
Staff Analysis of Proposed Amendment to the
Dane County Water Quality Plan
**Revising the Sewer Service Area Boundary and Environmental
Corridors in the Waunakee Urban Service Area**
“Heyday Development”

History of the Waunakee Urban Service Area

The Waunakee Urban Service Area (USA) was established in 1971 with the adoption of the first sewer service plan. Environmental Corridors were delineated in 1985. The first amendment occurred in 1988. There have been 20 amendments to this service area since its creation totaling 1,586 acres of developable land and 697 acres of Environmental Corridor. The most recent amendments of the service area by the Village were recommended by the Commission and approved by the Wisconsin DNR (WDNR) in the spring of 2023, adding roughly 40 acres in the northeast corner of Waunakee in May 2023 (WDNR Project Number DC-0223).

Planning in Waunakee

The Village of Waunakee adopted their joint comprehensive plan with the Town of Westport in 2017. The Comprehensive Plan is substantially consistent with the adopted [2050 Regional Development Framework](#) (Framework). The requested amendment areas are planned for and contiguous to compatible uses as envisioned in the Framework and the Village’s long-range plans.

Existing Conditions

Land Use

The Village of Waunakee is requesting an amendment to the Waunakee USA in the northeastern corner of the Village. The amendment area is east of the intersection of Madison Street and Easy Street. The requested amendment area totals approximately 77 acres. It is a planned mixed residential, called “community residential” in the Comprehensive Plan. Most land surrounding the amendment area is agricultural and rural residential. Refer to **Table 1** for existing and planned land uses.

Table 1
Existing and Planned Land Use¹

Land Use Category	Amendment Area	
	Existing Land Use Acres (see Map 3)	Proposed Land Use Acres (see Map 4)
Agriculture	57.8	
Natural Area		21.5
Open Land	17.6	
Parks/Outdoor Recreation		14.0
Residential, Multifamily		15.3
Residential, Rural	0.6	0.6
Residential, Single Family		14.5
Right-of-Way	0.3	4.8
Stormwater Management		6.5
Water	0.8	
	77.1	77.1

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 areas. There are no previously recorded archaeological inventories for this area.

Natural Resources

The amendment area is within the Waunakee Marsh–Sixmile Creek (HUC 12: 070900020601) subwatershed (see **Map 5**). There are two delineated wetlands within the amendment area and an intermittent unnamed tributary to Sixmile Creek. Surface runoff from the amendment area eventually drains to Sixmile Creek, which is designated as an Exceptional Resource Water (ERW) from mile 0 to 12.08, under the state’s antidegradation rules (see NR 102 and NR 207). ERWs are not significantly impacted by human activities and provide valuable fisheries or unique habitat features. As such, this waterway is considered by WDNR to be an Area of

¹ Acreages listed in application materials may vary from acreages calculated through mapping in GIS by staff depending upon applicant data sources and mapping methods.

Special Natural Resource Interest (ASNRI) which indicates special ecological value of the resource and is intended as a basis for management decisions.

The amendment area is not within a drainage district. Wastewater from the amendment area will be treated at the Nine Springs Wastewater Treatment Facility, operated by Madison Metropolitan Sewerage District (MMSD). The treated effluent is discharged to Badfish Creek and Badger Mill Creek, bypassing the Yahara chain of lakes.

Wetlands

WDNR's Wisconsin Wetland Inventory (WWI) shows two emergent / wet meadow wetlands within the amendment area. A wetland delineation ([link to report](#)) was conducted by Wetland & Waterway Consulting, LLC in November 2024 within the amendment area. The site investigation and field delineation determined there were two wetlands within the amendment area (see **Figure 1**). The northern wetland (Wetland B) and southern wetland (Wetland A) are both described as shallow water marshes occupying a shallow depressional basin dominated by reed canary grass (*Phalaris arundinacea*) and river bulrush (*Bolboschoenus fluviatilis*). Wetland B is also dominated by narrowleaf cattail (*Typha angustifolia* L.).



Figure 1. Wetland Delineation (Wetland & Waterway Consulting, 2024)

The delineated wetlands, with a minimum 75' vegetated buffer, are required to be designated as Environmental Corridor per the adopted Policies and Criteria for Environmental Corridors ([link to document](#)), as part of the *Dane County Water Quality Plan*.

In addition to the delineated wetlands within the amendment area, there are also other wetlands near the amendment area. According to the WWI, the wetland area directly to the west is classified as palustrine persistent emergent / wet meadow. This wetland complex is associated with an intermittent unnamed tributary to Sixmile Creek.

Sixmile Creek

The runoff from the amendment area drains to the southwest via an intermittent unnamed tributary to Sixmile Creek that flows through the northwestern portion of the amendment area and is within the Waunakee Marsh-Sixmile Creek subwatershed. Sixmile Creek (WBIC 805500 / WATERSID 11692) is 12.08 miles long and flows through the Village of Waunakee, ultimately draining into Lake Mendota. The 43 square mile watershed encompasses predominately agricultural lands and the growing community of Waunakee. The creek is listed as an Exceptional Resource Water by the DNR. The creek provides spawning areas for Lake Mendota's fish and offers a warm water sport fishery. Sixmile Creek has cool-cold and cool-warm main stem natural communities.

The lower reach of the creek (from mile 0 to 8.5) is impaired for Total Phosphorus. There is a DNR monitoring station on Sixmile Creek at Waunakee Park (Station ID 10012036). Data from 2025 monitoring indicated field measurements of dissolved oxygen of 5 to 11 mg/L, an average transparency of 114 cm, and macroinvertebrate scores of 2.67 to 3. There is another downstream DNR monitoring station on Sixmile Creek at Mill Rd (Station ID 10010966). Data from summer/fall 2025 monitoring indicated lab measurements of phosphorus of 0.14 to 0.22 mg/L. There is one active USGS baseflow monitoring station ([USGS-05427910](#)) downstream of the amendment area at County Trunk Highway M. While daily water quality data is no longer recorded at this station, 2024 data indicated daily measurements of phosphorus of 0.0711 to 0.586 mg/L. Chloride data is not collected at these monitoring stations.

Springs

Springs represent groundwater discharge visible to the casual observer. The Wisconsin Geological and Natural History Survey (WGNHS) maintains an inventory of springs in Dane County and throughout the state. From 2014 to 2017, the WGNHS surveyed springs statewide that were expected to have flow rates of at least 0.25 cubic feet per second (cfs). There are no known springs in or near the proposed amendment area.

Groundwater

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 CARPC staff for species designated as endangered, threatened, or of special concern identified one endangered insect and one natural community within a 1 to 2-mile radius of the amendment area. Therefore, it is recommended that a formal Endangered Species Resources Review be conducted by the WDNR or one of their certified reviewers for potential impacts to endangered resources, and habitat protection measures to be implemented if species are found.

The amendment area is within the High Potential Zone (species likely present) for the federally endangered Rusty Patched Bumble Bee ([link to web map](#)). Section 7 of the Endangered Species Act requires consultation with the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service when any action that is carried out, funded, or permitted by a federal agency may affect a federally listed endangered or threatened species. However, much of the proposed amendment area currently consists of disturbed ground and row crops and is not considered to be suitable habitat for the Rusty Patched Bumble Bee. The WDNR typically recommends that projects within the High Potential Zone include native trees, shrubs, and flowering plants; plants that bloom spring through fall; and the removal and control of invasive species in any habitat used for foraging, nesting, and overwintering. The USFWS developed a list of plants favored by Rusty Patched Bumble Bee ([link to list](#)). Implementing these conservation measures should be coordinated with the WDNR Endangered Resources Review Program, as needed.

Soils and Geology

The amendment area is located within the Waunakee Moraines Land Type Association of Wisconsin. The Association classifies the surficial geology of this area as rolling till plain and irregular drumlins with scattered bedrock knolls, lake plains, and outwash plains.

Surface elevations within the amendment area range from around 924 feet to 950 feet. There are areas of steep (> 12%) and very steep (>20%) slopes within the amendment area that coincide with the unnamed intermittent stream and mapped wetland area (see **Map 6**).

According to the General Soil Map of Dane County, the soils in the amendment area are in Plano-Ringwood-Griswold association. These soils are moderately well drained and well drained, deep silt loams and loams. **Table 2** shows detailed classifications for soils in the

amendment area (see **Map 7**) and **Table 3** shows important soil characteristics for the amendment area.

There is one hydric soil within the amendment area (see **Map 7**), which are good indicators of existing and former (drained) wetlands. The Wacousta soil (the Wa map unit) makes up 9.7% of the area. According to the Soil Survey Geographic data for Dane County developed by the NRCS ([link to web soil survey](#)), the Elburn soils (the EfB map unit) are not hydric, but they do have a seasonal (April to June) zone of water saturation within 5 feet of the ground surface. The EfB soils are somewhat poorly drained and can pose a limitation for buildings with basements, and coincide with the mapped wetland area.

Table 2
Soils Classification

Soil	% of Area	General Characteristics
Plano Silt Loam; PnB	40.6	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.
Elburn Silt Loam; EfB	29.5	Deep, somewhat poorly drained, nearly level and gently sloping soils in glaciated stream valleys. Soils have high fertility, moderately slow permeability, and a moderate hazard of erosion. Poses severe limitations for development due to depth to saturated zone.
Ringwood Silt Loam; RnB	10.8	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.
Wacousta Silty Clay Loam; Wa	9.7	Deep, poorly drained, nearly level soils on low benches in old lake basins. Soils have low fertility, moderately slow permeability, and no hazard of erosion. Poses severe limitations for development due to ponding and depth to saturated zone.
Troxel Silt Loam; TrB	5.5	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.
Ringwood Silt Loam; RnC2	3.1	Deep, well drained, gently sloping and sloping soils on glaciated uplands. Soils have high fertility, moderate permeability, and a severe hazard of erosion. Poses moderate limitations for development due to slope, low bearing capacity, and erodibility.

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	PnB, RnB, TrB	56.9
Hydric Soils (Indicates Potential / Restorable Wetlands)	Wa	9.7
Poorly Drained Soils with Seasonal High Water Table (< 5')	EfB	29.5
Soils Associated with Steep Slopes (> 12%)	None	0
Soils Associated with Shallow Bedrock (< 5')	None	0
Best Potential for Infiltration in Subsoils	PnB, RnB, RnC2	54.5

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 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 50 to 137 feet, with the shallowest depths generally being in the eastern portion of the amendment area, and the deepest depths being in the western portion of the amendment area (see **Map 8a**). There are no karst features identified in the amendment area based on available data.

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

Contamination

CARPC staff reviewed the DNR Remediation and Redevelopment Tracking System database ([link to database](#)) and Remediation and Redevelopment (RR) Sites Map ([link to map viewer](#))

for records of contamination within the amendment area. No records of investigation or cleanup activities were found.

Proposed Urban Services

Parks and Open Space

The proposed development includes three outlots dedicated to park, stormwater management, or open space (containing wetlands). These areas total 13 acres within the amendment area (see **Map 2**). All stormwater areas, parks, and open space areas are proposed for placement in Environmental Corridors.

Wastewater

Overview

Sanitary sewer service will be provided to the proposed development within the amendment area by connection to the Village of Waunakee sanitary sewer collection, which then flows to the MMSD wastewater collection and treatment system. The amendment area will be served by 8-inch and 12-inch gravity sewer flowing to the proposed lift station located near Madison St (see **Figure 2**). The lift station will pump flows south along Madison St through 6-inch forcemain to an existing manhole near the intersection of Madison Street and Skyview Drive. Wastewater will then gravity drain through 8-inch sewer and through a series of Village-owned interceptors before discharging to the MMSD-owned Northeast Interceptor – Waunakee Extension near the intersection of South Division Street and the Wisconsin Southern Railroad. From there, wastewater flows via the Northeast Interceptor – Waunakee Extension to Pump Station 14 within the MMSD System, and eventually to the Nine Springs Wastewater Treatment Facility.

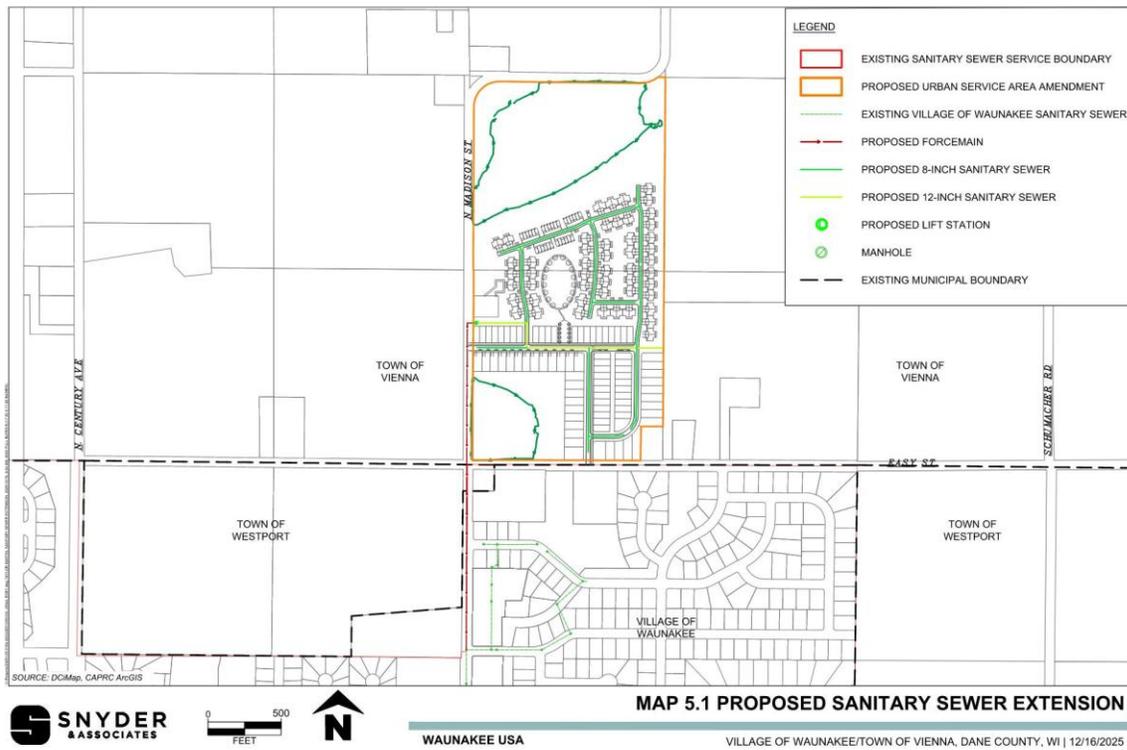


Figure 2. Proposed Sanitary Collection System (Snyder & Associates, Inc., December 16, 2025)

Collection System

The proposed development within the amendment area consists of approximately 83 single-family residential units and 132 multi-family residential units contributing to wastewater flows. The Village estimates that the amendment area will generate an annual average of approximately 47,300 gallons per day (gpd) of wastewater, or 33 gallons per minute (gpm). This assumes 2.75 persons per dwelling unit and an average wastewater generation rate of 80 gallons per capita per day (gpcd) for residential land uses, per flow metering data contained in the *2018 Sanitary Sewer Comprehensive Plan for the Village of Waunakee*, prepared by Strand Associates, Inc. on behalf of the Village of Waunakee (hereinafter, *2018 Sewer Comp Plan*). Accounting for infiltration and inflow, the Village estimates that the amendment area will generate a peak daily flow rate of approximately 208,200 gpd (0.208 MGD), or 145 gpm (0.32 cfs), utilizing a peaking factor of 4.0 for residential land uses.

The proposed 8-inch and 12-inch sanitary sewers within the amendment area are anticipated to have sufficient capacity for estimated peak flows based on minimum slope requirements per NR 110. The proposed lift station near Madison Street will be sized to accommodate peak daily flows from the ultimate development area as described in the Village’s application. The subsequent calculations assume that the lift station will pump flows no greater than the calculated peak daily flow rate from the amendment area. The lift station will pump flows south through a 6-inch forcemain along the southwestern edge of the

amendment area to a manhole on Madison Street. The downstream 8-inch sewer in Madison Street and Greenbrier Drive currently receives an average daily flow of 13 gpm (0.029 cfs) and a peak daily flow of 37 gpm (0.082 cfs), based on results from flow monitoring conducted in 2024. Including flows from the proposed development, this sewer will receive a total peak daily flow of 182 gpm (0.41 cfs) and will remain below its capacity of 345 gpm. Flows from the 8-inch Greenbrier Drive sewer and the remaining portion of the Northeast basin will discharge to the 12-inch Northeast Interceptor along North Fairbrook Drive. The Village estimates the Northeast Interceptor receives peak daily flows of approximately 77 gpm (0.17 cfs). Including the proposed flows, the Northeast Interceptor will convey approximately 222 gpm (0.49 cfs) and will remain below its theoretical capacity of 718 gpm. The Northeast Interceptor will discharge flows to the 12-inch Northeast/Northwest Interceptor sewer near the intersection of West Verleen Avenue and North Fairbrook Drive. Including flows from the Northwest basin, the Northeast/Northwest interceptor receives average daily flows of 103 gpm (0.23 cfs) and peak daily flows of 283 gpm (0.63 cfs). As described in the Village's application, this interceptor will receive a peak daily flow of 428 gpm (0.95 cfs) including the additional flows from the amendment area and will remain below its capacity of 750 gpm. The downstream sewers include the Sixmile Interceptor, the Sixmile/Division Street Interceptor, and ultimately the Waunakee Extension of the Northeast Interceptor. Detailed information about recent average daily and peak daily flows is not available, however the proposed increase in flow rate based on data from the *2018 Sewer Comp Plan* is minor in comparison to the total theoretical capacity of the interceptors.

The Village has shown that there is sufficient existing wastewater collection system capacity to serve the proposed amendment area. Future development within the ultimate development area of the proposed lift station will require further assessment of flows.

Wastewater Treatment Facility

Madison Metropolitan Sewerage District (MMSD) will provide wastewater treatment for the amendment area. The amendment area will need to be annexed into the MMSD service boundary. The Nine Springs Wastewater Treatment Facility (WWTF) is located on Moorland Road, Madison. Treated effluent had been discharged to Badfish Creek within the Badfish Creek Watershed (Lower Rock River 8 Basin) and Badger Mill Creek within the Upper Sugar River Watershed (Sugar-Pecatonica Basin) since 1998; however, the discharge to Badger Mill Creek was conditionally approved to be discontinued in September of 2024 ([see DNR Letter DC-0238](#)) and has since ceased.

The rated monthly design flow capacity of the facility is 56.0 million gallons per day (MGD) and the maximum daily design flow capacity is 68.6 MGD. In the year 2024, the facility received an average monthly influent hydraulic loading of 40.0 MGD (72% of the 56.0 MGD design capacity), including infiltration and inflow, according to the 2024 Compliance

Maintenance Annual Report (CMAR) (link to 2024 CMAR). It is expected to reach 90% of current hydraulic design capacity around 2026 based on current projected growth rate assumptions. This already occurs on occasion, although average flows did not exceed 89% design capacity for any month in 2024. MMSD completed a facility plan in 2017, titled Liquid Processing Facilities Plan, that recommended improvements to the liquid treatment processes at the plant, including the addition of hydraulic capacity. These improvements are being implemented in multiple phases between 2018 and 2030. For the 20-year planning period, treatment for this area is expected to remain at the existing wastewater treatment facility location with expanded capacity of the system as the need is foreseen. MMSD staff were contacted regarding the proposed development. Staff responded with questions necessitating clarification in the reporting provided by the applicant but otherwise did not express concerns about serving this additional area.

The facility's WPDES permit for wastewater discharge expired on March 31, 2025, and the new permit has not yet gone into effect. Limits within the existing permit will remain in effect until a new permit is issued. MMSD did not have issues meeting its WPDES permit limits for the quality of effluent discharged to Badfish Creek and Badger Mill Creek, according to their 2024 CMAR. Permit limits are specific to each outfall; however, effluent sampling is performed upstream of the flow split to each outfall. Effluent quality reporting below refers to Badfish Creek, where approximately 95% of discharge is released (prior to change in effluent discharges, as described above). Below is a summary of the major effluents reported in the 2024 CMAR for the Badfish Creek outfall:

- The biochemical oxygen demand (BOD) effluent quality for 2024 was well below the monthly average limit, with a monthly average of 2.6 mg/L (14% of the limit) and a maximum concentration of 4 mg/L (21% of the limit) for the months of January and February.
- The total suspended solids (TSS) effluent quality for 2024 was below the monthly average limit, with a monthly average of 4.9 mg/L (25% of the limit) and a maximum concentration of 8 mg/L (40% of the limit) for the month of September.
- The ammonia (NH₃) effluent quality for 2024 was well below the monthly average limits (limits vary by month), with a monthly average of 0.340 mg/L (5-19% of the limit) and a maximum concentration of 0.778 mg/L (19% of the limit) for the month of March.
- The phosphorus (P) effluent quality for 2024 was below the monthly average limit, with a monthly average of 0.31 mg/L (20-57% of the limit) and a maximum concentration of 0.57 mg/L (57% of the limit) for the month of September.

Badfish Creek is a tributary to the Rock River, and thus the currently applicable WPDES permit for MMSD includes phosphorus and TSS limits for effluent to Badfish Creek to comply with the

Total Maximum Daily Load (TMDL) developed for the Rock River Basin to protect and improve water quality. In addition to the TMDL limits, future water quality-based effluent limits (WQBEL) have been considered in the WPDES permit. The interim limit for phosphorus discharged to Badfish Creek is a 1.0 mg/L monthly average required beginning May 2020 (previous limit was 1.5 mg/L), with a final WQBEL of 0.225 mg/L. Additionally, an interim limit of 0.6 mg/L, expressed as a six-month average (May through October and November through April) is required beginning May 2020, with a final WQBEL of 0.075 mg/L. To meet the WQBEL for phosphorus, MMSD has implemented a Watershed Adaptive Management (WAM) approach, leading a diverse group of partners called Yahara Watershed Improvement Network (Yahara WINS) in implementing phosphorus reducing practices in the Yahara Watershed ([link to Yahara WINS website](#)).

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

Water System

Overview

Water will be provided to the amendment area by connection to the Village's municipal water system. The Waunakee Water and Light Commission provides municipal water through a public water distribution system which includes approximately 415,276 lineal feet of water, three booster pump stations, and five high-capacity groundwater wells. Four wells pump directly into the distribution system, and one pumps into a reservoir. The wells are at depths ranging from approximately 420 to 752 feet with a capacity of 650 to 1,200 gallons per minute (gpm). In total, the gross capacity of the municipal wells is approximately 5,050 gpm, or 7.27 million gallons per day (MGD). The firm capacity (with the largest well assumed to be out of service) is approximately 3,850 gpm, or 5.54 MGD. The Village has four elevated storage tanks and one ground-level reservoir with a combined capacity of 1.35 million gallons. The Village's application states that Well No. 2 is temporarily out of service; Based on the *2018 Water System Study Update* for Waunakee Utilities, the four active wells have a gross capacity of 4,420 gpm, or 6.37 MGD.

Water supply within the amendment area will be provided by 8-inch mains connecting to extensions of existing 10-inch main on Madison Street and 8-inch main on Stone Edge Court within the adjacent development to the south (see **Figure 3**). Water main will be internally

looped within the amendment area and a water main stub will be constructed near the eastern boundary of the amendment area to facilitate future development.

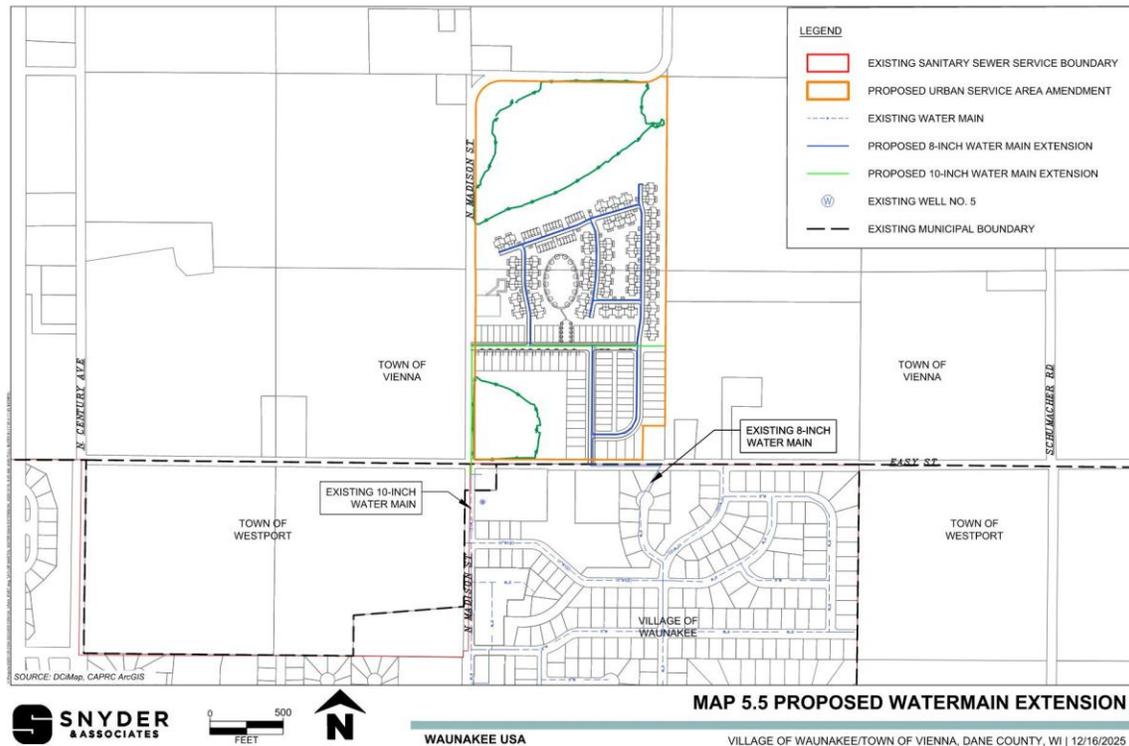


Figure 3. Proposed Water Distribution System (Snyder & Associates, Inc., December 16, 2025)

System Evaluation

According to the 2024 Annual Report to the Public Service Commission of Wisconsin ([link to 2024 Annual Report](#)), the Village pumped an average of 1,079 gpm, or 1.55 MGD, in 2024, which is approximately 28% of its firm pumping capacity. In 2024, the maximum amount pumped in any one day was 2,157 gpm, or 3.11 MGD, which was reported to be due to extreme weather conditions. Current average daily demand on the water system is 1,437,151 gpd (1.44 MGD) or 998 gpm, based on water sales (excluding water losses and other non-revenue water). The Village application references a “sales to pumping” ratio of 88% based on analysis conducted during the 2018 Water System Study Update to account for this discrepancy.

Water losses in the Village’s distribution system were an average of 113,932 gpd, or 0.114 MGD, in 2024, which accounted for 7% of the net water supplied. Almost all water losses were due to unreported and background leakage. In 2024, there were 3 main breaks and 2 service breaks which were repaired. Water losses in the Village’s distribution system were 8% in 2023 and 10% in 2022. 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 proposed development consists of 215 single-family and multi-family dwelling units contributing to water demand. The annual average daily water demand for the amendment area is estimated to be approximately 49,053 gallons per day, or 34.1 gpm. This assumes 591 persons in the residential units using an average daily demand of approximately 83 gallons per day (gpd), as described in the Village's application. The estimated peak daily demand is 122,633 gpd, or 85 gpm, based on a peak daily demand factor (average daily to peak daily) of 2.5 for residential land uses. The estimated peak hourly demand is approximately 10,219 gallons/hour, or 170 gpm, based on a peak hourly demand factor (peak daily to peak hourly) of 2 for residential land uses, based on the Village's application. Using the Village's sales to pumping ratio and including the projected demand from the amendment area, the total peak daily demand on the water system (2,157 gpm existing, based on 2024 records) is anticipated to be 2,548 gpm. The peak hourly demand is anticipated to be 5,095 gpm.

The estimated average daily water demand from the amendment area represents an increase of approximately 3% of the current demands on the system. During peak hourly times, water demand may exceed pumping capacity and may need to be taken from storage; however, there is adequate storage capacity to handle this (note: this is already the case without adding additional demand from the amendment area). In addition, the Village's application states there are plans to construct another elevated storage tank to expand system capacity and improve service reliability. Therefore, it is anticipated that the existing water supply system and proposed capacity improvements will support the additional demand from the proposed amendment area.

Stormwater Management System

Overview

The amendment area (site) is within the Waunakee Marsh-Sixmile Creek (HUC 12: 070900020601) subwatershed (see **Map 5**). This area currently consists almost entirely of agricultural row crops, aside from the wetlands in the southwest corner and northern portion (see **Map 2** and **3**). The site contains two high points but generally slopes toward one of the two wetlands (see **Map 6**). There is an internally drained close basin in the east-central portion of the site. There is an offsite watershed to the east (approximately 44 acres) which drains to the closed basin and ultimately through the site to toward the southwest wetland; there is also an very large (approximately 960 acres) offsite watershed to the north which drains through the channel and wetlands within the northern portion of the site, which is part of a larger wetland complex extending further west. All runoff leaving the site eventually flows southwest to an unnamed tributary of Sixmile Creek and then to Sixmile Creek approximate 5,000 feet to the southwest (see **Figure 1**).

Proposed Stormwater Management Plan

According to the Village's application, new development within the amendment areas will meet current stormwater regulations for peak rate control and attenuation, water quality (total suspended sediment, or TSS, reduction), volume control (infiltration), and oil and grease control, though oil and grease control will likely not be required given the type of development proposed.

Pretreatment of stormwater runoff for total suspended solids (TSS) and peak discharge rate attenuation is required prior to entering wetlands in accordance with NR 151 regulations. Avoiding direct and secondary impacts to wetlands is also required, requiring that changes to wetland functional values be avoided in accordance with NR 103—this includes, among other things, maintaining wetland hydrology and temperature.

Temporary stormwater management and erosion control using appropriate best management practices during construction will also be required, including appropriate phasing of ground disturbing activities to limit the amount of exposed soil. Depending on the extent of construction, a particular emphasis on limiting offsite transport of sediment from the construction area will be important to reduce any transport of sediment or nutrients from the existing site to the wetlands.

As discussed previously under the Natural Resources section, Sixmile Creek and the associated wetlands are all designated Areas of Special Natural Resource Interest (ASNRI). Though the site does not drain directly to this water body, consideration of enhanced stormwater controls is appropriate as these water resources are vulnerable to impacts from proposed development if such impacts are not mitigated through appropriate stormwater controls. A proactive approach to effectively managing stormwater across the entire watershed (sometimes beyond minimum standards) is important help to mitigate the impacts of development on downstream properties and water resources.

A conceptual stormwater management plan was provided as a supplement to this amendment proposal. The plan proposes two primary areas of stormwater management, including a wet detention basin and infiltration basin upslope of each of the wetland areas to capture runoff from the development site (see **Figure 4**). The closed basin depressional area is intended to be filled (modeling of existing/predevelopment conditions must include this depressional storage volume), and the offsite drainage area which flows to this point now will be routed to the northern stormwater management area via a drainage swale. The northern basins (Basins 1P and 2P) will be privately owned and maintained, requiring to be subject to a stormwater maintenance agreement to be recorded with the Register of Deeds. The southern basins (Basins 3P and 4P) will receive runoff from the public right-of-way and are intended to be dedicated to the public and will be owned and managed by the Village.



Figure 4. Proposed Stormwater Management Watersheds (Snyder & Associates, Inc., 2025)

NR 151.124(4)(a)2. and 811.12(5)(d) of the Wisc. Admin. Code includes separation requirements for potential contamination sources, including a 400-foot setback for infiltration basins from public wells and up to a 100-foot setback from private wells for certain stormwater facilities. There are four private wells within or immediately adjacent to the amendment area, according to the Wisconsin DNR Well Inventory Viewer database ([link](#)). The final design of stormwater facilities will need to account for private (non-community) wells associated with the existing private wells and maintain proper setbacks in accordance with NR 812 regulations. Existing onsite private wells will need to be abandoned and sealed in accordance with applicable DNR and local requirements.

A detailed stormwater management plan review and approval by state, local, and regional agencies is required prior to beginning any development construction. The plan will be required to meet all stormwater management and performance standards of the Village of Waunakee, Dane County, and WDNR current at the time of development, as well as any performance standards made a condition of DNR approval of this amendment request.

Performance Standards

The Village of Waunakee stormwater management and performance standards are contained within Chapter 109 of the Village of Waunakee Code of Ordinances. Dane County stormwater standards are detailed within Dane County Code of Ordinances, Chapter 14.

WDNR stormwater standards and related wetlands standards are within Administrative Code Chapters NR 103, NR 151, and NR 216. Development within the amendment area will be required to follow the more protective requirements contained within the respective standards.

The Village proposes stormwater management performance measures for the amendment area to meet applicable stormwater standards currently required by the State of Wisconsin, Dane County, and Village of Waunakee, and include:

- a. Post-development 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.
- b. Sediment control for the average annual rainfall period to reduce total suspended solids leaving the post-development site by at least 80%, as compared to no runoff management controls, with sediment control pretreatment occurring prior to infiltration for runoff from parking lots and new road construction within commercial, industrial, and institutional land uses.
- c. Post-development infiltration (stay-on) volume control to maintain at least 90% of the predevelopment infiltration (stay-on) volume for the average annual rainfall period, without exception for sites determined to be within a closed basin watershed.
- d. Maintain predevelopment groundwater annual recharge rates of approximately 9 to 10 inches per year, as estimated in *Groundwater Recharge in Dane County, Wisconsin Estimated by a GIS-Based Water Balance Model* (WGNHS, 2012), or by site-specific analysis, as an elective alternative to meeting the 90% stay-on requirement if more than two percent (2%) of the site is required to be used as effective infiltration area, if allowed by ordinance.
- e. Oil and grease control to treat the first one-half inch of runoff using the best available technology for commercial, institutional, and any other land uses where the potential for pollution by oil or grease exists.
- f. Minimize impacts to the hydrology of onsite and offsite wetlands and avoid significant changes to wetland functional values.

Impacts and Effects of Proposal

Environmental Corridors

The proposed amendment area includes a total of approximately 41 acres of Environmental Corridor (see **Map 10**). This will include the delineated wetlands with associated buffer, park, open space, and proposed stormwater management areas in accordance with the Environmental Corridor Policies and Criteria ([link to document](#)) adopted in the *Dane County*

Water Quality Plan. A small amount of what is proposed as Environmental Corridor also coincides with mapped Voluntary Environmental Corridor, as described below.

Estimated Environmental Corridors are required to be included in Environmental Corridors when those areas are added to the urban service area. Estimated Environmental Corridors include natural resource features such as the 1% annual chance floodplain, waterbodies, streams and wetlands, plus their required vegetative buffers, riparian steep slopes, existing public lands, parks, and conservancy areas, and existing stormwater management facilities. These areas are mapped based on regionally available information, such as the Wisconsin Wetland Inventory data.

The proposed amendment area includes 6.3 acres mapped as Voluntary Environmental Corridor, including potentially restorable wetlands and hydric soils, of which 3.8 acres are proposed to be designated as Environmental Corridor with this amendment (see **Map 10**). Voluntary Environmental Corridors are natural resources that are not legally protected from development, but still provide important benefits to the region, and are advised to be considered for inclusion in Environmental Corridors, above the minimum requirements. This concept is described more in the [2050 Regional Development Framework](#) (Framework) and is aimed at achieving the goal of conserving water resources and natural areas. The Voluntary Environmental Corridor recommendations include natural resource features such as the 0.2% annual chance floodplain, potentially restorable wetlands, internally drained areas, hydric soils, current/potential Ice Age Trail Corridor, and Natural Resource Area boundaries identified in the Dane County Parks and Open Space Plan.

Meeting Projected Demand

Department of Administration (DOA) population estimates for January 2025 place Waunakee at a total population of 16,860. Waunakee's population has grown by 13% since the 2020 Decennial Census.

The proposed amendment area would add 214 residential units. Assuming 2.3 persons per housing unit, the amendment would account for approximately 492 additional residents. The DOA projects a total population of 24,833 by 2050. That is an increase of 7,973 people from the 2025 estimate, approximately 3,467 housing units. The proposed amendment would add 82 single-family units and 132 multi-family units to the Waunakee housing market.

Phasing

The amendment requested is under 100 acres and does not require a phasing plan.

Surface Water Impacts

Development creates impervious surfaces (e.g., 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 (e.g., detention basins and infiltration basins) this would result in significantly increased stormwater runoff rates and volumes, as well as reduced infiltration and groundwater aquifer replenishment. Even when designing to current state and county requirements, development results in increased runoff volume and reduced infiltration volume. 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 bank-full 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 provide more protective standards for runoff volume control through local ordinances making it more difficult to fully mitigate the effects of development on receiving waters. In 2021, Dane County adopted peak rate control requirements for the 200-year storm event in their ordinance as well as requirements for closed basins, which applies to all communities in Dane County.

The Village of Waunakee proposes to mitigate the urban nonpoint source impacts of the proposed development by requiring the implementation of various stormwater best management practices that will be designed and constructed to meet, or exceed, current Dane County standards for pollutant reduction, runoff volumes, peak flows, water temperature, and groundwater recharge. Such practices will help 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](#). WI Salt Wise's chloride reduction trainings are open to all municipal and private winter maintenance professionals in the region. Village of Waunakee personnel are encouraged to attend winter salt certification classes and training for winter road maintenance to stay current on the latest trainings.

West Nile virus has been regularly found within Dane County since 2003 and is considered endemic. Given the proximity of the development to the wetlands and proposed stormwater management facilities, including wet detention basins, there is the potential for elevated prevalence of nuisance insects, including mosquitoes which carry West Nile virus. Public Health Madison & Dane County conducts routine sampling and monitoring of mosquito larvae at select sites across the county to better understand and reduce the risk of West Nile virus in Dane County. Where monitoring indicates elevated levels, treatment is performed. Additional information can be found in the 2025 monitoring report ([link to report here](#)).

Groundwater Impacts

Without effective mitigation practices which *exceed* state, county and local ordinance, converting natural areas to urban development shifts the ground/surface water balance in streams and wetlands from a groundwater-dominated system to one dominated more and more by surface water runoff. This can result in a reduction in baseflow to streams, which is crucial for maintaining stream flow between precipitation events. This can also result in subsequent reductions in stream quality and transitions to less desirable biological communities more tolerant to these impaired conditions.

Groundwater modeling using the 2016 Groundwater Flow Model for Dane County, developed by the WGNHS ([link to website](#)), shows that 2010 modeled baseflow in Sixmile Creek at Mill Road decreased compared to predevelopment flow conditions. These reductions are likely due to the cumulative effects of well water withdrawals and loss of baseflow due to development in the groundwater watershed. Pre-development conditions represent no well pumping within the model. Further decline compared to 2010 conditions is anticipated for the year 2040, according to modeling. Refer to **Table 4** below.

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

Stream	No Pumping	2010	2040
Sixmile Creek (Mill Road)	9.1 cfs	7.6 cfs	7.1 cfs

*Source: Groundwater Flow Model for Dane County, developed by the WGNHS
 (2016 Modeling)*

Generally, groundwater discharge occurs along the entire length of perennial streams and is the source of stream baseflow. The loss of baseflow from the cumulative effects of well water pumping and urbanization 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](#)). Reducing per capita water demand and fully maintaining pre-development groundwater recharge by infiltrating stormwater runoff helps to replenish groundwater, maintain baseflow, and mitigate this impact. The regional groundwater model is a useful tool for evaluating different configurations and scenarios of municipal groundwater well withdrawals on these stream systems.

Public Participation Comments

During the public review period, CARPC received zero (0) written comments.

A public hearing was held on the proposed amendment at the January 8, 2026, meeting of the Capital Area Regional Planning Commission. Representatives from the Village of Waunakee, including the Village Deputy Administrator and members of the development team gave a presentation on the proposed amendment and spoke in favor of it. No registrants spoke on the amendment. Discussion among Commissioners followed. A recording of the public hearing is available as part of the video recording of the full Commission meeting on the CARPC Meetings webpage ([link](#)). The following summarizes the questions and discussion points raised, all of which were responded to by the applicant:

- Inquiries on design details and performance standards of the stormwater management system.
- Inquiry on whether mosquito larva testing has been conducted or if planned for, given the proximity to the wetlands.

- Clarifying questions on the annexation status as well as the home product being built.

Conclusions and Staff Water Quality Recommendations

There is sufficient existing treatment plant system capacity at the Nine Springs Wastewater Treatment Facility and sufficient existing capacity in the collection system to serve the proposed amendment area.

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

It is CARPC staff's opinion that the proposed amendment is consistent with water quality standards under Wis. Stat. § 281.15, and the adopted Policies and Criteria for the Review of 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

CARPC staff recommend approval of this amendment in recognition of state and local requirements including the following:

1. Environmental Corridors are required to be delineated to meet the Environmental Corridor Policies and Criteria adopted in the *Dane County Water Quality Plan*.
2. Sediment 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.
3. Easements and perpetual legal maintenance agreements with the Village of Waunakee, to allow the Village to maintain stormwater management facilities if owners fail to do so, are required for any facilities located on private property.
4. Temporary erosion and sediment control best management practices shall be implemented to reduce the occurrence of sediment transport offsite during construction. If development occurs in phases, interim stormwater management practices shall be implemented to ensure compliance with all applicable regulations.
2. Review and approval of stormwater management plan(s) for the amendment area by Regional Planning Commission staff is required as part of the sewer extension review process. Stormwater management plan(s) shall meet or exceed all applicable

standards required by Wisconsin DNR (NR 151, NR 103, etc.), Dane County (Ch 14), and Village of Waunakee (Chapter 109), including:

- a. Post-development 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.
- b. Sediment control for the average annual rainfall period to reduce total suspended solids leaving the post-development site by at least 80%, as compared to no runoff management controls, with sediment control pretreatment occurring prior to infiltration for runoff from parking lots and new road construction within commercial, industrial, and institutional land uses.
- c. Post-development infiltration (stay-on) volume control to maintain at least 90% of the predevelopment infiltration (stay-on) volume for the average annual rainfall period, without exception for sites determined to be within a closed basin watershed.
- d. Maintain predevelopment groundwater annual recharge rates of approximately 9 to 10 inches per year, as estimated in *Groundwater Recharge in Dane County, Wisconsin Estimated by a GIS-Based Water Balance Model* (WGNHS, 2012), or by site-specific analysis, as an elective alternative to meeting the 90% stay-on requirement if more than two percent (2%) of the site is required to be used as effective infiltration area, if allowed by ordinance.
- e. Oil and grease control to treat the first one-half inch of runoff using the best available technology for commercial, institutional, and any other land uses where the potential for pollution by oil or grease exists.
- f. Minimize impacts to the hydrology of onsite and offsite wetlands and avoid significant changes to wetland functional values.

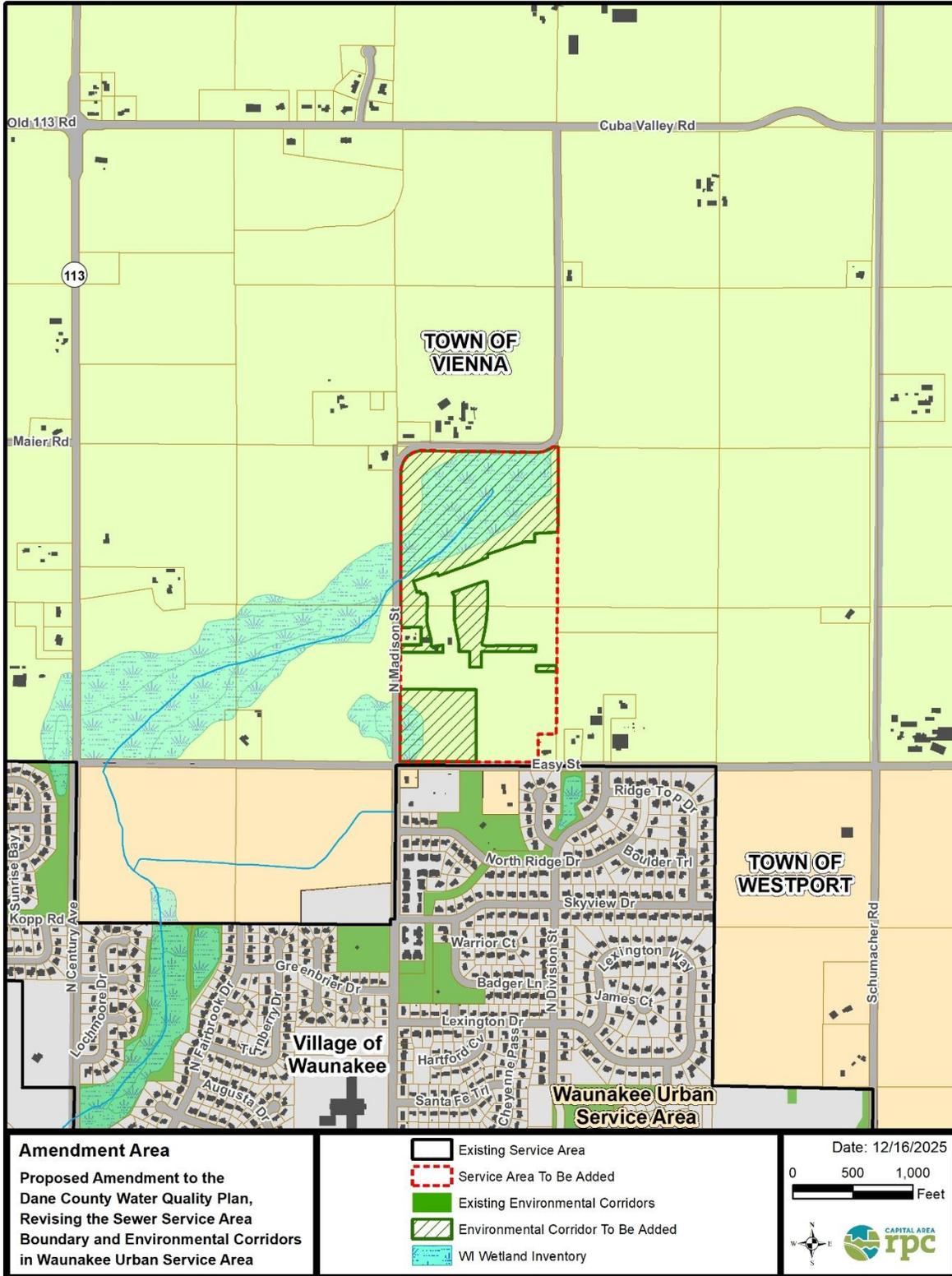
Recommendations

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

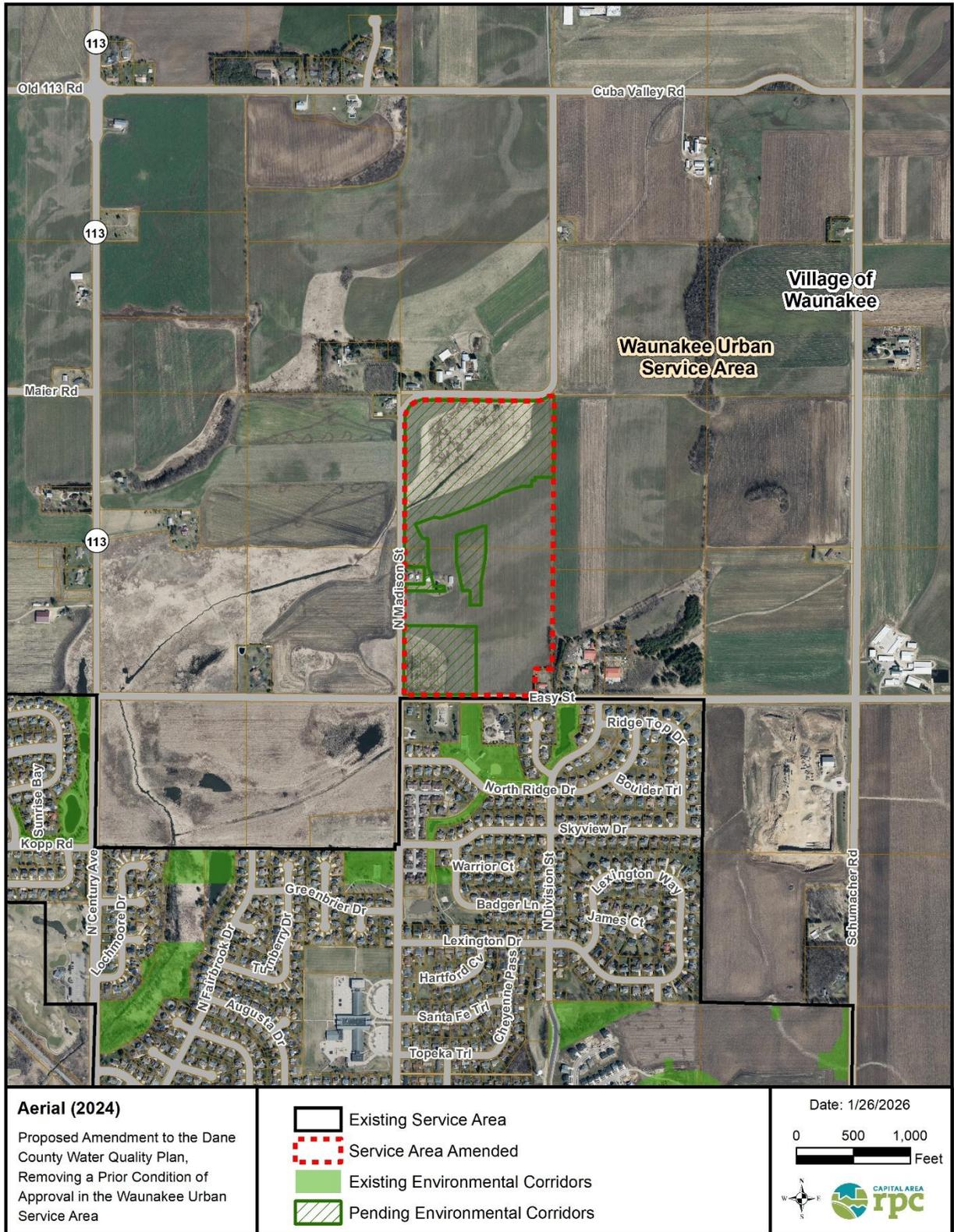
1. Continue to participate in regional water quality initiatives including Wisconsin Salt Wise, the Madison Area Municipal Storm Water Partnership (MAMSWaP), and Yahara WINS.
2. Foster the responsible use of chlorides by encouraging public and private winter maintenance professionals to attend the winter salt certification classes offered by Wisconsin Salt Wise.

3. Encourage the removal and control of invasives and the use of native flora in landscaping, where appropriate within the entire amendment, and for all areas designated as Environmental Corridor.
4. Request a formal Endangered Resources Review by the WDNR for potential impacts to endangered resources like rare plants, animals, and natural communities, and take necessary habitat protection measures if species are found, based on the results of screening conducted.
5. Encourage the removal and control of invasives and the use of native flora favored by the Rusty Patched Bumble Bee in landscaping to provide suitable habitat for this pollinator, where appropriate, due to the amendment area being within the High Potential Zone for the federally endangered Rusty Patched Bumble Bee.

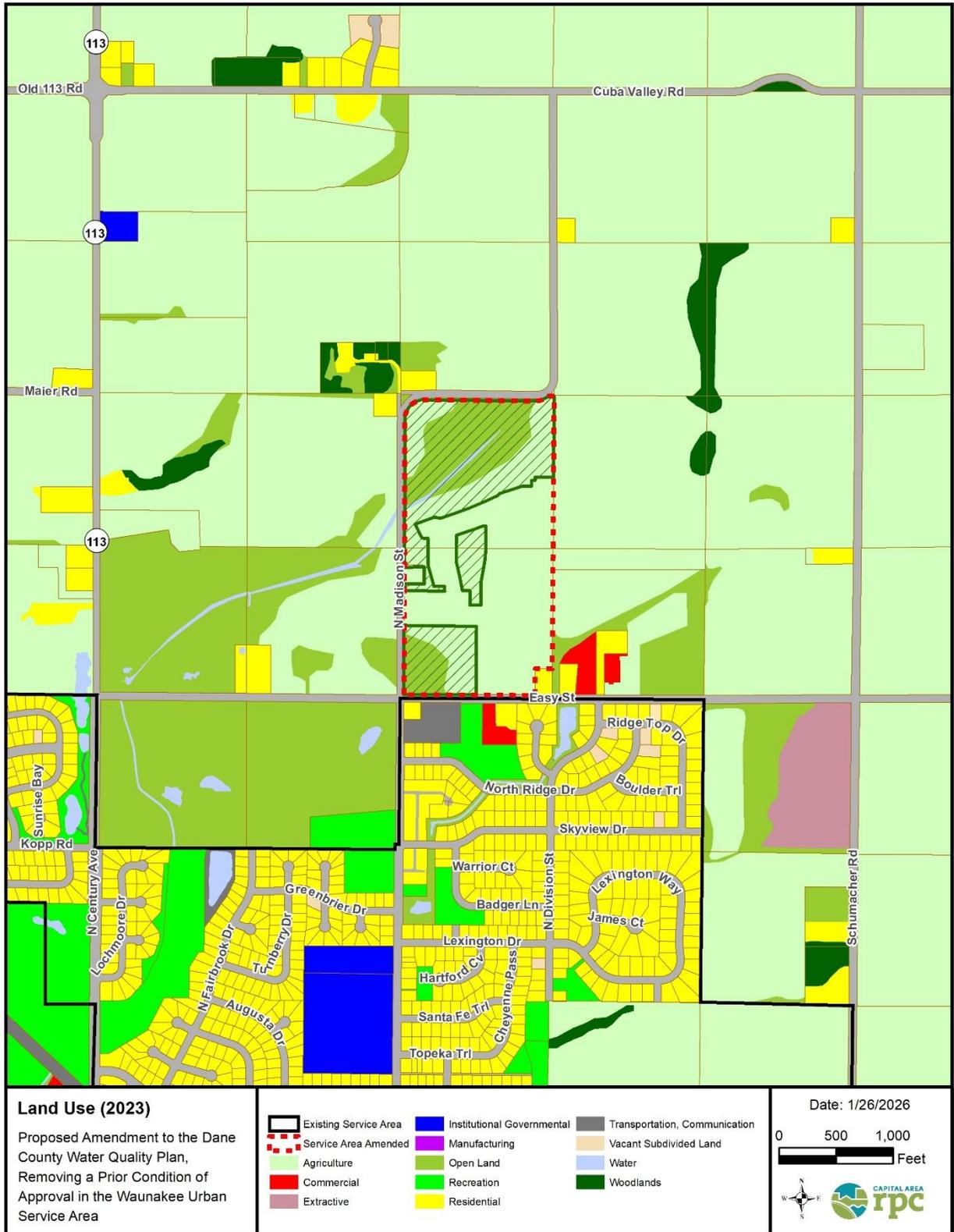
Map 1 - Amendment Area



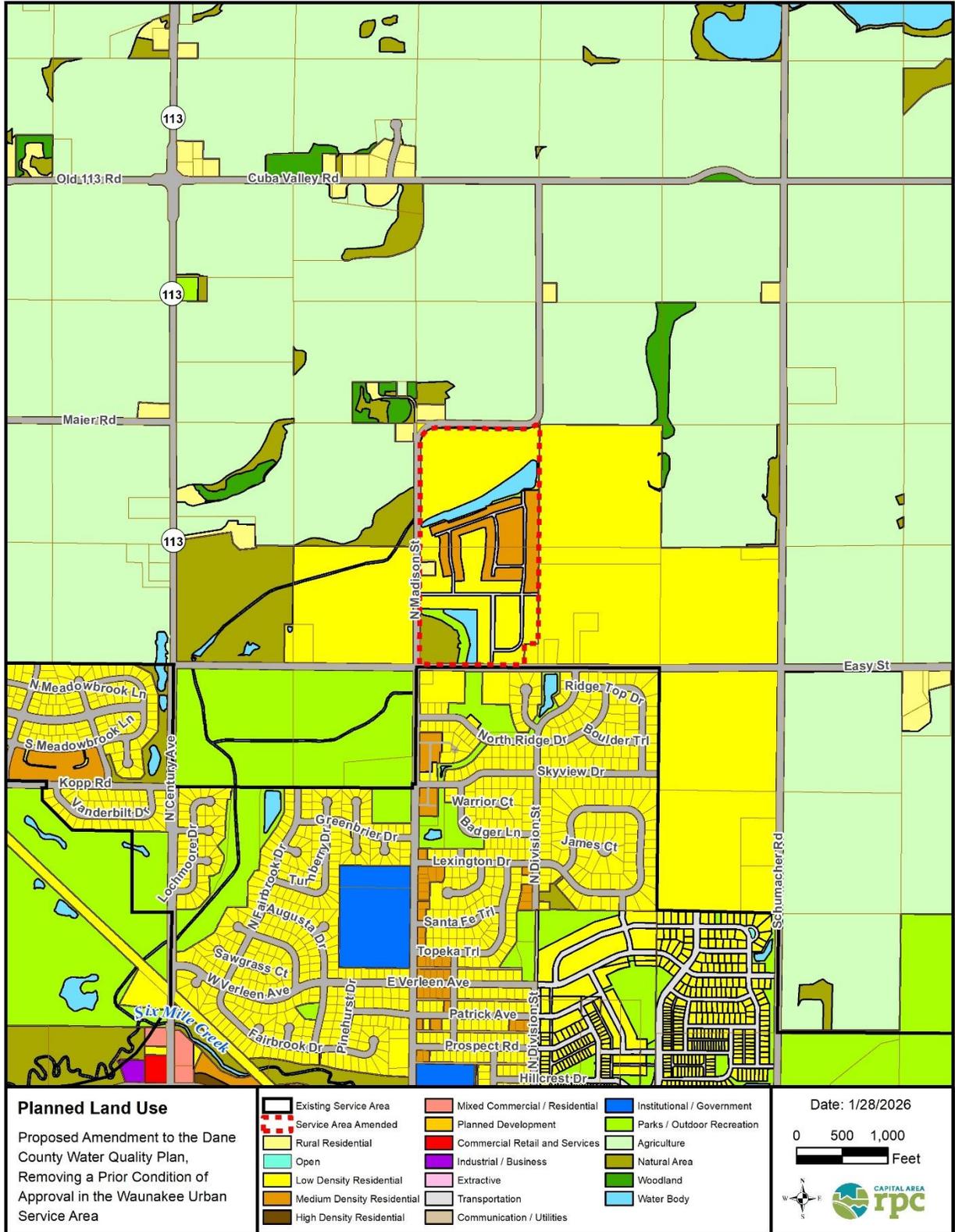
Map 2 – Aerial



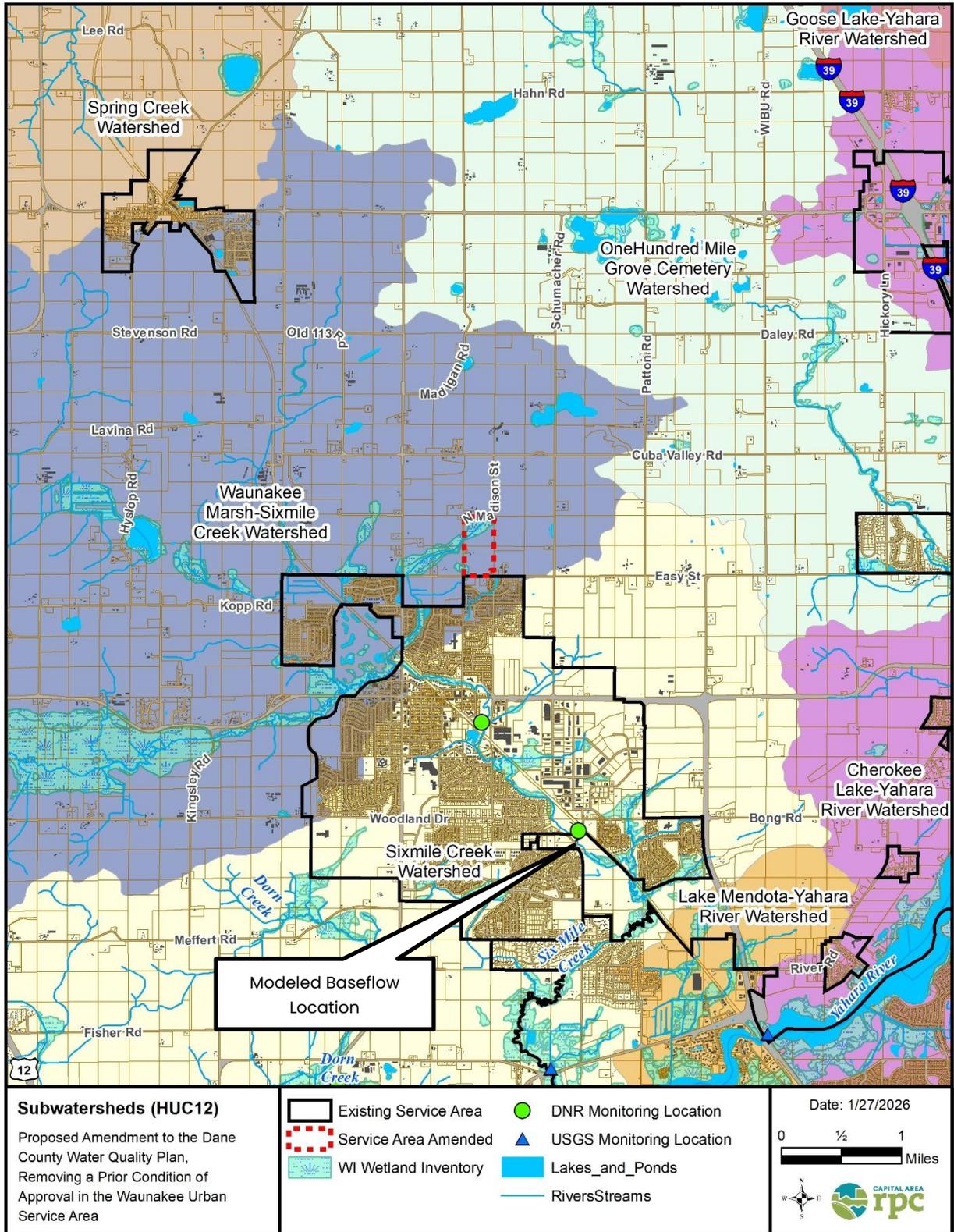
Map 3 – Existing Land Use



Map 4 – Planned Land Use



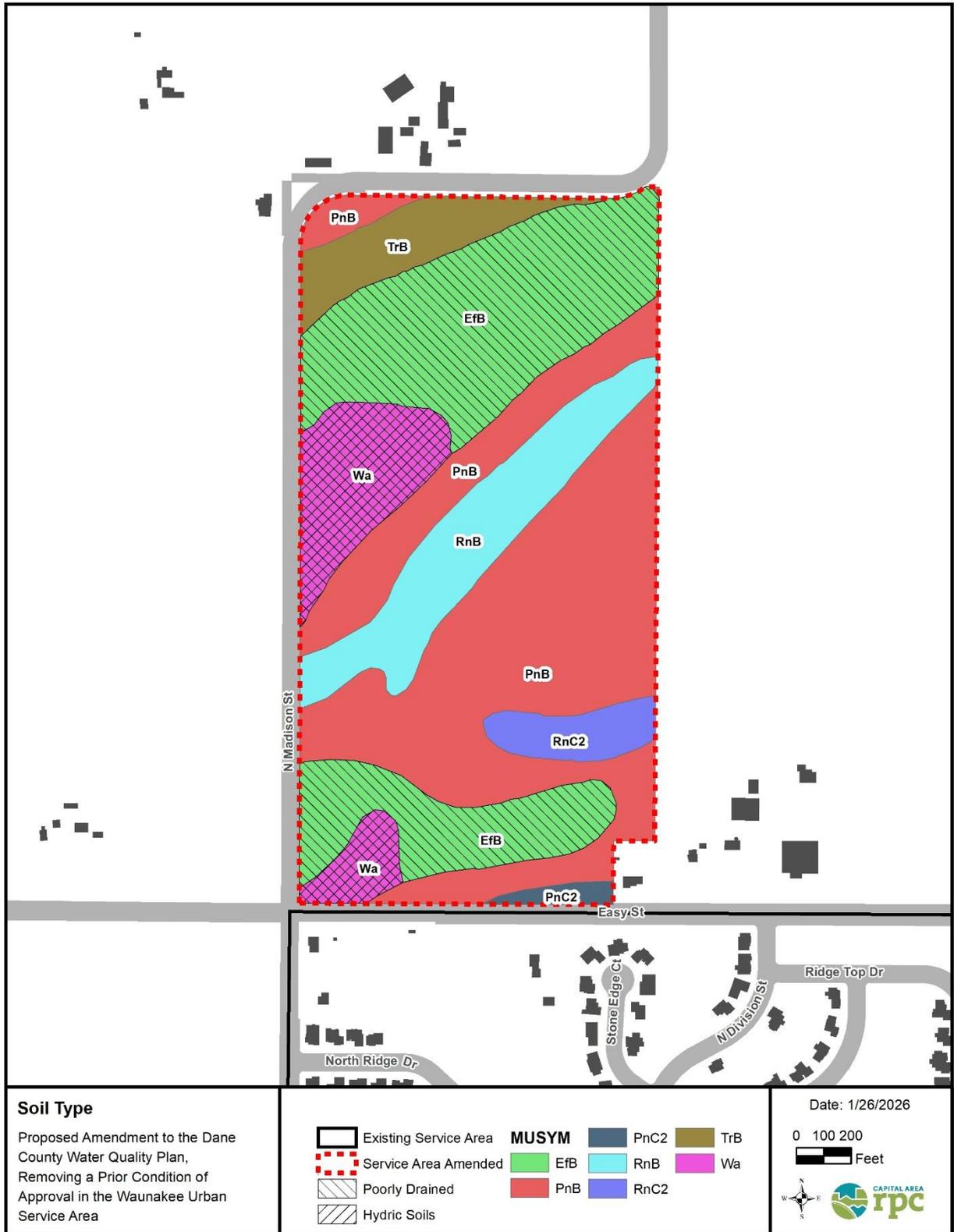
Map 5 – Subwatersheds



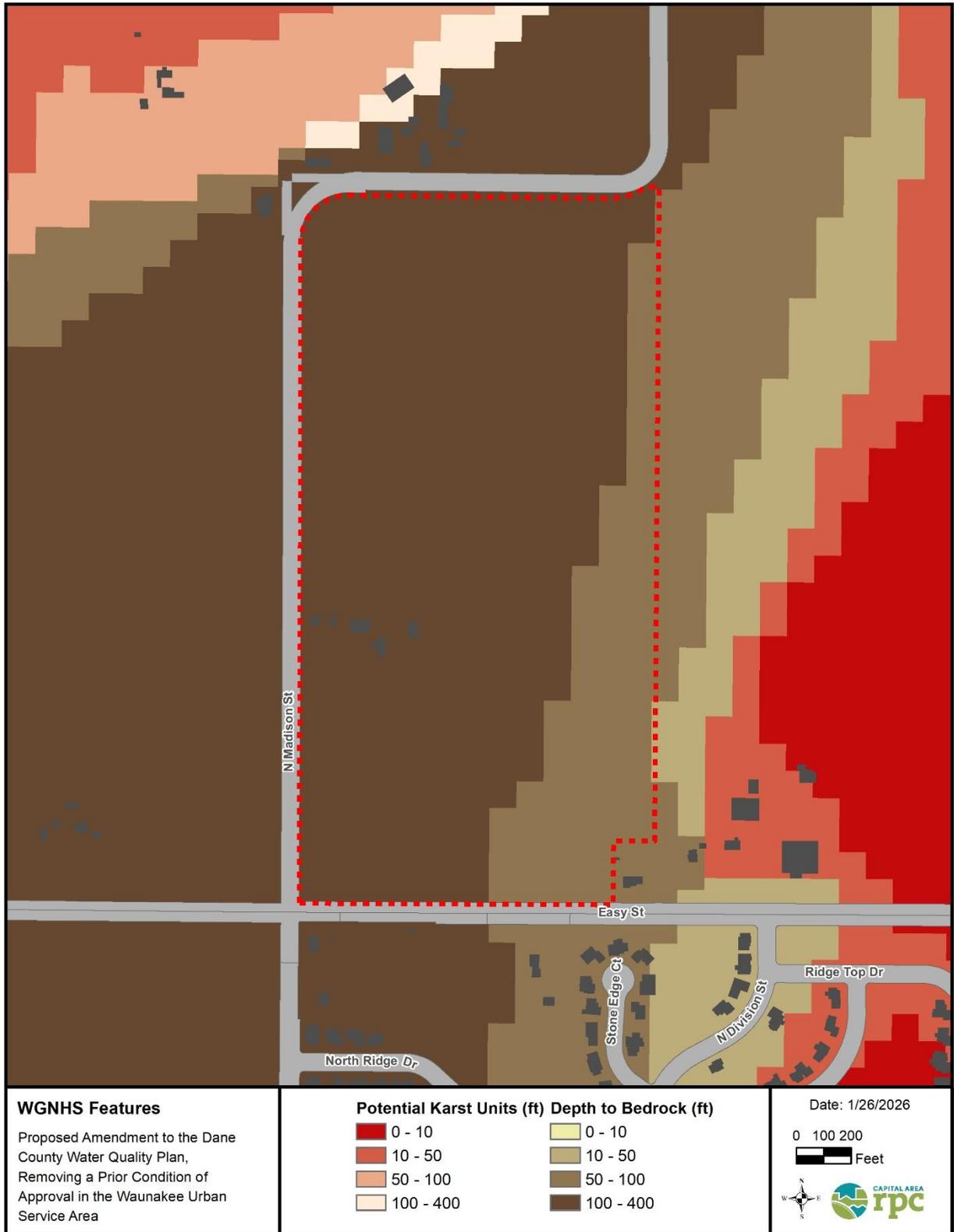
Map 6 – Elevations



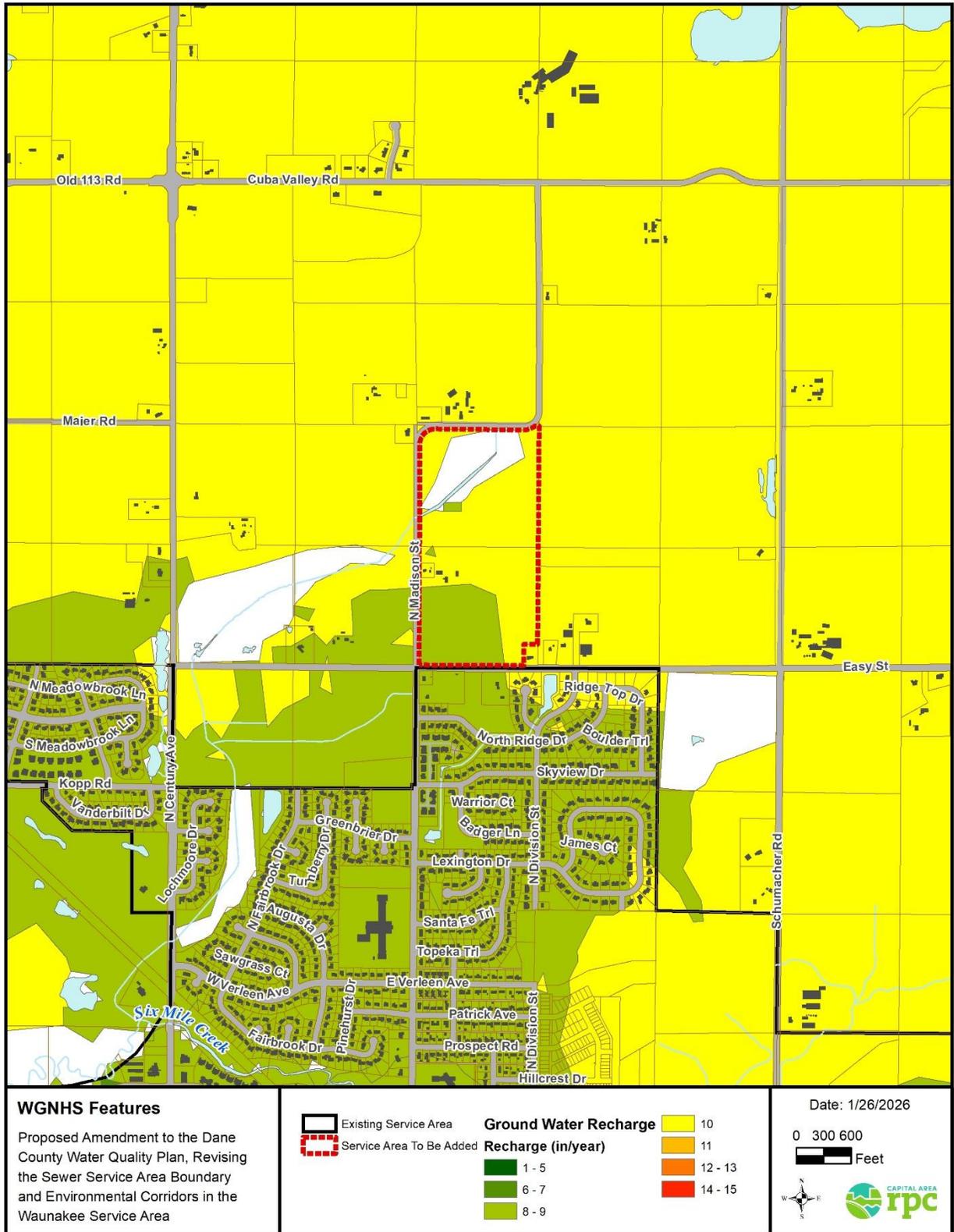
Map 7 - Soil Type



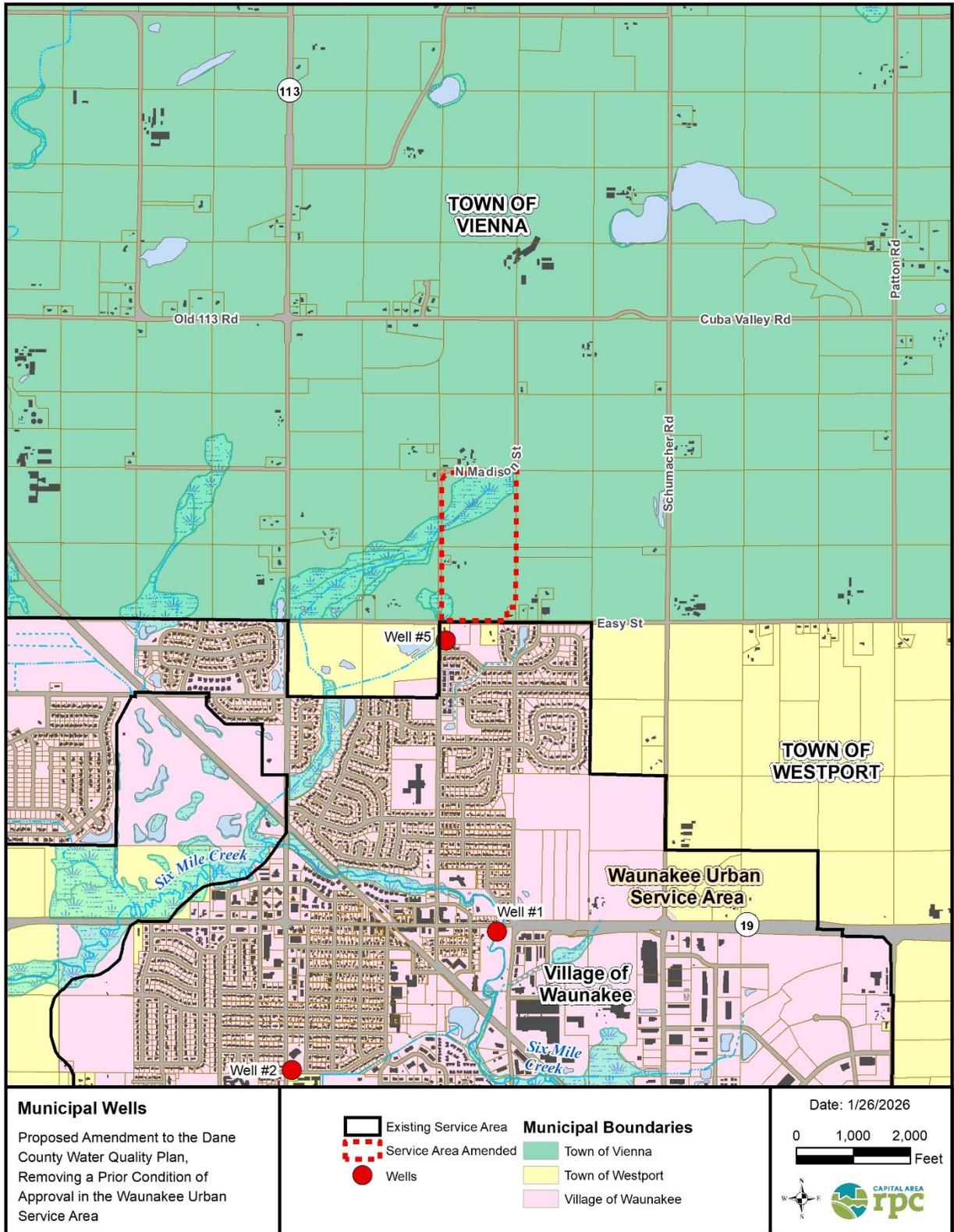
Map 8a – WGNHS Bedrock Depth



Map 8b – WGNHS Groundwater Recharge Rates



Map 9 – Municipal Wells



Map 10 – Proposed Environmental Corridor

