

2030 BRILLION SEWER SERVICE AREA PLAN

Prepared by the
East Central Wisconsin Regional Planning Commission

in cooperation with the

State of Wisconsin
Department of Natural Resources

WDNR Certification Date: *Insert date*

The preparation of this document was financed in part through a Water Quality Planning Assistance Grant from the Wisconsin Department of Natural Resources and Section 205(j) of the Clean Water Act.

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ABSTRACT

Title: BRILLION SEWER SERVICE AREA PLAN

Staff: Joe Huffman – SSA Planner

Subject: Sanitary sewer service area delineation for future community growth.

Date: **Insert Date** (WDNR Certification Date)

Planning Agency: East Central Wisconsin Regional Planning Commission
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*This plan updates and supersedes the 2000 Brillion Sewer Service Area Plan which is an element of the Manitowoc River Basin Water Quality Management Plan. This plan was prepared by the East Central Wisconsin Regional Planning Commission and was certified by the Wisconsin Department of Natural Resources on **Insert Date** as part of the State of Wisconsin Water Quality Management Plan. It provides population and land use projections and delineates future growth areas for the Brillion Sewer Service Area. Also identified are environmentally sensitive areas which should not be developed. This plan contains policy recommendations encouraging cost-effective and environmentally sound development patterns.*

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Plan Assumptions & Reader Notes

The beginning year for this update was 2012, and hence; data was finalized late 2012 to coincide with this starting timeframe. The plan itself looks out 20 years into the future (2030). The reader should further note that all references to SSA boundaries and acreages are associated with the ‘updated’ (2012) land use conditions, not with the ‘current’ (2000) plan features. Basically, the plan is written as if it has already obtained WDNR approval.

2030 SSA Population, Development and Acreage Projections

In order to ease the reading of this document, all of the detailed demographic and development projection data for each Designated Management Areas (DMA) are contained in a separate appendix (Appendix B). Figures for the aggregate SSA are referenced in the text for descriptive purposes. An attempt was made to have all data reflect conditions as of April, 2012. The planning horizon also encompasses a slightly longer time span, rather than the traditional 20 year span. This will allow staff to provide (in 5-year increments) a 20-year population and development projection when reviewing sewer projects and sizing through the Water Quality Management (WQM or 208) review process.

Future Land Use Designations

The SSA plan has tables and maps which illustrate 2030 SSA’s vacant acreage by proposed land use type. Each community’s land use classification scheme was assessed and simplified so that common land use categories could be compared.

BRILLION SEWER SERVICE AREA

PLANNING AREA DESCRIPTION

The planning area is defined partially by what is felt to be an approximation of the "ultimate service" area of the treatment plant based on capacity, the extent of service areas for individual lift stations or interceptor sewers, as well as delineating and including nearby clusters of development currently on on-site systems which may have long-term needs for sanitary sewer (usually more than 20 years).

The Brillion planning area and sewer service area are located in the northeastern part of Calumet County at the intersection of USH 10 and CTH PP. The majority of the planning area is located within the Town of Brillion, with some portions extending into the Town of Rantoul, and includes the City of Brillion. This plan update re-configures the planning area to exclude large areas of WDNR wetlands, (Exhibit 2). The total Planning Area encompasses approximately 5, 217.7 acres or 8.2 square miles. The updated Planning Area includes all of Sections 22, 23, 24, 25 and portions of Sections 21, 26, 27, 28, 34, 35 and 36 in T.20N-R.20E, and; portions of Sections 1, 2 and 3 in T.19N-R.20E.

Planning area additions/expansions: There were approximately 672 acres deleted from the previous planning area. Of the 672 acres removed, 632 acres were designated wetland areas with the remaining 40 acres being removed from the Town of Rantoul. Only 40 acres were being added to expand the planning area. The 40 acre planning area expansion is located along Round Lake Road, more particularly the NW ¼, SE ¼, Section 36, T20N, R20E. This minor addition is to avoid a coincidence of line between the sewer service area, (SSA), and the planning area boundary, (PAB). In summary, the 2050 Brillion planning area boundary had a net decrease of 632 acres from the previous plan, (Exhibit 2).

LAND USE AND DEVELOPMENT

Exhibit 3 illustrates the 2012 existing land use for the Brillion SSA along with the updated planning area boundary for reference purposes. This information is based on the Commission's detailed land use inventory with corrections made by the community during the update process. This data corresponds with a timeframe (or 'snapshot') of mid-year 2012

In this update, the 2030 SSA contains 1,834.6, an increase of 11% over the last plan period or 183.3 acres. Within the 2030 SSA 910 acres (49.6%) are considered to be developed. The developed lands can be described as follows (Appendix B, Table B-11): 520 acres of single family and multi-family residential land use (20% of total SSA); 35.7 acres of commercial land use (1.9% of total SSA); 48.4 acres of industrial land use (2.6% of total SSA); 300.3 acres of transportation/road use (16.4% of total SSA); 153.3 acres of public/institutional/use (8.4% of total SSA); 5.8 acres of utility

use or planned stormwater detention ponds (0.3% of total). A total of 62.1 acres are considered to be undevelopable land areas or 3.4%. The remaining 137 acres, (7.5% of total area), are designated as environmentally sensitive areas that include wetland and/or stream buffers and designated wetland areas.

Residential Development

Residential development within the 2030 Brillion Sewer Service Area is the dominate land use category. There are considered to be 15.9 acres of multi-family residential, exclusively confined to the city's south central downtown district. The balance of residential development, 350.3 acres of single family residential can be found concentrated in the central north-south corridor within the City of Brillion and scattered residential development throughout the service area. Planned residential developments are expected to continue within the Brillion service area thus promoting cost-effective delivery of services.

Commercial Development

Existing commercial development can be found within the downtown district of Brillion which represents approximately 27.5% of all commercial development, (9.8 acres). Commercial activity has made significant inroads north of USH 10 in the City of Brillion. Commercial development accounts for 75% of all commercial development or 28.6 acres. There are no known designated commercial or office parks within the City of Brillion.

Industrial Development

Industrial development is confined primarily within the north and northeast portion of the 2030 service area. While there are no known designated industrial parks in the City of Brillion, 39.2 acres or 81% of the industrial development lies north and east of USH 10. Small pockets of industrial development are found in the downtown district amounting to less than 2 acres or 3.9% of the total industrial development. The Brillion area is home to at least three major manufacturing or industrial operations providing major employment opportunities to the surrounding area. One active quarry and a municipal landfill can be found in the northern most portion of the City of Brillion. The large land masses have no impact to the wastewater treatment facility thereby not being a contributor to flow volumes and therefore not part of the 2030 Brillion Sewer Service Area.

Public/ Institutional Uses

The City of Brillion provides public and administrative services with respect to open space and recreational facilities, fire protection, police services, educational opportunities, public drinking water and sewer service. The City of Brillion provides park facilities that can be describe as such; Horn Park located east of North Parkway Drive and north of Madison Street; Heritage Park located on South Main Street and CTH PP; Peters Athletic Field located on South Glenview Avenue and Tesch Street; South Park located on South Main and Horn Streets. In addition, the City of Brillion is host to the Deer Run Golf Course situated east of CTH PP and north of Fawn Ridge Subdivision.

In a more regional sense the Brillion area has access to organizations and natural settings that include the Brillion State Wildlife Area, High Cliff State Park, the Brillion Conservation Club and the Brillion Nature Center. Several lakes are in the area for boating, wildlife and fishing opportunities. The most notable water body is Round Lake located southeast of the City of Brillion providing surface water activities. Public and parochial schools are part of the Brillion School District.

A mixture of urban, agricultural, recreational and rural development is present in the planning area. The City of Brillion is the core of denser urban development. With a 2030 estimated population of 3,308 persons, the City of Brillion covers an area of approximately 1,757.9 acres, (2.75 square miles), of which approximately forty-six per cent is developed. The Towns of Brillion and Rantoul, to the extent they are included in this plan, is developing predominately residential land uses with large vacant areas of agricultural and woodland uses. The existing developments within the towns are served by on-site systems.

Exhibit #2 2050 Planning Area Boundary

Exhibit #2 Year 2012 Existing Land Use

LIMITING ENVIRONMENTAL CONDITIONS

Limiting environmental conditions for development are found throughout the Brillion planning area as indicated on Exhibit 4. Areas of steep slope are prevalent in the eastern and southern quadrants of the planning area with smaller areas scattered throughout the service area. High bedrock appears to be consolidated to an area south and west of the wastewater treatment facility. Being a rather large expanse this bedrock area covers approximately 275 acres. Ground water within two feet of the surface is abundant throughout the City of Brillion and the Towns of Brillion and Rantoul as a whole. These conditions will pose minor limitations for development and the use of individual septic systems within the planning area.

Watersheds & Water Features

The Brillion Sewer Service Area and its Planning Area falls entirely within the North Branch Manitowoc River subwatershed of the Manitowoc River Basin with all drainage flowing directly or indirectly into Lake Michigan via existing ditches, wetland areas, and stream corridors. The North Branch Manitowoc River subwatershed covers most of northeastern Calumet County and encompasses approximately 42,746 acres (66.8 square miles). This subwatershed was recommended for additional study and assessment to determine the watershed's ranking for the NPS priority selection process according to the Manitowoc River Basin Plan (WDNR, 1991).

Major surface water features within the Brillion Planning Area include:

- Spring Creek - According to the Manitowoc River Basin Plan, this creek is a very hard water stream originating north of Brillion and flowing for more than five miles generally southwesterly before draining into the Brillion Marsh and continuing to its confluence with the North Branch Manitowoc River. The sport fishery of this creek is limited due to the sluggish flow of water through the Brillion Marsh, as well as the periodic low oxygen content;
- Black Creek - This creek is located in the southern portion of the Planning Area, north of Deer View Road. According to the Surface Water Resources of Calumet County (WDNR, 1971), Black Creek is an intermittent stream that seasonally flows into Brillion Marsh with little or no fishery potential.
- Grass Lake - According to the Surface Water Resources of Calumet County, Grass Lake is a marshy basin which contains no fishery and has little recreational use except waterfowl hunting. No public access is available to this lake.
- Brillion Marsh - The largest wetland area within the subwatershed, this marsh is the headwaters for the North Branch Manitowoc River.

Wetlands

Wetlands are essential environmental features for providing wildlife habitat, scenic open spaces, flood water retention and groundwater discharge areas. Wetlands act as a natural filtering system for nutrients such as phosphorus and nitrates. They provide a buffer zone protecting shorelines and streambanks. These wetlands are found throughout the Planning Area, but are most prevalent in the western and southern portions.

Forested wetlands are found mainly in the southern portion of the Planning Area, east of CTH PP, while several areas of scrub/shrub wetlands existing north of USH 10 and west of CTH PP. Large areas of palustrine, emergent, narrow-leaved wetlands exist within the Brillion Marsh, the headwaters for the North Branch Manitowoc River. Portions of this marsh are owned by the WDNR and designated as the Brillion State Wildlife Area. The Brillion State Wildlife Area is managed primarily for waterfowl and is open for public hunting, trapping, and dog trials. Great egrets, a Wisconsin threatened species, are common during the summer months within the Wildlife Area.

Wisconsin Administrative Code NR 115 and NR 117 mandate that wetlands be protected in both the rural and urban areas of the state. In the unincorporated areas, NR 115 protects wetlands or portions of wetlands within the shoreland zone that are designated on Wisconsin Wetland Inventory maps prepared by the Wisconsin Department of Natural Resources. To protect wetlands in incorporated areas, NR 117 was enacted in 1983 and requires that all wetlands or portion of 5 acres or more in size located in the shoreland zone be protected and outlines minimum shoreland zoning standards for Wisconsin cities and villages. In addition to NR 115 and NR 117, NR 103 outlines water quality standards for wetlands and requires that all practicable alternatives be considered to avoid and minimize wetland disturbance and to ensure preservation, protection, restoration and management of wetlands. Any alterations that are to be made to any wetland, regardless of size, need to be reviewed and approved by the U.S. Corps of Engineers and the WDNR before any action can be taken.

Floodplains

Mapped FEMA Floodplains exist within various portions of the defined Planning Area. Areas susceptible to flooding are considered unsuitable for any type of development due to the potential health risks and property damage. As revised in 1984, the Flood Insurance Rate Map (FIRM) for the *unincorporated* portions of Calumet County identify numerous areas within the Town of Brillion and Town of Rantoul which are subject to flooding within the 100-year floodplain. These areas are located along Black Creek and surrounding Grass Lake in the southern portion of the Planning Area; encompassing a majority of the Brillion Wildlife Area in the western portion; along Spring Creek and the "Ariens Ditch" in the northern portion, and; in several spotty low-lying areas in the eastern portion of the Planning Area. A majority of the floodplain areas outside of the City are currently undeveloped at this time and will place some moderate limitations on the expansion of development.

As revised in 1984, the Flood Insurance Rate Map (FIRM) for the *incorporated* portions of Calumet County identify areas within the City of Brillion subject to flooding within the 100-year floodplain along the Spring Creek corridor, Black Creek corridor, and the "Ariens Ditch". A large portion of these areas are currently developed or encroached upon which has caused flooding problems in previous years. The City has taken some measures recently to construct new flood control structures and identify future stormwater detention/retention ponds which will alleviate future flooding. Several of these flood storage areas are shown as "undevelopable" on Exhibit 1. Several of the floodplain areas are in the process of being re-evaluated by FEMA for exclusion from the floodplain designation.

Soils

Soils support the physical base for development within the Planning Area. Knowledge of the limitations and potential difficulties of soil types is important in evaluating land use proposals such as residential development, utility installation and other various projects. Some soils exhibit characteristics such as slumping, compaction, erosion, and high water tables which place limits on development. Severe soil limitations do not necessarily indicate areas cannot be developed, but rather indicate more extensive construction measures must be taken to prevent environmental and property damage. These construction techniques generally increase the costs of development and the utilities needed to service that development.

According to the Soil Survey of Calumet and Manitowoc Counties, prepared by the USDA in 1980, three major soil associations are present within the Brillion Planning Area:

- **Kewaunee-Manawa-Poygan Association:** This soil association encompasses approximately 80 percent of the Planning Area. This association consists of soils on undulating ground moraines made up of knolls, ridges, and plains that are dissected by drainageways and broad depressions. The soils are mostly nearly level to sloping, but along the sides of drainageways and on escarpments, they are steeper. These soils are well drained to poorly drained that have a dominantly clayey subsoils and substratum. They have good potential for cultivated crops but have severe limitations for use as septic tank absorption fields.
- **Pella-Mundelein-Shiocton:** This soil association comprises approximately 10 percent of the Planning Area and is located just west of the City limits. This soil association coincides with many areas of the Brillion Wildlife Area. This association consists of soils on till plains and in glacial lake basins. The soils are mostly nearly level, but in some areas are gently sloping. These soils are somewhat poorly drained and poorly drained that are dominantly loamy throughout. If drained, these soils have good potential for cultivated crops. These soils have severe limitations for use as septic tank absorption fields.
- **Houghton-Palms-Willette:** This soil association is located in the south-central and south-eastern portion of the Planning Area and comprises approximately 10 percent of the total

area. This association consists of soils in glacial lake basins and on till plains. They are nearly level and are very poorly drained. Most of these soils are in natural vegetation of trees and sedges which provide good habitat for wildlife. These soils also have severe limitations for septic systems.

Based on this soils information, no steep slopes (12% or more) are present within the Planning Area. Bedrock located near the surface is of concern primarily in the northern portion of the planning area. The depth to bedrock within the Planning Area ranges from 33 feet in the northeastern portion to 178 feet in the western portion. High bedrock may not only hinder development due to the cost of rock excavation, but it also coincides with a lack of soil which can filter pollutants before they reach groundwater; thus, the potential for groundwater contamination in high or exposed bedrock areas can be extremely high.

Groundwater

The groundwater resources of area are generally plentiful and of fair quality. Groundwater resources within the Planning Area are linked directly to the surficial glacial deposits and underlying bedrock structure. The Brillion Planning Area covers the Niagara Dolomite bedrock formation almost entirely. Since no detailed geologic maps are available in this area, a small portion of the southern and/or western extent of the Planning Area may or may not contain this geologic layer of bedrock. In most areas along the western extent of the Niagara Dolomite, an escarpment (cliff face or steep slope) is present, however; in the Brillion area this western extent is "submerged" below glacial till. Assuming that this bedrock layer is present throughout the Planning Area, four aquifers should be present. These aquifers can be generally described as follows:

- The Water Table Aquifer - Present in all areas of the Planning Area and consists of glacial sediments deposited by several glacial advances that covered portions of all of Calumet County. The thickness of this aquifer is variable, being greatest in pre-glacial bedrock valleys and least over topographic highs in the bedrock surface. Sand and gravel seams, present throughout the aquifer, typically can transmit adequate amounts of water for private well systems.
- The Niagara Aquifer - Specific to the area underlying the Niagara Cuesta, this aquifer forms an important regional aquifer along the western side of Lake Michigan. The Niagara Aquifer is underlain by Mequoketa Shale which does not transmit water easily and, therefore, acts as a confining layer between the Niagara Aquifer and the much more expansive Sandstone Aquifer of Wisconsin. The Niagara Aquifer consists of water stored in cracks and fractures located randomly throughout the rock. Fractured rock aquifers are particularly susceptible to pollution. In such areas, human activities and land uses take place in close proximity to features that provide relatively direct point source input routes for aquifer recharge. Dissolved and suspended contaminants can be moved rapidly across the land and into the subsurface with little or nothing to inhibit them. Examples of

affected water supply wells, springs, and surface water bodies are common in such geologic settings. The potential for groundwater contamination is classified as high throughout most of this area.

- The Platteville-Galena Aquifer - Located below the Water Table Aquifer and below the layer of Mequoketa Shale, this aquifer is comprised primarily of dolomite and acts as a leaky confining layer over the sandstone aquifer. It does not transmit water as readily as the underlying sandstone, but it is capable of supplying adequate amounts of water to private water systems due to secondary fractures.
- The Cambrian (St. Peter's) Sandstone Aquifer - The area's thickest and most important aquifer, it is the most widely used for sustained high capacity wells for municipal and industrial uses.

All City of Brillion residents are provided public drinking water from a municipal system drawing water from three individual wells. Two of these wells are approximately 180 feet in depth, drawing groundwater from the Niagara Dolomite (Silurian) Aquifer, while the third well is at a depth of 805 feet and drawing groundwater from both the Galena-Platteville and St. Peter Sandstone formations. The two shallower wells are more susceptible to contamination due to the fractured nature of the dolomitic limestone of the Niagara Dolomite formation. Individual shallow wells outside of the City are also more susceptible to the threat of contamination.

Concerns on the future provision of public water to areas of the City exist based on the topography of the land. According to the City's engineers, areas in the eastern portion of the City or beyond, which are at or above 864' above sea level, may not be serviceable by municipal water without significant modifications to the water system to increase water pressure. This will limit the amount of new development in these areas and, if not improved, direct most new development to the western and southern areas of the City.

Exhibit #4 ESA's & Limiting Environmental Conditions

DESIGNATED MANAGEMENT AREAS

Exhibit 5 illustrates the existing Designated Management Areas (DMAs) within the 2030 Brillion Sewer Service Area. DMAs are the legal entities (communities, sanitary districts, or utility districts), responsible for the collection and/or treatment of wastewater. Within the Brillion Planning Area there are four governmental entities which exist, one of which is the DMA.

City of Brillion *
 Town of Brillion
 Town of Rantoul
 Calumet County

**indicates DMA designation*

Short descriptions of each DMA, including basic information on their involvement in land use planning and intergovernmental cooperation activities is contained below:

City of Brillion - The City of Brillion covers an area of approximately 2.2 square miles, or 1,330.6 acres, (the acreage figures are for the portions actually within the 2030 Sewer Service Area). In the 2010 Census count the City had a population of 3,148 persons with 2.43 persons per household.

The City is equipped with a Community Development department and a City Administrator's office conducting land use planning and capital improvement projects. In addition, the City Plan Commission and City Council oversee the adoption of major development efforts. The City of Brillion is currently operating under an adopted 2003 Comprehensive Land Use Plan with amendments to the plan as recently as 2009. The City of Brillion is the sole collector and treatment of wastewater for the 2030 Brillion Sewer Service Area.

Town of Brillion – Roughly 27% or 488 acres that make up the 2030 Brillion Sewer Service Area are considered to be Town of Brillion. There is very little existing development, primarily residential, within the 2030 Brillion Sewer Service Area. The vast majority or, 68%, remains in agriculture and other vacant developable property. A majority of residents within the Town of Brillion rely on individual on-site wastewater treatment systems (conventional, mound, and holding tank). Calumet County currently has a ban on holding tank installations for new development, however; they may be used as replacement systems. The Town of Brillion adopted their Smart Growth Plan in 2003. According to the 2010 Census the Town of Brillion had a total of 546 households with a rate of 2.72 persons per household.

Town of Rantoul – The Town of Rantoul has the least impact on the 2030 Brillion Sewer Service Area. Actual sewer service is limited to the extreme southern portion of the service area

along CTH PP. A small area of service area is also located south of Round Lake Road. As with the Town of Brillion, residents in the Town of Rantoul utilize on-site wastewater systems for

Exhibit #5
Political Jurisdictions & DMA's

treatment means. In terms of land use planning the Town of Rantoul is included in the *'Calumet County Year 2025 Smart Growth Plan'* adopted in 2007 with plan amendments added as recently as 2012. According to the 2010 Census the Town of Rantoul had a total of 272 households with a rate of 2.93 persons per household.

SEWERAGE COLLECTION AND TREATMENT SYSTEM

A majority of residents within the Towns of Brillion and Rantoul rely on individual on-site wastewater treatment systems (conventional, mound, and holding tank). Calumet County currently has a ban on holding tank installations for new development, however; they may be used as replacement systems. Although the City provides public sewer, there are several homes in outlying areas of the City which are still utilizing on-site systems.

The City of Brillion's wastewater treatment facility (WWTF) is located on 1201 Clearwater Drive in the southwestern portion of the community. This facility was constructed in 1981 with several minor modifications occurring to the present date. The treatment plant uses an activated sludge treatment system to process raw sewerage followed with tertiary filtrations by sand filters. The treated effluent is discharged into Black Creek, a tributary of the Manitowoc River with treated sludge being fed to a reed bed. In the event the reed bed cake is removed plans are in place to land fill or land spread the sludge. The plant has had an excellent record of performance and has consistently met permit limits. During the reporting year 2011 the Brillion wastewater treatment facility had removal efficiencies of 97.2% for Biochemical Oxygen Demand, (BOD), with an average monthly effluent of 3.6 mg/l and Total Suspended Solids, (TSS), effluent averaging 3.4 mg/l per month. According to the 2011 Compliance Maintenance Annual Report (CMAR), the plant was designed for a maximum average design flow of 993,000 gallons per day (.993 mgd). The annual average monthly flow for 2011 was .726 mgd; therefore, approximately 27 percent of the capacity remains unused in the system. Recent upgrades to the plant include the replacement of a sludge pump and blower motor.

In summary, the permit and design information for the City of Brillion treatment plant is as follows:

- **WPDES Permit Number:** WI-002443-07-0
- **Receiving water:** Brillion Marsh via Black Creek (MA04), Calumet County
- **Design Flow:** .993 mgd
- **Average Flow (Jan.- Dec., 2011):** .726 mgd
- **Design BOD (lb./day):** 1,203
- **Average BOD Influent (lb./day, Jan.-Dec., 2011):** 135.1
- **Average BOD Effluent (lb./day, Jan.-Dec., 2011):** 3.6
- **Treatment Type:** Activated Sludge

- **Sludge Treatment:** Aerobic Digestion
- **Sludge Disposal:** Feed sludge to reed beds

Collection/Conveyance Systems

The City's existing wastewater collection system consists mainly of eight inch gravity sewers. The smaller sewers lead to larger collector (10-inch to 15-inch) sewers, which, in turn, feed into a series of 18-inch and 21-inch interceptors located in the central portion of the City. Wastewater is then pumped into a 14-inch forcemain for transport into a 21-inch interceptor which leads to the treatment plant. In total, there is slightly over 17 miles of public sewers within the City. The City currently jet cleans 1/5 of the entire system each year, inspects 25% of the manholes per year and does television inspections as deemed appropriate to identify infiltration and inflow problems. The City has, in 2012, developed a "*Wet Weather Facility Plan*" to address inflow/infiltration issues as related to the Brillion sewer collection system. Exhibit 6 depicts the major gravity sewers, force mains and lift stations.

There are four lift stations within the Brillion sewer system system, two of which are fairly new and service existing and future single family residential subdivisions located in the southern portion of the City. Larger areas of planned residential in the southwestern portion of the service area will be serviceable by gravity sewers utilizing the lift station located near CTH PP, (Fawn Ridge Subdivision). Lands in the northwestern portion of the service area are serviced by gravity sewers and a lift station located on USH 10 and Northway Drive. Post-development activity has yet to materialize given the recent construction of a high school south of USH 10. As development progresses in the northwest portion of the service area, it may require the City to strategize for additional lift stations or perform analysis on existing lift stations for possible upgrades. At the time of this update the treatment plant's CMAR indicates there are no known issues or concerns related to the existing four lift stations within the service area.

Table 1
2011 Brillion WWTP Performance Report

Exhibit 6
WWTF & Infrastructure Locations

FORECAST GROWTH AND DEVELOPMENT

The 2030 Brillion Sewer Service Area is expected to have similar rates of growth as compared to previous years, (Table 2). The total sewer service area is projected to increase by 780 people, (859 including a 10% increase), thus bringing the population of 5,432 in 2010 to 6,212 persons in the year 2030. It should be noted, however, the majority of additional gains in population are found in the Town of Brillion, (616 persons during the planning period). Wisconsin Department of Administration projections, (which have yet to be released for 2012), show a **decline/increase** in total population between 2010 and 2030. The WDOA expects a total population of **####** in 2030; a **(decrease/increase)** of **##** persons from 2010. Projected households, (dwelling units), will **(decrease/increase)**, even though a decline in population is shown, due to the decreasing persons per household size over time. With a 10% market factor built in an increase of 303 households are expected between 2010 and 2030. It is estimated that 92% of these units, (279), will single family residential; 3%, (9), duplex units, and 5%, (15), slated for multi-family housing units. Residential densities of 3.0 single family units per acre, 5.0 units for duplex per acre and 10 units per acre for multi-family construction. These densities dictate an additional residential acreage need of 112 acres to sustain residential development. Actual allocations to the plan show only 82 acres of vacant developable lands being added for residential development. This low allocation is offset by two prominent areas designated as residential development within the existing sewer service area.

Labor force and employment statistics from the 2010 Census shows the City of Brillion with a labor force of 2,300 persons. The actual participation rate is at 1, 574 persons or 68%. The forecasts for commercial and industrial growth amounted to a negligible 17 acres. Actual allocations for industrial and commercial uses totaled approximately 46 acres. The 2030 Brillion Sewer Service Area anticipates continued economic growth as evidenced by designating these allocations as a priority two development area.

Based on the increase in population for the year 2030 the allocations expanding the service area seem reasonable for this particular plan update. In addition, the proximity to the Fox Cities, Green Bay and Manitowoc coupled with a strong industrial base and the completion of a new high school in recent years, the City will likely continue to experience growth at or above the projections shown in Table 2.

Based on this information, this update of the SSA attempted to re-allocate or, (re-position), existing vacant lands to appropriate growth areas instead of adding significant amounts of new land to the SSA. Conforming the sewer service area boundary with updated wetland buffers required minor re-allocations for the purposes of consistency.

Table 2

Brillion SSA Population/Housing Projections, 2010-2030

GROWTH ALLOCATION AREAS AND 2030 SSA

The policy basis for allocating acreage for future development is outlined in the Sewer Service Area Delineation and Planning Process on page ##. These policies take into account a broad range of land use and environmental concerns directed toward encouraging orderly, cost-effective and environmentally sound development. Working within the broad policy base, the sewer service area plan also considers sewer system capacities, land development market trends, development plans and preferences of the individual communities. New vacant lands available for development within the updated SSA boundary total 726 acres.

Priority Development Area Mapping

During the SSA Plan update a thorough assessment regarding the phasing, or ‘priority’ areas of development was determined by the City of Brillion. During the working meetings with the City and email exchanges, a map was developed which indicated their general thoughts of development timing based on their local comprehensive plan, landowner knowledge and planned capital improvements. Three levels of ‘priority’ were assigned to overall areas requested for addition to the current plan update and can be simply described as follows: Priority #1 – generally felt to develop in the next 5 to 10 years; Priority #2 – generally felt to develop in 10 to 20 years, and; Priority #3 – generally thought to develop in 20 or more years, primarily based on the need for and timing of major sewer infrastructure. For the entire SSA, the ‘priority area requests’, were as follows:

- Priority #1 areas – 145 acres;*
- Priority #2 areas – 91.8 acres;** and
- Priority #3 areas – 129.2 acres.

Exhibit 7 illustrates the ‘priority areas’ and their location based on the City’s request. While East Central will not formally hold each community to these development priorities, they will serve to remind the Commission, community, and public of the basic thoughts of development timing determined in 2012. It should be noted that East Central may, and in some cases has, recommended conditions be attached to WDNR sewer extension approvals where needed to deal with conflicts related to development timing issues or to preserve designated environmentally sensitive areas that lie within the growth allocation areas.

*The 145 acres listed as a Priority #1 consist of two separate areas. Both of these areas were previously included in the 2020 Sewer Service Area Plan and are **not** considered to be allocation areas. The first area totals approximately 93 acres located along Bastian Road in the northwest corner of the 2030 Brillion Sewer Service Area. This area is proposed to develop as single family and/or mixed residential construction. The second area totaling approximately 53 acres would accommodate and continue with the phasing of the Fawn Ridge Subdivision. This area is

located south of Ridgeway Road and CTH PP in the southern reaches of the 2030 Brillion Sewer Service Area. The City has a high priority in developing both of these areas.

A third of this total priority or 30.4 acres were previously within the 2020 Brillion Sewer Service. This area along East National Avenue is scheduled for residential development. While it may be considered in-fill development, the City of Brillion places a high priority to develop this parcel to utilize the advantages of the existing infrastructure. This area is **not an allocated addition to the 2030 Brillion Sewer Service Area.

While East Central will not formally hold each community to these development priorities, they will serve to remind the Commission, community and public of the basic thoughts of development timing determined in 2012. It should be noted that East Central may, and in some cases has, recommended conditions be attached to WDNR sewer extension approvals where needed to deal with conflicts related to development timing issues or to preserve designated environmentally sensitive areas that lie within the growth allocation areas.

Exhibit 7
Priority Development Areas Mapping

Table 3
Summary of 2020 & Proposed 2030 SSA Conditions

Year 2030 Sewer Service Area

The year 2030 Sewer Service Area for the Brillion WWTF is illustrated in Exhibit 8 and contains a total of 1,834.6 acres. Of this total, 127.6 acres have been designated as environmentally sensitive areas (ESAs) and 726 acres are considered to be vacant/developable areas. If one removes the vacant acreage that is reserved for public or institutional uses based on community requests of 42.1 acres, from this total, a final figure of 683.9 acres are left to accommodate traditional residential, commercial, and industrial development. This compares to a calculated vacant acreage need of 151.0 acres for these types of development; therefore, an ‘excess’ of 574 vacant acres exists within the 2030 SSA, (Table B-11, Appendix B details the 2030 existing land use figures). A short description of the acreage allocations and growth areas are provided below (see Exhibit 8 regarding acreage allocation locations):

- **City of Brillion** - Based on the Priority Development Areas mapping, (Exhibit 7), the City of Brillion identified two areas as a priority one development area. As previously stated these areas were already designated as 2020 sewer service area prior to the 2030 update process. These areas total 145 acres and are proposed to develop as single family residential and/or mixed residential uses. So, as a technical matter there were no sewer service area allocations for the City of Brillion, per se.
- **Town of Brillion** – All allocated acreage awarded to the 2030 Brillion Sewer Service Area lies within the Town of Brillion. The 183 acre addition is split into two separate areas with opposing proposed land use designations. The first area totals approximately 61.4 acres located in the northern limits of the service area bisected by Hacker Road. This allocation is proposed to develop as commercial/industrial. The second area of this allocation totals approximately 129.2 acres and is situated in the southeastern quadrant of the 2030 Brillion Sewer Service Area. The allocation area straddles Blackbird Lane with a small portion extending east of Round Lake Road. There are 29.3 acres of existing residential development within this allocation and the remaining vacant developable acreage is slated for single family residential. It is anticipated that annexation to the City of Brillion would be required to receive municipal services.
- **Town of Rantoul** – There were no allocations within the Town of Rantoul. Changes, however, were made to the planning area boundary. A forty acre area in the extreme south central portion of the planning area was removed and placed as a planning area expansion south of Blackbird Lane and east of Round Lake Road.

Minor administrative adjustments were made along the 2030 Brillion Sewer Service Area boundary. These adjustments are the result of the requirement to buffer the designated wetlands. East Central obtained updated wetland delineations from the Wisconsin Department of Natural Resources. Based on these updated wetlands it was necessary to bring the 2030 sewer service

area boundary into conformance. In terms of acreage there were 8.3 acres added as a result of the administrative correction and approximately 13.1 acres removed for the same reasons. The final result shows a net decrease of 4.8 acres to the overall 2030 sewer service area boundary.

East Central has long maintained that extensive development between the current sewer service area and planning area boundaries be discouraged. By limiting planned subdivisions in these areas will greatly reduce the cost of retro-fitting utilities as the community expands outward. These recommendations and policies may be found on [page ##](#) referencing Addendum Policy 1.4. This policy targets primarily urbanized developments, however, the Towns of Brillion and Rantoul could well benefit from its stated purpose.

Holding Tank Service Areas

There are sewage holding tanks and individual on-site septic systems within the 2050 Brillion Planning Area. According to Wisconsin Administrative Code NR113 septic pumpage from these systems are directed to the regional treatment facilities. According to the 2011 Compliance Maintenance Annual Report the Brillion WWTF did not receive any outside septage nor was it requested to do so by private haulers. In addition, large holding tanks exceeding 3,000 gallons per day need a special holding tank service area designation. There are no known large holding tanks present in the 2050 Brillion Planning Area.

Exhibit #7
Priority Development Areas

WATER QUALITY ASSESSMENT and DEVELOPMENT IMPACTS

Continued urbanization of the Brillion Planning Area will impact surface and groundwater resources. Short term impacts include the increase in surface water runoff and pollutant loadings as well as a reduction in groundwater recharge areas. Long term, cumulative development impacts include the loss of baseflow in streams and enhanced stream flashiness (flooding). The scope of these impacts cannot be precisely determined because specific development characteristics (location, type, density) are unknown. However, it is possible to generally estimate water quality impacts by applying assumptions concerning the nature of future development.

Point Source Water Quality Impacts

Population growth and commercial / industrial development will increase loadings to the wastewater treatment plant, and ultimately to surface waters of the Brillion Marsh. Without a wastewater engineering assessment it is not possible to analyze specific flows for the different existing land uses and estimate future flows for comparison to treatment plant design capacity. A rough estimate comparing existing average daily flows of current development can be made, (see table 4). Based upon this analysis, the average flows are expected to increase by .175 mgd or 175,000 gallons which is within the design capacity of the current treatment facility.

Non-point Source Water Quality Impacts

The Brillion Sewer Service Area lies within the North Branch Manitowoc River subwatershed of the Manitowoc River Basin. The diversity of land uses within this watershed may contribute significant amounts of sediment loads, nutrients and other pollutants into the watershed. These loadings are carried via existing ditches, stream corridors and wetland areas found throughout the 2030 Brillion Sewer Service Area. Directly or indirectly, these loadings are ultimately deposited in Lake Michigan.

It is anticipated that surface runoff and pollutant loadings will increase with the forecast growth for the 2030 Brillion SSA. The placement of roads, buildings, parking lots and other large impervious areas increase the amount of water run-off thus carrying organic and inorganic pollutants associated with these land use types. The Department of Natural Resources has general guidelines for estimating unit area loadings of pollutants by land use categories. Within the 2030 Brillion SSA, four pollutants, (sediment, phosphorus, zinc and lead), have been analyzed for eight land use categories. The estimated loadings address both existing and future land uses. The estimates only relate to land uses within the service area with resultant impacts on the local rivers, streams and open water. Specific subwatershed analysis was not performed.

The estimated annual pollutant loadings for the existing development area, (based on 2012 land use), within the 2030 Brillion SSA are listed in Table 5. The land uses within this area consist

primarily of older development with significant infrastructure therefore stormwater mitigation is more difficult and costly in these areas.

Table 6 illustrates the future annual pollutant loadings expected based on the total amounts of development which could occur by 2030 within the Brillion SSA if all the available vacant lands were developed. The pollutant loadings are estimates for the proposed land uses with no significant stormwater mitigation measures or practices adopted. Proposed land uses are shown in Exhibit 9, Year 2030 SSA & Proposed Land Use. Utilization of stormwater detention facilities, site development controls, preservation of green space and other measures can help mitigate urban non-point source impacts on water quality. These loadings can serve as a baseline for proposed areawide stormwater reduction efforts.

Groundwater Impacts

Increased development of the recharge areas could have long-term impacts on the groundwater recharge. Conversion of rural/agricultural lands to urban uses may impact both the quality and quantity of groundwater as development continues. Groundwater recharge will decrease as areas are paved over or built upon. At the same time, withdrawal of groundwater on a regional basis is likely to increase for domestic, commercial and industrial use.

Water Quality Protection & Stormwater Management

Cumulative impacts, including loss of base flow in streams from increased development of impervious surfaces and enhanced stream flashiness and the resulting stream bank erosion from alterations to headwaters and tributaries, will occur with full build-out of the sewer service area. Stormwater management actions other than large-scale detention ponds are available for older urban areas such as enhanced street sweeping, comprehensive stormwater management and other nonstructural best management practices.

Stormwater management requirements are incorporated in the City of Brillion's Subdivision Design Ordinance to address run-off and on-site erosion as control measures. This ordinance applies to commercial, industrial and residential development of lands within the corporate limit area. Whether the developments are residential in nature or commercial/industrial construction the City may require storm sewer and/or detention pond construction as part of the stormwater management planning. The 25-year storm is the standard used in determining both pre and post development rates of runoff. Stormwater management plans for stormwater facilities require the implementation of the Wisconsin Construction Best Management Practices to address water quality and water quantity issues.

East Central recommends receipt of preliminary subdivision plats for review for a conformance check with the sewer service area and water quality plan. Recommendations would be made for final plat approval based on water quality, stormwater management, environmental and cultural resource concerns.

East Central also provides mandatory sewer extension review comments. Where sanitary sewer extensions are proposed in mapped environmentally sensitive areas or on other lands whose physical characteristics indicate susceptibility to erosion or flooding, or where development of such lands is likely to impair surface or groundwater quality or uses, East Central may identify mitigating conditions to be incorporated into the development proposal. East Central may also request the WDNR to attach such conditions to any sewer extension approval for the proposed development. Where the impacts of development pose significant water quality impacts or negatively impact environmentally sensitive areas, the Commission may recommend denial of the proposed extension.

Voluntary preliminary plat review and mandatory sewer extension review are the primary mechanism for service area plan implementation and the attainment of water quality plan objectives.

RECOMMENDATIONS

1. Continue to implement existing plans and programs to control infiltration and inflow to the wastewater treatment plant so as to increase capacity for new developments.
2. Monitor new development and loadings to the WWTF in order to determine the appropriate time for the City to initiate facility planning efforts to address potential capacity deficiencies.
3. Close coordination for the planning of any sewer development in the transitional areas should be undertaken by the City of Brillion, the Town of Brillion, and the Town of Rantoul.
4. Efforts should be made to direct development to areas where sewers are already in place before extending new sewers into undeveloped areas. Efforts should also be made to maximize use of gravity sewers as well as capacity of existing wastewater pumping stations to avoid the capital, operating and maintenance costs associated with constructing new pumping facilities.

5. Environmental conditions in the planning area warrants concern with regard to construction site erosion, destruction of wetlands and impacts on ground and surface water quality. Development should either be directed away from wetlands and areas of steep slopes or appropriate erosion control measures should be applied to minimize the erosion hazard.

PLAN IMPLEMENTATION

Although sewer service area planning was initiated at the state and federal levels, successful implementation of each plan rests primarily at the local level with some guidance provided by East Central Planning. In the state-approved Areawide Water Quality Management Plan, certain local units of government were assigned water quality-related management functions. Entities with adequate authority to plan, construct, operate and maintain wastewater collection and treatment facilities were designated as management agencies for portions of the planning area within their jurisdictions.

The City of Brillion has been designated as a Class III Designated Management Agency (DMA) to provide wastewater collection and treatment within its planning area. As a Designated Management Agency for wastewater treatment and collection the City should do the following:

1. Adopt the Brillion Sewer Service Area Plan;
2. Review and update development policies and regulations in light of the sewer service plan and recommendations;
3. Submit preliminary land subdivision plats which are proposed to be sewered to the East Central Wisconsin Regional Planning Commission for review for consistency with sewer service area plans for the area;
4. Submit sanitary sewer extension requests to the East Central Wisconsin Regional Planning Commission for review for consistency with sewer service area plans prior to being submitted to the WDNR for approval;
5. Submit wastewater facilities plan elements and amended plan elements to the East Central Wisconsin Regional Planning Commission for review for consistency with sewer service area plans prior to submittal to the WDNR for approval; and
6. Carry out their management responsibilities for treatment facilities and collection systems as specified by state and federal requirements.

Implementation of the SSA Plan relies mainly on local government actions which use the plan recommendations as a guide for the extensions of new sewers to service development. However, ECWRPC plays an advisory role in these decisions in two distinct ways:

1. ECWRPC requests that communities within the region require developers to submit "preliminary" subdivision plats for staff review and comment (advisory only). Staff not only checks the proposed plat (whether sewer or using on-site treatment) for conformance with the municipality's SSA Plan, but also reviews the subdivision's overall design and, more specifically, check the following items: potential water quality impacts to environmental corridors; groundwater aquifer / private well concerns; impacts to other natural and cultural features; construction site erosion control methods; storm-water management methods and concerns; internal vehicle/bicycle/pedestrian transportation system design; and other social / service provision impacts (i.e., parks, adjacent land use conflicts, police and fire protection, etc.), and;
2. Sewer extension requests are required to be submitted to ECWRPC for review and comment. Hopefully, staff has reviewed the preliminary plat prior to the extension request which can reduce conflicts at this point. However, staff normally requests that a copy of the final plat be submitted with the extension request. ECWRPC then issues a "208 Water Quality" letter if the extension request is in conformance with the municipality's current SSA Plan. In general, if the extension request is within the designated SSA and does not have negative impacts to defined environmental corridors, a letter will be issued. Sometimes, requests fall outside of the SSA Boundary and thereby, usually initiates an SSA Amendment Request for continued consideration. If negative water quality impacts will occur to designated environmental corridors, a denial of the extension will occur, or recommended mitigation measures (i.e., stormwater management / erosion control devices, etc.) will be attached to the approval.

Utilizing these two methods, a majority of the water quality concerns relating to construction and development can be effectively monitored by ECWRPC for individual projects; thereby, assisting to attain the water quality objectives outlined within the plan's goals. In addition to ECWRPC's role in implementing sewer service area plans, local units of government may exercise other authority conferred upon them by state statute to preserve and protect water quality.

Local units may use this authority to plan and manage land use and development through subdivision, zoning and other development ordinances. Criteria can be written into existing ordinances or new ordinances can be adopted which promote orderly development and address water quality concerns. Additional actions by local units of government which are recommended for water quality protection include the adoption of construction site erosion and stormwater management ordinances and the preservation of greenways along existing drainage corridors.

