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

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## 1) History of the Dane Urban Service Area

The Dane Urban Service Area was established in 1976 and originally included about 651 acres. Only three changes have been made to the Dane USA since that time. In 1991 environmental corridors were established in the USA. In 1992, the USA was amended to delete 80 acres on the northwest corner and add 80 acres on the southeast. In 2013, the USA was amended to remove 235 acres for farmland preservation.

## 2) Existing Conditions

### a) Land Use

The requested amendment area is located at the southeastern corner of the Village of Dane (see Map 1). The 28 acre site is contiguous to the Dane Urban Service Area along the site's northern border. The area is located between Old 113 Rd, the Wisconsin and Southern Railroad's Reedsburg Line, and Capitol Valley Park.

Surrounding Land Uses Include:

- North: Single-family residential, Vacant Subdivided (residential), Park
- S/W/E: Agriculture

Existing Land Use	Acres
Agriculture	23.6
Stormwater Management	2.0
Parks/Outdoor Recreation	2.0
Transportation, Communications, and Utilities	0.5
<b>TOTAL</b>	<b>28.1</b>

Proposed Land Use	Proposed Acres	Env. Corridor Acres
Low Density Residential	13.4	
Stormwater Management / Natural Area	7.7	7.7
Transportation	5.0	
Parks/Outdoor Recreation	2.0	2.0
<b>TOTAL</b>	<b>28.1</b>	<b>9.7</b>
<b>NET DEVELOPABLE</b>	<b>18.4</b>	

The site is identified for future single-family residential development in the May 2013 Dane Comprehensive Plan and its Future Land Use map. The site was added to the Village by direct annexation in April 2019.

### ***b) 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 (see Attachment 1).

### ***c) Natural Resources***

The proposed amendment area is located in the Waunakee Marsh-Sixmile Creek watershed of the Lower Rock River Basin (see Map 5). The amendment area drains to Sixmile Creek along an unnamed drainage way located approximately 0.7 miles to the east. The two municipal wells serving the Village are located in the Spring Creek watershed. Wastewater from the Village of Dane is treated at the Madison Metropolitan Sewerage District (MMSD) Wastewater Treatment Facility. The treated effluent is discharged to either Badfish Creek or Badger Mill Creek and bypasses the Yahara Chain of Lakes before entering the Yahara River. There are no wetlands, waterbodies, floodplains, or hydric soils located within the amendment area.

#### Sixmile Creek

The proposed amendment area is entirely within the Waunakee Marsh-Sixmile Creek watershed (HUC 12 – 070900020601), which flows into the Sixmile Creek Watershed (HUC 12 – 070900020602) before entering Lake Mendota. Six Mile Creek is 12.08 miles long and flows through the Village of Waunakee, ultimately draining into Lake Mendota. The combined 61.7 square mile watersheds encompass predominately agricultural lands and the growing community of Waunakee. The creek is listed as an Exceptional Resource Water by the Wisconsin Department of Natural Resources (WDNR). The creek provides spawning areas for Lake Mendota's fish and offers a warm water sport fishery. The lower reach of the creek (from mile 0 to 8.5) is impaired for Total Phosphorus. There is a WDNR monitoring station on Six Mile Creek at the Mill Road Bridge. Limited chloride monitoring results from that station indicated that chloride levels averaged 97 mg/L in 2011. United States Geological Survey (USGS) baseflow monitoring indicated chloride levels of 43 mg/L in 2015-2016. Six Mile Creek has cool-cold and cool-warm main stem natural communities.

#### Spring Creek

The two municipal wells serving the Village of Dane are located in the 46.9 square mile Spring Creek Watershed (HUC 12 - 070700050204), which flows into the Lower Wisconsin River at Lake Wisconsin. Spring Creek is 11.88 miles long, with 3.61 miles flowing through Dane County and 8.27 miles flowing through Colombia County. The headwaters are located in the Lodi Marsh State Wildlife Area and the stream flows through the growing City of Lodi. The 3.61 miles in Dane County are considered an Exceptional Water Resource by WDNR and the entire stream in a Class II trout stream. There has been a decline in natural reproduction of trout downstream of Lodi due to channelization and loss of cover for fingerling trout. Habitat improvement projects have been completed to address this issue. An unnamed tributary which enter Spring Creek in the City of Lodi is listed as impaired for phosphorus. Spring Creek has cool-cold headwater and main stem natural communities and 2007 fish IBI (index of biotic integrity) monitoring at the headwaters (station located at Lee Road) suggests good to excellent stream condition.

#### Wetlands

There are no wetlands in or adjacent to the amendment area according to the WDNR's wetland inventory.

### 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. There are no known springs in or near the proposed amendment area. The closest springs are over 4 miles from the amendment area in the Spring Creek wetlands and in the Waunakee Marsh wetlands (see Map 5). Groundwater discharge generally occurs along the entire length of perennial streams and is the source of stream baseflow. The regional groundwater model has been used to evaluate the possible effects of current and future municipal groundwater well withdrawals on these spring and stream systems.

### Groundwater

Groundwater modeling, using the [2016 Groundwater Flow Model for Dane County](#) developed by the WGNHS, shows that baseflow in Sixmile Creek, at the point of perennial flow closest to the proposed amendment area (See Map 5), has decreased from 3.4 cfs during pre-development conditions (no well pumping) to 3.0 cfs in 2010 (Table 4). Baseflow in Spring Creek, at the point of perennial flow closest to the proposed amendment area, has decreased slightly from 2.9 cfs during pre-development conditions to 2.8 cfs in 2010. These reductions are due to the cumulative effects of well water withdrawals from multiple municipalities in the groundwatershed.

In 2012, the WGNHS published a report, [Groundwater Recharge in Dane County, Wisconsin, Estimated by a GIS-Based Water-Balance Model](#), 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 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](#). A screening review of this database conducted by Regional Planning Commission staff for species designated as endangered, threatened, or of special concern did not identify any species of special concern within a one-mile radius of the amendment area.

### Soils and Geology

The amendment area is located within the Bristol Till Plain. The Land Type Associations of Wisconsin classifies the surficial geology of this area as undulating till plain with low drumlins and scattered wetlands and bedrock knolls.

Surface elevations in the amendment area range from around 1050 feet to 1020 feet with a ridge separating the north and south portions of the amendment area. 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 are primarily in the Plano – Ringwood – Griswold association. These soils are moderately well drained and well drained, deep silt loams and loams. Table 2 shows detailed classification for soils in the amendment area (see Map 7). Table 3 shows important soil characteristics for the amendment area (see Map 7).

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](#), the Plano and Troxel soils (the PnB and TrB map units) are not hydric, but they can have a seasonal (April to June) zone of water saturation within 5 feet of the ground surface. Both of these soils are classified as 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>	34.4	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>Plano Silt Loam; PnB</i>	20.9	Deep, well drained and moderately well drained, nearly level to 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 to low bearing capacity.
<i>Troxel Silt Loam; TrB</i>	17.2	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 moderate limitations for development due to shrink/swell potential and depth to saturated zone.
<i>Ringwood Silt Loam; RnC2</i>	11.7	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 slope, low bearing capacity, shrink/swell potential, and erodibility.
<i>Plano Silt Loam; PoB</i>	11.3	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 moderate limitations for development due low bearing capacity and erodibility.
<i>Warsaw Silt Loam; WrB</i>	3.1	Gently sloping and sloping, well-drained soils on benches in stream valleys. Soils have medium fertility, moderate permeability, and slight to moderate hazard of erosion. Poses slight to moderate limitation for development due to moderate bearing capacity and shrink/swell potential.
<i>McHenry Silt Loam; MdD2</i>	1.3	Deep, well-drained, gently sloping to moderately steep soils on glacial uplands. Soils have medium fertility, moderate permeability, and a severe hazard of erosion. Poses severe limitations for development due to steep slopes, erodibility, and 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
<i>Prime Agricultural Soils</i>	<i>PnB, PoB, RnB, TrB, WrB</i>	<i>87.0</i>
<i>Hydric Soils (Indicates Potential / Restorable Wetlands)</i>	<i>None</i>	<i>0</i>
<i>Poorly Drained Soils with Seasonal High Water Table (&lt; 5')</i>	<i>None</i>	<i>0</i>
<i>Soils Associated with Steep Slopes (&gt; 12%)</i>	<i>MdD2</i>	<i>1.3</i>
<i>Soils Associated with Shallow Bedrock (&lt; 5')</i>	<i>None</i>	<i>0</i>
<i>Best Potential for High Rates of Infiltration in Subsoils</i>	<i>MdD2, PnB, PoB, RnB, RnC2, TrB, WrB</i>	<i>100.0</i>

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

According to WGNHS data, the majority of bedrock within the amendment area is in the Trempealeau Group, which is quartz sandstone, dolomitic siltstone, silty dolomite, and sandy dolomite, consisting of two formations, the Jordan and the underlying St. Lawrence Formations, which were combined as one mapping unit. The bedrock thickness is about 75



feet, where not eroded. According to WGNHS data, the depth to bedrock ranges from less than 10 feet in the north to greater than 100 feet in the southwest of the amendment area (see Map 8). The depth to bedrock in the majority of the amendment area is 50 to 100 feet.

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 are 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 may be encountered in the amendment area at a depth range from 35 to 80 feet (see Map 8). This is too deep for any potential karst features to be a concern for stormwater infiltration.

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.

### **3) Proposed Urban Services**

#### ***a) Parks and Open Space***

The proposed amendment area includes 2 acres of existing park space that is part of the Capital Valley Park and 2 acres of existing stormwater detention basin. The planned land use includes an additional 5.7 acre of open space that will primarily be used for stormwater management (See Map 4).

#### ***b) Public Water System***

The Dane Water and Sewer Utility operate two high capacity wells with a combined capacity to deliver 1,512,000 gallons per day (gpd), or 1,050 gallons per minute (gpm) (see Map 12). Well No. 2 is 440 feet deep and has a rated capacity of 300 gpm. Well No. 3 is 660 feet deep and has a rated capacity of 750 gpm. The Village's water system currently has 150,000 gallons of storage provided by one above ground storage tank. The Village's average municipal water demand over the last five years is 61,942 gpd (43 gpm) with a maximum daily average of 163,000 gpd (113 gpm). Using a population of 1020, this results in an average daily demand of 60.7 gpd per person and an average maximum daily demand of 159.8 gpd per person. Applying a peaking factor of 3 to the average daily demand results in a peak hourly water demand of 129 gpm.

Water will be provided to the amendment area by way of an 8-inch water main loop with connections to existing 8-inch mains at the terminus of Valley Road and at the intersection of Capitol Drive and Capitol Valley Way (see Map 10). The estimated average daily water demand for the amendment area will be 9,014 gpd, (6.26 gpm), based on 55 new residential units with 2.7 persons per house and 60.7 gpd per person. The peak daily demand for the amendment area is estimated to be 16.5 gpm using a peaking factor of approximately 2.6, which was calculated based on Village average daily demand of 61,942 gallons versus a peak day demand of 163,000 gallons. The combined peak daily demand for the existing Village and the amendment area will be 129 gpm with a peak hourly demand of 147 gpm. This estimate places the peak hourly demand at just less than half of the West Street pump capacity of 300 gpm.

Prior to 2014, water losses in the Village's distribution system had been steadily increasing, reaching a level of 12% of net water supplied in 2013. Since that time the Village has taken action to address this situation such that water losses have been reduced to only 5% in 2018. The Wisconsin Administrative Code [PSC 185.85\(4\)\(b\)](#) requires a utility with more than 1,000 customer to submit a water loss control plan to the Public Service Commission if the utility reports its percentage of water losses exceed 15%.

### **c) Wastewater**

Sanitary sewer service will be provided to the amendment area by connections to existing 8-inch mains at the terminus of Valley Road and at the intersection of Capitol Drive and Capitol Valley Way (see Map 9). Both extensions will drain to the Village's Capitol Valley Estates Park Lift Station. The lift station has a firm capacity of 350 gpm with one pump out of service (2 pumps each rated at 350 gpm). This lift station discharges via a 12-inch force main to the Village of Waunakee sanitary sewer system where it enters the Madison Metropolitan Sewerage District's collection system.

The Village estimates that the combined amendment area will generate an average of 7,301 gpd. Using a peaking factor of 4.0, it is estimated that the amendment area will generate a peak flow of 20 gpm. The estimate is consistent with historical wastewater generation rates in the Village. The Village monitors lift station flows. Over the past four years the average daily flow has been 0.050 mgd and the maximum daily flow has been 0.055 mgd.

As part of a lift station maintenance project, in June 2019 the Village had a capacity evaluation conducted for the lift station for future 2040 conditions. The evaluation estimated the maximum peak hour flow in 2040, based on projected growth, to be 262 gpm. This is well within the capability of the currently installed pump capacity, with a margin of safety.

#### Wastewater Treatment Facility

MMSD will provide wastewater treatment for the amendment area. The Nine Springs Treatment Facility has a design capacity of 50 million gallons per day (mgd) and received an average of 42.1 mgd in 2017, 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. 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 Nine Springs 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<sup>1</sup>. MMSD's Wisconsin Pollutant Discharge Elimination System (WPDES) permit which requires pollution prevention and source reduction initiatives for chlorides, such as the [Wisconsin Salt Wise Partnership](#). MMSD has not had any issues meeting its WPDES permit limits for the quality of effluent discharged to Badfish Creek according to their [2017 Annual Report](#). In 2017, the effluent monthly average Total Suspended Solids ranged from 3.2 to 7.6 mg/L, below the 20 mg/L permit limit for Badfish Creek. The effluent monthly average ammonia ranged from 0.13 to 0.59 mg/L, below the 1.8 to 4.1 mg/L permit limit for Badfish Creek. The effluent monthly average total phosphorus ranged from 0.22 to 0.38 mg/L, below the current 1.5 mg/L permit limit but not low enough to meet future water quality based effluent limits (WQBEL) for phosphorus. The total phosphorus monthly limit of 1.5 mg/L is an interim limit and will be reduced to 0.075 mg/L on a six month average and 0.225 mg/L on a monthly average. MMSD has

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<sup>1</sup> [Chloride Compliance Study Nine Springs Wastewater Treatment Plant Final Report, AECOM, 2015](#)

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.

#### **d) Stormwater Management System**

The preliminary stormwater management plan for the amendment area includes a series of bioretention basins positioned along a slope such that the higher basins will flow into the lower basins. This series of basins are located in a rear yard green space in the center of the amendment area. In addition, a detention or retention pond will also be located in the northwest corner of the amendment area. All of these facilities will be located in public outlots and will be dedicated to the Village at the completion of the project. These facilities will generally provide water quality treatment, 80% Total Suspended Solids (TSS) reduction, and volume reduction, 90% stay-on of the average annual storm. It is anticipated that infiltration performance will further reduce TSS (and other pollutants such as Total Phosphorus) from stormwater discharges as well as reduce runoff temperature. Collectively, the stormwater facilities will also provide peak discharge rate control to account for storms up to and including the 100-year rainfall event.

Based on NRCS soil survey data, the northern part of the amendment area has the potential to experience a seasonal high water table between three and five feet of the surface, but the entire amendment has the potential for high rates of infiltration in the subsoils. The WDNR Conservation Practice Standard 1002 - Site Evaluation for Stormwater Infiltration requires field verification for areas of the development planned for infiltration facilities appropriately so that performance can be maximized while protecting groundwater resources. This includes a site assessment for karst features. The conceptual stormwater management plan incorporates bioretention higher in the landscape, which should be advantageous for infiltration.

#### **Performance Standards**

The Village of Dane proposes stormwater management performance measures to meet or exceed standards required by the State of Wisconsin (NR 151), Dane County (Chapter 14), and Village of Dane (Chapter 275) stormwater regulations, as follows:

- 1) Require post-construction sediment control (reduce total suspended solids leaving the site by at least 80%, with a minimum of 60% of that control occurring in a retention pond prior to infiltration) for the 1-year, 24-hour design storm. This is consistent with the standards currently required by Dane County.
- 2) Require post-construction peak runoff rate control for the 1-, 2-, 10-, and 100-year, 24-hour design storms to “pre-development” peak runoff rates. This is consistent with the range of design storms currently required by Dane County.
- 3) Require infiltration of 90% of the increased post-development runoff volume, when compared to the predevelopment volume, resulting from the 100-year, 24-hour design storm. This is consistent with the stay-on standard for new development currently required by Dane County regulations.
- 4) Maintain pre-development groundwater annual recharge rate of 9 to 10 inches per year for this area 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.

#### **e) Environmental Corridors**

There are no environmentally sensitive areas within or adjacent to the amendment area. The proposed amendment area includes a total of addition of 9.7 acres of environmental

corridor for park, open space, and stormwater management areas (See Map 1). This includes 2 acres of existing park space that is part of the Capital Valley Park, 2 acres of existing stormwater detention basin, and an additional 5.7 acre of new open space that will primarily be used for stormwater management.

#### **4) Impacts and Effects of Proposal**

##### ***a) Meeting Projected Demand***

Dane is projected to grow by 405 people and 182 households between 2010 and 2040. Land demand projections estimate that a total of 81 additional acres would be needed by 2040. Department of Administration (DOA) population estimates for 2018 indicate that 1,001 residents call The Village of Dane home. The 2017 American Community Survey 5-Year Estimate estimated a total of around 409 (+/-53) housing units in the Village.

##### ***b) Phasing***

The amendment application does not specify phasing for the 28 acre development.

##### ***c) 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 urban service area amendment agreements. In 2017, State statute 281.33(6)(a)(1) was changed to limit the ability of local governments to adopted higher

standards for runoff volume through local ordinances.

The Village 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 the current standards for pollutant reduction, runoff volumes, peak flows, water temperature, and groundwater recharge to address the potential impacts of the proposed development on the receiving waters.

#### **d) 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, with subsequent reductions in stream quality and transitions to more tolerant biological communities.

Groundwater modeling indicates that the cumulative effects of year 2010 well water withdrawals from all municipalities have resulted in a 0.4 cfs decline in baseflow in Sixmile Creek (Table 4) compared to the pre-development (no pumping) baseflow of 3.4 cfs. An additional 0.1 cfs decline is anticipated by the year 2040, according to modeling, reducing the baseflow to 2.9 cfs.

Groundwater modeling for Spring Creek indicates that the cumulative effects of year 2010 well water withdrawals from all municipalities have resulted in a negligible decline in baseflow compared to the pre-development (no pumping) baseflow of 2.85 cfs.

According to the 2014 WDNR report [Ecological Limits of Hydrologic Alteration in Dane County Streams](#), no significant change in the fish community status from 2010 conditions is expected to occur as a result of the projected 2040 reduction in baseflow in Sixmile Creek or Spring Creek.

The loss of baseflow from the cumulative effects of well water pumping is a regional issue, beyond the boundaries of a single Urban Service Area Amendment or even a single municipality. This issue is discussed along with potential management options in the recently updated [Dane County Groundwater Protection Planning Framework](#) (Technical Appendix G of the Water Quality Plan).

Maintaining pre-development groundwater recharge helps to maintain baseflow and mitigate this impact. The Village of Dane proposes to maintain the pre-development annual recharge rate (estimated as 9 to 10 inches per year for this area according to the WGNHS study). Experience has shown that this criterion is generally met when 90% of pre-development runoff volume is maintained for the development area through infiltration measures.

Table 4 Modeled Baseflow Results Due to Current and Anticipated Future Municipal Well Water Withdrawals (All Municipal Wells)			
Stream	No Pumping	2010	2040
<i>Sixmile Creek</i>	<i>3.4 cfs</i>	<i>3.0 cfs</i>	<i>2.9 cfs</i>
<i>Spring Creek</i>	<i>2.9 cfs</i>	<i>2.8 cfs</i>	<i>2.8 cfs</i>

## 5) Comments at the Public Hearing

A public hearing was held on the proposed amendment at the July 11, 2019 meeting of the Capital Area Regional Planning Commission. During the public hearing, downstream property owners Joe and Diane Ripp raised concerns about stormwater discharge from the Village's existing detention basin adversely impacting their farm field and crops. They requested funding for a grassed waterway to route the stormwater through their property. Key questions from Commissioners at the public hearing were related to the direction and ultimate discharge point of stormwater from the proposed development, the density of the proposed development, and infill potential in the Village.

As a follow-up to the property owner's concern, Commission staff met with Village representatives to visit the site and to discuss options for addressing this concern, including following the [City of Madison's stormwater ordinance language for discharge off-site to other private lands](#). Following the rain events on July 18<sup>th</sup> and 19<sup>th</sup> (~ 3" total over the 2 days, with ~ 2" occurring in 4 hours early in the morning of the 19<sup>th</sup>), Commission staff again visited the site to examine the stormwater flows into the Ripp farm. Staff observed that most of the flow is coming from the existing stormwater basin outlet with no real flow from the culvert under the railroad tracks to the west. Relatively high flows were entering the Ripp farm from the culvert under Capitol Valley Way that then spread out across the field and infiltrated before reaching the culvert under Old 113 Rd. Actions have been recommended to the Village of Dane to further improve water quality and environmental resource management in response to the issues raised.

## 6) 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 wastewater collection system and lift station capacity to serve the proposed amendment area.

Since 2002, there have been stormwater management standards in effect at the state, county, and local level to require stormwater management and erosion control plans and structural best management practices designed to address the impacts of development on water quality, runoff volumes, peak flows, water temperature, and groundwater recharge. In 2011 county and local standards for runoff volume control were increased beyond state standards to further address the potential stormwater impacts of development. Since 2010 many communities adopted even higher standards for volume control through their own ordinances or as part of urban service area amendment agreements. In 2017, State statute 281.33(6)(a)(1) was changed to limit the ability of local governments to adopted higher standards for runoff volume through local ordinances.

The Village 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 or exceed current standards for pollutant reduction, runoff volumes, peak flows, water temperature, and groundwater recharge to address the potential impacts of the proposed development on the receiving waters.

It is the Regional Planning Commission staff's opinion that the proposed amendment is consistent with water quality standards under Wis. Stat. § 281.15, with the conditions of approval identified below. Additional actions have also been recommended below to further improve water quality and environmental resource management.

### ***a) Conditions***

Regional Planning Commission staff recommends approval of this amendment, based on the land uses and services proposed, and conditioned on the continued commitment of the Village of Dane to pursue the following:

1. Submit a detailed stormwater management plan for Regional Planning Commission staff review and approval (in conjunction with DCL&WCD staff) prior to any land disturbing activities in the amendment area. The stormwater management plan shall include the following:
  - a. Install stormwater and erosion control practices prior to other land disturbing activities. Protect infiltration practices from compaction and sedimentation during land disturbing activities.
  - b. Control peak rates of runoff for the 1-, 2-, 10-, and 100-year 24-hour design storms to pre-development levels, in accordance with the Dane County Stormwater Ordinance.
  - c. Provide at least 80% sediment control for the amendment area based on the 1-year, 24-hour design storm, with a minimum of 60% of that control occurring prior to infiltration, in accordance with the Dane County Stormwater Ordinance.
  - d. Maintain the post development stay-on volume to at least 90% of the pre-development stay-on volume for the one-year average annual rainfall period, in accordance with the Dane County Stormwater Ordinance.
  - e. Maintain 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, in accordance with the Dane County Stormwater Ordinance.
2. Stormwater management facilities shall be placed in public outlots whenever feasible and designated as environmental corridor. Easements and perpetual legal maintenance agreements with the Village, to allow the Village to maintain stormwater management facilities if owners fail to do so, shall be provided for any facilities located on private property.
3. Delineate environmental corridors to include the stormwater management areas, park, and open space, to meet *Dane County Water Quality Plan* criteria for the delineation of environmental corridors. Submit plats showing environmental corridors for Regional Planning Commission staff review and concurrence prior to recording.
4. Work with the downstream property owner (Ripp) to address their concern of existing stormwater basin discharge through their property by doing some combination of the following options:
  - a. Coordinate and participate in the design and installation of a grassed waterway on their property.
  - b. Obtain an easement or other agreement for the discharge of stormwater from the Village through their property.
  - c. Mitigate the increased volume of discharge on their property prior to discharge through the Capitol Valley Way culvert by implementing stormwater practices that match the pre-development volumetric discharges from the Village to other private lands not under their control in storm events including the 1, 2, 5 & 10-year storms.
  - d. Stabilize the outlet of the culvert discharge under Capital Valley Way.
  - e. Improve the performance of the existing storm water management basins by modifying the outlet structures and possibly expanding the capacity in combination with new development.

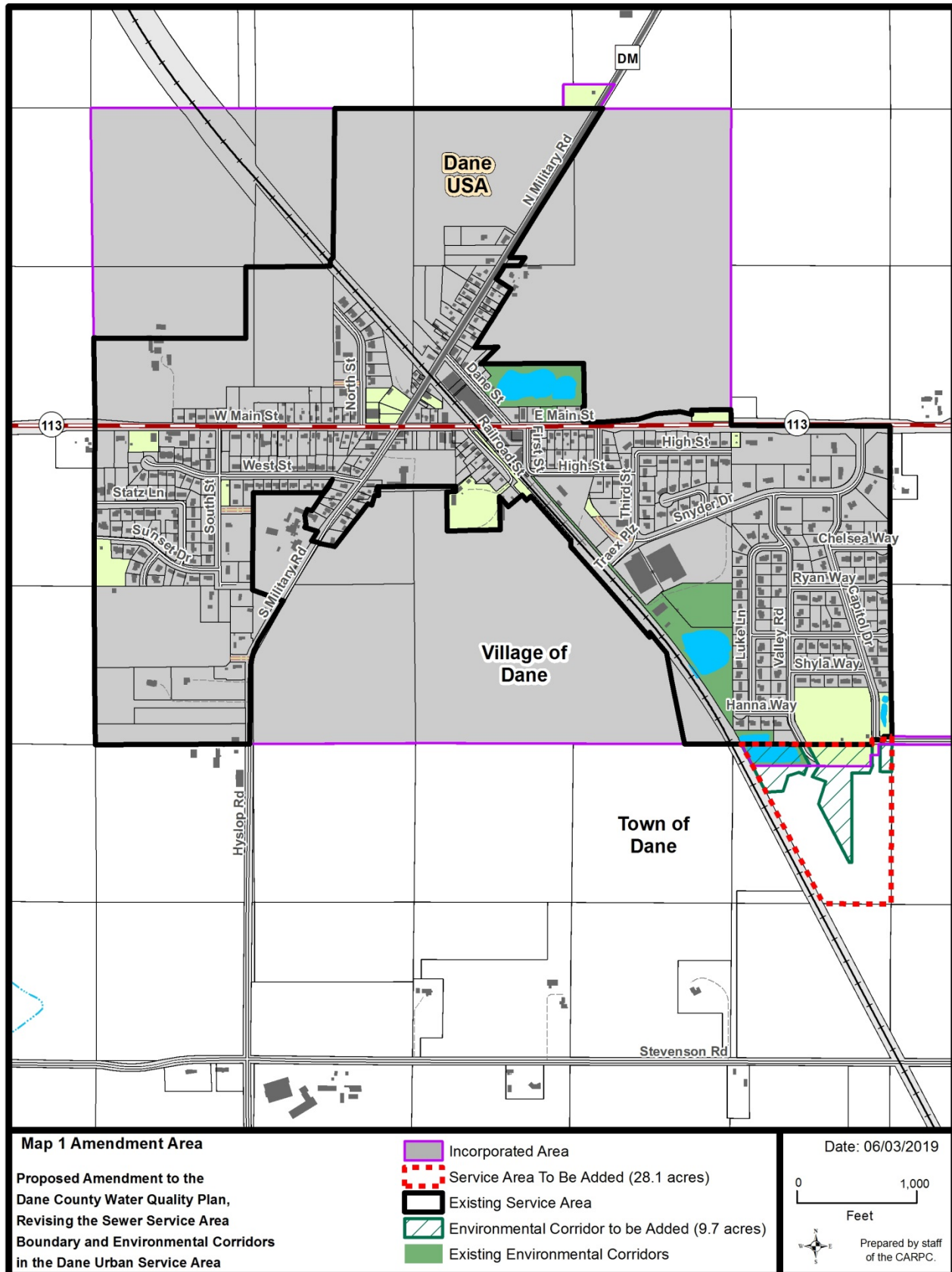
**b) Recommendations**

1. Encourage the responsible use of deicers and water softeners by participating in the trainings and outreach activities of the [WI Salt Wise Partnership](#).



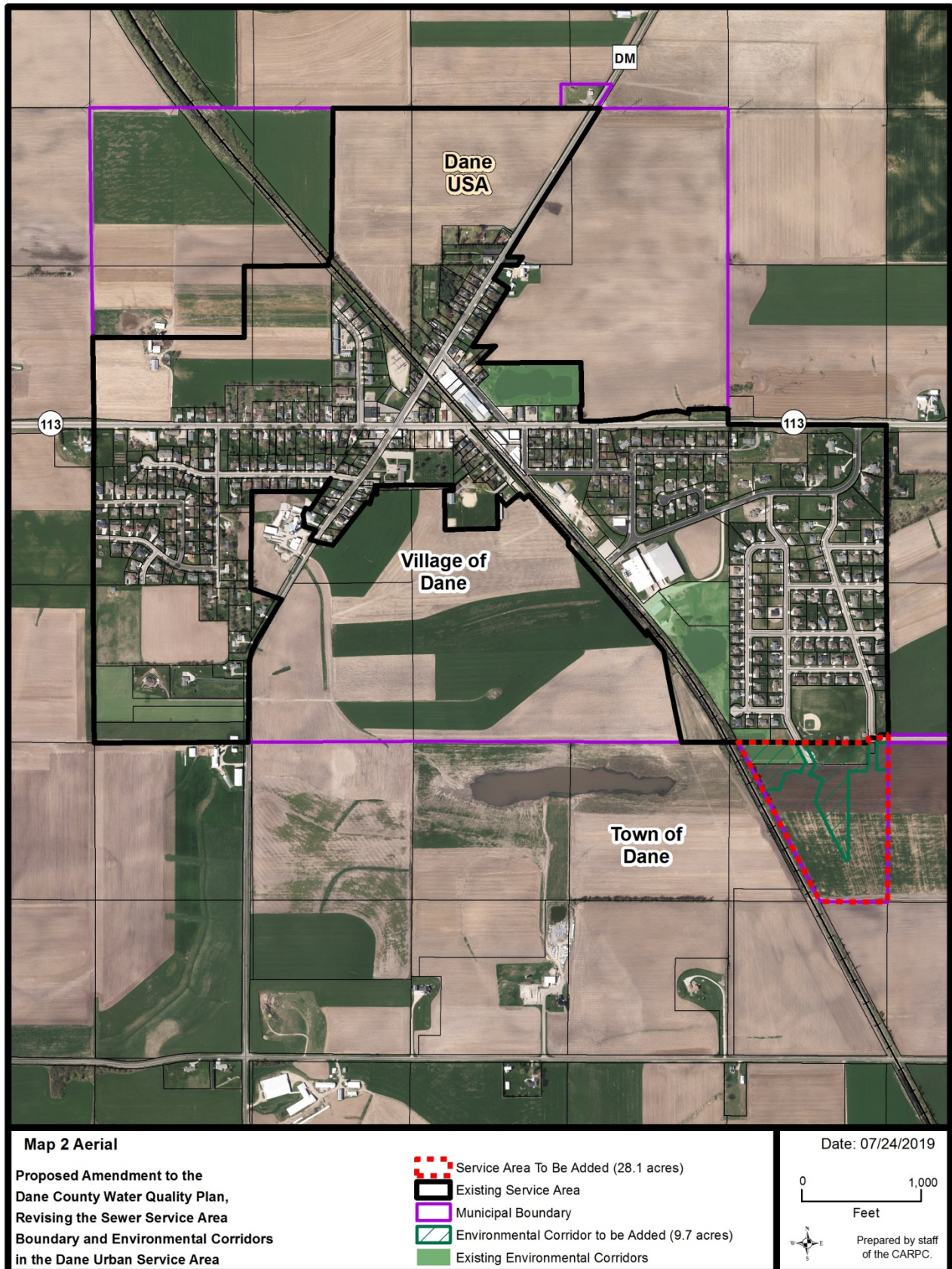
## 7) Maps

Map 1 - Amendment Area

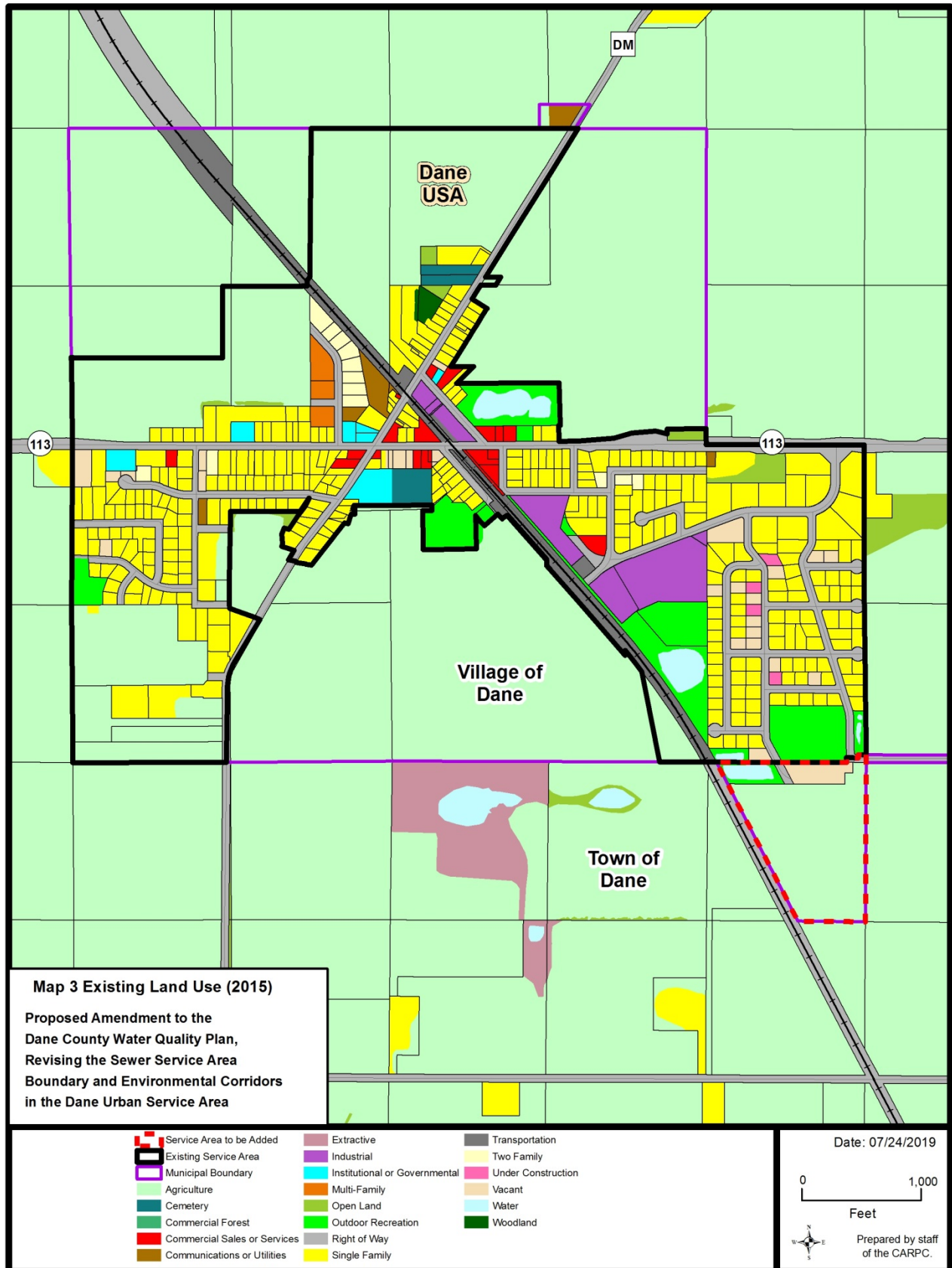




Map 2 – Aerial

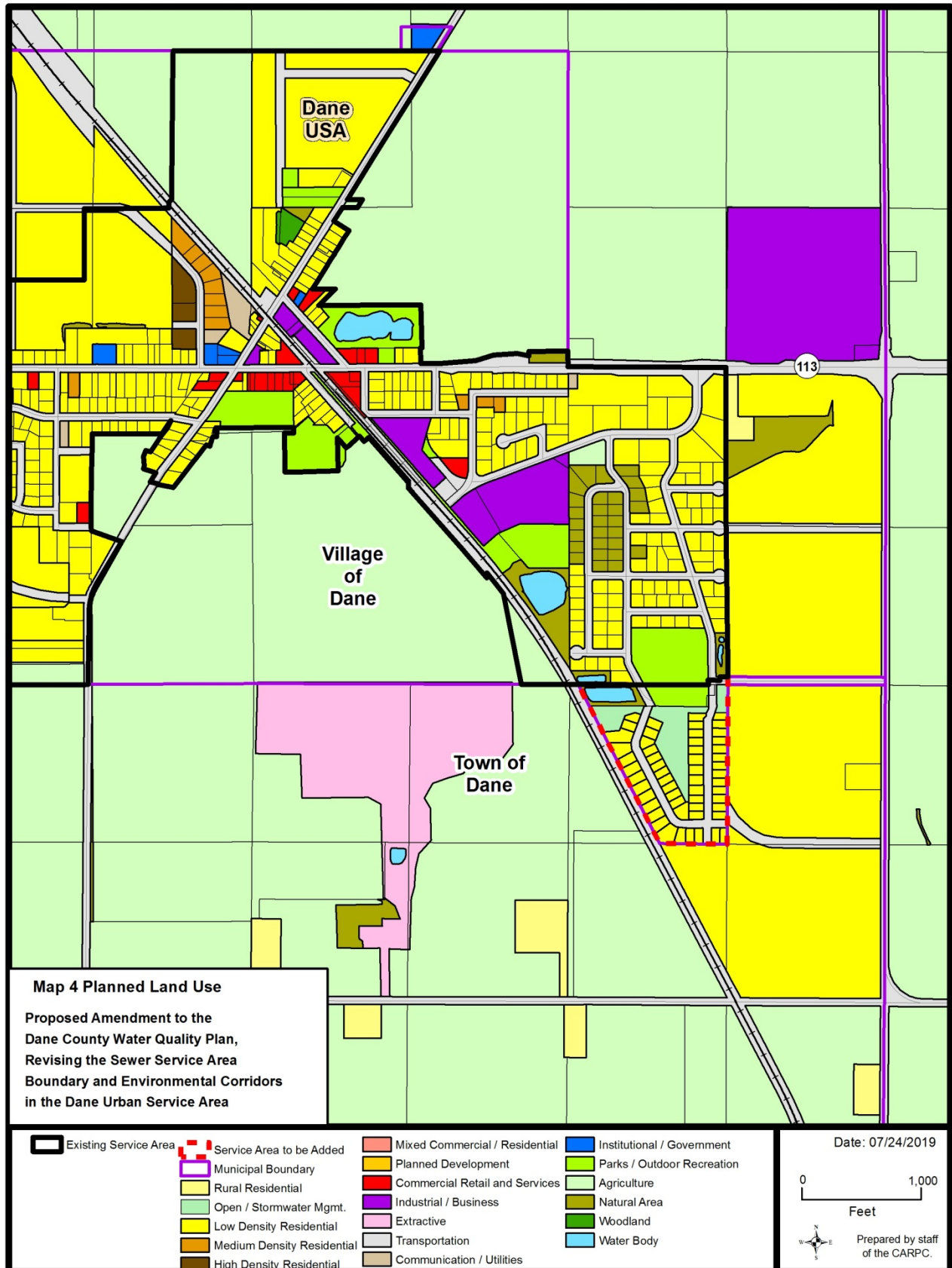


Map 3 – Existing Land Use

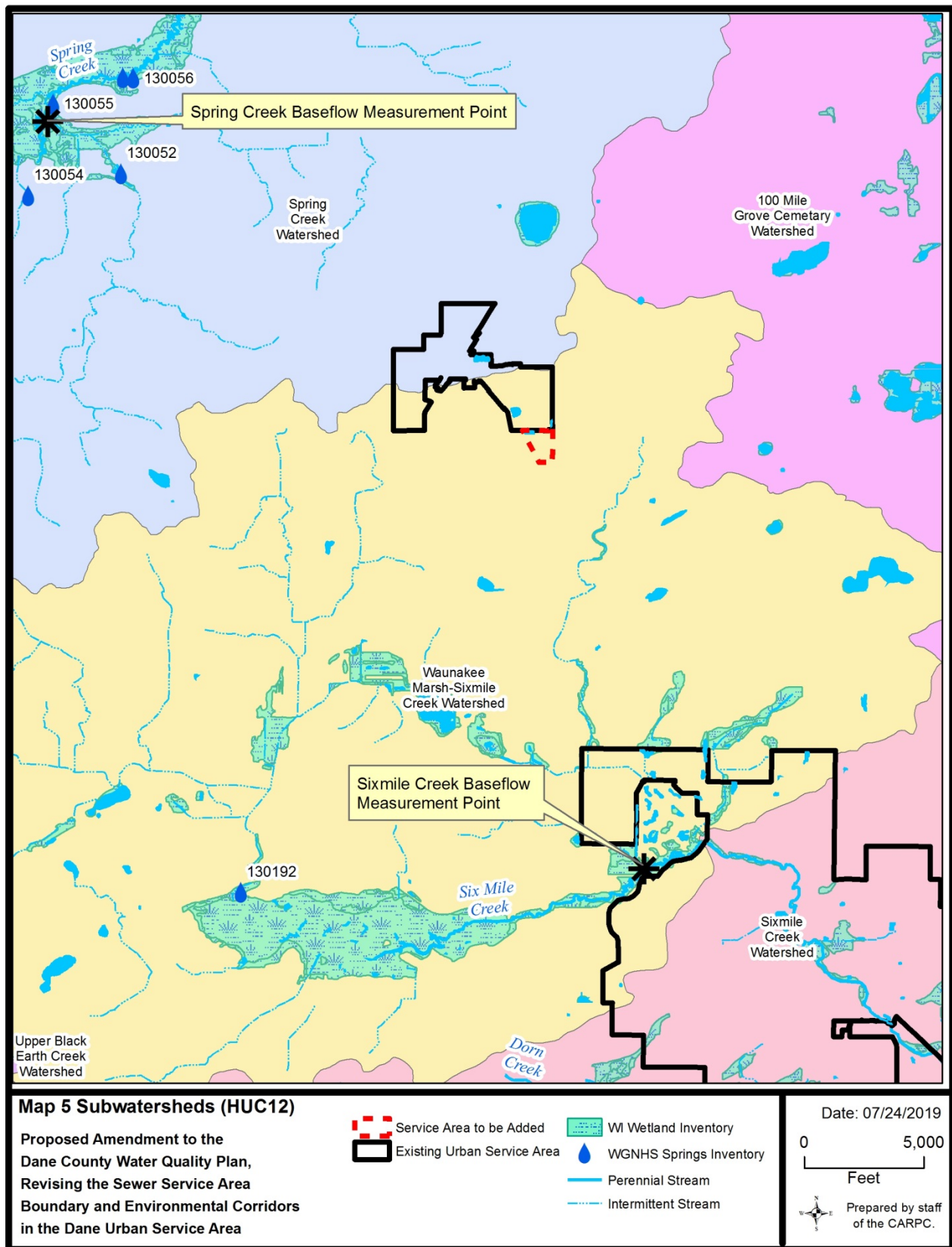




Map 4 – Planned Land Use

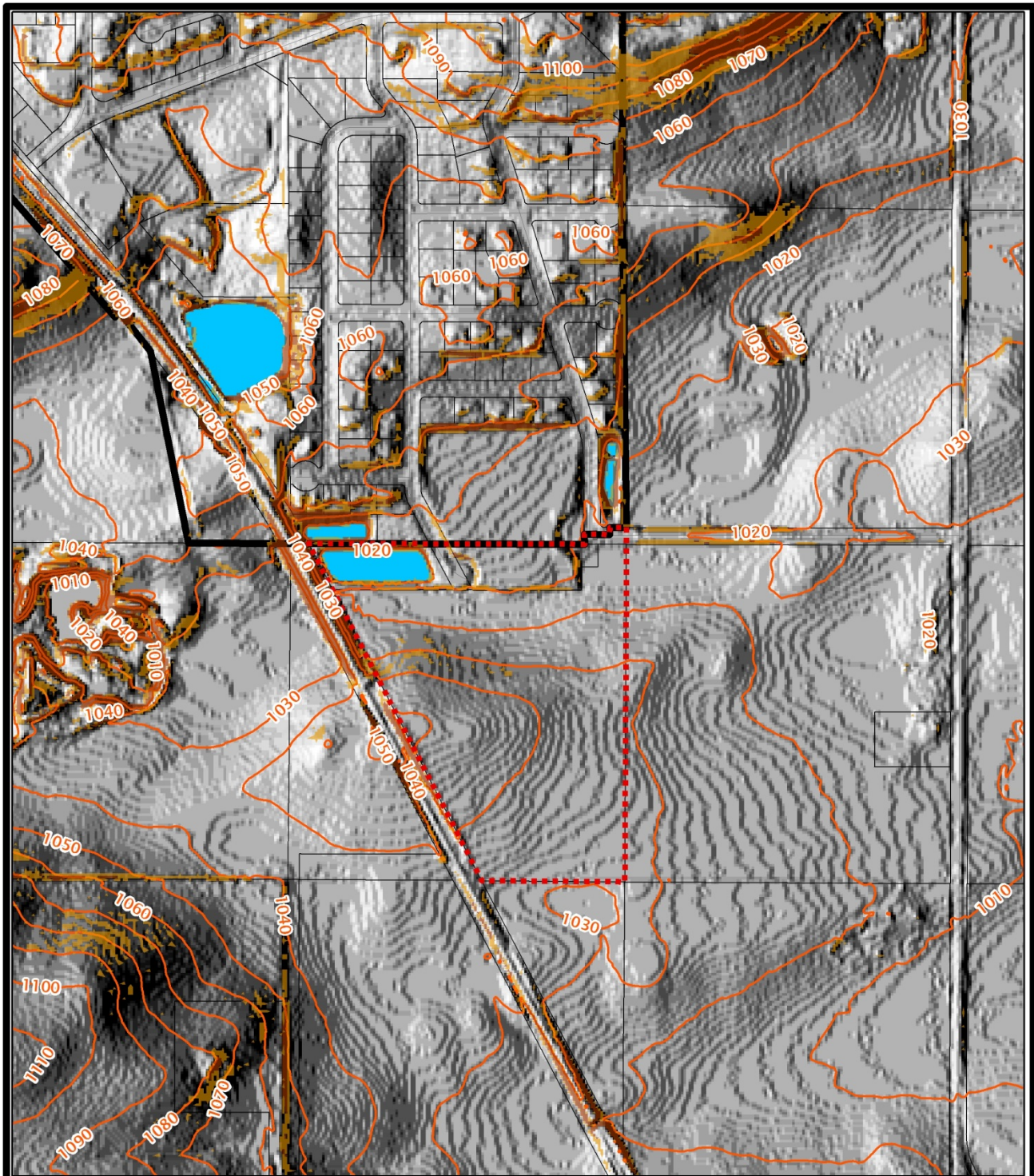


Map 5 - Subwatersheds





Map 6 - Elevations





### Map 6 Elevation

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

-  Existing Service Area Boundary
-  Service Area To Be Added
-  Contours (10ft) 2009
-  Lakes and Ponds

#### Steep Slopes

##### Percent Slope

-  12% to less than 20%
-  20% and greater

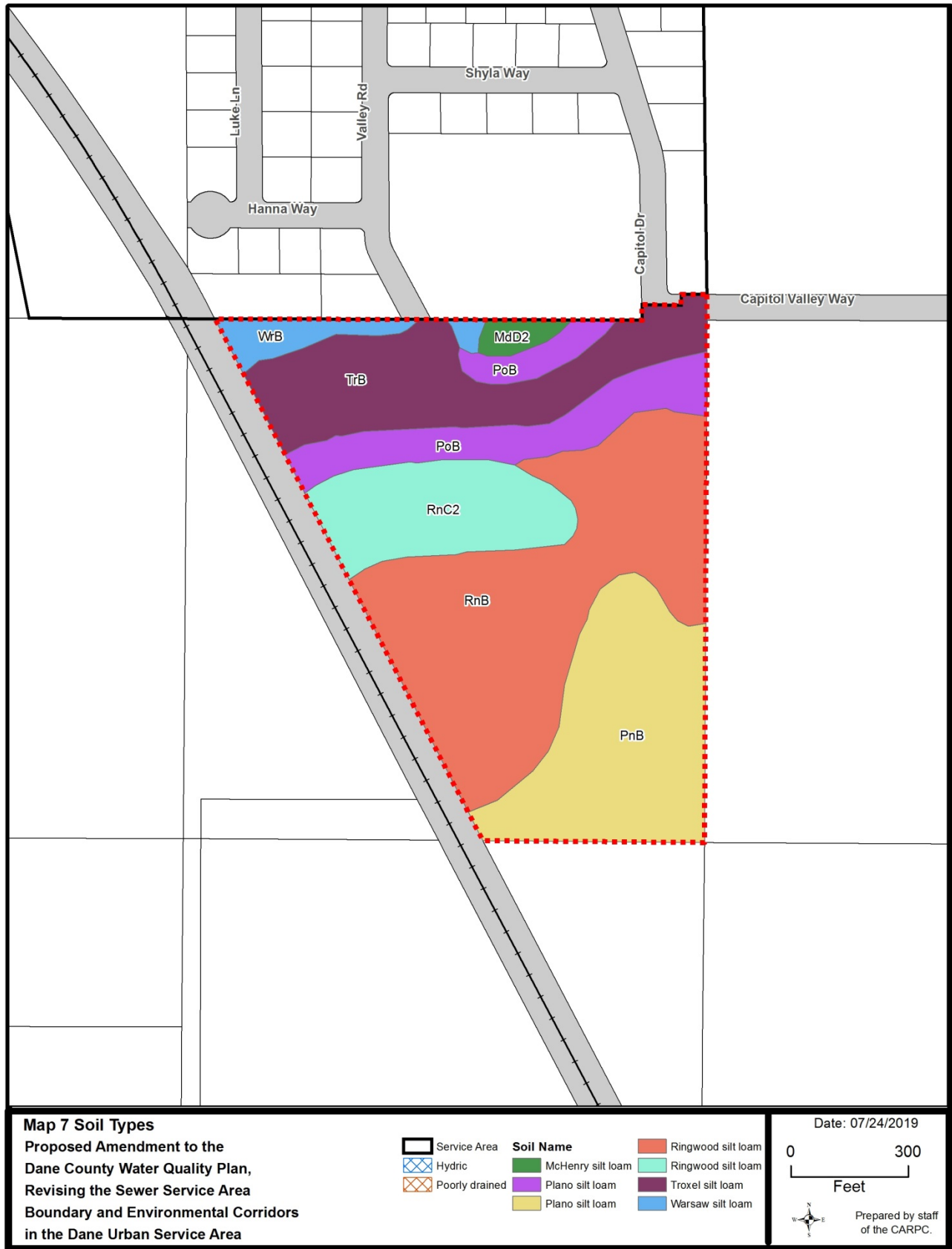
Date: 07/24/2019

0 500  
Feet

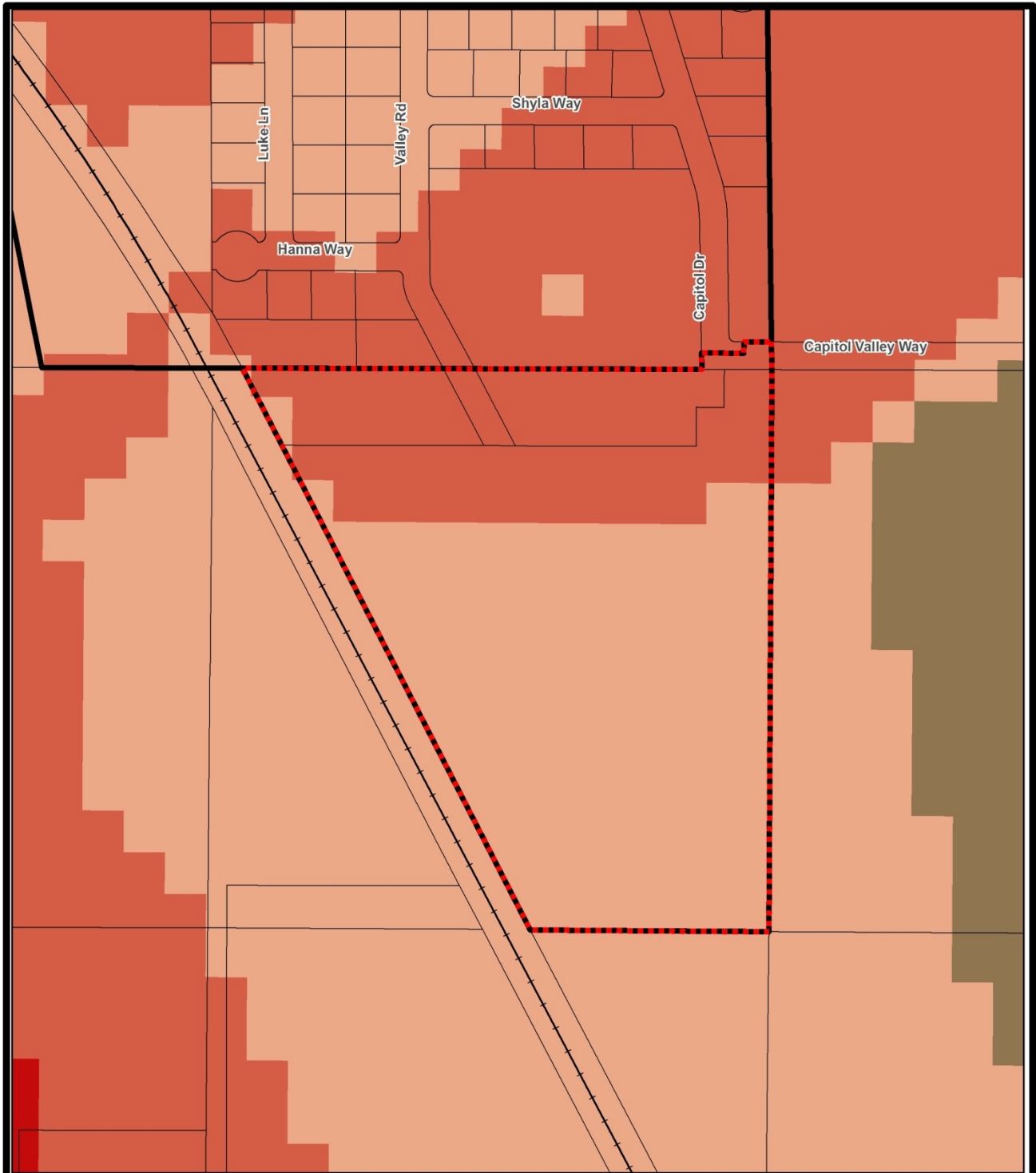


Prepared by staff  
of the CARPC.

Map 7 - Soil Type



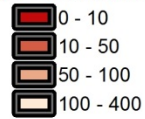
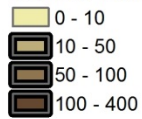
Map 8 – WGNHS Bedrock Depth and Potential Karst Features



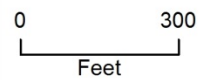
**Map 8 WGNHS Bedrock Depth and Potential Karst Features**

**Proposed Amendment to the  
Dane County Water Quality Plan,  
Revising the Sewer Service Area  
Boundary in the Village of Dane Urban Service Area**

**Depth to Bedrock (ft) Potential Karst Units (ft)**



Date: 06/06/2019



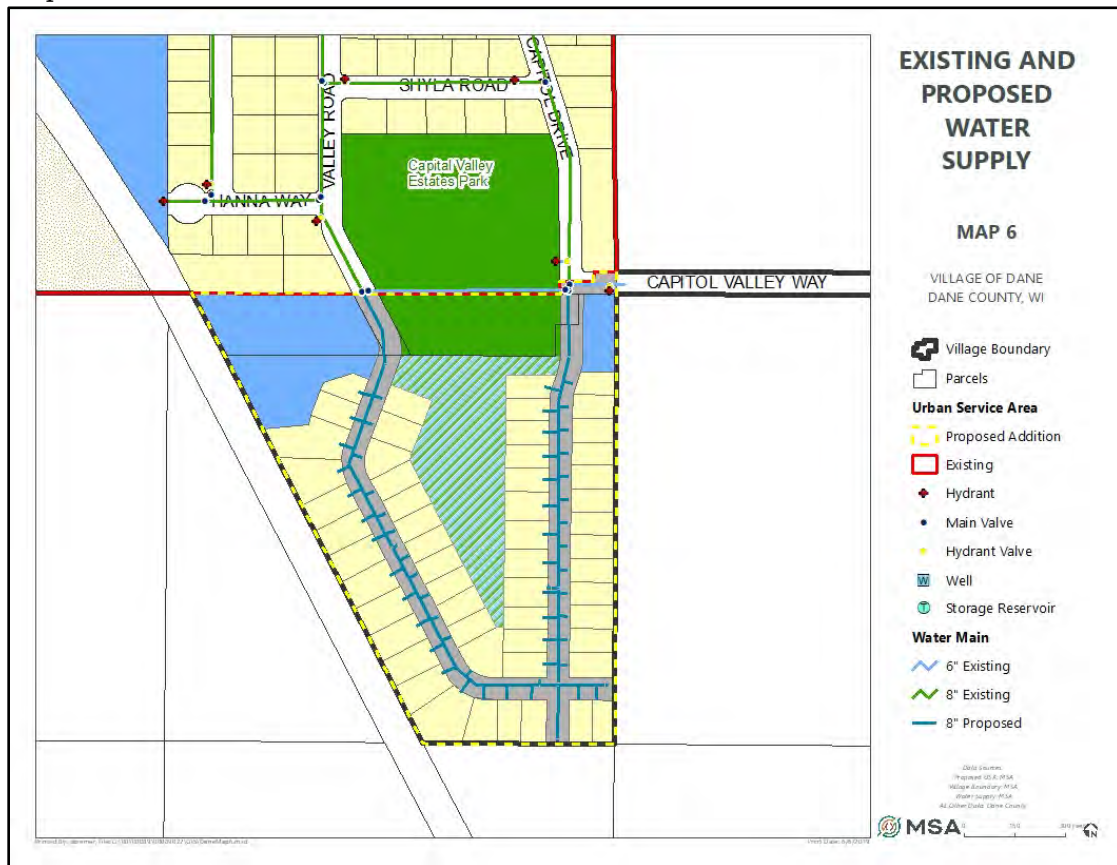
Prepared by staff  
of the CARPC.



Map 9 – Planned Sanitary Sewer Service

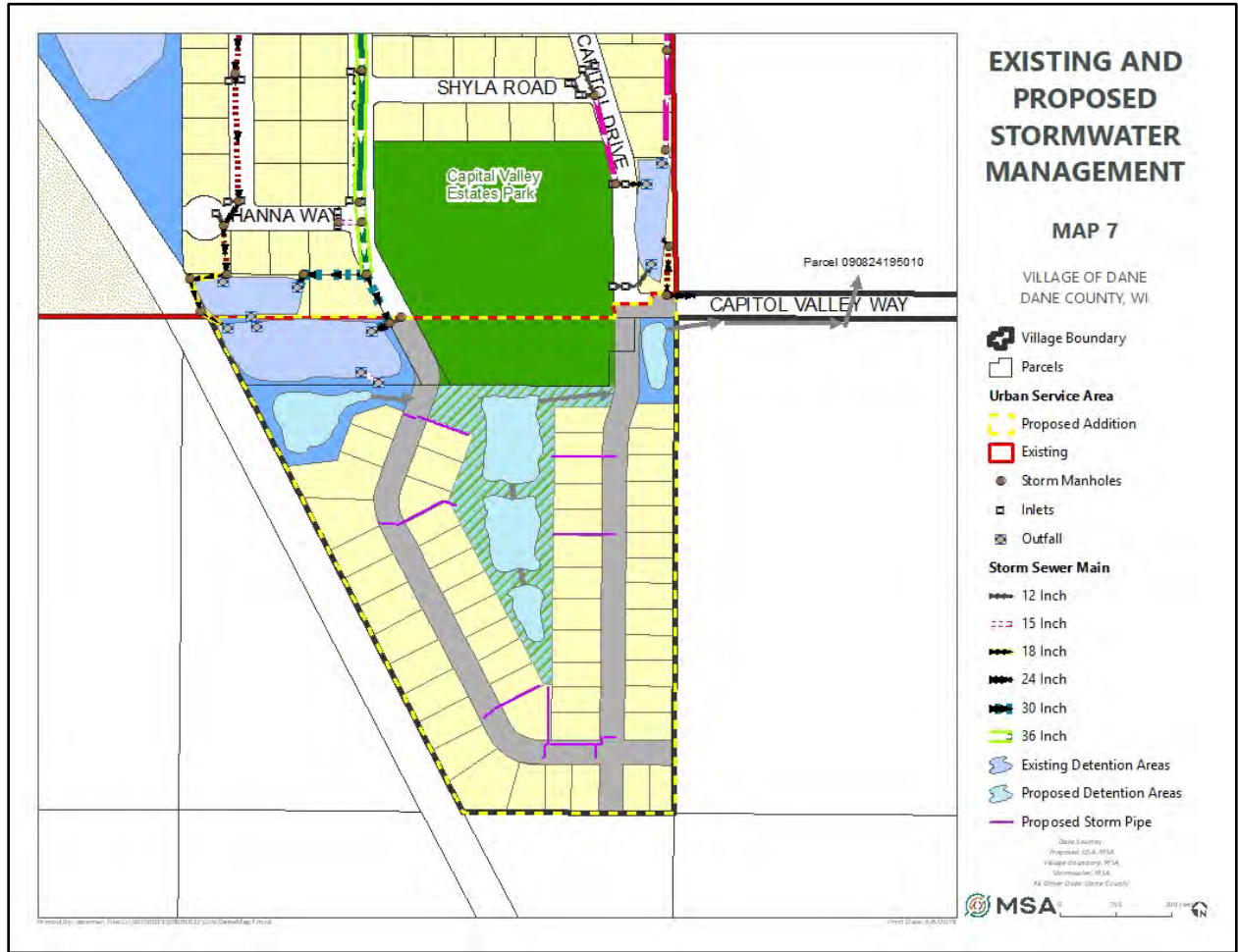


Map 10 – Planned Water Service

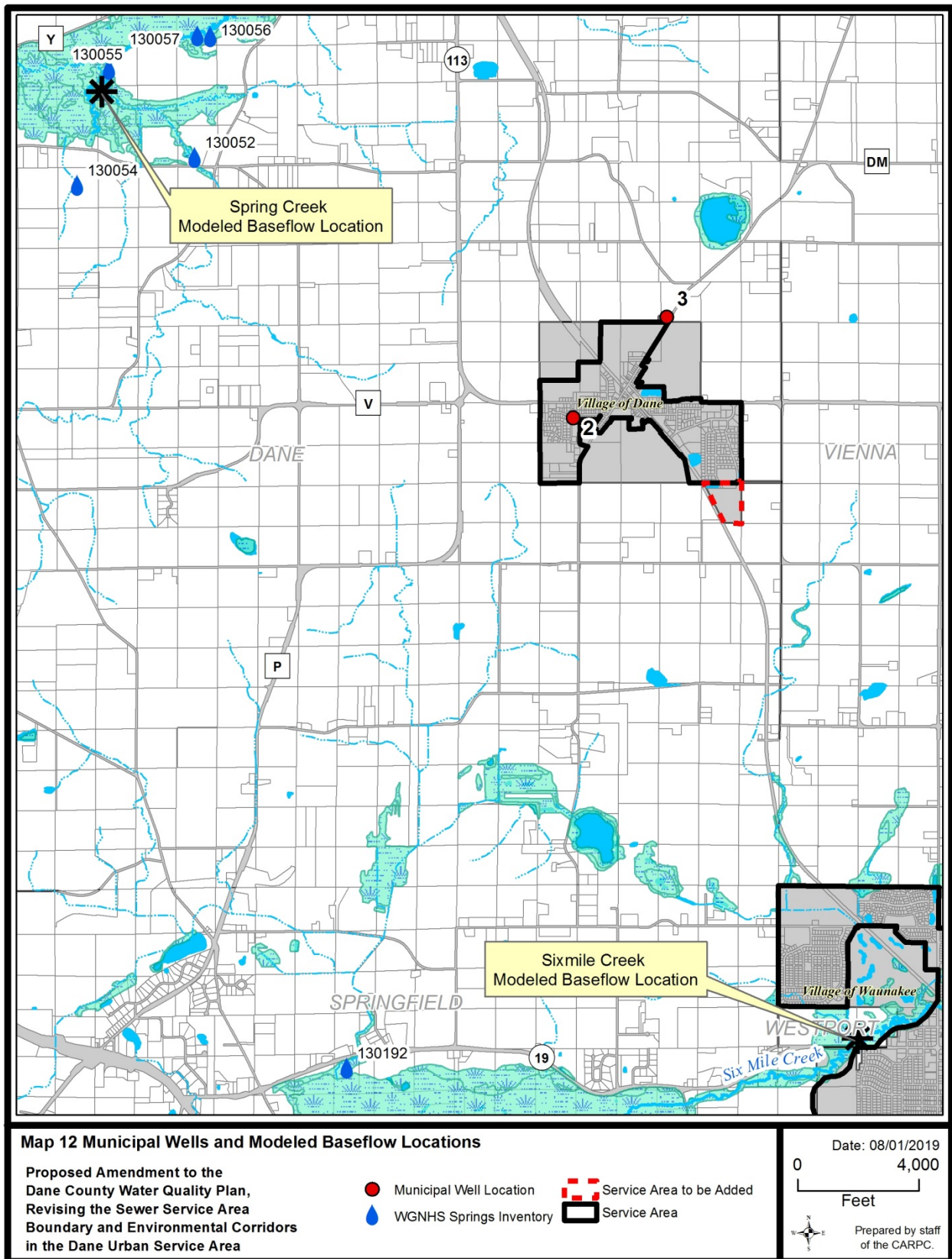




Map 11 – Proposed Stormwater Management System



Map 12 – Municipal Wells and Modeled Baseflow Locations



## Attachment 1 – Wisconsin Historical Society Letter



19 June 2019

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 Dane Urban Service Area, Dane County, Wisconsin

Dear Mr. Higgins:

No previously recorded archaeological sites have been recorded in, or adjacent to the parcels delineated in the amendment. A review of available evidence indicates that no wetlands, drainages, or other landscape features that are typical indicators of American Indian settlement are present. Therefore, we see no reason why the project cannot proceed as designed.

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  
608-264-6496, [john.broihahn@wisconsinhistory.org](mailto:john.broihahn@wisconsinhistory.org)

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