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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 Oregon Urban Service Area**

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### **History of the Oregon Urban Service Area**

The Oregon Urban Service Area was first delineated in 1980. The first amendment to the Oregon Urban Service Area occurred in 1984, refining the boundary and delineating Environmental Corridors. There has been a total of 11 amendments to this urban service area since its creation totaling 673 acres of developable land and 369 acres of Environmental Corridor. The most recent amendment of the service area by the Village of Oregon was recommended by the Commission and approved by the WDNR in 2018.

### **Planning in Oregon**

The Village of Oregon is requesting amendment to the Oregon USA. The location of the requested amendment has been identified in Village planning documents as “Planned Neighborhood” since the 2004 Comprehensive Plan. The amendment area is further identified as “Potential Urban Service Expansion Area” by the Village’s Future Land Use Map. The “Planned Neighborhood” category is described as primarily single-family residential with a mixture of one or more complimentary uses. The amendment area includes single-family lots and a neighborhood park, one of the suggested uses. Village planning documents describe the amendment area as a transition between residential neighborhoods in the Village (north and west) and residential development in the Town (south and east).

### **Existing Conditions**

#### ***Land Use***

The requested amendment area is located along the southern border of the Village, west of Wolfe Street/CTH MM, and north of the intersection of Wolfe Street and Harding Street. The requested amendment is roughly 20 acres in size. All land is located in the Town of Oregon and planned for annexation into the Village of Oregon. The land is currently used for agriculture. Immediately adjacent land uses include Village and Town residential developments.

Surrounding Planned Land Uses Include:

- North: Residential, Recreational (Foxboro Golf Course), Institutional (Oregon Middle School)
- South: Rural Residential, Agriculture
- East: Agriculture, Recreational (Foxboro Golf Course)
- West: Residential

Table 1 Existing and Planned Land Use		
Land Use Category	Existing Land Use Acres (see Map 3)	Proposed Land Use Acres (see Map 4)
Agriculture	19.5	
Park and Open Space		3.2
Residential		9.2
Rights-of-Way	0.5	4.0
Stormwater Management		3.6
<b>Total</b>	<b>20.0</b>	<b>20.0</b>

### ***Cultural and Historic Sites***

The Wisconsin Historical Society has been contacted regarding the presence of any known archaeological sites or cemeteries within the amendment area. No surveys are recommended at this time. (See Attachment 1).

### ***Natural Resources***

The proposed amendment area is in the Oregon Branch watershed (HUC 12: 070900020801, Map 5), ([link to DNR data](#)) a tributary of Badfish Creek ([link to DNR data](#)). Wastewater from the amendment area will be treated at the Oregon Wastewater Treatment Facility (Map 5). The treated effluent is also discharged to the Oregon Branch.

### Wetlands

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

The WWI includes emergent / wet meadow and forested wetlands approximately 0.8 miles downstream of the amendment area that are associated with Oregon Branch and its tributaries. The 2008 *Dane County Wetlands Resource Management Guide* ([link to report](#)) classifies the downstream wetlands along Oregon Branch as Group V wetlands. A Group V wetland is an area that no longer exists or functions as a wetland but has the potential to be restored.

### Oregon Branch

Oregon Branch (WBIC 800700 / WATERS ID 11656) is a small spring-fed stream that originates within the Village of Oregon and flows southeast approximately ten miles to the confluence with Rutland Branch to form Badfish Creek (Map 5). The 22.1 square-mile Oregon Branch sub-watershed encompasses predominantly agricultural lands. The creek has a low gradient of 8.2 feet/mile. Prior to the 1920s, Oregon Branch was considered a marginal trout water, but habitat was destroyed by stream ditching and straightening. The combined historic effects of stream channelization, urban and agricultural nonpoint source pollution, and wastewater discharges have greatly modified the original stream characteristics. The stream is classified by WDNR as a

limited aquatic life (LAL) stream from its headwaters to the confluence with the Rutland Branch; the stream is classified as a limited forage fishery (LFF).

Oregon Branch has been listed as impaired for PCBs in fish tissue since 2012. This water was assessed by DNR during the 2018 listing cycle and based on the most updated information, no change in the existing impaired waters listing was needed.

There are two DNR monitoring stations on Oregon Branch, one at Rutting Road ([Station ID 133105](#)) and one at Sunrise Road ([Station ID 133102](#)). Summer 2021 monitoring at the Sunrise Road station indicated field measurements of dissolved oxygen of 8.5 to 10.5 mg/L, an average transparency of 120 cm, and a macroinvertebrate index score of 2.0. No chloride data is collected at this station. There are no active USGS baseflow monitoring stations on Oregon Branch. Oregon Branch has cool-warm headwater, cool-warm main stem natural community.

#### Badfish Creek

Badfish Creek (WBIC 799500 / WATERS ID 11653), a small stream formed by the confluence of its Oregon and Rutland Branches, has also been ditched, straightened, and widened. In the 1970s water quality was poor due to the large volume of effluent from MMSD and Oregon's treatment plant. Improvements in wastewater treatment capabilities and effluent quality since then have improved water quality in Badfish Creek. Since 1983, more than 42 fish species have been observed. Badfish Creek has been listed as impaired for PCBs in fish tissue and sediment since 1998. Badfish Creek is considered a cool-warm mainstem natural community.

#### Springs

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 the proposed amendment area. From 2014 – 2017, the WGNHS surveyed springs statewide that were expected to have flow rates at least 0.25 cubic feet per second (cfs). The Oregon Branch Watershed contains one inventoried spring in Dane County, Dane County Spring #26 (Map 5). Dane County Spring #26 is located at Thomson Park in the Village of Oregon. It was surveyed in 2016 with a discharge rate of 0.5 cfs, specific conductance of 860  $\mu$ S/cm, temperature of 50° F, and a pH of 7.12. Springs represent groundwater discharge visible to the casual observer. Generally, groundwater discharge occurs along the entire length of perennial streams and is the source of stream baseflow. The regional groundwater model is a useful tool for evaluating different configurations and scenarios of municipal groundwater well withdrawals on these stream systems.

#### Groundwater

Groundwater modeling, using the 2016 Groundwater Flow Model for Dane County developed by the WGNHS ([link to website](#)), shows that 2010 modeled baseflow in Oregon Branch, approximately 1,700 feet east of Highway 14 (see Map 5), increased compared to predevelopment flow conditions (0.9 to 2.5 cfs; Table 4). This increase is due to the return of treated wastewater effluent to Oregon Branch. Pre-development conditions represent no well pumping and no effluent discharge within the model.

In 2012, the WGNHS published a report, *Groundwater Recharge in Dane County, Wisconsin, Estimated by a GIS-Based Water-Balance Model* ([link to report](#)), estimating the existing groundwater recharge rates in Dane County based on the soil water balance method. The study estimates that the existing groundwater recharge rate in the proposed amendment area ranges from 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](#)). An Endangered Resources Preliminary Assessment was completed December 9, 2020 by the Bureau (see USA amendment application). It indicated that the project is covered by the Broad Incidental Take Permit/Authorization for No/low Impact Activities.

The amendment area overlaps with the High Potential Zone (species likely present) for the federally endangered Rusty Patched Bumble Bee. Section 7 of the Endangered Species Act requires consultation with the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service when any action that is carried out, funded, or permitted by a federal agency may affect a federally listed endangered or threatened species. The proposed amendment area currently consists of paved areas and row crops and is not considered to be suitable habitat for the Rusty Patched Bumble Bee. WDNR recommended that the proposed development include suitable active season and suitable overwintering habitat for the Rusty Patched Bumble Bee. It is also recommended that the project include native trees, shrubs and flowering plants; plants that bloom spring through fall; and the removal and control of invasive plants 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

Most of the amendment area is located within the West Johnstown – Milton Moraines Land Type Associations of Wisconsin. The Association classifies the surficial geology of this area as rolling hummocky moraine and outwash plain complex with scattered bedrock knolls. A smaller portion along the eastern edge of the amendment area is located within the East-Johnstown – Milton Moraines Land Type Association. The Association classifies the surficial geology of this area as undulating hummocky moraine and outwash plain complex with scattered lake plains.

Surface elevations within the amendment area range from around 971 feet to 1069 feet. The amendment area includes a few small, scattered areas of steep (>12%) slopes typically associated with road embankments and a small hill in the southwestern portion of the amendment area (see Map 6). There are no riparian steep slopes requiring placement in environmental corridors.

According to the Natural Resource Conservation Service (NRCS) Soil Survey of Dane County, the soils in amendment area are in Dodge – St. Charles - McHenry association. These soils are well drained to moderately well drained, deep silt loams. Table 2 shows detailed classification for soils in the amendment area (Map 7) while Table 3 shows important soil characteristics for the amendment area.

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

According to the Soil Survey Geographic data for Dane County developed by the USDA Natural Resources Conservation Service ([link to web soil survey](#)), the St. Charles and Batavia soils (the ScC2, ScB and BbB 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.



These soils are classified as well drained and therefore do not pose a limitation for buildings with basements.

**Table 2**  
**Soils Classification**

Soil	% of Area	General Characteristics
<i>Kidder loam; KdD2</i>	49.3	Deep, well drained, gently sloping to very steep soils on glaciated uplands. Soils have medium fertility, moderate permeability, and a very severe hazard of erosion. Poses severe limitations for development due to slope.
<i>McHenry silt loam; MdC2</i>	22.2	Deep, well drained, gently sloping to moderately steep soils on glaciated uplands. Soils have medium fertility, moderate permeability, and a moderate to severe hazard of erosion. Poses slight to moderate limitations for development due to slopes, shrink/swell potential and low bearing capacity.
<i>St. Charles silt loam; ScC2</i>	21.0	Deep, well drained, sloping soils to moderately steep soils on glaciated uplands. Soils have high fertility, moderate permeability, and a severe hazard of erosion. Poses severe limitations for development due to slope.
<i>St. Charles silt loam; ScB</i>	5.3	Deep, well drained, sloping soils to moderately steep soils on glaciated uplands. Soils have high fertility, moderate permeability, and a moderate to severe hazard of erosion. Poses moderate limitations for development due to slopes, shrink/swell potential and low bearing capacity.
<i>Batavia silt loam; BbB</i>	2.0	Deep, well drained, nearly level to sloping soils on high benches. Soils have high fertility, moderate permeability, and a moderate hazard of erosion. Poses moderate limitations for development due to shrink/swell potential.

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

**Table 3**  
**Soils Characteristics**

Characteristic	Soil Map Symbols (see Map 7)	% of Area
Prime Agricultural Soils	ScB, BbB	7.3
Hydric Soils (Indicates Potential / Restorable Wetlands)	None	0
Poorly Drained Soils with Seasonal High-Water Table (< 5')	None	0
Soils Associated with Steep Slopes (> 12%)	KdD2	49.3
Soils Associated with Shallow Bedrock (< 5')	None	0
Best Potential for Infiltration in Subsoils	KdD2, MdC2, ScC2, ScB, BbB	100

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

According to WGNHS data, bedrock within the western two-thirds of the amendment area is in the Sinnipee Group. Bedrock in the Sinnipee Group is dolomite with some limestone and shale, and consists of three formations including the Galena, Decorah, and Platteville Formations. Thickness is less than 100 feet. Bedrock within the eastern third of the amendment area is in the Ancell Group. Bedrock in the Ancell Group is medium-grained, mature quartz sandstone, and consists of two formations including the Glenwood and St. Peter Formations. Thickness is about 100 feet. According to WGNHS data, the depth to bedrock in the amendment area ranges from as little as 0 feet to up to 20 feet, with the shallowest depths generally being in the northern part and deepest depths generally being in the southeastern part of the amendment area (see Map 8).

As is common throughout much of the upper Midwest, karst features such as enlarged bedrock fractures are prevalent in the local dolomite uplands. Karst features such as

vertical fractures and conduits provide primary pathways for groundwater movement and can dramatically increase groundwater susceptibility when present. The location of karst features is difficult to predict, and the thickness and type of the overlying soil greatly affects how much water drains into them. Where clay soils are thick, infiltration rates are likely to be very low. However, where bedrock fractures are near the surface infiltration rates can be very high. Based on the WGNHS karst potential data, karst features may be encountered in the amendment area at depths ranges from 0 feet to 10 feet in the western two-thirds the amendment area (see Map 8). The proposed stormwater infiltration areas are located in the southeastern corner of the site away from the highest karst potential. The Wisconsin Department of Natural Resources Conservation Practice Standard 1002 - Site Evaluation for Stormwater Infiltration requires field verification for areas of the development site considered suitable for infiltration. This includes a site assessment for karst features in this area. If shallow karst features are found, adequate protection measures are required to address any potential for groundwater contamination.

There is no minimum separation distance for roofs draining to surface infiltration practices. However, Dane County ordinance requires infiltration practices to be located so that the separation distance between the bottom of the infiltration system and the elevation of seasonal high groundwater or the top of bedrock is at least 5 feet for residential arterial roads and 3 feet for other impervious surfaces. Soil test pits are required as part of the stormwater management plan to assure that infiltration practices are sited in locations that will not adversely affect groundwater quality.

## **Proposed Urban Services**

### ***Parks and Open Space***

There is one proposed 3.2-acre neighborhood park and one proposed 3.6-acre stormwater management area proposed as public outlots in the eastern portion of the amendment area (see Map 4).

### ***Water System***

Oregon Municipal Water and Sewer provides municipal water through a public water distribution system which includes approximately 285,653 lineal feet of water main and three active high-capacity groundwater wells within the Village. The wells are at depths ranging from approximately 890 to 950 feet with an average capacity of 850 to 1,000 gallons per minute (gpm). In total, the gross capacity of the municipal wells is 2,700 gpm (3.89 million gallons per day, MGD). The firm capacity (with the largest well assumed to be out of service) is approximately 1,700 gpm (2.45 MGD). The Village has three ground-level reservoirs, two standpipes, and one elevated tank, with a combined storage capacity of 1.27 million gallons. According to the 2020 Annual Report to the Public Service Commission of Wisconsin (link to [2020 - WEGS Annual Report](#)), the Village pumped an average of 550 gpm or 792,280 gpd (0.79 MGD), approximately 32% of its firm pumping capacity. This is consistent with the Village's estimate of an average of 535 gpm or 770,000 gpd. In 2020, the maximum amount pumped in any one day was 1.53 MGD.

The Village estimates the current average peak hourly demand is 1,900 gpm. While this is beyond the firm capacity of the system, the available storage capacity is sufficient to keep up with demand. In addition to keeping up with peak demand, as needed, the Village routinely utilizes its water storage capacity to keep water fresh in storage tanks. Within the next two years, the Village anticipates installing an additional well which would increase the Village's capacity by an estimated 1,000 gpm.

Water losses in the Village's distribution system were an average of 45,877 gpd (0.05 MGD) in 2020, which accounted for 6% of the net water supplied in 2020. Approximately 92% of this was due to unreported and background leakage, with the remaining due to reported leaks. In 2020, there were ten main breaks and one service break which were repaired. Water losses in the Village's distribution system were 15% in 2018 and 9% in 2019. The Wisconsin Administrative Code PSC 185.85(4)(b) requires a utility with more than 1,000 customers to submit a water loss control plan to the Public Service Commission (PSC) if the utility reports its percentage of water losses exceeds 15%.

Water supply within the amendment area will be provided by water main extensions from existing 8-inch stubs on Ridgeview Lane to the north (connecting to 12-inch water main on Foxfield Road) and on Ridgeview Lane to the west, creating a loop of the existing water main on Ridgeview Lane. Water main will also be extended to a dead end on Autumn Ridge Court. Individual service connections will be provided to each proposed lot. The Village estimates that the average daily water demand for the amendment area will be 7,750 gpd, which assumes 100 gallons per person per day (gpcd), 2.5 persons/unit and 31 housing units. Using a typical peak daily factor of 2.0, the estimated peak daily demand is 15,500 gpd (0.02 MGD). The peak hourly demand is estimated to be 22 gpm, based on a peak hourly demand factor of 2.0. These estimates are reasonable based on land use and the 2020 Annual Report. The estimated average daily water demand and peak hourly demand represent an increase of approximately 1% of the current demands on the system, and it is anticipated that the existing water supply system will support the additional demand from the proposed amendment area.

### ***Wastewater***

Sanitary sewer service will be provided to the amendment area by connection to the Village's existing sanitary sewer along Foxfield Road to the north, which flows via the South Perry Interceptor to the Village of Oregon Wastewater Treatment Facility. Within the amendment area, the lots will be served by 8-inch gravity sanitary sewer and individual sewer laterals. The proposed sanitary sewer within the amendment area will be connected to the existing sewer on Foxfield Road by a proposed 8-inch sanitary sewer along Ridge View Lane (within Phase I of Autumn Ridge).

The amendment area consists of 31 single-family residential lots contributing to wastewater flows. The Village estimates that the amendment area will generate an average of 7,750 gallons per day (gpd) of wastewater, or 5.4 gallons per minute (gpm). This assumes 2.5 persons per dwelling unit and an average wastewater generation of 100 gpcd. Utilizing a peaking factor of 4, it is estimated that the amendment area will generate a peak flow of 22 gpm. This estimate is consistent with typical design wastewater generation rates for the proposed residential lots. Furthermore, the estimated 250 gpd per dwelling unit (100 gpcd multiplied by 2.5 persons/unit) is conservative compared to the existing average wastewater flow rate per single-family dwelling unit in the Village, which was calculated to be 130 gpd according to the Southeast Side Sewer System Analysis conducted by the Village's engineering consultant, Town and Country Engineering, as provided in the Village's application.

The proposed 8-inch sanitary sewer main within the amendment area as well as the proposed 8-inch connecting sewer to Foxfield Road are anticipated to have a minimum capacity of 334 gpm, based on a design slope of 0.40% (minimum allowable per NR 110). As part of the Sewer System Analysis, the receiving South Perry Interceptor was

evaluated for existing conditions, currently planned development (including the amendment area), and remaining capacity for future development. The capacity of the limiting section of sewer was determined to be 775 gpm and currently receives a peak flow of 383 gpm. According to the Sewer System Analysis, the currently planned development (including the amendment area) will add 134 gpm in flow, which leaves an additional available capacity of 202 gpm. Although it should be noted that the assumptions used in the analysis were less conservative than the estimates used for the design of the amendment area (refer to discussion on flow per dwelling unit in preceding paragraph), the receiving interceptor has sufficient capacity to handle the anticipated peak flow from the amendment area (22 gpm).

#### Wastewater Treatment Facility

The Oregon Wastewater Treatment Facility (WWTF) will provide wastewater treatment for the amendment area. The WWTF is located on Perry Parkway and discharges to the Oregon Branch of Badfish Creek within the Badfish Creek Watershed of the Lower Rock River Basin. The rated monthly design flow capacity of the facility is 1.80 MGD and the maximum daily design flow capacity is 3.7 MGD. In the year 2020, the facility received an average monthly influent hydraulic loading of 1.74 MGD (96% of the 1.80 MGD design capacity), including infiltration and inflow, according to the 2020 Compliance Maintenance Annual Report (CMAR) ([link to 2020 CMAR](#)). The monthly influent loading exceeded the design capacity in six months during 2020. The Village of Oregon is growing steadily, and the Village recognizes that WWTF upgrades are needed in the near future. In July 2020, the Village's engineering consultant prepared a Facilities Planning Document report which evaluated alternatives to meet future loading conditions and comply with current and future permit requirements ([link to Facilities Planning Document Report](#)). The primary alternatives evaluated were: 1) maintenance and improvements to the existing WWTF, and 2) regionalization with the Madison Metropolitan Sewerage District (MMSD) via pumping. Based on several factors, the Facilities Planning Document recommended the option for maintenance and improvements to the existing WWTF. The planned improvements are intended to be completed in phases, with the first phase being implemented immediately and the final phase in approximately 2035, or as dictated by peak flows.

The Village has not had any issues meeting its WPDES permit (effective May 2020, expires March 2025) limits for the quality of effluent discharged to Oregon Branch, according to the 2020 CMAR). Below is a summary of the major effluents reported on in the 2020 CMAR:

- The biological oxygen demand (BOD) effluent quality for 2020 was below the monthly average limit, with a monthly average of 5.6 mg/L (28% of the limit) and a maximum of 7 mg/L (35% of the limit) for the months of September and December.
- The total suspended solids (TSS) effluent quality for 2020 was below the monthly average limit, with a monthly average of 5.1 mg/L (25% of the limit) and a maximum of 8 mg/L (40% of the limit) for the month of December.
- The ammonia (NH<sub>3</sub>) effluent quality for 2020 was well below the monthly average limit (varies by month), with a monthly average of 0.0398 mg/L (less than 2% of the respective limits) and a maximum of 0.0501 mg/L (1.9% of the respective limit) for the month of September.
- The phosphorus (P) effluent quality for 2020 was below the monthly average limit, with a monthly average of 0.67 mg/L (30-98% of the respective monthly limit) with a maximum of 1.08 mg/L (98% of the limit).

The WWTF discharges to a tributary to the Rock River, and thus the WPDES permit includes TSS and phosphorus limits to comply with the Total Maximum Daily Load (TMDL) developed for the Rock River Basin to protect and improve water quality. In the case of phosphorus, the future water quality-based effluent limit (WQBEL) has a six-month seasonal average limitation of 0.075 mg/L and a monthly average limitation of 0.225 mg/L, based on current in-stream phosphorus data. To meet the WQBEL for phosphorous, the Oregon WWTF has been approved by Wisconsin DNR to implement a watershed adaptive management approach (WAM). The adaptive management interim limitation for phosphorus is 0.6 mg/L, expressed as a six-month average (May through October and November through April), and goes into effect beginning the period from May 1, 2023 through October 31, 2023. Additionally, a 1.0 mg/L monthly average is required beginning May 2020 (previous limit was 1.1 mg/L). Oregon WWTF will participate in the Yahara Watershed Improvement Network (Yahara WINs) to implement phosphorus reducing practices within the watershed ([link to website](#)). The previously discussed Facilities Planning Document includes proposed improvements to address the WAM interim limitations, but not the final WQBEL.

### ***Stormwater Management System***

The Village of Oregon stormwater management and performance standards are contained within Chapter 22 of the Village of Oregon Code of Ordinances. Dane County Code of Ordinances, Chapter 14, contains stormwater management and performance standards which apply to all areas of Dane County. The amendment area will be required to follow the more stringent standards contained within the respective ordinances, as well as Wisconsin DNR requirements contained in NR 151 and NR 216. The Village contracts with Town & Country Engineering for stormwater management plan review.

The conceptual stormwater management plan consists of a wet retention basin and infiltration basin in the southeastern corner of the amendment area to address stormwater quality and quantity requirements for the 1<sup>st</sup> Addition to Autumn Ridge (also referred to as Autumn Ridge Phase II). The majority of runoff from the proposed amendment area will flow to the stormwater facilities for treatment through a network of storm sewer pipes and open-channel vegetated swales. The proposed stormwater management facilities will ultimately be owned and maintained by the Village.

Discharge from the stormwater basins will drain directly to the CTH MM right-of-way. Stormwater within the right-of-way flows south within a roadside swale where it will leave the Village of Oregon (upon proposed annexation) and enter the Town of Oregon. Approximately 250' south of the amendment area, stormwater crosses east beneath CTH MM through existing culverts, flows north and east a short distance within a roadside swale, then crosses back north beneath Harding Street through existing culverts and into an agricultural field (area of conceptual future phase, although not within the proposed amendment area). The agricultural field generally drains to the northeast across portions of adjacent lots within the Town of Oregon before entering the Town of Rutland. The amendment area accounts for approximately 18% of the watershed draining to this point. From here, stormwater drains along a poorly defined drainage way containing a series of mapped wetlands and wet spots through several private properties, across Wisconsin DOT right-of-way, beneath US Highway 14, and north along a mapped intermittent stream, eventually draining to the Oregon Branch of Badfish Creek.

The preliminary stormwater management plan indicates that there will be no runoff volume increase from the amendment area for the 1-year through the 50-year, 24-

hour design storm, and a relatively minimal increase of approximately 3% for the 100-year, 24-hour design storm (0.1 ac-feet increase).

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

#### Performance Standards

The Village of Oregon 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 Oregon (Chapter 22) 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- and 2-year, 24-hour design storms (using NRCS MSE4 storm distributions) to match predevelopment peak runoff rates. This is consistent with the standards currently required by Dane County.
3. Require post-construction peak runoff rate control to limit the 10-year, 24-hour design storm (using NRCS MSE4 storm distributions) to the 2-year, 24-hour design storm predevelopment peak runoff rate, and the 100-year, 24-hour design storm to the 10-year, 24-hour design storm predevelopment peak runoff rate. This is consistent with the standards currently required by the Village of Oregon and exceeds the standards currently required by Dane County.
4. Require post-development infiltration (stay-on) volume of at least 90% of the pre-development infiltration (stay-on) volume for the average annual rainfall. This is consistent with the infiltration standard for new development currently required by Dane County regulations.
5. Require no increase in runoff volume for the 1-year through the 50-year, 24-hour design storms. This exceeds the standards currently required by the Village of Oregon and Dane County.
6. Maintain predevelopment groundwater annual recharge rate of 9 to 10 inches per year as estimated by the Wisconsin Geological and Natural History Survey in a 2012 report titled "Groundwater Recharge in Dane County, Wisconsin Estimated by a GIS-Based Water Balance Model." This is consistent with the standards currently required by Dane County.

#### ***Environmental Corridors***

The amendment area includes approximately 6.8 acres of environmental corridor (see Map 2). This includes park/open space and planned stormwater management areas.



## **Impacts and Effects of Proposal**

### ***Meeting Projected Demand***

Preliminary projections anticipate that Oregon will grow by roughly 6,000 new residents and 2,000 new households over the coming 30 years. The requested amendment would add 31 single-family residential units on 9 acres of land (3.4 dwelling units per acre). As noted in the application, the price-point of these units will be lower than recent single-family offerings elsewhere in the Village. Draft goals and objectives from the *Regional Development Framework* encourage the creation of housing units at a variety of price-points to meet housing demand to ensure equitable access to housing.

### ***Phasing***

The requested amendment does not exceed 100 acres. A phasing plan is not required.

### ***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 increased stormwater runoff rates and volumes, as well as reduced infiltration. Without structural best management practices for erosion control, development would also cause substantial short-term soil erosion and off-site siltation from construction activities. Scientific research has well documented that without effective mitigation measures, the potential impacts of development on receiving water bodies can include the following:

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

Natural drainage systems attempt to adapt to the dominant flow conditions. In the absence of mitigation measures, the frequency of bank-full events often increases with urbanization, and the stream attempts to enlarge its cross section to reach a new equilibrium with the increased channel forming flows. Higher flow velocities and volumes increase the erosive force in a channel, which alters streambed and bank stability. This can result in channel incision, bank undercutting, increased bank erosion, and increased sediment transport. The results are often wider, straighter, sediment laden streams, greater water level fluctuations, loss of riparian cover, and degradation of shoreland and aquatic habitat.

Since 2002, there have been stormwater management standards in effect at the state, county, and local level to require stormwater management and erosion control plans and structural best management practices designed to address the impacts of development on water quality, runoff volumes, peak flows, water temperature, and groundwater recharge. In 2011, county and local standards for runoff volume control

were increased beyond state standards to further address the potential stormwater impacts of development. Since 2010 many communities adopted even higher standards for volume control through their own ordinances or as part of USA amendment agreements. In 2017, State statute 281.33(6)(a)(1) was changed to limit the ability of local governments to adopted higher standards for runoff volume through local ordinances. In response to climate change, the City of Madison adopted peak rate control for the 200-year storm event in their ordinance in June 2020. Dane County is expected to do the same this summer, which will make this requirement universal to all of the communities in Dane County.

The Village of Oregon 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 or exceed current Dane County standards for pollutant reduction, runoff volumes, peak flows, water temperature, and groundwater recharge to address the potential water quality impacts of stormwater runoff from the proposed development on the receiving waters. The Village is exceeding current standards by requiring higher levels of peak rate and volume control for this development.

Regional partners are actively working to address chlorides through the Wisconsin Salt Wise Partnership. It is recommended that the Village of Oregon encourage the responsible use of deicers and water softeners by participating in the trainings and outreach activities of the Wisconsin Salt Wise Partnership ([link to website](#)).

### **Groundwater Impacts**

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

Groundwater modeling indicates that the return of treated effluent to the Oregon Branch effectively compensates for local groundwater withdrawals within the Oregon Branch watershed and have resulted in a 1.6 cfs increase in Oregon Branch baseflow (location of modeling shown on Map 5) from predevelopment (no pumping) to 2010 (Table 4). A 0.1 cfs decline compared to 2010 conditions is anticipated for the year 2040, according to modeling.

<b>Table 4</b> Modeled Baseflow Results Due to Current and Anticipated Future Municipal Well Water Withdrawals (All Municipal Wells)			
<b>Stream</b>	<b>No Pumping</b>	<b>2010</b>	<b>2040</b>
<i>Oregon Branch</i>	<i>0.9 cfs</i>	<i>2.5 cfs</i>	<i>2.4 cfs</i>

## **Comments at the Public Hearing**

A public hearing was held on the proposed amendment at the July 8, 2021 meeting of the Capital Area Regional Planning Commission. Representatives of the Village of Oregon and the development team spoke in favor of the amendment. The Town of Oregon submitted a letter (Attachment 2) noting the Village's efforts to address stormwater management concerns raised by Town residents and the Town's subsequent comfort level with the proposed plan. There was no public comment opposed to the proposed amendment. Commissioners had several questions related to the proposed stormwater management plan including the ultimate flow path of stormwater runoff from the amendment area and the potential for karst to impact infiltration of stormwater in the amendment area.

## **Conclusions and Staff Water Quality Recommendations**

With the improvements identified in the Wastewater Treatment Facilities Plan, approved by DNR in 2020, there is sufficient treatment plant system capacity at the Oregon Wastewater Treatment Facility to serve the proposed amendment area.

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

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

In addition, the Village of Oregon and development team for this plat have agreed to higher stormwater management standards for this amendment area to address the stormwater concerns raised at the Town of Oregon public hearing. Namely, there will be no runoff volume increase from the amendment area for the 1-year through the 50-year, 24-hour design storm, and a relatively minimal increase (approximately 3%) for the 100-year, 24-hour design storm.

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

### **State and Local Requirements**

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

1. State and local review and approval of stormwater management plan(s) is required, including Regional Planning Commission staff review and approval as part of the sewer extension review process.
  - a. Stormwater and erosion control practices are required to be installed prior to other land disturbing activities. Infiltration practices are required to be protected from compaction and sedimentation during land disturbing activities.
  - b. Peak rates of runoff are required to be controlled for the 1-, and 2-year 24-hour design storms to “pre-development” levels, in accordance with the Village of Oregon and Dane County Stormwater Ordinances. In addition, the Village of Oregon Ordinance requires peak runoff rate control to limit the 10- year 24-hour design storms to the “pre-development” level of the 2-year event, and the 100-year, 24-hour design storms to the “pre-development” level of the 10-year event.
  - c. Sediment control is required that achieves at least 80% sediment control for the amendment area based on the average annual rainfall, with a minimum of 60% of that control occurring prior to infiltration, in accordance with the Village of Oregon and Dane County Stormwater Ordinances.
  - d. Runoff volume control is required that maintains the post development stay-on volume to at least 90% of the pre-development stay-on volume for the average annual rainfall period, in accordance with the Village of Oregon and Dane County Stormwater Ordinances.
  - e. Maintaining pre-development groundwater recharge rates from the Wisconsin Geological and Natural History Survey’s 2012 report, *Groundwater Recharge in Dane County, Wisconsin, Estimated by a GIS-Based Water-Balance Model* (a range of 9 to 10 inches/year for the amendment area or by a site specific analysis), when required by the Village of Oregon and Dane County Stormwater Ordinances.
2. Field verification for areas of the development site considered suitable for infiltration including a site assessment for karst features is required by the Wisconsin Department of Natural Resources Conservation Practice Standard 1002 - Site Evaluation for Stormwater Infiltration.
3. Easements and perpetual legal maintenance agreements with the Village, to allow the Village to maintain stormwater management facilities if owners fail to do so, are required for any facilities located on private property. Stormwater management facilities shall be placed in public outlots whenever feasible and designated as environmental corridor.
4. Environmental corridors are required to be delineated to include the proposed park and stormwater management areas to meet the Environmental Corridor Policies and Criteria adopted in the *Dane County Water Quality Plan*.

***Additional Agreements for the Amendment Area***

In addition to the existing state and local requirements, the Village of Oregon and the development team have agreed to pursue the following water resource management measures for the amendment area:

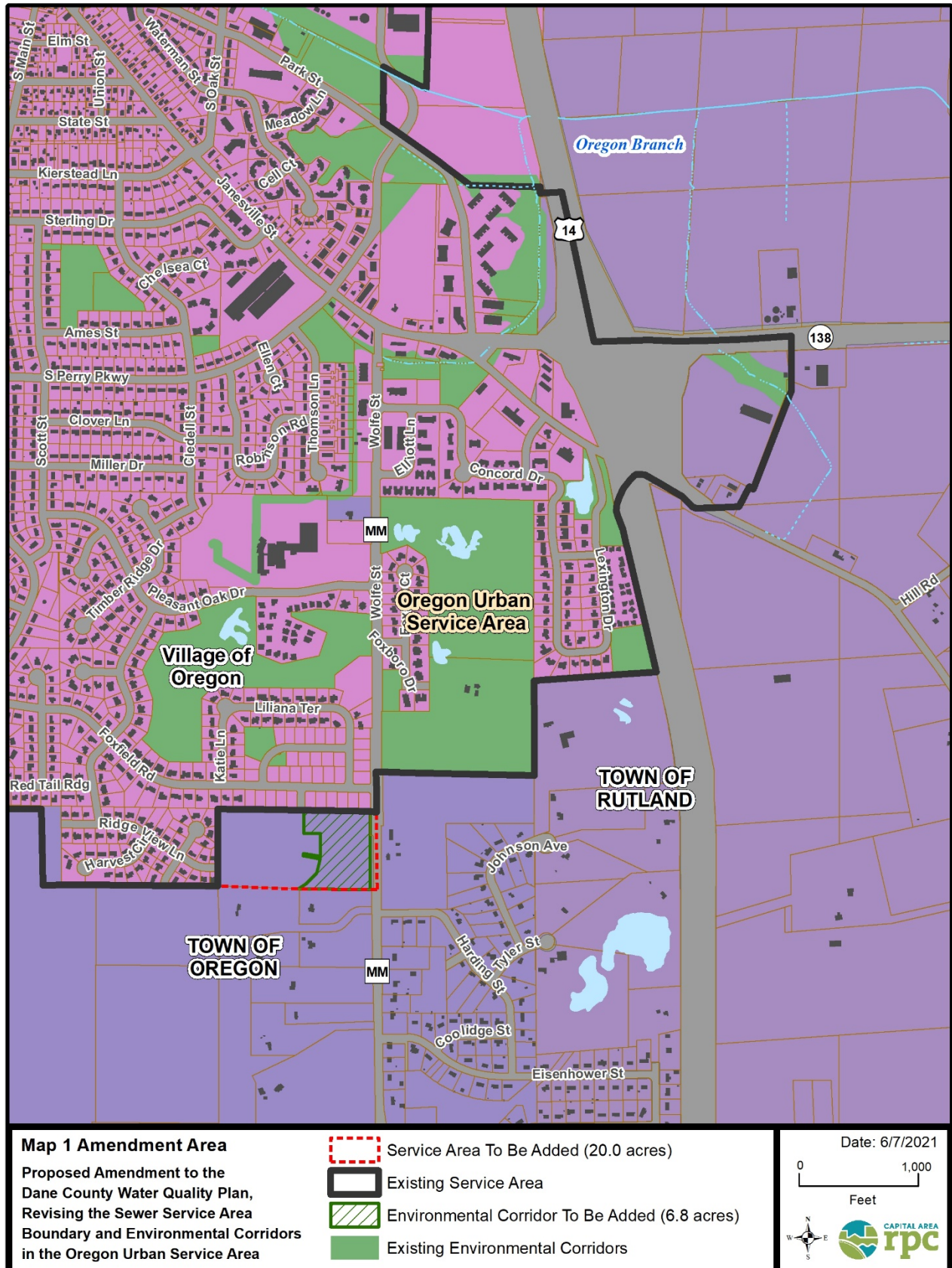
1. Require no increase in runoff volume for the 1-year through the 50-year, 24-hour design storms.

***Recommendations***

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

1. Encourage the use of native flora favored by the Rusty Patched Bumble Bee in landscaping to provide suitable habitat for this pollinator, where appropriate.
2. Encourage the responsible use of deicers and water softeners by participating in the trainings and outreach activities of the Wisconsin Salt Wise Partnership.

Map 1 - Amendment Area



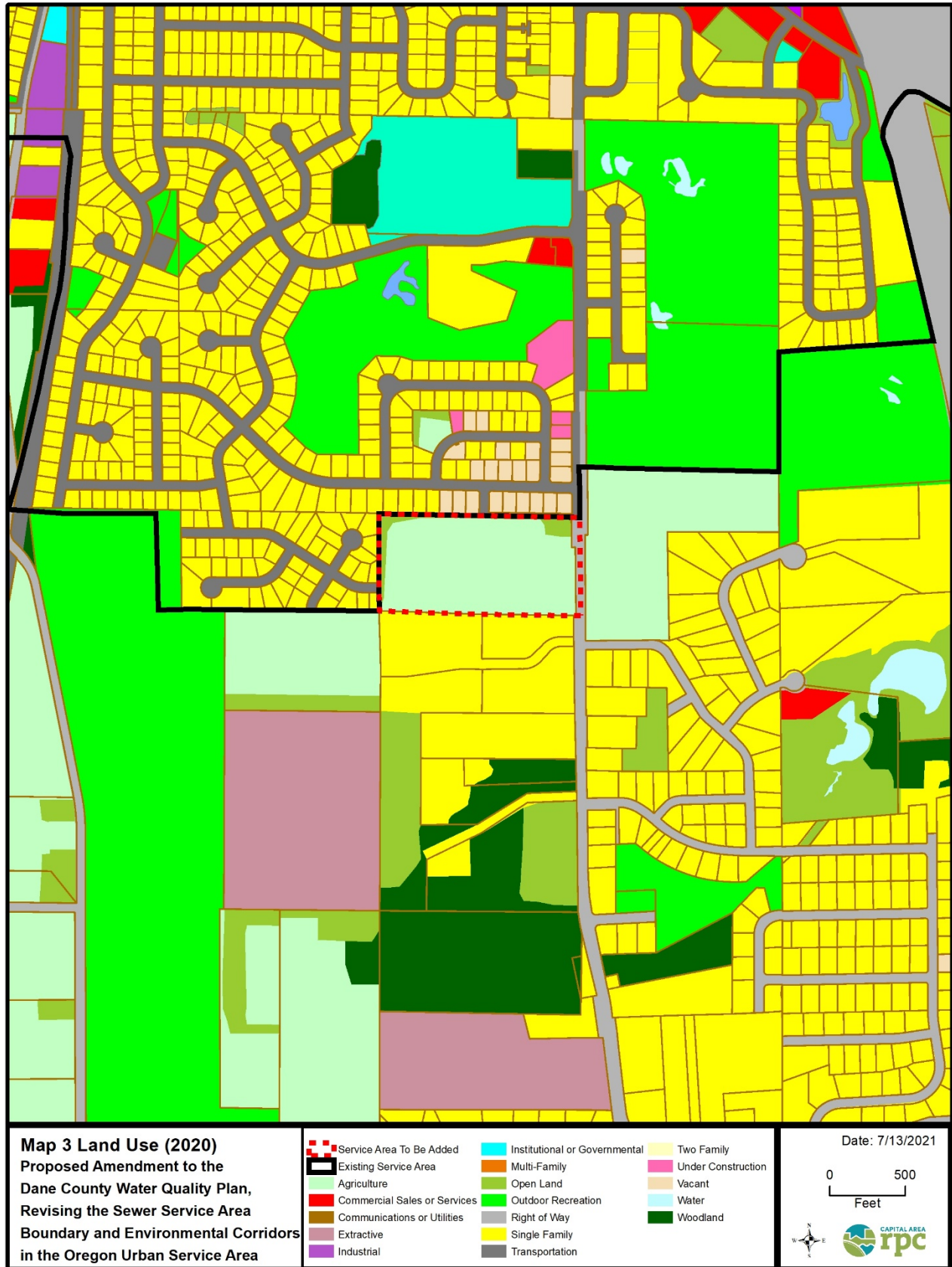


Map 2 – Aerial

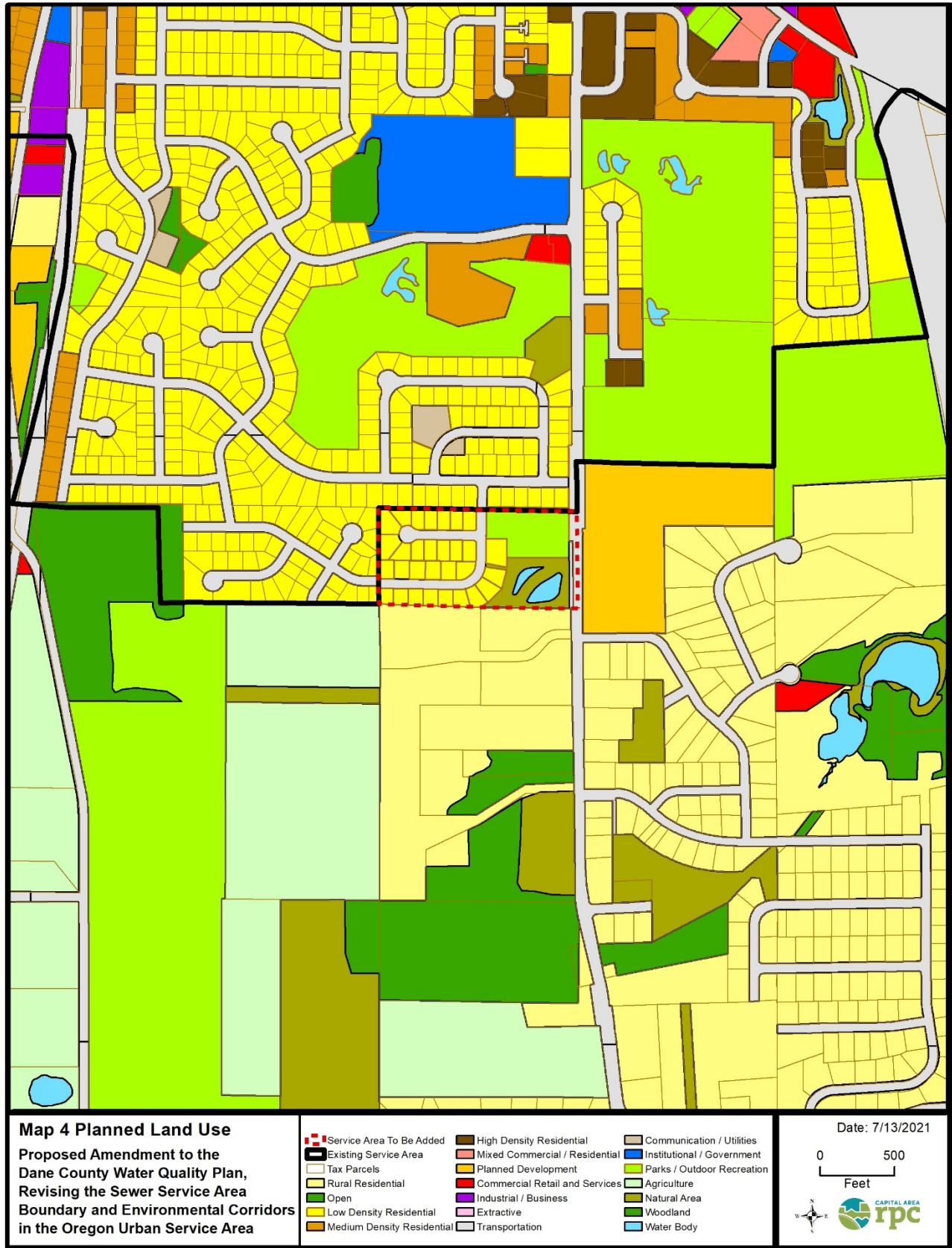




Map 3 – 2015 Land Use

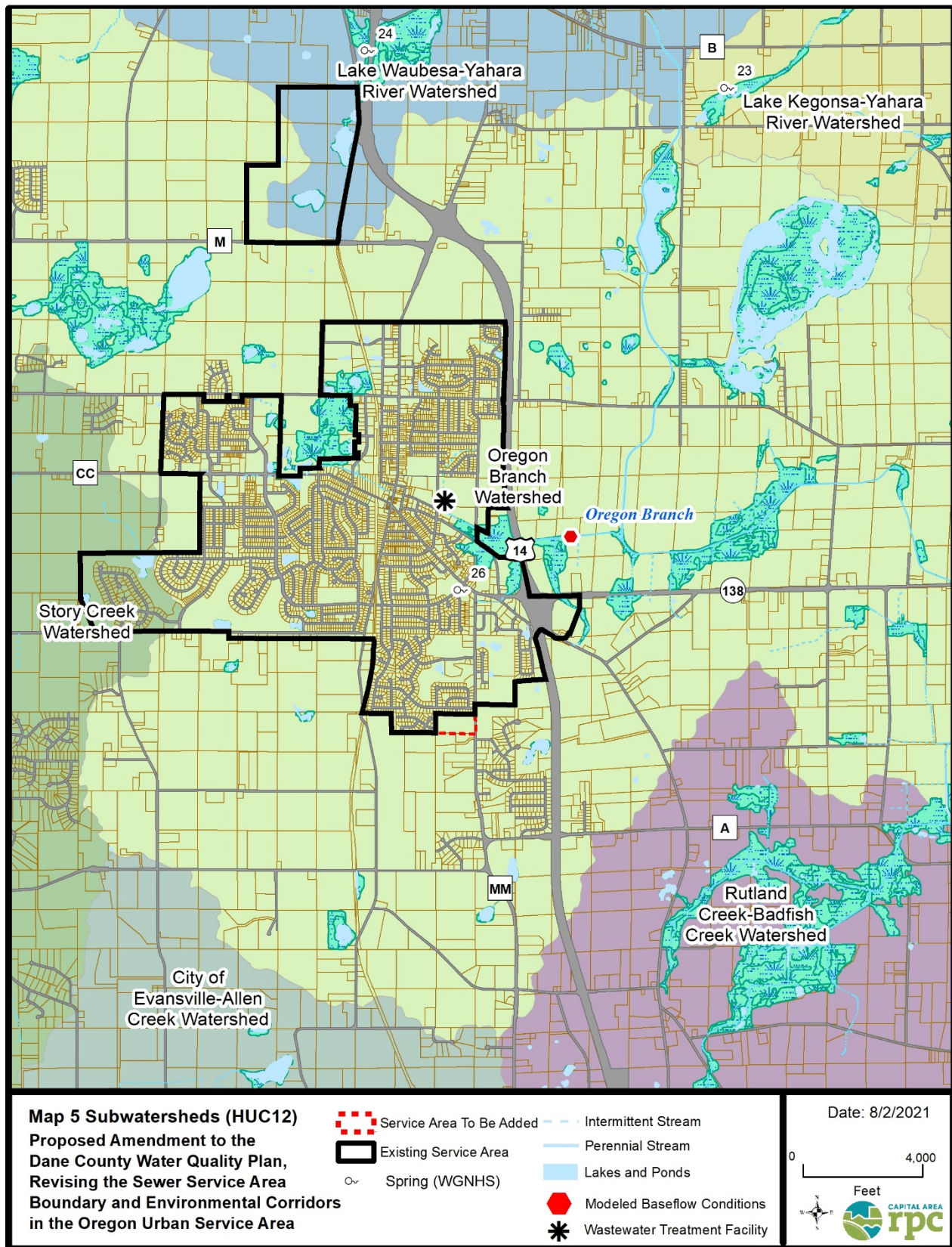


Map 4 – Planned Land Use



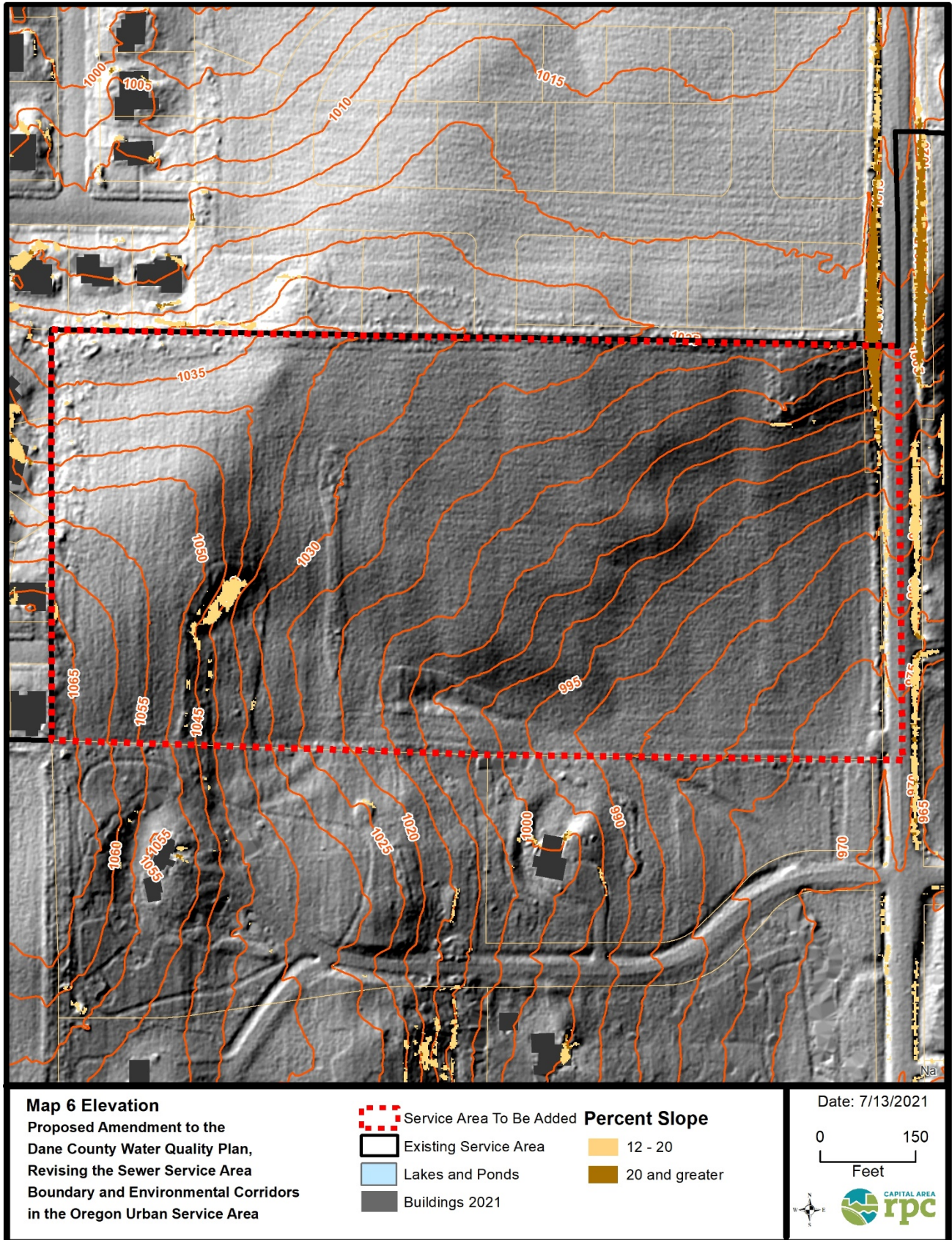


Map 5 - Subwatersheds

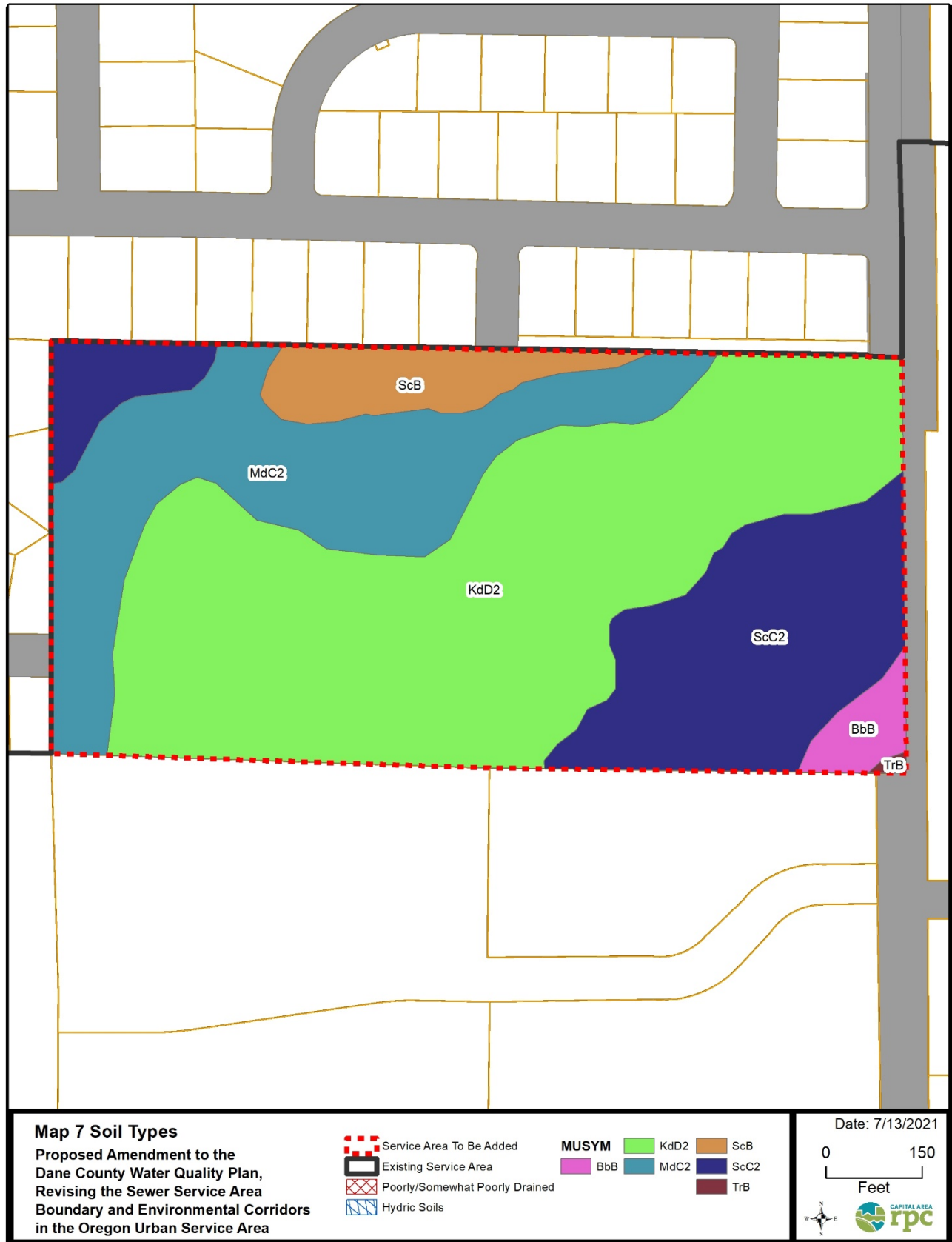




Map 6 - Elevations

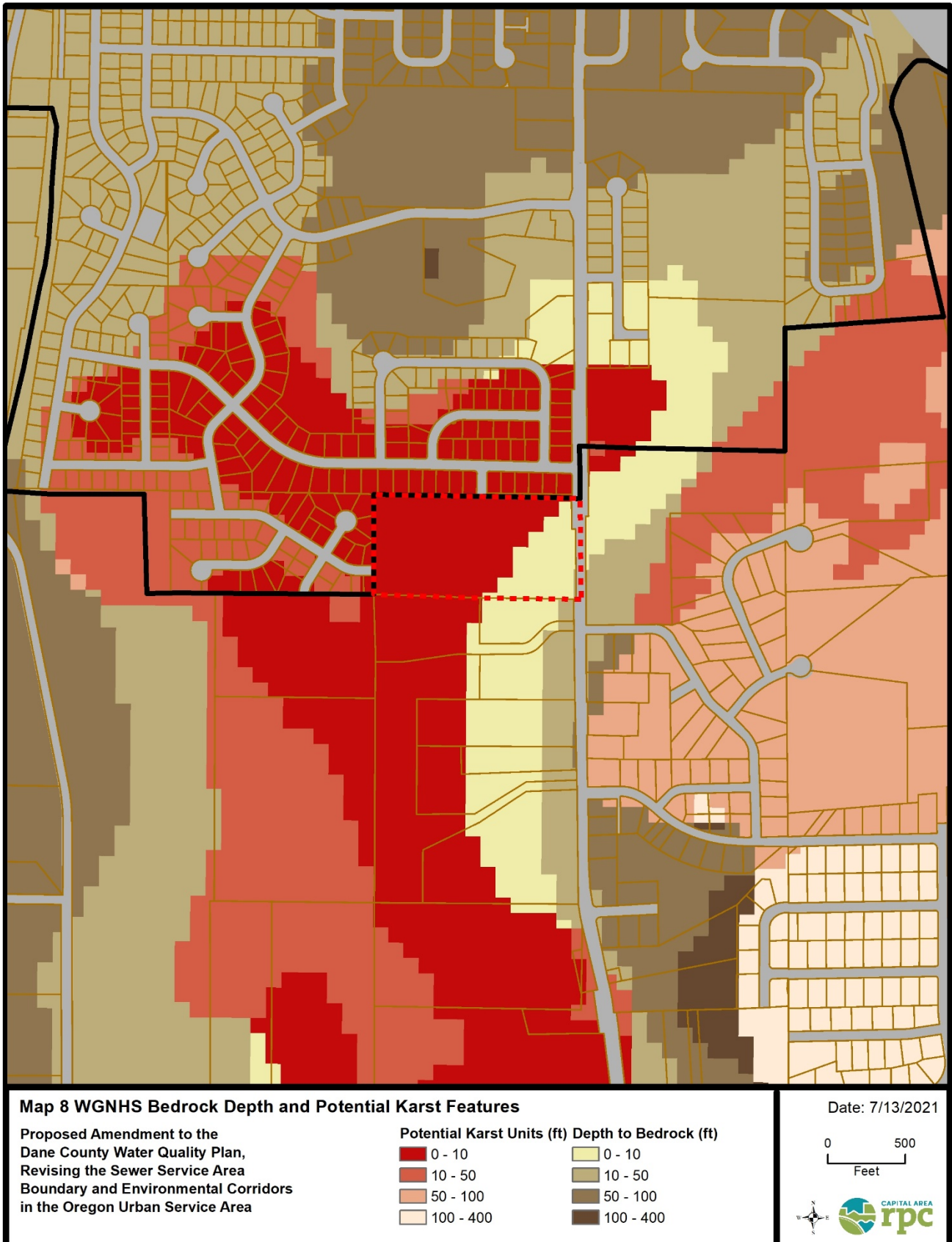


Map 7 - Soil Type

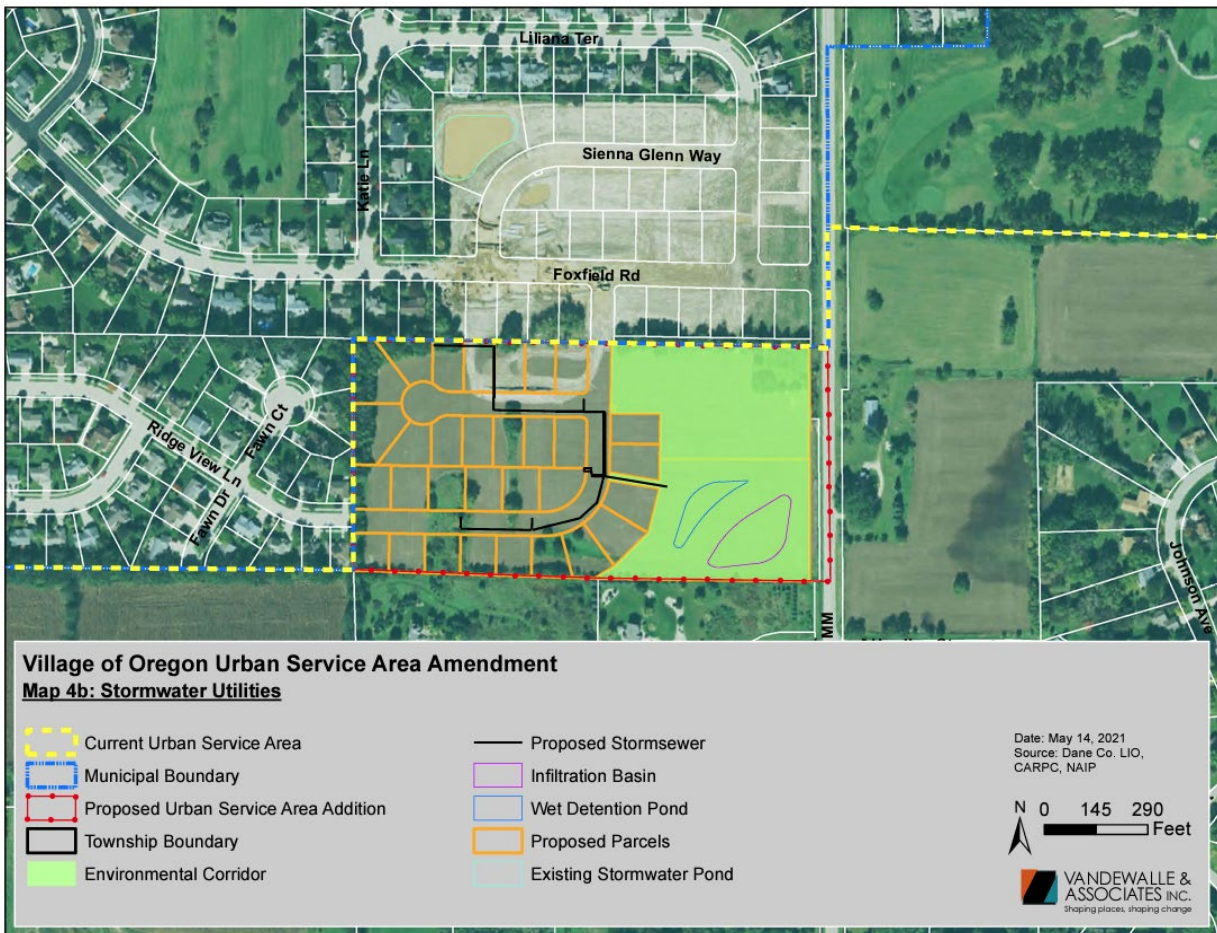
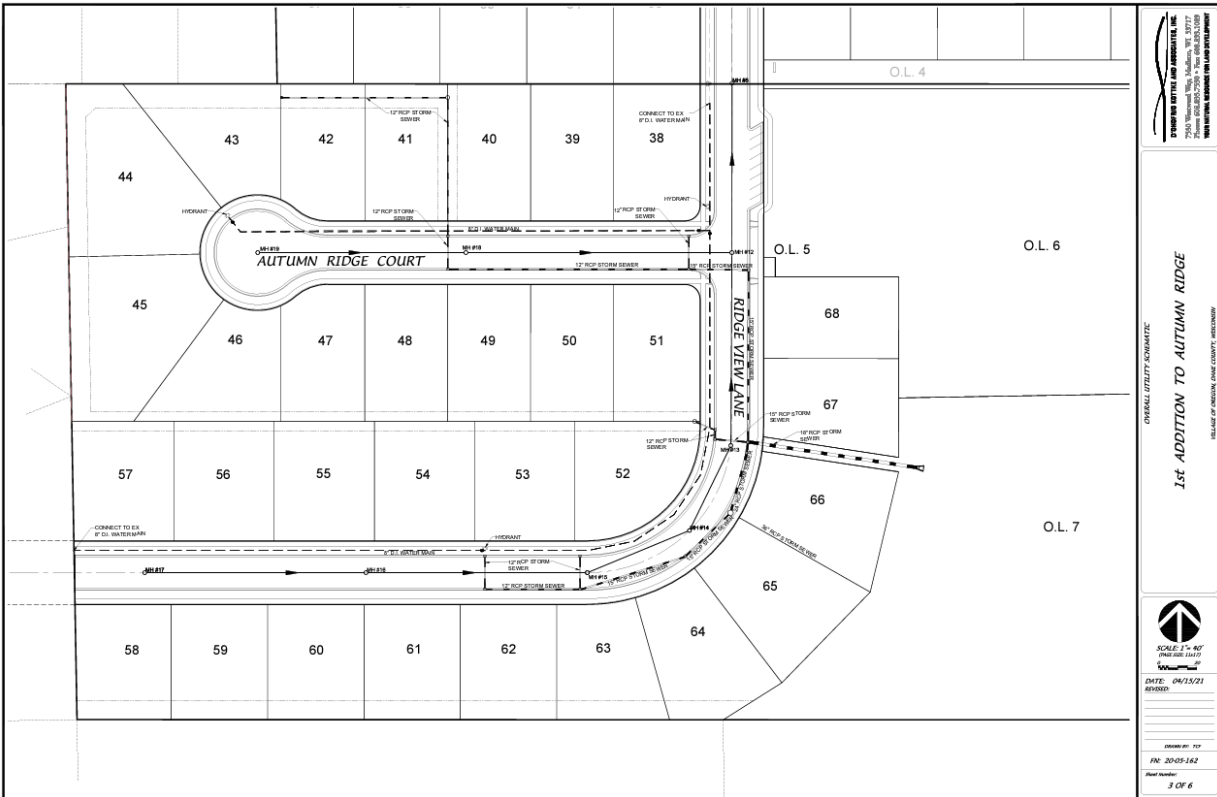




Map 8 – WGNHS Bedrock Depth and Potential Karst Features

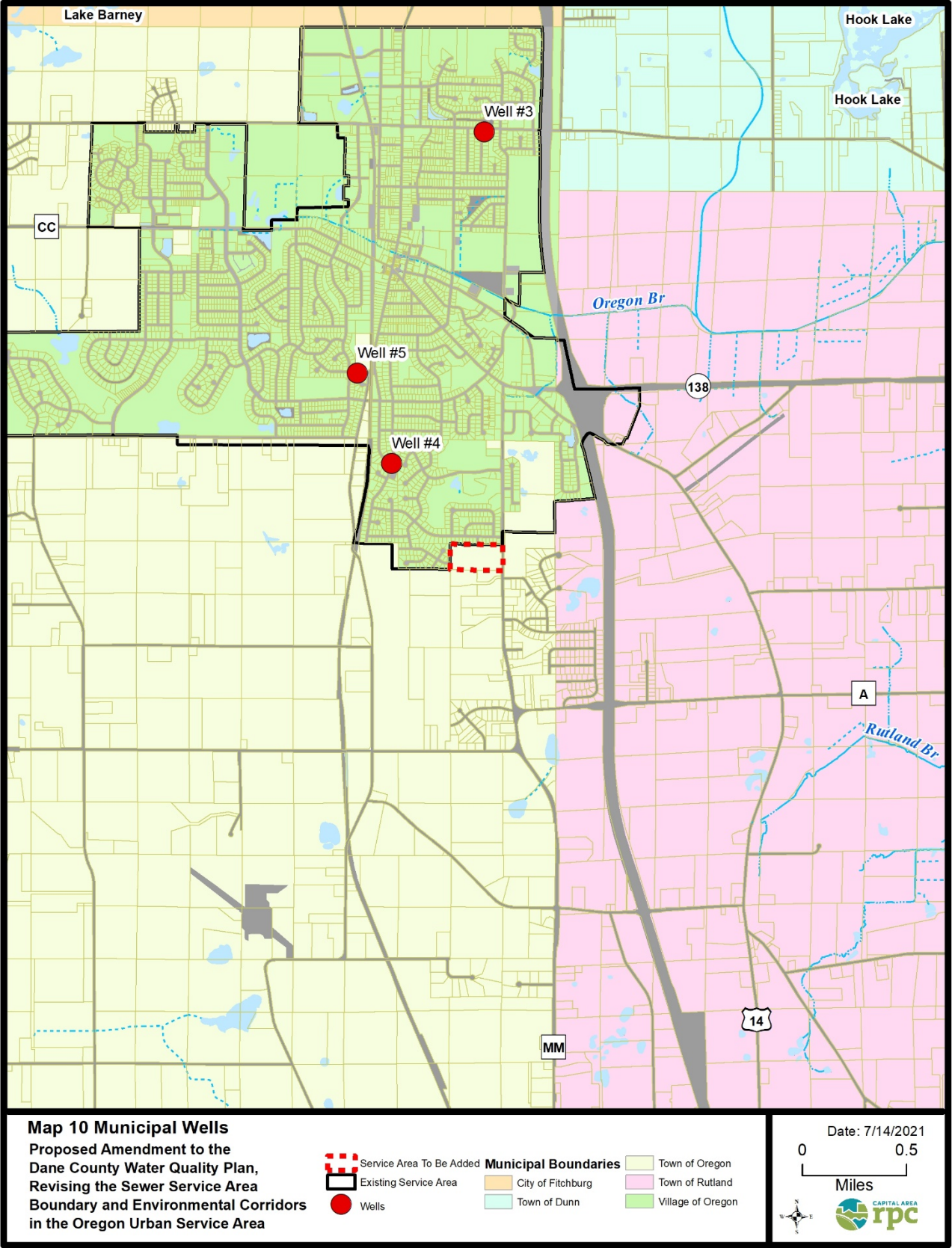


## Map 9 – Planned Utilities and Stormwater Management





Map 10 – Municipal Wells





July 28, 2021

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

RE: Proposed Amendments to Oregon Urban Service Areas, Dane County, Wisconsin

Dear Mr. Higgins:

No previously recorded archaeological sites have been recorded in, or adjacent to the parcel delineated in the amendment. We do not feel that archaeological survey of the amendment area would result in the identification of significant cultural resources.

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. **Work cannot resume until the Wisconsin Historical Society gives permission.**

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,

Amy L. Rosebrough  
Staff Archaeologist  
State Archaeology and Maritime Preservation  
608-264-6494  
[Amy.rosebrough@wisconsinhistory.org](mailto:Amy.rosebrough@wisconsinhistory.org)

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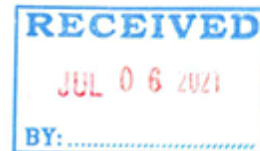
## *Town of Oregon*

1138 Union Road  
Oregon, WI 53575  
Phone (608) 835-3200  
Fax (608) 835-2235  
Web Site: [www.town.oregon.wi.us](http://www.town.oregon.wi.us)  
e-mail: [townoforegon@mailbag.com](mailto:townoforegon@mailbag.com)

Wayne L. Ace, Chairperson  
Jason Marshall, Supervisor  
Fred Clark, Jr., Supervisor  
Kate Gladding, Supervisor  
Arlen Christensen, Supervisor  
Jennifer Hanson, Clerk  
Stephanie Goth, Treasurer  
Kurt Maher, Constable  
Accurate Appraisal, Assessor

June 22<sup>nd</sup>, 2021

Capital Area Regional Planning Commission (CARPC)  
100 State Street  
Ste. 400  
Madison, WI 53703  
608-474-6017



Subject: Village of Oregon request to Amend the Dane County Water Quality Plan, revising the sewer service area boundary and environmental corridors in the Oregon Urban Service Area

The Town of Oregon and the Village of Oregon joined efforts to provide informational meetings for the residents of Oregon Township regarding Phase II of Autumn Ridge. These meetings took place during January and May of 2021. The primary concern for residents was how Phase II would impact the drainage and potential flooding of their properties. Many properties in this neighborhood were already experiencing issues with drainage. The Town of Oregon contacted Dane County Water Resources and asked engineer Elliot Mergen to provide guidance with storm water management planning for this project.

Town of Oregon Park Committee Chair, Steve Root guided a small site visit to the areas of concern in early June for the project developer, project engineer, and CAPRC staff.

After much discussion and consideration, the Town of Oregon is comfortable with the plan for Phase II of Autumn Ridge. The Township continues to have concerns regarding Autumn Ridge Phase III and will address them when/if it is initiated.

Should any unexpected issues occur to residents as a result of the Phase II Development, we are asking that the Village of Oregon address flooding and drainage issues that arise and Phase III not be pursued if Phase II causes such complications. We are confident that we can work with the Village of Oregon to address them.

If CARPC staff has any questions regarding this letter or resident concerns, they can contact Stephanie Goth, Deputy Clerk/ Treasurer [sgoth@town.oregon.wi.us](mailto:sgoth@town.oregon.wi.us) 608-835-3200.

Cc:  
Wayne Ace, Board Chairperson.  
Jason Marshall, Board Supervisor  
Kate Gladding, Board Supervisor  
Fred Clark, Jr., Board Supervisor  
Arlen Christensen Board Supervisor and Plan  
Commission Member

Brian Duffin, Plan Commission Chairperson  
Arlan Kay, Plan Commission  
Dave Hagemann, Plan Commission  
Sharon Christensen, Plan Commission  
Tim Yanachek, Plan Commission  
Andy Blomstrom, Plan Commission  
Jennifer Hanson, Clerk