularly phosphorus and nitrogen, to be carried to the Waubesa Wetlands. Excess nutrients could support the proliferation of invasive species in these wetlands and Lake Waubesa. Stormwater planning should retain the discharge of such nutrients and such retention should be planned for in the construction and post-construction phases.

The Town's second concern with Fitchburg's Urban Service Area Amendment is increased stormwater volume and the potential for flooding along Swan Creek. Small stream basins, such as Swan Creek, can be most adversely affected by urbanization. Alterations to this stream's hydrology could correspondingly have adverse impacts to the Waubesa Wetlands and Lake Waubesa. While stormwater runoff from the development within this amendment proposal would not drain directly into Swan Creek, measures should still be taken to ensure drainage does not negatively impact this waterway. Since climate change has, and will continue to, unleash heavier rainfalls throughout Dane County, the Town encourages this development to plan for heavier storm events. The City of Madison recently amended their stormwater ordinance in response to climatic changes. They now require stormwater planning for 200-year rainfalls. The Town encourages Fitchburg and the developers to also be on the leading edge of stormwater planning and to engineer and install stormwater facilities that can handle 200-year storm events.

While nutrient runoff and increased stormwater volume to Swan Creek are the Town's two primary concerns, CARPC should look closely on implementing additional conditions that will protect the Waubesa Wetlands.

Sincerely,

Ben Kollenbroich
Town of Dunn Planning & Land Conservation Director

From: [Linda Firestone](#)
To: [Mike Rupiper](#)
Subject: FW: CARPC Meeting 7 9 2020
Date: Thursday, July 9, 2020 7:18:11 AM
Attachments: [Instant Phosphorous at Swan Lalor.pdf](#)

Mr. Schooler is already registered as a meeting participant.

Regards,

Linda K. Firestone
Administrative Services Manager
Capital Area Regional Planning Commission
100 State Street, Suite 400
Madison, WI 53703
Cell: (608) 358-6057

Sign up for our newsletter

-----Original Message-----

From: schooler@tds.net <schooler@tds.net>
Sent: Wednesday, July 8, 2020 5:27 PM
To: Linda Firestone <lindaf@capitalarearpc.org>
Cc: Joy Zedler <jbzedler@wisc.edu>; Cal DeWitt <cbdewitt@wisc.edu>; ALEX EVERETT WENTHE <aewenthe@wisc.edu>
Subject: CARPC Meeting 7 9 2020

Linda,

I am Steven Schooler and reside at 2824 Waubesa Ave., Madison, WI 53711. I am retired so am not employed by anyone but am an active member and board member for the Friends of Waubesa Wetlands. I have registered to comment on item 6a of the agenda concerning the requested revision by the City of Fitchburg. Because I am not certain of my ability to participate in the meeting on 7 9 2020, I submit this written comment. I may still try to attend the public hearing but please accept this as my comment.

The Friends of Waubesa Wetlands is dedicated to preserving these very unique wetlands which abut Lake Waubesa which also serve to preserve the water quality of Lake Waubesa. I believe other members of our organization will comment further but I would like to focus on the water quality of a particular but critical stream that is part of the watershed for Waubesa Wetlands, namely Swan Creek. The City of Fitchburg has approved numerous significant developments in past several years that impact on Swan Creek. This is simply one more of many. Yet, I am very concerned that there has been no study by the City of the impact of these developments of the water quality of this vital tributary. I am sure developers have done studies of the potential adverse impact of stormwater but I am not aware of anything done by the City that documents what has been the actual impact of all the development to date. In particular, the development of Northeast Neighborhood is under construction currently with planned development in stages but there has been and continues to be major development along Lacy Road, Syene Road and East Cheryl Parkway, all of which significantly impact Swan Creek with storm water run off. (Indeed, one of the earliest developments in the area is named "Swan Creek".) The major study conducted recently by the Nelson Institute for Environmental Studies was conducted in 2018, entitled "Assessing land Use Impacts and Promoting Community Engagement in the Waubesa Wetlands Watershed". I believe the link to this report is actually a part of the Friends of Waubesa Wetlands web site which is part of the CARPC website but it also can be found at <https://nelson.wisc.edu/docs/wrm-2018-report.pdf>.

There are many recommendations from this report but I would like to focus on one I believe to be the most critical: the installation of a USGS long-term monitoring site at Swan Creek (where it intersects at Lalor Road).

As background, Todd Stuntebeck of the USGS (United States Geological Survey) has been in contact with the City of Fitchburg with a proposal for such a monitoring station. He would not share the exact details of the proposal (the

City knows the details), but he did share the cost would be roughly a base of \$25,000 per year plus the sampling costs (which are dependent on what, who and how often) for the sampling. He also shared that the USGS would match a significant share of the cost. Again, the details of his proposal reside with the City.

This monitoring station is critical for the understanding of the impact of this and all of the other development on the Waubesa Wetlands, and ultimately, Lake Waubesa. Let me just give one illustration of how important this is.

I am a volunteer with the Rock River Coalition which does base flow monitoring for Murphys and Swan Creeks. There are two sites on each stream (actually a third on Murphys but it has not been staffed for some time). Fortunately, we are able to get nutrient data analyzed with the help of MMSD (Madison Metropolitan Sewerage District). I have been trying to analyze the data over the years. I will focus on total phosphorous (just to pull a nutrient out of the air) but others have similar histories (TN, TKN, Ortho-Phosphorous).

Using the baseline sampling at Swan Lalor Road, the mean annual values of TP in mg/L were:

2015 .22

2016 .14

2017 .17

2018 0.0975

2019 .14

The Rock River Coalition standard is .075 for this stream for TP.

Based upon this, we might believe everything, even with all of the new development is "hunky dory". It is decreasing over time and approaching the water quality limits. But, there is the rest of the story.

In 2018, as part of the Nelson Institute Study, a continuous, instantaneous monitor installed and the students did additional grab samples (some during high participation events). The average for these student grab samples was .183 mg/L. Much higher and somewhat concerning, but there is more. The results of instantaneous monitor for 25 selected times is attached. The mean for these samples was .30 mg/L with the maximum being .746 mg/L. The mean is more than 3 times the grab sample base line and the maximum is 7 to 8 times the base flow monitoring.

There can be no dispute that all of the developments with the significant increase in storm water drainage contribute to these incredible disparities. But the real key is, that without more extensive, continuous monitoring, no one, not the developers with their extensive engineering models, not the City which is allowing the development (but gaining increase revenue as a result) and not the citizens and residents of this county, have a clue what is going on. This is like spotting an ice berg from a vessel and based upon what is seen, concluding everything is okay.

So, most of the pieces are in place and the data clearly demonstrates the need. There is no reason the City and the developers can not afford (particularly with the financial assistance of the USGS) to place a monitoring system in Sway Creek at Lalor as recommended by the Nelson Institute Report.

Linda, please let me know you received this and it will be submitted to the committee.

Thank you.

Phosphorus (Instantaneous) at Swan Creek - Swan Creek At Lalor Road, 10010972

Instantaneous phosphorus was gathered at this station 25 times during the period of monitoring, from 04/22/18 to 10/31/18. Phosphorus values are displayed in the graph below and reflect the following values:

Minimum: .051 mg/L
Maximum: .746 mg/L
Mean: .30 mg/L
Median: .278 mg/L

