City of Kaukauna
Board of Public Works October 16, 2023
jn/engr dept

Agenda Item - 2d
2023 Total Maximum Daily Loading (TMDL) Implementation Plan Updates

Background

As a Permitted Municipality under Wisconsin NR 216, with a General Permit to Discharge Under the Wisconsin Pollutant Discharge Elimination System - WPDES Permit No. WI-S050075-3, municipalities within a watershed with Total Maximum Daily Loading(TMDL) must reduce pollutants of concern within their permit term. The City of Kaukauna Municipal Separate Storm Sewer System(MS4) boundary includes land within the Lower Fox TMDL, including the watersheds of Garners Creek, Konkapot Creek, Apple Creek, Plum Creek and the main stem Lower Fox Basin, all having TMDL requirements to reduce Total Suspended Solids(TSS) and Total Phosphorus (TP).

If, a full reduction pollutant load reduction cannot be achieved within the permit term, alternate provisions and reports must be made to the Wisconsin Department of Natural Resources (WDNR). The additional requirements coming due are attached. Many of the requirements were previously met with updates to the City Post-Construction Stormwater Management Ordinance (attached) and updates to our leaf collection and street sweeping programs. The City has worked with McMahon Associates to provide the updated maps and pollutant reduction analysis documents which are incorporated into the previously approved Stormwater Management Plan of Action.

Please review the updates and contact John Neumeier with any questions or concerns.

Recommended Action

1) Motion to receive and place on file the 2023 Total Maximum Daily Loading (TMDL) Implementation Plan Updates to the Stormwater Management Plan of Action and direct the Engineering Department to submit the updates to WDNR.

   and

2) Direct the Director of Public Works to apply for continued coverage under the WPDES General Permit.

GENERAL PERMIT TO DISCHARGE UNDER THE WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM - WPDES PERMIT NO. WI-S050075-3

A.5.3 If the permittee determines by October 31, 2021, that it is unable to achieve the reductions stipulated under sections A.5.2.a and A.5.2.b, the permittee shall meet the following requirements by October 31, 2023:

a. Pursuant to the permittee's authority under s. 281.33(6)(a)2., Wis. Stats., the permittee shall create or revise and promulgate a municipal storm water management ordinance applicable to redevelopment that requires compliance with post-construction storm water management performance standards that are stricter than the uniform statewide standards established by the Department. When reporting to the Department under section A.6.3, the permittee shall include a justification for the level of pollutant reduction in the ordinance with an assessment of the progress it achieves towards full compliance with the TMDL. The redevelopment reductions may be adjusted to account for other storm water control measures that may exist. The permittee may also establish TP reduction levels for redevelopment projects.

b. The permittee shall create or revise a municipal ordinance that requires the development and implementation of a maintenance plan for all privately-owned storm water treatment facilities for which the permittee takes a TSS and/or TP reduction credit. The permittee shall develop and implement procedures and measures to verify and track that the storm water treatment facilities are inspected on a regular schedule and maintained in the intended working condition in accordance with the plans. The permittee shall require that maintenance agreements be recorded with the appropriate property records that obligates the current and future owners to implement the maintenance plans.

c. The permittee shall revise or promulgate a municipal ordinance that requires the submittal of record drawings for storm water management facility that the permittee takes a TSS and/or TP reduction credit. The permittee shall require submittal of the record drawing prior to close-out of the local permit or upon final approval and shall maintain appropriate records and tracking of the plans.

d. If the pollutant of concern is TP, the permittee shall implement, expand, or optimize a municipal leaf collection program coupled with street cleaning to serve areas where municipal leaf collection is not currently provided within the MS4 but for which a phosphorus reduction has been assigned and additional reductions could be achieved.

e. Within the MS4 permitted area, the permittee shall inventory the condition of the conveyance systems and outfalls. Where erosion or scour is occurring, the permittee shall develop a schedule to stabilize the identified areas over a 5-year period.

f. The permittee shall install at least one new structural BMP or enhance one or more existing structural BMPs to reduce a pollutant of concern discharged via storm water runoff to an impaired waterbody for which a WLA has been assigned to the permittee. The permittee shall develop and implement a maintenance plan for each new structural BMP.

g. The permittee shall conduct an analysis of the current municipal street cleaning program, to determine if additional pollutant loading reductions can be achieved. The permittee shall evaluate optimizing sweeping frequency, targeting of critical areas and time periods, and instituting parking restrictions. Ifa pollutant reduction can be achieved through optimizing the existing street cleaning program, the permittee shall adopt the optimized program the next calendar year or provide a written explanation to the Department explaining why the optimize street cleaning program is not feasible and provide alternative options to achieve similar pollutant reductions.

Stormwater Management Plan of Action

CITY-WIDE STORMWATER QUALITY MANAGEMENT PLAN OF ACTION

Prepared For The

CITY OF KAUKAUNA

OUTAGAMIE COUNTY, WISCONSIN

October 4, 2023
AWS/JWN

McMAHON ENGINEERS ARCHITECTS

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Prepared By

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NEENAH, WISCONSIN

Updated - October 4, 2023

McM. No. K0006-91700668

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APPENDICES

CITY-WIDE STORMWATER QUALITY MANAGEMENT PLAN OF ACTION

Prepared For The

CITY OF KAUKAUNA

OUTAGAMIE COUNTY, WISCONSIN

Prepared By

McMAHON

NEENAH, WISCONSIN

October 4, 2023

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1.0 INTRODUCTION

At the request of the City of Kaukauna, McMAHON prepared the following City-Wide Stormwater Quality Management Plan of Action. The purpose of the plan is to provide the City with the long-term guidance necessary to comply with Wisconsin Administrative Code NR 216 stormwater regulations and improve water quality in receiving waters. Pursuant to NR 216, the City of Kaukauna obtained a WPDES Municipal Stormwater Discharge Permit from the DNR on December 15, 2006. The purpose of the permit is to regulate discharges from municipal separate storm sewer systems (MS4) and reduce urban non-point source pollution.

Relationship to Other Plans:

This City-Wide Stormwater Quality Management Plan of Action compliments and is part of efforts to implement recommendations contained in several existing resource management plans. These related resource management plans include the following:

- The Lower Green Bay Remedial Action Plan (RAP) recommends 50% total phosphorus reduction for the Green Bay Area of Concern. The RAP also recommends a reduction in other urban stormwater pollutants such as sediment, heavy metals, toxics, and bacteria. The RAP was finalized by WDNR in 1993. The RAP recommends that municipalities develop and implement programs for construction site erosion control, post-construction stormwater management, illicit discharges, and shoreland / wetland zoning. The RAP also recommends that municipalities develop and implement programs that preserve, restore and enhance environmental corridors, shoreline buffers, wetlands, habitat, and public access for shoreline fishing, boating and other water-based recreation. To meet these goals, the RAP recommends planning and implementation of best management practices to reduce nonpoint source pollutants. The RAP also recommends that municipalities seek innovative and alternative ways to achieve nonpoint source goals.

- The Total Maximum Daily Load (TMDL) developed for the Lower Fox River Basin identifies total suspended solids (TSS) and total phosphorus (TP) allocations for urban stormwater, wastewater, and agricultural sources located within the Lower Fox River Basin. The TMDL was approved by the U.S. Environmental Protection Agency (EPA) in 2012. More specifically, the TMDL identifies allocations for urban stormwater in the Apple Creek, Garners Creek, Fox River, Kankapot Creek, and Plum Creek basins.

- The Comprehensive Plan for the City of Kaukauna contains several recommendations related to natural resource management and stormwater management: (1) control stormwater volume so as to minimize property damage during heavy, moderate, or long term storm events; (2) filter storm water run-off to improve the quality of the watershed; (3) administer policies and zoning ordinances that protect all of the environmental and constructed features within the community; (4) maintain adequate open space in development applications where natural ecological features are preserved and green space is left to enhance the quality of life for residents; (5) work cooperatively with adjoining municipalities; (6) ensure short and long-term development plans are shared with other governmental entities.

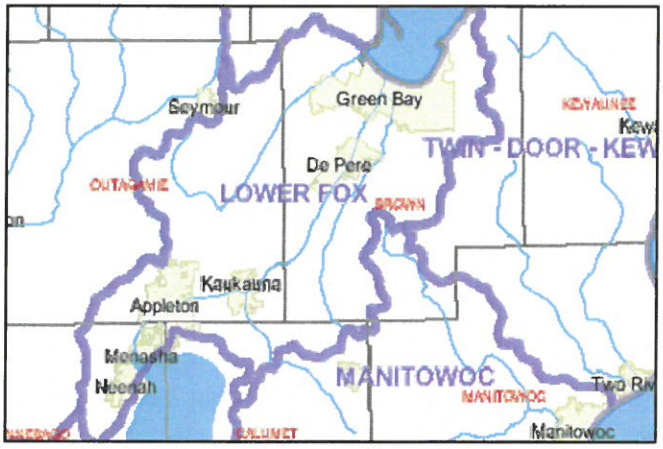
2.0 OVERVIEW OF STUDY AREA

The study area for this Stormwater Management Plan is depicted in Figure 1. The study area contains approximately 5,132 acres. The City of Kaukauna is located in Outagamie County, Wisconsin. As shown in Figure 2, several Municipal Separate Storm Sewer System (MS4) jurisdictions are located within and directly adjacent to the City. The 2023 population for the City is estimated at 17,372. The City of Kaukauna is part of the Appleton Urbanized Area as determined by the US Census Bureau.

Basins

The Wisconsin Department of Natural Resources (WDNR) divided the state into 24 basins or Water Management Units (WMU). The study area for the two Villages is located in the Lower Fox River Basin or WMU. The WMU boundary is similar to the federally designated 8-digit Hydrologic Unit Code (HUC) boundary for the Lower Fox River Basin.

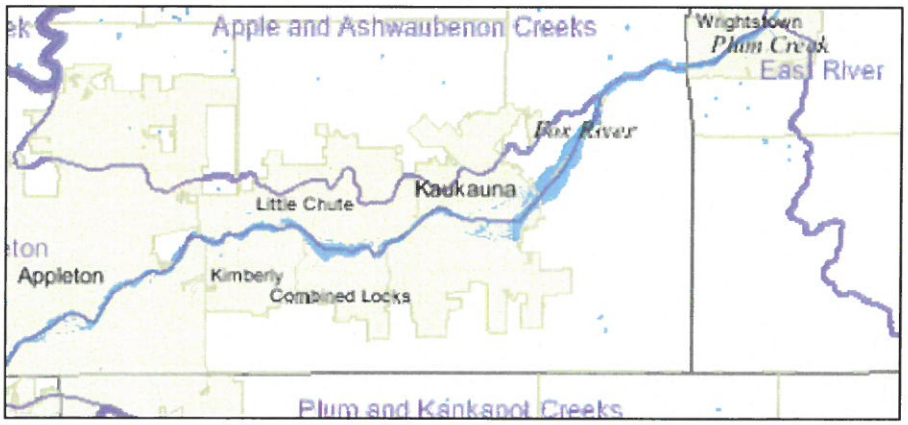
Exhibit 2-1: Lower & Upper Fox River Basins



Watersheds

The WDNR divided the Lower Fox River Basin into 6 watersheds. The City's study area is located in three of these watersheds: Apple & Ashwaubenon Creeks Watershed (LF02-113), Plum and Kankapot Creeks Watershed (LF03-113) and Fox River - Appleton Watershed (LF04-113).

Exhibit 2-2: Plum & Kankapot Creeks Watershed



Sub-Watersheds

For purposes of this stormwater management plan, the WDNR watershed was divided into five sub-watersheds. The sub-watersheds are depicted in Figure 3 and summarized in Table 2-1. The sub-watersheds were delineated after considering the locally designated stormwater planning boundaries, federally designated 12-digit Hydrologic Unit Code (HUC) boundaries, and state designated Total Maximum Daily Load (TMDL) sub-basin boundaries.

Table 2-1: Sub-Watersheds

Sub-Watershed	HUC-12	TMDL Sub-Basin Name
Apple Creek	040302040202 Apple Creek	Apple Creek
Fox River	040302040205 Garners Creek-Fox River	Lower Fox River Main Stem
Garners Creek	040302040205 Garners Creek-Fox River	Garners Creek
Kankapot Creek	040302040203 Kankapot Creek	Kankapot Creek
Plum Creek	040302040204 Plum Creek	Plum Creek

Natural Resources

Natural resource features include surface waters (lakes, rivers, streams), wetlands, and endangered or threatened resources. Natural resource features located in the study area are depicted in Figure 4. Some of these natural resource features are protected with a special regulatory designation such as outstanding resource water, exceptional resource water, 303(d) impaired water, endangered species, and threatened species. Natural resource features located in the study area with one of these special regulatory designations are identified below.

Outstanding and exceptional resource waters are pristine surface waters which are not significantly impacted by human activities and provide valuable fisheries, unique hydrological or geological features, outstanding recreational opportunities, or unique environmental settings. For example, cold water trout streams and natural waterfalls are typically classified as an outstanding or exceptional resource waters. The City of Kaukauna does not discharge stormwater runoff into any outstanding resource waters or exceptional resource waters.

Impaired water bodies are degraded surface waters which are not meeting water quality standards or their potential uses, such as fishing and swimming, due to pollutants and poor water quality. The US EPA requires each state to update its 303(d) impaired waters list

every two years, including Wisconsin. The City of Kaukauna discharges stormwater runoff into five 303(d) impaired waters:

- Apple Creek: Apple Creek is a 303(d) impaired water body due to a blend of non-point and point source pollution. Pollutants of concern include total phosphorus and sediment/total suspended solids. Impairments include degraded habitat. The attainable use for Apple Creek is fish and aquatic life. Currently, Apple Creek is not supporting its attainable use.

- Fox River: The Fox River is a 303(d) impaired water body due to contaminated sediment and a blend of non-point and point source pollution. Pollutants of concern include total phosphorus and polychlorobiphenyls. Impairments include low dissolved oxygen and contaminated fish tissue. The attainable use for the Fox River is warm water sport fishery. Currently, the Fox River is not supporting its attainable use.

- Garners Creek: Garners Creek is a 303(d) impaired water body due to non-point source pollution. Pollutants of concern include total phosphorus and sediment/total suspended solids. Impairments include degraded habitat. The attainable use for Garners Creek is warm water sport fishery. Currently, Garners Creek is not supporting its attainable use.

- Kankapot Creek: Kankapot Creek is a 303(d) impaired water body due to a blend of non-point and point source pollution. Pollutants of concern include total phosphorus and sediment/total suspended solids. Impairments include degraded habitat. The attainable use for Kankapot Creek is fish and aquatic life. Currently, Kankapot Creek is not supporting its attainable use.

- Plum Creek: Plum Creek is a 303(d) impaired water body due to a blend of non-point and point source pollution. Pollutants of concern include total phosphorus and sediment/total suspended solids. Impairments include degraded habitat. The attainable use for Kankapot Creek is fish and aquatic life. Currently, Kankapot Creek is not supporting its attainable use.

Endangered and threatened resources are wild animal and plant species which are either in danger of extinction throughout all or a significant portion of its range or likely to become endangered in the foreseeable future. Typically, the location of an endangered or threatened species is tracked in Wisconsin's Natural Heritage Inventory and is only identified by township. Sensitive species that are particularly vulnerable to collection or disturbance are only identified by county. The Natural Heritage Inventory maps and species lists are routinely updated by WDNR. To prevent collection or disturbance of sensitive species, endangered and threatened resources are not depicted in Figure 4.

Cultural Resources

Cultural resources are places of cultural significance. Some cultural resources are protected with a special regulatory designation such as archeological sites and historical sites. Cultural resource features located in the study area with one of these special regulatory designations are identified below.

Archeological sites may be located within the study area, but cannot be disclosed by law. The State of Wisconsin maintains maps and a computer database on the location and nature of archaeological sites. Special permission is required to view these maps and databases. The location of archaeological sites is exempt from public disclosure to prevent collection or disturbance of valuable artifacts.

Historical sites located within the City and listed in the Wisconsin Historical Society's register are depicted in Figure 4 and summarized in Table 2-2.

Table 2-2: Historical Sites

I.D.	Historic Name	Location	Reference No.
1	Black, Merritt, House	104 River Road	84003752
2	Brokaw, Norman, House	714 Grignon Street	84003754
3	Fargo's Furniture Store	172-176 W. Wisconsin Ave.	84003755
4	Free Public Library of Kaukauna	111 Main Avenue	84003756
5	Grignon, Charles A., House	Augustine Street	72000064
6	Holy Cross Church	309 Desnoyer Street	84003758
7	Kaukauna Locks Historic District	Fox River - East past Canal St.	93001327
8	Klein Dairy Farmhouse	1018 Sullivan Avenue	84003760
9	Kuehn Blacksmith Shop-Store	148-152 E. 2nd Street	84003761
10	Lindauer and Rupert Block	137-141 E. 2nd Street	84003763
11	Martens, Julius J Company Building	124-128 E. 3rd Street	84003764
12	Meade, Capt. Matthew J., House	309 Division Street	84003765
13	Nicolet Public School	109 E. 8th Street	84003767
14	Osprey Site	Address Restricted	97001644
15	St. Andrews, Frank, House	320 Dixon Street	84003768
16	St. Mary's Catholic Church	119 W. 7th Street	84003769
17	Stribley, Charles W., House	705 W. Wisconsin Avenue	84003770
18	US Post Office, Former	112 Main Avenue	91001990

Remediation & Waste Disposal Sites

Remediation sites are places where cleanup of environmental soil or groundwater contamination is ongoing or completed. Remediation sites may involve hazardous wastes, underground storage tanks, or other contaminant sources. Waste disposal sites are places where solid wastes are stored. Understanding the location of remediation and waste

disposal sites is an important consideration when evaluating potential stormwater retrofit locations. The approximate location of WDNR identified remediation sites (open and closed sites) and waste disposal sites (not archived) are depicted in Figure 4.

Soils

Soil information is from the *Outagamie County Soil Survey,* Natural Resource Conservation Service, U.S. Department of Agriculture. The U.S. Department of Agriculture has classified soil types into four hydrologic soil groups (HSG). The four hydrologic soil groups (i.e. A, B, C and D) are classified according to the minimum infiltration rate of the soil column. Group A soils have the highest permeability rate or lowest runoff potential, whereas Group D soils have the lowest permeability rate or highest runoff potential. Hydrologic soil groups are depicted in Figure 5.

MS4 System

The municipal separate storm sewer system (MS4) consists of publicly owned or operated conveyance systems including streets, curbs, gutters, catch basins, storm sewers, swales, channels, culverts, and occasionally bridges. The MS4 system is depicted in Figure 6.

The MS4 system contains several structural best management practices (BMPs). The structural BMPs are depicted in Figure 7 and summarized in Table 2-3. Structural BMPs include wet detention ponds, dry detention ponds, biofilters, proprietary devices, and other devices. Some of these structural BMPs are publicly owned and others are privately owned.

The MS4 system is based on available records. The MS4 system contains three different types of surface drainage: curb & gutter, grass swales, and no controls. The types of surface drainage are depicted in Figure 8. Figure 8 also depicts riparian areas that discharge directly into the Fox River without passing through the City's MS4.

Table 2-3: Structural BMPs

BMP ID	BMP Name	Type of Structural BMP	BMP Owner	Maintenance Agreement
A2b	Van Epern Pond	Wet Pond	City	Yes
A5b	*G and G Machine*	Biofilters	Private	Yes
A5c	Kelso Park Pond	Wet Pond	City	Yes
A6d1	Badger Drive Pond	Dry Pond	City	Yes
A8a	Renee Court Stormceptor	Proprietary	City	Yes
A11	Northridge Drive Pond	Dry Pond	City	Yes
A13a1	Commerce Crossing 1 Pond	Wet Pond	City	Yes
A13a2	Commerce Crossing 2 Pond	Wet Pond	City	Yes
A14b	Commerce Crossing 3 Pond	Wet Pond	City	Yes
A16a	Wildenberg Estates North Pond	Wet Pond	Private	Yes
A17a	Kay Street Pond	Dry Pond	Private	Yes
A18a	Wildenberg North 1 Pond	Wet Pond	Private	Yes
A19a	Hurkman Heights 4 Pond	Wet Pond	Private	Yes
A19b	Wildenberg North 2 Pond	Wet Pond	Private	Yes
F1b4	Lamplighter Apartments Pond	Wet Pond	Private	Yes
F1d	Agricultural Park Pond	Wetland System	City	Yes
F5d1	Lamplighter Apartments Pond	Wet Pond	Private	Yes
F5d13	Rose Tree Villas	Biofilters	Private	Yes
F9-1	Catherine Street Pond	Wet Pond	City	Yes
F13b1	Hurkman Heights South Pond	Wet Pond	Private	Yes
F13b4	Wildenberg Estates South Pond	Wet Pond	Private	Yes
F23d1	Bluestem 3 Pond	Wet Pond	Private	Yes
F23d3	Autumn Court Pond	Dry Pond	Private	Yes
F23e	Camden Way Pond	Wet Pond	Private	Yes
F23f1	Fenway Court Pond	Wet Pond	Private	Yes
F24e6	Andrea Michelle Court Pond	Wet Pond	Private	Yes
F24g	Meadowview South Pond	Wet Pond	Private	Yes
F24k	Whitewolf Lane Pond	Wet Pond	Private	Yes
F26b	Company Woods Pond	Wet Pond*	City	Yes
F27c4	Softball Diamond #2	Biofilters	City	Yes
F36c1	MSB Biofilter North	Biofilters	City	Yes
F36c2	MSB Biofilter South	Biofilters	City	Yes
F36c3	DPW Underground Pond	UG Wet Pond	City	Yes
G2a	Moon Ridge Court Pond	Wet Pond	Private	Yes
G2b	Park Trail Apartment Pond 5	Dry Pond	Private	No
G3d	Jonen Park Bio Retention Device	Biofilters	City	Yes
G3f	Parkwood Drive Pond	Dry Pond	Private	Yes
G3g	Sunny Meadows Pond	Dry Pond	Private	Yes
G3h	Newton Lane Court Pond	Wet Pond	Private	Yes
G3k	Jonen Park Pond	Wet Pond	City	Yes

BMP ID	BMP Name	Type of Structural BMP	BMP Owner	Maintenance Agreement
G4a	Coriander Court Pond	Wet Pond	Private	Yes
G4b	Lemongrass Way Pond	Wet Pond	Private	Yes
K1a2	Softball Diamond #1	Biofilters	City	Yes
K4	Horseshoe Park Pond	Wet Pond	City	Yes
K4m2	Debruin Street Pond	Dry Pond	Private	Yes
K4m3	Joshua Street Pond	Dry Pond	Private	Yes
K4m7-1	Park Trail Apartment Pond 1	Dry Pond	Private	No
K4m7-2	Park Trail Apartment Pond 2	Dry Pond	Private	No
K4m7-3	Park Trail Apartment Pond 3	Dry Pond	Private	No
K4m7-4	Park Trail Apartment Pond 4	Dry Pond	Private	No
K4m7-5	Ann Street Pond	Dry Pond	Private	Yes
K7c2	Piggly Park Pond	Wet Pond	City	Yes
K7d	Coffee Hill Pond	Wet Pond	Private	Yes
K8f	Loderbauer Pond	Wet Pond	Private	Yes
K9a	Inside the Park Pond	Wet Pond	City	Yes
P2a1	Kavanaugh Road Pond	Dry Pond	Private	Yes
P2a2	Kavanaugh Pond	Wet Pond	City	Yes
P3a	Countryside Estates Pond	Wet Pond	Private	Yes
P3b	Bluestem 2 Pond	Wet Pond	Private	Yes
P3c	Bluestem 3 Pond	Wet Pond	Private	Yes

WPDES Industrial Permits

As shown in Figure 9 and summarized in Table 2-4, there are 13 industrial operations with coverage under a WPDES Industrial Permit that are currently located within the City of Kaukauna. WPDES Industrial Permits are regulated by the WDNR. Some WPDES Industrial Permits may allow discharges into the MS4 system during dry weather. Understanding the location of the WPDES Industrial Permitted sites is important to effective implementation of the City's stormwater program.

Table 2-4: WPDES Industrial Permits

I.D.	Site Name	Site Address	WPDES Permit No.
1	Expera Specialty Solutions	600 Thilmany Rd	S067849
2	MCC Kaukauna Quarry	421 Plank Road	0046515
3	Roloff Manufacturing	400 Gertrude Street	S067849
4	Bassett Mechanical	1215 Hyland Avenue	S067857
5	Team Industries	1200 Maloney Road	S067857
6	Schuh Transport/OSI Environmental Inc.	2000 Badger Road	S067857
7	Safety Kleen Systems Inc.	2201 Badger Road	S067857
8	Goldin Iron & Recycling Corporation	300 Farmland Drive	S058831

I.D.	Site Name	Site Address	WPDES Permit No.
9	Rolling Frito-Lay Sales	2350 Northridge Drive	S067857
10	Profile Finishing Systems	1700 Progress Way	S067857
11	Classic Gears & Machining	2551 Northridge Drive	S067857
12	Fahrner Asphalt Sealers, LLC - Kaukauna	860 East Line	S067857
13	UPS Ground Freight	1700 Tower Drive	S067857

Drinking Water System

The City of Kaukauna is responsible for protecting the drinking water system. The City obtains drinking water from groundwater aquifers using five municipal wells. The municipal wells are depicted in Figure 11. Well 4 (BG574), Well 5 (BG575), Well 8 (HJ196), Well 9 (BG578) and Well 10 (BG576) currently do not have a wellhead ordinance. The City does have a well protection plan with the DNR restricting activities within a 1,200 foot radius around each well. According to the DNR, the Kaukauna Utilities system is susceptible to contamination by volatile organic compounds (VOCs), nitrate, beryllium, and microbes. The system has moderate susceptibility to contamination by synthetic organic compounds (SOCs). The system has low susceptibility to contamination by ethylene dibromide (EDB).

Land Uses

The location of publicly owned parks, recreational areas, open lands, and municipal facilities are depicted in Figure 9. Understanding the location of publicly owned land is important to effective implementation of the municipal stormwater program.

Table 2-5: Land Uses

Land Use	2004 Land Use		2012 Land Use		Future Land Use	
	(acres)	(%)	(acres)	(%)	(acres)	(%)
Residential						
High Density	176	4.4%	178	3.7%	178	3.7%
Low Density	258	6.4%	288	6.0%	323	6.7%
Med Density	1,373	34.3%	1,424	29.7%	1,589	33.1%
Multi-Family	72	1.8%	79	1.6%	98	2.0%
Suburban	41	1.0%	49	1.0%	91	1.9%
Commercial						
Commercial Strip	140	3.5%	109	2.3%	184	3.8%
Commercial Downtown	20	0.5%	20	0.4%	20	0.4%
Office Park	22	0.5%	24	0.5%	54	1.1%
Shopping Center	29	0.7%	33	0.7%	33	0.7%
Institutional						

Hospital	11	0.3%	11	0.2%	11	0.2%
Misc. Institutional	66	1.7%	70	1.4%	72	1.5%
School	86	2.1%	86	1.8%	86	1.8%
Industrial		0.0%		0.0%		0.0%
Light Industrial	388	9.7%	471	9.8%	612	12.8%
Medium Industrial	95	2.4%	128	2.7%	130	2.7%
Open Space						
Cemetery	30	0.8%	30	0.6%	41	0.9%
[1]Park	251	6.3%	362	7.5%	505	10.5%
	2004 Land Use		**2012 Land Use**		**Future Land Use**	
Land Use	**(acres)**	**(%)**	**(acres)**	**(%)**	**(acres)**	**(%)**
Railroad	33	0.8%	42	0.9%	42	0.9%
[2]Undeveloped	662	16.5%	1,118	23.3%	454	9.5%
Highway/Freeway	253	6.3%	280	5.8%	277	5.8%
Total:	4,008	100.0%	4,801	100.0%	4,801	100.0%

[1]Includes grass and water associated with stormwater ponds/facilities.
[2]Undeveloped land includes agriculture, grass, woods, wetlands open water, and quarries.

Land uses on or before October 1, 2004 are depicted in Figure 10 and summarized in Table 2-5. Table 2-5 summarizes the 2004 land uses located within the urban planning boundary. For purposes of the NR 151 pollutant analysis, undeveloped in-fill sites less than 5 acres are shown to be developed based on adjoining land uses. Undeveloped in-fill sites greater than 5 acres are shown as agriculture, woods, grass, or another undeveloped open space, as appropriate.

2012 land uses are depicted in Figure 11 and summarized in Table 2-5 for the study area. For purposes of the Total Maximum Daily Load (TMDL) pollutant analysis, the undeveloped in-fill sites are shown as agriculture, grass, woods, wetland or another undeveloped open space, as appropriate.

Future land uses are depicted in Figure 12 and summarized in Table 2-5 for the study area. For purposes of the Total Maximum Daily Load (TMDL) pollutant analysis, the future land uses generally match the 2012 land uses, except the appropriate undeveloped sites are converted to a future land use based on adjoining land uses and information from the City.

3.0 TMDL POLLUTANT ANALYSIS

A Total Maximum Daily Load (TMDL) is the maximum amount of a pollutant that a water body can receive and still meet water quality standards. A TMDL for excess total phosphorus and total suspended solid (e.g. sediment) pollutants was developed by the WDNR for the Lower Fox River Basin. The TMDL for the Lower Fox River Basin was approved by the US Environmental Protection Agency (EPA) on May 18, 2012.

The Lower Fox River Basin has 14 streams and rivers that are impaired by phosphorus and/or sediment pollutants. Excessive amounts of these pollutants cause poor water clarity, increase algae, impact swimming, and degrade aesthetics. The top photograph depicts Fox River algae during 2008 (WDNR photo) and the bottom photograph depicts sediment discharging into Green Bay during 2011 (Steve Seilo photo).

The Lower Fox River Basin TMDL was calibrated and developed using stream, river and lake monitoring data collected by the United States Geological Survey, WDNR, University of Wisconsin-Green Bay, UW-Milwaukee, and NEW Water (Green Bay MSD).

As shown in Figure 6, the City's storm sewer system discharges to five impaired Lower Fox River Basin waterways: Apple Creek, Garners Creek, Fox River, Kankapot Creek and Plum Creek. Apple Creek, Garners Creek, Fox River, Kankapot Creek, and Plum Creek are all specifically included in the Lower Fox River Basin TMDL.

Performance Standard

The TMDL Report developed for the Lower Fox River Basin states that a Municipal (MS4) Stormwater Discharge Permit cannot be reissued without a waste load allocation that is consistent with an EPA approved TMDL. The WDNR anticipates reissuing the City of Kaukauna's MS4 Permit during 2024.

The TMDL Report developed for the Lower Fox River Basin identifies waste load allocations for permitted Urban MS4 areas. The total phosphorus (TP) and total suspended solid (TSS) waste load allocations identified in the TMDL Report for the City's municipal boundary are summarized in Tables 3.-1 and 3-2, respectively.

Table 3-1: Phosphorus Allocations from TMDL Report

TMDL Sub-Basin	City Urban Area (acres)	Total Phosphorus (TP)			
		Baseline (lbs/yr)	Allocated (lbs/yr)	Reduction (lbs/yr)	Reduction (%)
Apple Creek	794.7	563	394	169	30.0%
Garners Creek	1,827.2	739	517	222	30.0%
Fox River	193.1	126	46	80	63.2%
Kankapot Creek	1,207.4	1,312	918	394	30.0%
Plum Creek	33.2	46	32	14	30.4%
Total:	4,055.5	2,786	1,908	878	31.5%

Table 3-2: Sediment Allocations from TMDL Report

TMDL Sub-Basin	City Urban Area (acres)	Total Suspended Solids (TSS)			
		Baseline (lbs/yr)	Allocated (lbs/yr)	Reduction (lbs/yr)	Reduction (%)
Apple Creek	794.7	237,775	142,665	95,110	40.0%
Garners Creek	1,827.2	410,816	142,959	267,857	65.2%
Fox River	193.1	54,218	27,167	27,051	49.9%
Kankapot Creek	1,207.4	666,000	399,600	266,400	40.0%
Plum Creek	33.2	15,120	9,072	6,048	40.0%
Total:	4,055.5	1,383,929	721,463	662,466	47.9%

As shown in Tables 3-1 and 3-2, the TMDL Report expresses the MS4 allocation as both a load reduction (pounds per year) and a percent reduction. Based on WDNR guidance, the TMDL's percent reduction should be used for MS4 permit compliance, rather than the TMDL's load reduction (pounds per year). However, the TMDL's percent reduction requires adjustment to a "no controls" condition before using for MS4 permit compliance. WDNR guidance describes the TMDL adjustment methodology in greater detail. Table 3-3 summarizes the adjusted TP and TSS percent reductions for the City. The adjusted TMDL percent reductions in Table 3-3 are based on the "no-controls" condition and are used for evaluating alternatives for MS4 permit compliance.

Table 3-3: Adjusted TMDL Percent Reductions

TMDL Sub-Watershed	Adjusted TSS Reduction from No-Controls	Adjusted TP Reduction from No-Controls
Apple Creek	52.0%	40.5%
Garners Creek	60.0%	68.7%
Fox River	72.2%	40.5%
Kankapot Creek	52.0%	40.5%
Plum Creek	52.0%	40.5%

Methodology

The TMDL pollutant analysis uses the Source Loading and Management Model for Windows (WinSLAMM version 10). WinSLAMM is a stormwater quality model that predicts runoff volumes and non-point source pollution loads for urban land uses. WinSLAMM also calculates the amount of pollutant removal provided by Best Management Practices (BMPs) such as street sweeping, catch basin cleaning, grass swales, grass filter strips, biofiltration, infiltration basins, wet ponds, wetland systems, proprietary devices, and other BMPs.

The TMDL pollutant analysis uses the series of small rainfall events that occurred between March 29, 1968 and November 25, 1972 in Green Bay, Wisconsin. For purposes of MS4 Permit compliance, this 5-year rainfall series was determined by the WDNR to represent an average annual rainfall condition for municipalities located in Northeast Wisconsin.

The TMDL pollutant analysis uses data files developed by the United States Geological Survey (USGS) and WDNR for the WinSLAMM model. The data files identify typical runoff volumes, pollutant concentrations, pollutant distributions, pollutant deliveries, and pollutant particle size distributions for typical urban stormwater runoff. The WinSLAMM data files obtained from the USGS and used in the TMDL pollutant analysis are as follows:

- WisReg - Green Bay Five Year Rainfall.ran
- WI_GEO02.ppdx
- v10 WI_SL06 Dec06.rsv
- WI_avg01.pscx
- WI_Res and Other Urban Dec06.std
- WI_Com Inst Indust Dec06.std
- Freeway Dec06.std
- Nurp.cpz

The TMDL pollutant analysis is based on the standard land use files developed by the WDNR for WinSLAMM. The standard land use files identify the amount of roof, parking lot, driveway, sidewalk, street, and lawn source areas which are typical for each standard land use. The standard land use files also identify the amount of connected imperviousness for each source area.

The TMDL pollutant analysis uses the study area depicted in Figure 1, the Sub-Watersheds depicted in Figure 3, and the 2012 land uses depicted in Figure 11. For purposes this TMDL pollutant analysis, the study area contains 4,801 acres. Of the 4,801 acre study area, the 327 acres of undeveloped land use (i.e. agriculture, quarries, wetlands, and open water) are excluded from the analysis. As such, the TMDL allocations apply to 4,474 acres of developed urban area in the Apple Creek, Garners Creek, Fox River, Kankapot Creek, and Plum Creek Sub-Watersheds. The WDNR is currently developing TMDL and WinSLAMM modeling guidance to assist with MS4 Permit compliance. This TMDL pollutant analysis will likely require updating after the WDNR guidance documents are completed.

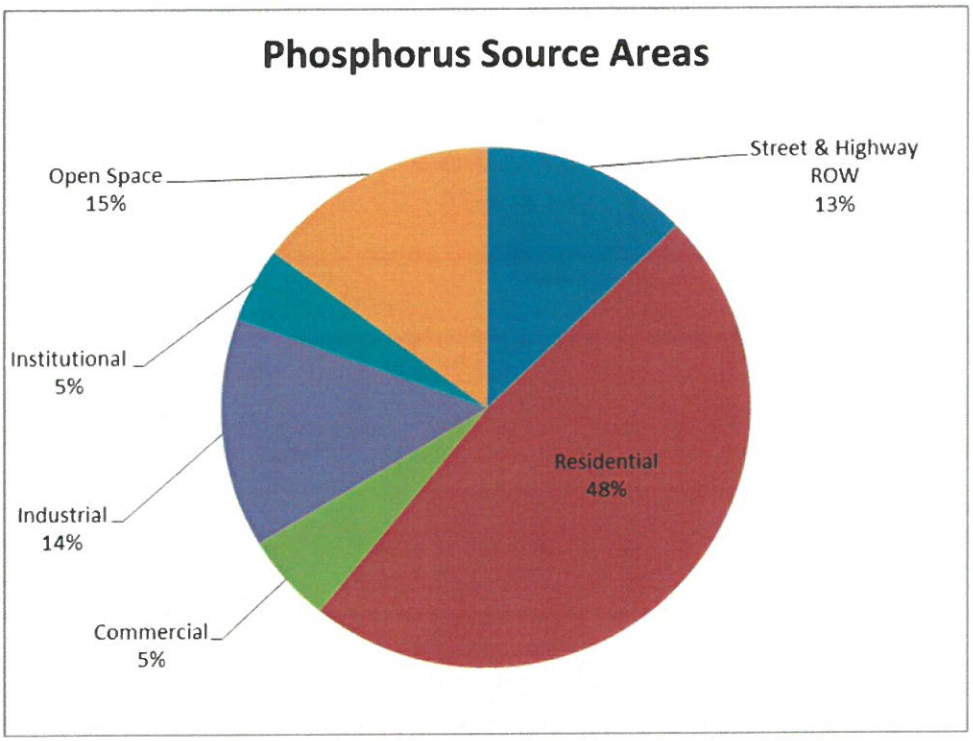
Baseline Load

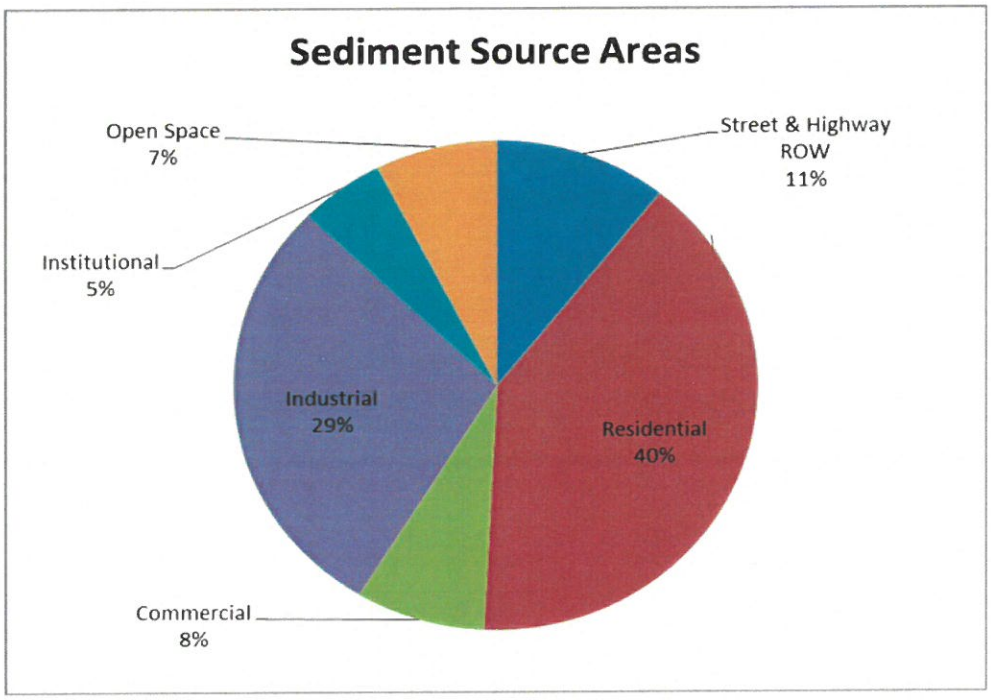
The TMDL baseline loads using WinSLAMM are summarized by land use in Table 3-4 and Exhibit 3-1. These baseline or "no control" loads exclude the pollutant reduction benefits of existing BMPs. As shown in Table 3-4 and Exhibit 3-1, residential land uses comprise the majority of land area, but street and highway land uses generate the largest pollutant loads.

Table 3-4: TMDL Baseline Loads by Land Use (WinSLAMM)

Land Use	Area (acres)	Area (%)	TP (lbs/yr)	TP (%)	TSS (lbs/yr)	TSS (%)
Residential	2,018	45%	1,515	48%	390,785	40%
Commercial	186	4%	174	6%	77,385	8%
Industrial	599	13%	451	14%	277,892	29%
Institutional	166	4%	146	5%	50,892	5%
Open Space	1,225	27%	464	15%	72,765	7%
Street & Highway ROW	280	6%	402	13%	104,074	11%
Total	4,474	100%	3,151	100%	973,793	100%

Exhibit 3-1: TMDL Baseline Loads by Land Use (WinSLAMM)





The City-wide Stormwater Management Plan (SWMP) dated December 26, 2013 contains a list of baseline pollutant yields (pounds per acre per year) and loads (pounds per year) from WinSLAMM for total phosphorus and total suspended solid pollutants. The baseline pollutant yields and loads are ranked by drainage area from highest to lowest within the Sub-Watersheds. Figures provided in the 2013 SWMP depict the WinSLAMM baseline pollutant yields and loads.

The TMDL pollutant analysis is based on the sub-watershed areas and WinSLAMM baseline pollutant loads contained in Tables 3-5, 3-6 and 3-7, respectively. These sub-watershed areas and baseline pollutant loads are categorized by MS4 jurisdiction and riparian property.

Table 3-5: Watershed Areas

	Watershed Areas (WinSLAMM)								
	City MS4		County Hwy		State Hwy		Riparian		Total
Sub-Watershed	(acres)	(%)	(acres)	(%)	(acres)	(%)	(acres)	(%)	(acres)
Apple Creek	794.7	18%	19.4	0%	90.2	2%	0.0	0%	904.2
Garners Creek	1,900.7	42%	55.1	1%	7.2	0%	112.8	3%	2,075.8
Fox River	193.1	4%	7.1	0%	0.0	0%	0.0	0%	200.2
Kankapot Creek	1,207.4	27%	48.3	1%	4.2	0%	0.0	0%	1,259.9
Plum Creek	33.2	1%	0.3	0%	0.0	0%	0.0	0%	33.4
Total	4,129.0	92%	130.2	3%	101.6	2%	112.8	3%	4,473.5

Table 3-6: Total Phosphorus Baseline Loads

	Total Phosphorus Baseline Loads (WinSLAMM)								
	City MS4		County Hwy		State Hwy		Riparian		Total
Sub-Watershed	(lbs/yr)	(%)	(lbs/yr)	(%)	(lbs/yr)	(%)	(lbs/yr)	(%)	(lbs/yr)
Apple Creek	519.0	16%	27.0	1%	108.5	3%	0.0	0%	654.5
Garners Creek	1,221.5	39%	88.7	3%	10.6	0%	56.3	2%	1,377.1
Fox River	142.6	5%	9.9	0%	0.0	0%	0.0	0%	152.5
Kankapot Creek	872.3	28%	66.8	2%	7.6	0%	0.0	0%	946.7
Plum Creek	22.5	1%	0.4	0%	0.0	0%	0.0	0%	23.0
Total	2,777.9	88%	192.8	6%	126.7	4%	56.3	2%	3,153.7

Table 3-7: Total Suspended Solid Baseline Loads

	Total Suspended Solid Baseline Loads (WinSLAMM)								
	City MS4		County Hwy		State Hwy		Riparian		Total
Sub-Watershed	(lbs/yr)	(%)	(lbs/yr)	(%)	(lbs/yr)	(%)	(lbs/yr)	(%)	(lbs/yr)
Apple Creek	221,672	23%	5,006	1%	34,634	4%	0	0%	261,311
Garners Creek	365,793	38%	22,738	2%	2,864	0%	20,960	2%	412,356
Fox River	37,440	4%	1,716	0%	0	0%	0	0%	39,156
Kankapot Creek	239,905	25%	14,688	2%	1,880	0%	0	0%	256,474
Plum Creek	5,454	1%	74	0%	0	0%	0	0%	5,528
Total	870,264	89%	44,222	5%	39,378	4%	20,960	2%	974,824

Allocation Analysis

Each MS4 permitted entity located within the City's municipal boundary is anticipated to receive a portion of the phosphorus and sediment waste load allocations contained in the TMDL Report. These MS4 permitted entities include the City of Kaukauna, Outagamie County Highway Department, and Wisconsin Department of Transportation (DOT). In addition to the MS4 permitted entities, riparian areas located along the Fox River or areas that do not drain through the permitted portion of the City's MS4 system are also anticipated to receive a portion of the allocations.

For purposes this analysis, the portions of developed urban area which were excluded from the TMDL pollutant analysis include the following:

- State & County Highways: The TMDL pollutant analysis excludes the pollutant load for state and county highway right-of-ways. The City has limited authority to regulate stormwater runoff, issue permits, and charge stormwater utility fees to state and county highway right-of-ways. Also, the state and county highway right-of-ways are separately regulated and permitted by WDNR. Of the 4,473.5 acres of developed urban area located within the Apple Creek, Garners Creek, Fox River, Kankapot Creek, and Plum Creek Sub-Watersheds, 4,129.0 acres are City MS4 jurisdiction, 130.2 acres are County MS4 jurisdiction, and 101.6 acres are State MS4 jurisdiction. Connecting highways are included in the City's MS4 jurisdiction.

- Riparian: The TMDL pollutant analysis excludes the pollutant load from riparian areas discharging directly into the Fox River without passing through the City's MS4 system. Of the 4,473.5 acres of developed urban area located in the Apple Creek, Garners Creek, Fox River, Kankapot Creek, and Plum Creek Sub-Watersheds, 112.8 acres are classified as riparian.

- Publicly Owned Parcels: The TMDL pollutant analysis includes the pollutant load for publicly owned parcels located within the urban planning boundary. Unlike state and county highway right-of-ways, the City has legal authority to regulate stormwater runoff, issue permits, and charge a stormwater utility fee to publicly owned parcels. For these reasons, the TMDL pollutant analysis includes the pollutant load for publicly owned parcels.

- WPDES Industrial Permits: The TMDL pollutant analysis includes the pollutant load for industrial areas with coverage under a WDPES Industrial Permit for 12 of the 13 industrial permitted facilities. The pollutant analysis excludes Expera Specialty Solutions for the alternatives provided. The City of Kaukauna had an initial conversation with Thilmany (now Expera Specialty Solutions), about potentially isolating their storm sewer system and discharging their runoff into their Wastewater Treatment Facility. Expera is looking at isolating their storm sewer system to reduce stormwater utility charges. Of the 4,129.0 acres within the City's MS4 jurisdiction, 73.5 acres that are privately owned are Expera Specialty Solutions. The excluded area is shown on Figure 15.

  The remaining industrial facilities are included in the analysis for the following reasons: the City has legal authority to regulate stormwater runoff; the City has legal authority to charge a stormwater utility fee; it is difficult to determine which portions of an industrial site are covered by a WPDES Industrial Permit; and the pollutant load is the City's responsibility if the WPDES Industrial Permit is terminated or certified "No Exposure" in the future. For these reasons, the TMDL pollutant analysis includes the pollutant load for industrial permitted areas, except quarries which are excluded from the City's MS4 jurisdiction.

2017 & 2023 Best Management Practices

Several BMPs qualified for TMDL pollutant reduction credit in 2017: street sweeping, grass swales, Van Epern Pond, G and G Machine Biofilters, Kelso Park Pond, Commerce Crossing 2 Pond, Commerce Crossing 3 Pond, Wildenberg Estates North Pond, Lamplighter Apartments Pond, Rose Tree Villas Biofilter, Hurkman Heights South Pond, Wildenberg Estates South Pond, Autumn Court Pond, Camden Way Pond, Fenway Court Pond, Andrea Michelle Court Pond, Meadowview South Pond, Whitewolf Lane Pond, Softball Diamond #2 Biofilter, Moon Ridge Court Pond, Jonen Park Biofilter, Newton Lane Court Pond, Jonen Park Pond, Coriander Court Pond, Lemongrass Way Pond, Softball Diamond #1 Biofilter, Horseshoe Park Pond, Piggly Park Pond, Loderbauer Pond and Kavanaugh Pond and the Coffee Hill Pond. Grass swales owned or operated by County and State MS4 jurisdictions are not included in the existing condition TMDL pollutant analysis. The 2012 BMPs are depicted in Figure 13.

The BMPs qualified for the TMDL pollutant credit in 2023 includes those listed above for 2017 with the addition of Company Woods Pond, Catherine Street Pond, DPW Underground Detention Pond. Other BMPs were constructed since 2017 privately or were new development and are considered to have minimal benefits. Therefore, they were not included in this analysis and would be included in future City-wide SWMP updates. The 2023 BMPs are depicted in Figure 14.

- Apple Creek: Table 3-8 indicates the 2023 BMPs provided a 38.9% TP reduction within the Apple Creek Sub-Watershed, which does not satisfy the 40.5% TP reduction required in Table 3-1. Also, Table 3-8 indicates the 2023 BMPs provided a 58.0% TSS reduction within the Apple Creek Sub-Watershed, which satisfies the 52.0% TSS reduction required in Table 3-2.

- Garners Creek: Table 3-8 indicates the 2023 BMPs provided a 27.0% TP reduction within the Garners Creek Sub-Watershed, which does not satisfy the 68.7% TP reduction required in Table 3-1. Also, Table 3-8 indicates the 2023 BMPs provided a 40.1% TSS reduction within the Garners Creek Sub-Watershed, which does not satisfy the 60.0% TSS reduction required in Table 3-2. As such, additional BMPs are needed within the Garners Creek Sub-Watershed to target both sediment and phosphorus pollutants.

- Fox River: Table 3-8 indicates the 2023 BMPs provided a 14.2% TP reduction within the Fox River Sub-Watershed, which does not satisfy the 40.5% TP reduction required in Table 3-1. Also, Table 3-8 indicates the 2023 BMPs provided a 22.0% TSS reduction within the Fox River Sub-Watershed, which does not satisfy the 72.2% TSS reduction required in Table 3-2. As such, additional BMPs are needed within the Fox River Sub-Watershed to target both sediment and phosphorus pollutants.

- Kankapot Creek: Table 3-8 indicates the 2023 BMPs provided a 26.7% TP reduction within the Kankapot Creek Sub-Watershed, which does not satisfy the 40.5% TP reduction required in Table 3-1. Also, Table 3-8 indicates the 2023 BMPs provided a 39.2% TSS reduction within the Kankapot Creek Sub-Watershed, which does not satisfy the 52.0% TSS reduction required in Table 3-2. As such, additional BMPs are needed within the Kankapot Creek Sub-Watershed to target both sediment and phosphorus pollutants.

- Plum Creek: Table 3-8 indicates the 2023 BMPs provided a 42.9% TP reduction within the Plum Creek Sub-Watershed, which satifies the 40.5% TP reduction required in Table 3-1. Also, Table 3-8 indicates the 2023 BMPs provided a 64.1% TSS reduction within the Plum Creek Sub-Watershed, which satisfies the 52.0% TSS reduction required in Table 3-2.

2017 Condition:

Pollutant Analysis Summary - Urban Study Area									
		TSS							
Sub-Watershed	Area (acres)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Total Load Reduct (lbs)	Total Load Reduct (%)	TMDL Load Redct Req'd (lbs)	TMDL Load Redct Req'd (lbs)	Addt'l Load Redct Req'd (lbs)	TMDL TSS Redct Satisfied (Y/N)
Apple Creek	794.7	221,672	93,148	128,524	58.0%	115,269	52.0%	-13,254	Y
Fox River	1,827.2	336,567	267,720	68,847	20.5%	243,001	72.2%	174,154	N
Garners Creek	193.1	37,328	22,346	14,982	40.1%	22,397	60.0%	7,415	N
Kankapot Creek	1,207.4	239,905	145,829	94,076	39.2%	124,751	52.0%	30,675	N
Plum Creek	33.2	5,454	1,957	3,497	64.1%	2,836	52.0%	-661	Y
Totals:	4,055.5	840,926	531,000	309,926	36.9%	508,254	60.4%	198,328	N

Pollutant Analysis Summary - Urban Study Area									
		TP							
Sub-Watershed	Area (acres)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Total Load Reduct (lbs)	Total Load Reduct (%)	TMDL Load Redct Req'd (lbs)	TMDL Load Redct Req'd (lbs)	Addt'l Load Redct Req'd (lbs)	TMDL TP Redct Satisfied (Y/N)
Apple Creek	794.7	519.0	317.2	201.8	38.9%	210.2	40.5%	8.4	N
Fox River	1,827.2	1,179.7	1,028.4	151.3	12.8%	477.8	40.5%	326.5	N
Garners Creek	193.1	142.6	104.1	38.5	27.0%	98.0	68.7%	59.5	N
Kankapot Creek	1,207.4	872.3	639.8	232.5	26.7%	353.3	40.5%	120.7	N
Plum Creek	33.2	22.5	12.9	9.7	42.9%	9.1	40.5%	-0.5	Y
Totals:	4,055.5	2,736.2	2,102.3	633.8	23.2%	1,148.4	42.0%	514.5	N

2023 Condition:

Note: BMPs Added: Catherine Pond, Ann Street Underground Pond & Company Woods Pond

Pollutant Analysis Summary - Urban Study Area									
		TSS							
Sub-Watershed	Area (acres)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Total Load Reduct (lbs)	Total Load Reduct (%)	TMDL Load Redct Req'd (lbs)	TMDL Load Redct Req'd (lbs)	Addt'l Load Redct Req'd (lbs)	TMDL TSS Redct Satisfied (Y/N)
Apple Creek	794.7	221,672	93,148	128,524	58.0%	115,269	52.0%	-13,254	Y
Fox River	1,827.2	336,567	267,533	74,034	22.0%	243,001	72.2%	168,967	N
Garners Creek	193.1	37,328	22,346	14,982	40.1%	22,397	60.0%	7,415	N
Kankapot Creek	1,207.4	239,905	145,829	94,076	39.2%	124,751	52.0%	30,675	N
Plum Creek	33.2	5,454	1,957	3,497	64.1%	2,836	52.0%	-661	Y
Totals:	4,055.5	840,926	525,813	315,114	37.5%	508,254	60.4%	193,141	N

Pollutant Analysis Summary - Urban Study Area									
		TP							
Sub-Watershed	Area (acres)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Total Load Reduct (lbs)	Total Load Reduct (%)	TMDL Load Redct Req'd (lbs)	TMDL Load Redct Req'd (lbs)	Addt'l Load Redct Req'd (lbs)	TMDL TP Redct Satisfied (Y/N)
Apple Creek	794.7	519.0	317.2	201.8	38.9%	210.2	40.5%	8.4	N
Fox River	1,827.2	1,179.7	1,012.6	167.1	14.2%	477.8	40.5%	310.7	N
Garners Creek	193.1	142.6	104.1	38.5	27.0%	98.0	68.7%	59.5	N
Kankapot Creek	1,207.4	872.3	639.8	232.5	26.7%	353.3	40.5%	120.7	N
Plum Creek	33.2	22.5	12.9	9.7	42.9%	9.1	40.5%	-0.5	Y
Totals:	4,055.5	2,736.2	2,086.6	649.6	23.7%	1,148.4	42.0%	498.8	N

4.0 POLLUTANT REDUCTION ANALYSIS

WinSLAMM (version 10) was used in conjunction with national literature to analyze the stormwater quality benefits and cost-effectiveness of proposed urban stormwater BMPs such as street sweeping, catch basin cleaning, grass swales, grass filter strips, biofiltration, infiltration basins, wet detention ponds / wetland systems, proprietary devices, and mechanical / biological treatment facilities. The results of the pollutant reduction analysis are summarized herein. More detailed water quality results are provided in Appendix B.

The capital costs contained in Tables 4-1 through 4-7 are the estimated present value capital costs for the BMP. The capital costs include an allowance for construction, land acquisition, engineering, legal, and contingency costs. The 20-year costs provided in the tables are the estimated present value costs per pound of TSS removed during a 20-year period. The 20-year costs include an allowance for capital costs and long-term operation and maintenance costs. The 20-year period was determined to be a reasonable life cycle or planning period for evaluating BMP cost-effectiveness. A longer planning period would improve the cost-effectiveness of structural BMPs (e.g. wet detention pond) as compared to non-structural BMPs (e.g. street sweeping).

Street Sweeping

Street sweeping is effective at collecting large sediment particles (sand sized particles), trash, debris and leaves. Limited pollutant removal occurs for fine-grained particles such as silt, clay, metals and nutrients. Research indicates that street pollutants tend to accumulate within 3 feet of the street's curb and gutter. Wind turbulence from traffic tends to blow pollutants toward the curb. The curb acts as a barrier and traps pollutants. For streets without curb, wind turbulence generated by a passing vehicle tends to blow pollutants onto the adjacent grass area. As such, for street sweeping to be effective, the street must have curb.

The effectiveness of a municipal street sweeping program depends on the type of street sweeper, number of curb-miles, sweeping frequency, traffic volume, time of year, rainfall, and operator knowledge. In addition, the benefits of sweeping are significantly reduced when vehicles are parked along the curb. Whenever a street sweeper needs to maneuver around a parked car, the pollutants under the car are not removed. As such, the more cars parked along a street, the less pollutant removal.

There are two types of street sweeper: mechanical and high efficiency. Mechanical street sweepers use a broom to remove pollutants from the street surface and high efficiency street sweepers use a vacuum system to remove pollutants. Typically, the high efficiency sweeper is more effective at removing pollutants as compared to the mechanical sweeper. Table 4-1 summarizes typical street sweeping costs.

- High Efficiency (H.E.) Street Sweeper – The City currently uses a high efficiency street sweeper. The City also adopted a parking control ordinance to restrict parking along the street during sweeping operations.

Table 4-1: Street Sweeping & Catch Basin Cleaning

BMP	Pollutant Load Reduction		Avg. Annual TSS Cost ($/lb)
	TSS (%)	TP (%)	
M. Sweeper (Every 2 weeks, no parking ordinance)	3%	2%	$5.4
M. Sweeper (Every 2 weeks, with parking ordinance)	6%	4%	$2.5
H.E. Sweeper (Every 4 weeks, no parking ordinance)	2%	1%	$3.5
H.E. Sweeper (Every 4 weeks, with parking ordinance)	6%	4%	$1.2
H.E. Sweeper (Every 2 weeks, no parking ordinance)	5%	3%	$2.9
H.E. Sweeper (Every 2 weeks, with parking ordinance)	13%	8%	$1.2
H.E. Sweeper (Every week, no parking ordinance)	10%	6%	$2.9
H.E. Sweeper (Every week, with parking ordinance)	22%	14%	$1.4
Catch Basin Cleaning	12%	9%	$1.7

Catch Basin Cleaning

Catch basin cleaning is effective at collecting large sediment particles (sand sized particles), trash, debris and leaves. Limited pollutant removal occurs for fine-grained particles such as silt, clay, metals and nutrients. Catch basin sumps are effective for parking lots and streets that serve a small drainage area (less than 1 acre). Ideally, a catch basin sump has a minimum 3 foot depth to prevent scouring of previously settled pollutants during a rainfall.

Approximately 10% of the Cities MS4 system contains catch basin sumps. Catch basin sumps are dispersed throughout the City and are not mapped. The City is slowly eliminating the catch basin sumps due to their high cost and lower benefit. Typically, the City cleans catch basin sumps once a year if staff is available. The City of Kaukauna owns a JetVac for catch basin cleaning.

Based on WDNR Guidance, the City cannot obtain water quality credit for both catch basin cleaning and street sweeping. In the City, street sweeping is a priority since sweeping helps maintain aesthetics, reduces public complaints, and reduces catch basin grate clogging. For these reasons, the City prefers street sweeping as compared to catch basin cleaning.

Routine maintenance costs are high since catch basin sumps need to be cleaned in order to permanently dispose of trapped pollutants in the sump. As shown in Table 4-1, street sweeping every 2 weeks with a high efficiency street sweeper and adoption of a parking

control ordinance provides about the same pollutant reduction as catch basin cleaning, but is more cost effective.

Grass Swales

Grass swales remove pollutants from concentrated stormwater by filtration through the grass and infiltration into the soil. The filtering capacity depends on the flow depth in the swale as compared to the grass height. Typically, when the flow depth is above the grass, filtering is minimal and scouring of previously settled pollutants is a concern. The water quality benefits of a grass swale are largely determined by the infiltrating capacity of underlying soils and the depth to groundwater. A grass swale located in sandy soil has a much higher pollutant removal as compared to a grass swale located in clay soil. WDNR Technical Standard 1005 – Vegetated Infiltration Swale discusses design criteria for grass swales.

Grass swales are typically located along streets. As shown in Figure 8, most streets in the City are drained via curb and gutter, rather than grass swales. As shown in Figure 5, soils in the City are predominately clay (hydrologic soil group C and D). As such, the infiltrating capacity of the underlying soils is minimal. Due to the urban streets and clay soils in the City, the cost to retrofit a grass swale along an existing street is very high and the pollutant removal is relatively low. Table 4-2 summarizes the cost and water quality benefits of a grass swale retrofit. The costs contained in Table 4-2 can be compared to the other BMP costs contained in 4-1, 4-3, 4-4, 4-5 and 4-6.

Grass Filter Strips

Grass filter strips remove pollutants from stormwater by filtration through the grass and infiltration into the soil. The filtering capacity of a grass filter strip depends on its longitudinal slope, length and grass density. The water quality benefits of a grass filter strip are largely determined by the infiltrating capacity of underlying soils. A grass filter strip located in sandy soil has a higher pollutant removal as compared to a grass filter strip located in clay soil.

Grass filter strips are effective for parking lots that serve small drainage areas (less than 1 acre). Typically, grass filter strips need to be a minimum of 20 feet long, but at least as long as the contributing impervious surface length. A 64 foot wide parking lot would typically require a 64 foot long grass filter strip. As such, grass filter strips require a significant amount of land area as compared to other BMPs.

In order for a grass filter strip to be effective, the stormwater flowing into the filter strip cannot be concentrated within a swale, ditch, channel, gutter, or other similar conveyance system. Rather, the stormwater must be flowing across the surface of a parking lot, lawn or other ground surface in a very thin sheet of dispersed water.

As shown in Figure 8, the City does not currently have any grass filter strips. As shown in Figure 5, soils in the City are predominately clay (hydrologic soil group C and D). As such, the infiltrating capacity of the underlying soils is minimal. Due to the land requirements and predominately clay soils in the City, the construction and land costs to retrofit a grass filter strip are high as compared to the water quality benefit provided. Table 4-2 summarizes the cost and water quality benefits of a grass filter strip retrofit. The costs contained in Table 4-2 can be compared to the other BMP costs contained in 4-1, 4-3, 4-4, 4-5 and 4-6.

Table 4-2: Grass Swales & Grass Filter Strips

BMP	Pollutant Load Reduction		Avg. Annual TSS Cost ($/lb)
	TSS (%)	TP (%)	
Grass Swales – Retrofit C&G Streets	15%	10%	$178.0
Grass Filter Strips – Retrofit Parking Lot	98%	98%	$11.2

Biofiltration

Biofiltration devices remove pollutants from stormwater by filtration through an engineered soil mixture. Typically, the engineered soil is three feet deep and consists of a sand, compost, peat, and/or topsoil mixture. A diverse mix of prairie flowers, grasses, shrubs and/or trees are typically planted in a mulch layer located above the engineered soil. During a rainfall, stormwater is temporarily stored above the mulch layer until it can be filtered through the engineered soil. A perforated underdrain pipe located beneath the engineered soil collects the filtered water and discharges it into an adjacent storm sewer or other conveyance system. Biofiltration devices are effective for small drainage areas (less than 2 acres).

Biofiltration devices are called a "bioretention" device when the native soils located beneath the engineered soil layer are permeable and the majority of stormwater infiltrates into the native soils. In sandy soils, it may be feasible to eliminate the perforated underdrain pipe to further increase infiltration. Bioretention devices are used to recharge groundwater and improve stormwater quality, whereas biofiltration devices are primarily used to improve stormwater quality. WDNR Technical Standard 1004 – Bioretention for Infiltration discusses design criteria for bioretention and biofiltration.

Bioretention devices are sometimes called a "rain garden" if the device does not contain an engineered soil layer. Rain gardens are typically installed for groundwater recharge purposes rather than stormwater pollutant removal. Often, runoff from a residential roof, patio, sidewalk or driveway is directed to a rain garden. These residential source areas have a low pollutant load but generate a significant amount of runoff volume. Whenever a source area has a high pollutant load (i.e. street or parking lot), an engineered soil layer is recommended to provide a higher capacity filter media. A high capacity filter media reduces

the device's surface area, ponding duration, and clogging potential. If stormwater is allowed to pond on the surface of a rain garden, bioretention device, or biofiltration device for more than 24 hours, the plants may become diseased or die due to wet conditions or poor system hydrology.

Biofiltration devices are sometimes called a "bio-swale" if the device contains a longitudinal slope to facilitate flow conveyance. Typically, a bio-swale has a linear configuration. Bio-swales are typically installed within parking lots or along streets. Bio-swales can be used to recharge groundwater and/or improve stormwater quality. As such, a bio-swale may or may not include a perforated underdrain pipe.

As shown in Figure 5, soils in the City are predominately clay (hydrologic soil group C and D). Due to the predominately clay soils, biofiltration is more practicable for high load source areas as compared to a rain garden or bioretention device that relies on infiltration.

The costs to incorporate biofiltration into a street retrofit project or a street reconstruction project are summarized in Table 4-3. Typically, it is more cost-effective to incorporate biofilters into a street reconstruction project, as compared to a street retrofit project. The costs contained in Table 4-3 can be compared to the other BMP costs contained in 4-1, 4-2, 4-4, 4-5 and 4-6.

Table 4-3: Street Biofiltration

Street Corridor Land Use	Pollutant Load Reduction		Avg. Annual TSS Cost ($/lb)			
			Retrofit		Reconstruct	
	TSS (%)	TP (%)	Sand	Clay	Sand	Clay
Commercial Corridors	80%	71%	$5.5	$17.6	$4.4	$14.2
Industrial Corridors	80%	49%	$3.4	$11.6	$2.8	$9.3
Institutional Corridors	80%	72%	$3.8	$12.0	$3.1	$9.7
Residential Corridors	80%	66%	$6.7	$20.7	$5.4	$16.7
Open Space Corridors	80%	66%	$6.1	$20.1	$4.9	$16.2

The costs to incorporate biofiltration into a parcel retrofit project or a parcel reconstruction project are summarized in Table 4-4. Typically, it is more cost-effective to incorporate biofilters into a parcel or site reconstruction project, as compared to a parcel or site retrofit project. The costs contained in Table 4-4 can be compared to the other BMP costs contained in Tables 4-1, 4-2, 4-3, 4-5 and 4-6.

Table 4-4: Parcel Biofiltration

Parcel Land Use	Pollutant Load Reduction		Avg. Annual TSS Cost ($/lb)			
			Retrofit		Reconstruct	
	TSS (%)	TP (%)	Sand	Clay	Sand	Clay
Commercial Downtown	80%	69%	$65.0	$81.8	$52.5	$66.1
Hospital	80%	68%	$53.0	$76.2	$42.9	$61.6
Institutional	80%	66%	$38.0	$57.1	$30.7	$46.2
Light Industrial	80%	55%	$14.6	$17.7	$11.8	$14.3
Medium Industrial	80%	69%	$23.9	$35.7	$19.4	$28.9
Multi-Family Residential	80%	60%	$38.9	$71.6	$31.4	$57.9
Office Park	80%	67%	$35.4	$51.5	$28.6	$41.7
Schools	80%	63%	$33.6	$52.5	$27.2	$42.5
Shopping Center	80%	69%	$39.3	$51.8	$31.8	$41.9
Strip Commercial	80%	69%	$44.0	$57.6	$35.6	$46.6

Recent research has shown that biofilter media may not decrease total phosphorus. Research is being developed for sand filters and their respective pollutant reduction. A sand filter is similar to a biofiltration device except the engineered soil consists of 100% sand meeting one of the gradation options specified in Technical Standard 1004. Per WNDR guidance, a sand filter may obtain 80% TSS and 35% TP reduction for the filtering component of the devices. The WDNR is currently researching development of an engineered soil mixture that would achieve a greater TP removal credit than a sand filter. The costs to incorporate a sand filters into a street or parking lot retrofit or reconstruction project will be primarily the same as the biofiltration costs listed in Tables 4-3 and 4--4. The only difference between sand filters and biofiltration is that sand filters provide some level of TP removal for the filtered component.

Infiltration Basins

An infiltration basin is a water impoundment constructed over a highly permeable soil. The purpose of an infiltration basin is to temporarily store stormwater and allow it to infiltrate through the bottom and sides of the infiltration basin. Pollutants are removed by the filtering action of the underlying soil. The primary functions of an infiltration basin are to provide groundwater recharge, reduce runoff volumes, and reduce peak discharge rates. The secondary function of an infiltration basin is water quality. WDNR Technical Standard 1003 – Infiltration Basin discusses design criteria for infiltration basins.

Infiltration basins require pretreatment to prevent clogging and failure. WDNR Technical Standard 1003 - Infiltration Basin requires a pretreatment system to reduce the TSS load entering an infiltration basin by 60% for a residential land use and 80% for a commercial, industrial, or institutional land use. Typically, a wet detention pond or biofiltration device is used as the pretreatment system. The pretreatment system prevents the infiltration basin from failing and helps reduce the risk of groundwater contamination due to pollutants

contained in stormwater. Not all stormwater runoff should be infiltrated due to concern for groundwater contamination.

In order for an infiltration basin to be feasible, the depth to groundwater typically needs to be 5 feet or more and the soil needs to be a loam, silt or sand. As shown in Figure 5, soils in the City are predominately clay (hydrologic soil group C and D). Silty soils (hydrologic soil group B) in the City are generally located along the Kankapot Creek corridor and within the central portion of the City's north side. As such, the feasibility of an infiltration basin is very limited within the City.

Finally, a significant amount of the water quality benefit is provided by the infiltration basin's pretreatment system. Typically, the pretreatment system is a wet detention pond or biofiltration device. From a water quality perspective, an infiltration basin is not cost effective after considering the pretreatment costs. As such, infiltration basin costs are not included in the analysis; rather pretreatment system costs are included in the analysis (i.e. wet detention ponds and biofiltration devices).

Wet Detention Ponds / Wetland Systems

Wet detention ponds and wetland systems are effective at removing sediment, nutrients, heavy metals, oxygen demanding compounds (BOD), hydrocarbons, and bacteria. Pollutant removal within a wet pond and wetland system is primarily due to gravity settling of particulate pollutants and sediment. Filtration, adsorption and microbial decomposition also remove pollutants, particularly within a wetland system. WDNR Technical Standard 1001 – Wet Detention Pond discusses design criteria for wet detention ponds.

Typically, a wet detention pond or wetland system must contain a minimum water depth of 5 feet within a portion of the permanent pool to minimize re-suspension of pollutants during a rainfall event. The WDNR requires that wet detention ponds and wetland systems be sized using the National Urban Runoff Project (NURP) particle size distribution. To achieve an 80% reduction in TSS, a wet detention pond or wetland system typically needs to remove the 3 to 5 micron sediment particle.

Existing dry detention ponds located in the City were evaluated to determine the feasibility of converting into wet detention ponds. Currently, WDNR does not allow water quality credit for dry detention ponds. Existing dry detention ponds located within the City are depicted in Figure 7 and summarized in Table 2-3. Generally, wet detention ponds are not recommended for small watersheds (less than 15 to 20 acres in clay soil). A wet detention pond located in a small watershed may develop stagnation problems and become a public nuisance. Public acceptance of stormwater BMPs is important to the success of the City's stormwater program.

As shown in Figure 5, soils in the City are predominately clay (hydrologic soil group C and D). Since clay soils are not conducive to infiltration, wet detention ponds and wetland systems tend to be cost-effective BMP options. A cost analysis was completed to determine the most cost-effective retrofits within the City. As part of the analysis, aerial photographs were used to identify potential undeveloped properties that could be used for a retrofit. The location of storm sewer pipes and the watershed size in relation to the undeveloped property was also considered. Table 4-5 summarizes the cost and water quality benefits of those wet detention ponds / wetland systems analyzed for the City (partial list of analyzed ponds). Wet detention ponds analyzed for the City is provided in Appendix C. The costs contained in Table 4-5 can be compared to the other BMP costs contained in 4-1, 4-2, 4-3, 4-4 and 4-6.

Table 4-5: Potential Wet Detention Ponds / Wetland Systems

Wet Detention Pond / Wetland System	Drainage Area (acres)	Pollutant Reduction		Capital Costs*	Capital & O&M Costs Over 20 Years*	Avg. Annual TSS Cost ($/lb)*
		TSS (%)	TP (%)			
Grignon Park Disk Golf Pond	106	72%	50%	$282,470	$344,268	$1.95
Agricultural Park Pond Mod.	96	88%	52%	$480,800	$974,482	$2.10
Northridge Dr Dry Pond Conver	39	86%	60%	$348,580	$483,196	$2.19
MCC Quarry Regional Pond	346	81%	55%	$1,923,199	$1,920,938	$2.29
Seventh Street Pond	29	83%	63%	$186,310	$238,112	$2.57
Company Woods Expansion	44	78%	51%	$180,000	$215,010	$3.42
Fourteenth Street Pond	43	76%	53%	$186,310	$236,660	$3.05
Draper Street North Pond	121	55%	39%	$552,919	$580,068	$4.03
Winchester East Pond	23	78%	55%	$210,350	$243,313	$4.37
Sunny Meadows Pond	20	80%	55%	$155,058	$171,596	$5.08
Kelso Park Pond Expansion	441	70%	55%	$1,412,349	$1,526,520	$5.70
Badger Pond Conversion	48	82%	58%	$388,246	$445,614	$5.90
CTH HH Pond	27	82%	57%	$360,600	$404,036	$6.62
Fieldcrest Ponds	11	80%	55%	$352,000	$403,800	$6.79
Riverview Underground Pond	112	57%	42%	$2,155,175	$2,255,925	$8.28
MCC Quarry Pond	31	85%	43%	$276,460	$321,308	$8.86

** 2023 present value costs.*

In the 2002 version of the NR 151 rule, best management practices (BMPs) associated with post-construction sites containing new development may not be located in navigable waters to receive credit for meeting any performance standard in Chapter NR 151. This restriction has been retained in the revised rule. Also in the 2002 version of the rule, best management practices for existing development, re-development or in-fill development could receive water quality credit for wet detention ponds / wetland systems constructed within both perennial and intermittent streams if all applicable permits are received. As of January 1, 2011, NR 151.003 only allows water quality credit for newly constructed wet detention ponds / wetland systems constructed within intermittent streams for which all applicable permits are received.

In the future, the City may want to investigate the feasibility of adding polymers or flocculants to wet detention ponds to enhance pollutant removal efficiencies. Polymer or flocculent additions will likely require installation of mechanical injection systems. Due to WDNR environmental concerns, polymer and flocculent costs were not evaluated for this study. The WDNR is currently discussing if Wisconsin will allow the use of polymers and flocculants in wet detention ponds. This TMDL pollutant analysis will likely require updating after WDNR guidance documents regarding the use of polymer and flocculants in ponds is completed.

Concept drawings for a few of the Table 4-5 facilities are provided in Appendix C.

Proprietary Devices

Several private companies have developed proprietary stormwater quality treatment devices. These underground treatment devices are advantageous within ultra-urban watersheds where there is not land available for wet detention ponds, wetland systems, or biofiltration devices. Some of the devices are based on simple hydraulics and residence times, and others devices are based on complex hydrodynamics or the use of different filter materials. Maintenance activities vary from vacuum truck suctioning of pollutants to replacing filter media in cartridges. The WDNR Technical Standard 1006 - Proprietary Sedimentation Devices discusses design criteria for proprietary sedimentation devices.

Several proprietary devices were analyzed using WinSLAMM. For purposes of this analysis, various proprietary devices and drainage areas were evaluated to determine the device's cost effectiveness. McMahon contacted a local proprietary device supplier and asked the supplier to size the proprietary devices using their design methodology. McMahon then used the WinSLAMM model and unit size selected by the supplier to evaluate water quality benefits. Table 4-6 summarizes the costs and water quality benefits of those proprietary devices. The costs contained in Table 4-6 can be compared to the other BMP costs contained in 4-1, 4-2, 4-3, 4-4 and 4-5.

Table 4-6: Proprietary Devices

Structural BMP	Drainage Area (acres)	Pollutant Load Reduction		Capital Costs	Capital & O&M Costs Over 20 Years	Avg. Annual TSS Cost ($/lb)
		TSS (%)	TP (%)			
Vortechnic VX-11000 Unit	16.59	17%	14%	$60,000	$96,694	$4.61
Vortechnic VX-7000 Unit	10.42	22%	16%	$44,125	$72,665	$5.69
Vortechnic VX-9000 Unit	6.36	24%	18%	$44,250	$76,867	$9.89
Vortechnic VX-4000 Unit	6.36	20%	14%	$37,750	$62,213	$9.90

Mechanical / Biological Treatment Facilities

Mechanical / biological treatment facilities are not currently used in Wisconsin, with the exception of combined sewer systems that treat wastewater and stormwater. A mechanical / biological treatment facility would be difficult to implement for stormwater given the number of storm sewer outfalls located within the City. Significant storm sewer pumping would likely be needed to convey stormwater from each outfall to a regional stormwater treatment facility, similar to a wastewater treatment facility. As a result, stormwater treatment facilities are not typically cost effective BMPs. A mechanical / biological treatment facility and associated pumping systems are estimated to have an average annual cost that is well above $20 per pound of TSS removed. In addition, diverting low flows from all storm sewer outfalls to a regional treatment facility may dry up existing wetlands and streams located near the City's current storm sewer outfalls.

5.0 PLAN OF ACTION

The City is responsible for reducing phosphorus and sediment discharges to comply with the waste load allocations for the developed urban area. A Plan of Action was developed to satisfy the TMDL allocations. The Plan of Action identifies a combination of existing and proposed BMPs that satisfies TMDL allocations for the City MS4.

The Plan of Action is a living document, which may change in the future as implementation progresses. The Plan of Action provides an anticipated implementation schedule, including projected costs. The Plan of Action is depicted in Figure 15 and includes the following:

- Street sweeping with a high efficiency street sweeper and parking controls to improve pollutant reduction benefits. Street sweeping occurs 4 times per week for downtown areas and 2 times per week for main arterial roads. Weather permitting, street sweeping begins March 29 and ends November 25 of each calendar year.

- Proposed pond construction project required to meet the TMDL goals include: Badger Pond, Company Woods Expansion, Draper Street North Pond, MCC Quarry Regional Pond, Riverview Pond, Winchester East Pond, CTH HH Pond with Enhanced Settling, Fieldcrest Ponds with Enhanced Settling, Sunny Meadows Pond with Enhanced Settling and many street and rear-yard biofilters. Additionally, modifications to existing ponds include: Coriander Court Pond with Enhanced Settling, Horseshoe Park Pond with Enhanced Settling, Jonen Park Wet Pond with Enhanced Settling, Lemongrass Way Pond with Enhanced Settling, Moon Ridge Court Pond with Enhanced Settling, Newton Lane Court Pond with Enhanced Settling, and Kelso Park Pond Expansion.

- Future development was also considered as part of the TMDL Plan of Action. The future development areas are shown on Figure 15. These areas will have 80% TSS reduction in the developed condition.

Costs associated with the proposed structural BMPs are provided in Table 5-1. The capital costs include an allowance for construction, land, engineering, and contingency costs. The City's 25-year Capital Improvement Plan (CIP), developed for the Plan of Action is included in Appendix A. The 25-year CIP shows the TMDL allocations are planned to be met in the year 2040 (25 year timeline). The City currently has debt service which expires in 2025, which limits the ability to construct ponds in the near future. See Appendix A for more information.

Table 5-1: Plan of Action

Structural BMP	Opinion of Probable Cost	Construction Year	Apply for UNPS&SW Grant
Company Woods Expansion	$180,000	2023	2022
Riverview Pond	$2,140,925	2025	2024
Badger Pond	$402,364	2025	-
Horseshoe Park Pond with Enhanced Settling	$238,664	2027	-
Moon Ridge Court Pond with Enhanced Settling	$33,067	2027	2026
Sunny Meadows Pond with Enhanced Settling	$156,451	2029	2028
MCC Quarry Regional Pond	$1,993,134	2030	-
Jonen Park Wet Pond with Enhanced Settling	$122,647	2030	-
Draper Street North Pond	$623,291	2030	2030
Winchester East Pond	$244,771	2032	2032
Kelso Park Pond Expansion	$1,720,499	2035	2034
Fieldcrest Ponds with Enhanced Settling	$433,849	2036	2036
Coriander Court Pond with Enhanced Settling	$55,611	2036	-
Lemongrass Way Pond with Enhanced Settling	$151,906	2036	-
Newton Lane Court Pond with Enhanced Settling	$122,947	2036	-
Starwood Acres Pond	$573,026	2037	2036
CTH HH Pond with Enhanced Settling	$599,653	2040	2040
Bio Retention / Rain Gardens	$882,747	2040	-
Total	$10,643,070	-	-

6.0 IMPLEMENTATION & RECOMMENDATIONS

Below are various recommendations for the City to consider when implementing the Plan of Action and working toward MS4 Municipal Stormwater Permit compliance. The goal of the Plan of Action is to achieve long-term urban stormwater quality requirements established in the Lower Fox River Basin Total Maximum Daily Load (TMDL).

Operation & Maintenance

It is recommended that the City continue to operate and maintain its current stormwater management system, which provides a City-wide average Total Suspended Solids (TSS) and Total Phosphorus (TP) reduction of 37.5% and 23.7%, respectively. Operation and maintenance is needed in order for the stormwater system to perform as designed. It is recommended that the City monitor sediment depths within City-owned wet detention ponds. Sediment accumulation rates can be used to predict future dredging activities.

10-Year & 25-Year Capital Improvement Plan

It is recommended that the City manage and update a 10-year capital improvement plan. The 10-year capital improvement plan should include ample time for public input, grant applications, BMP design, regulatory permits, financing, and construction. The 10-year capital improvement plan should also take into consideration the timing of other local capital improvement projects, such as street reconstruction projects, utility projects, and private development projects. The City developed an initial capital improvement plan to assist with planning and implementation. The City established a 25-year CIP for the TMDL Plan of Action and is shown in Appendix A.

Public Education & Involvement

Public education and public involvement are recommended during development and implementation of the Plan of Action. Potential stakeholders include the general public, elected officials, City Staff, developers, regulatory entities, individual property owners and other regulated entities. Although this stormwater quality management plan includes a cost versus benefit analysis, the plan does not take into consideration intangibles such as public sentiment, public opinion, land availability, etc.

Municipal Leaf Collection Program

It is recommended that the City consider contributing stormwater utility funds to future leaf collection scientific research. The League of Municipalities, WDNR, and United States Geological Survey (USGS) plan to initiate a second leaf collection study during 2018 or 2019 to further quantify phosphorus reductions for urban source areas and drainage systems. The second study is anticipated occur over a 2 to 3 year period. The WDNR will use the study

results to develop additional leaf collection and phosphorus reduction guidance for municipalities. The municipal leaf collection / phosphorus reduction studies may reduce future wet detention pond costs for the City.

As new scientific research and guidance is released, it is recommended that the City review and update pollutant reduction credits for its municipal leaf collection program.

Financing Plan

It is recommended that the City develop a financing plan. The financing plan will allow the City to implement its Plan of Action and 10-year Capital Improvement Plan. Below is a discussion of various funding sources which may be available to the City. Depending on the project, funding options may be used individually or in combination.

- Stormwater Utility: Stormwater utilities are similar to sanitary and water utilities. Stormwater utilities generate revenue for stormwater related projects by charging property owners an annual service fee. Annual service fees are based upon the amount of runoff generated by a specific property. Properties with more impervious area (i.e. roofs, parking lots, driveways, etc.) are charged a higher fee as compared to properties with less impervious area. All properties, including tax exempt properties, pay the service fee. Rate adjustments are recommended as needed to fund the City's stormwater program.

- Grant Funding: Urban Non-Point Source and Stormwater (UNPS&SW) Construction Grants are recommended for urban retrofits that improve stormwater quality for existing development. The competitive WDNR grant program has a 50% state cost share rate and $150,000 maximum state cost share for eligible design and construction costs. The City has been awarded an UNPS&SW Construction Grant for some of its existing wet detention ponds. Grant applications are submitted to the WDNR in even numbered years, such as 2024 and 2026. If awarded a grant, funds are available for construction projects in the 2 year period following the application. The year in which the City is planning to submit an UNPS&SW Construction Grant application is summarized in Table 5-1 for each capital improvement project.

  Urban Non-Point Source and Stormwater (UNPS&SW) Planning Grants are recommended for urban planning projects that improve stormwater quality. The competitive WDNR grant program has a 50% state cost share rate and $85,000 maximum state cost share for eligible planning costs. In the past 15 years, the City has been awarded several planning grants to assist with Municipal Stormwater Permit compliance. UNPS&SW Planning Grant applications are submitted in odd numbered years, such as 2023 and 2025. Grant funds are available for planning projects in the following 2 year period.

Below are a few grant / loan programs which the City of Kaukauna may or may not be familiar with. Grant applications are recommended.

- Coastal Management Grant
- Community Development Block Grant
- Clean Water Fund
- Great Lakes Basin Program

- Debt / Bonds: General obligation and revenue bonds may be used to secure funding for stormwater projects. Property taxes and revenue fees are used for long-term debt payments.

- Impact Fees: Impact fees may be charged to developers for stormwater projects that benefit the development. Impact fees are usually paid during initial stages of development. Typically, projects include regional stormwater facilities or improvements to deficient downstream infrastructure. Often, other funding sources are needed to pay for project costs until developers and property owners are required to pay the impact fee. Impact fees are recommended as needed to fund the City's stormwater program.

- Tax Incremental Financing (TIF) District: TIF Districts may be used by Cities and Villages to fund stormwater projects that benefit property located within the District. Property value increases within the TIF District generate additional tax revenue that is used for long-term debt payments.

Inter-Governmental Agreements

It is recommended that the City execute an agreement with Outagamie County Highway Department and/or Wisconsin DOT within the next 5 years in order to take credit for pollutant reduction benefits of wet ponds, grass swales and street sweeping along County & State Highways. After executing an agreement, both the City and County and/or the City and State can benefit from pollutant reductions associated with street sweeping, grass swales and wet detention ponds. The City's Plan of Action assumes that the City enters into an intergovernmental agreement with the County Highway Department and Wisconsin DOT.

It is recommended that the City evaluate other inter-governmental agreements when implementing its Plan of Action. It may be more cost effective to work together with adjoining municipal jurisdictions to construct a mutually beneficial stormwater BMP, share equipment, restore a wetland, or improve water quality within all watersheds, especially the Garners Creek watershed, since phosphorus allocations are more stringent.

Redevelopment Sites

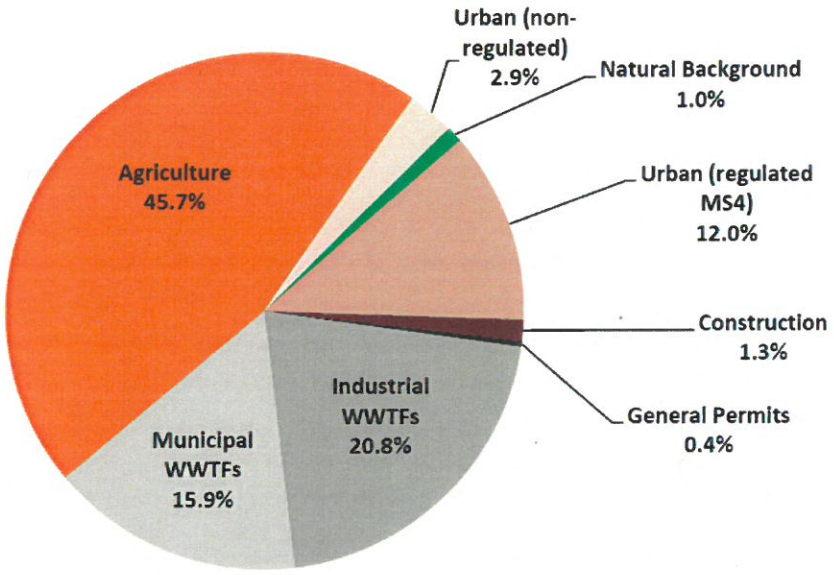
It is recommended that the City evaluate public / private partnerships with landowners when implementing its Plan of Action. As required by the City's Post-Construction Stormwater Management Ordinance, redevelopment sites with 1 acre or more of land disturbance are required to achieve a minimum 40% TSS & 30% TP reduction for Apple Creek, Kankapot Creek, and Plum Creek; a minimum 49.9% TSS & 63.1% TP reduction for Garners Creek and a minimum of 65.2% TSS & 30 TP reduction for the Fox River. Compliance with the TSS reduction is only required when a construction project occurs on the site. When redevelopment occurs on commercial, industrial, institutional and multi-family residential parcels, stormwater quality improvements will be required. Public / private partnerships provide an opportunity to work together such that both the landowner and City benefit.

For example, redevelopment of a 20 acre shopping center may provide an opportunity to increase the site's TSS reduction goal from 65.2% to 80% through a cost sharing agreement between the landowner and City. In some instances, cost sharing can be used as a financial incentive. Typically, it is more cost effective to incorporate stormwater quality improvements into an already planned construction project as compared to retrofitting a BMP without considering other construction activities in the watershed.

Watershed Adaptive Management

It is recommended that the City evaluate the feasibility and cost effectiveness of Watershed Adaptive Management when developing and implementing its Plan of Action. Adaptive management is a watershed approach that focuses on meeting water quality standards within a river, stream or lake in a more cost-effective manner. Watershed Adaptive Management needs to be initiated by a wastewater treatment facility owner, but would likely involve cooperation among other phosphorus dischargers including agricultural, urban stormwater, and wastewater dischargers. Exhibit 6-1 depicts the portion of phosphorus that is being generated by agriculture, urban stormwater and wastewater treatment facilities within the Lower Fox River Basin. Exhibit 6-1 was obtained from the Lower Fox River Basin TMDL Report.

Exhibit 6-1: Phosphorus Sources in Lower Fox River Basin



Water Quality Trading

It is recommended that the City consider water quality trading when implementing its Plan of Action. The cost for achieving compliance with TMDL allocations is not uniform among dischargers and source areas. As such, compliance with TMDL allocations may be more cost-effectively achieved by trading with other dischargers. Water quality trading is allowed between wastewater treatment facilities, agricultural landowners, and other urban stormwater dischargers. In order to be eligible for water quality trading, specific criteria needs to be satisfied. Water quality trading can be used in conjunction with Adaptive Management.

Stream & Shoreline Erosion

It is recommended that the City undertake stream, shoreline and channel stabilization projects to reduce the discharge of sediment and phosphorus pollutants associated with bed, bank or steep slope erosion. Stream and shoreline erosion can result in a significant amount of sediment and phosphorus pollutants being discharged into the City's sub-watersheds. The estimated sediment and phosphorus loads associated with existing stream or shoreline erosion problems were not estimated, since numeric TMDL credit is not currently provided by WDNR. Grant funding is available to assist with stream, shoreline and channel stabilization projects. In addition to the water quality benefits, these projects provide an opportunity to improve habitat, remove invasive species, and potentially restore wetlands.

Resource Management Plans

Several resource management plans were discussed in Section 1.0. It is recommended that the priorities and recommendations contained in these resource management plans be incorporated into this Plan of Action by reference.

APPENDIX A

25-year Stormwater Plan of Action CIP

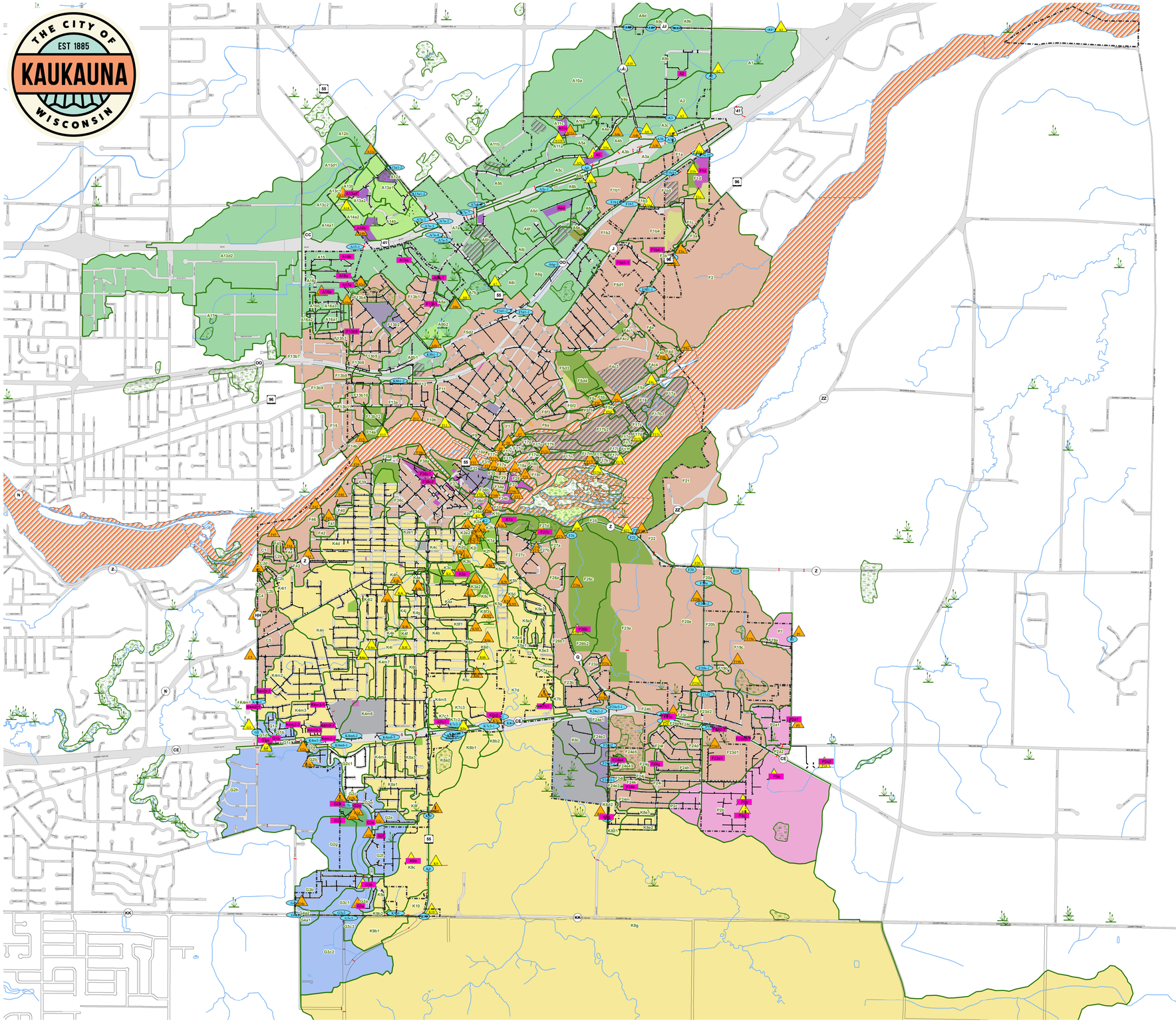
APPENDIX B

Water Quality Results

APPENDIX C

Pond Concepts

THE CITY OF KAUKAUNA EST 1885 WISCONSIN



MS4 Drainage System

- Bridges and Culverts
- Flow Arrows
- Storm Sewer System
- F22 Bridge and Culvert ID
- A1 Major Outfall I.D.
- A4a Minor Outfall I.D.
- A5 Structural BMP ID
- A1 Surface Water

Publically Owned Land

- Kaukauna Open Lands
- Kaukauna Recreational Areas
- Kaukauna Municipal Facilities
- Kaukauna School District
- Outagamie County Municipal Facility
- United States Government Property

Natural Resources

- WDNR Wetland Inventory (Less Than 2 Acres)
- WDNR Wetland Inventory (2 Acres or Greater)
- 303(d) Impaired Waters
- Surface Water
- Streams

WPDES Industrial Permits

- WPDES Industrial Permit I.D.
- Properties with WPDES Industrial Permits

Other Mapped Features

- Parcel Lines
- Right of Way
- Municipal Boundary
- County Boundary

TMDL Watershed Basins

- APPLE CREEK
- LOWER FOX RIVER
- GARNERS CREEK
- KANKAPOT CREEK
- PLUM CREEK

NORTH

0 1,500 3,000 4,500 6,000 7,500 Feet

Sources: City of Kaukauna, 2007-08; Wisconsin Department of Natural Resources, 2007; Outagamie and Calumet Counties, 2005.

FIGURE 6
MS4 SYSTEM
UPDATED 6/5/2020
STORM WATER MANAGEMENT PLAN
CITY OF KAUKAUNA
OUTAGAMIE COUNTY, WISCONSIN

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City of Kaukauna
SWMP Plan of Action Update
McM No. K0006 - 09-23-00107
October 2023

McMAHON ENGINEERS ARCHITECTS

Kaukauna ON THE FOX

III. Total Maximum Daily Load (TMDL) Water Quality Analysis: 2023 Condition: 2012 Land Use; High Effeciency Street Sweeper - Frequency of 4 times per week, WPC - Downtown Areas, 2 times per week, WPC - main arterial roadways, 1 time per week, WPC - STH 55 and Industrial / Business Parks, and twice per month, WPC - remaining areas. A parking control ordinance will be required for "remaining areas". A maintenance agreement with Outagamie County and the State of Wisconsin for water quality benefits of their grass swale conveyance system will be obtained.

Drainage System	Sub-Watershed	BMP Name	City of Kaukauna: UPB (Excludes Undeveloped Areas over 5 ac, Other MS4 Jurisdictions, Agricultural Areas & Waters of the State) Area (acres)	UPB Total Suspended Solids (TSS) Before Drain System (lbs/yr)	UPB TSS After Drain System (lbs/yr)	UPB TSS BMP Reduct (%)	UPB TSS After Outfall Control (lbs/yr)	UPB TSS Total Load Reduct (%)	UPB TSS Net Gain (lbs/yr)	UPB Total Phosphorus (TP) Before Drain System (lbs/yr)	UPB TP After Drain System (lbs/yr)	UPB TP BMP Reduct (%)	UPB TP After Outfall Control (lbs/yr)	UPB TP Total Load Reduct (%)	Expera Specialty Solutions Area (acres)	Expera TSS Provided Before Drain System (lbs/yr)	Expera TSS Provided After Outfall Control (lbs/yr)	Expera TSS Provided Load Reduct (%)	Expera TP Provided Before Drain System (lbs/yr)	Expera TP Provided After Outfall Control (lbs/yr)	Expera TP Provided Load Reduct (%)	Riparian Area (acres)	Riparian TSS Provided Before Drain System (lbs/yr)	Riparian TSS Provided After Outfall Control (lbs/yr)	Riparian TSS Provided Load Reduct (%)	Riparian TP Provided Before Drain System (lbs/yr)	Riparian TP Provided After Outfall Control (lbs/yr)	Riparian TP Provided Load Reduct (%)	County HWY Area (acres)	County HWY TSS Provided Before Drain System (lbs/yr)	County HWY TSS Provided After Outfall Control (lbs/yr)	County HWY TSS Provided Load Reduct (%)	County HWY TP Provided Before Drain System (lbs/yr)	County HWY TP Provided After Outfall Control (lbs/yr)	County HWY TP Provided Load Reduct (%)	State HWY Area (acres)	State HWY TSS Provided Before Drain System (lbs/yr)	State HWY TSS Provided After Outfall Control (lbs/yr)	State HWY TSS Provided Load Reduct (%)	State HWY TP Provided Before Drain System (lbs/yr)	State HWY TP Provided After Outfall Control (lbs/yr)	State HWY TP Provided Load Reduct (%)	Totals/Sums for Comparison Area (acres)	Totals TSS Provided Before Drain System (lbs/yr)	Totals TSS Provided After Outfall Control (lbs/yr)	Totals TSS Provided Load Reduct (%)	Totals TP Provided Before Drain System (lbs/yr)	Totals TP Provided After Outfall Control (lbs/yr)	Totals TP Provided Load Reduct (%)
EBMP A2b2	Apple Creek	Van Epern Pond	98.42	26,473	25,099	90.4%	2,539	90.4%	22,560	60.77	59.14	56.6%	26.35	56.6%															1.74	460	44	90.4%	2.65	1.15	56.6%								100.16	26,933	2,583	90.4%	63.43	27.50	56.6%
EBMP A5b	Apple Creek	G and G Machine Bio Retention Device	3.70	186	186	80.0%	37	80.0%	148	1.33	1.33	35.0%	0.86	35.0%																													3.70	186	37	80.0%	1.33	0.86	35.0%
EBMP A5c	Apple Creek	Kelso Park Pond	392.58	127,841	120,303	60.8%	50,127	60.8%	70,176	268.64	257.76	43.2%	152.72	43.2%															12.65	3,124	1,225	60.8%	17.21	9.78	43.2%	48.80	19,698	7,724	60.8%	60.87	34.61	43.2%	454.03	150,664	59,075	60.8%	346.73	197.11	43.2%
EBMP A6d1	Apple Creek	Kelso Park Pond	27.20	9,739	9,739	60.8%	3,819	60.8%	5,920	16.43	16.43	43.2%	9.34	43.2%																													27.20	9,739	3,819	60.8%	16.43	9.34	43.2%
EBMP A6f	Apple Creek	Kelso Park Pond	9.50	3,612	3,365	60.8%	1,416	60.8%	1,949	6.86	6.58	43.2%	3.90	43.2%																													9.50	3,612	1,416	60.8%	6.86	3.90	43.2%
EBMP A6h2	Apple Creek	Kelso Park Pond	11.42	4,172	4,172	60.8%	1,636	60.8%	2,536	6.83	6.83	43.2%	3.88	43.2%																						0.00	4	1	60.8%	0.01	0.00	43.2%	11.43	4,176	1,637	60.8%	6.84	3.89	43.2%
EBMP A13a1	Apple Creek	Commerce Crossing 2 Pond	27.76	3,963	3,399	84.2%	628	84.2%	2,771	15.77	14.90	54.8%	7.13	54.8%																						0.21	57	9	84.2%	0.33	0.15	54.8%	27.97	4,019	637	84.2%	16.10	7.28	54.8%
EBMP A13a2	Apple Creek	Commerce Crossing 2 Pond	17.06	3,743	2,865	84.2%	593	84.2%	2,272	11.14	9.77	54.8%	5.04	54.8%																													17.06	3,743	593	84.2%	11.14	5.04	54.8%
EBMP A14b	Apple Creek	Commerce Crossing 3 Pond	31.50	3,036	2,493	96.1%	118	96.1%	2,375	13.00	12.15	60.0%	5.20	60.0%																													31.50	3,036	118	96.1%	13.00	5.20	60.0%
EBMP A16b	Apple Creek	Wildenberg Estates North Pond	18.11	3,406	2,800	95.4%	156	95.4%	2,644	13.30	11.91	66.3%	4.48	66.3%																													18.11	3,406	156	95.4%	13.30	4.48	66.3%
None	Apple Creek		80.03	13,828	11,937		11,937	13.7%	0	53.30	48.95		48.95	8.2%																						41.19	14,875	13,974	6.1%	47.28	44.58	5.7%	121.22	28,702	25,911	9.7%	100.58	93.53	7.0%
PBMP A3c1	Apple Creek		0.69	594	369		369	37.8%	0	1.39	1.13		1.13	18.6%																													0.69	594	369	37.8%	1.39	1.13	18.6%
PBMP A4a	Apple Creek		8.56	2,487	1,752		1,752	29.5%	0	7.55	6.63		6.63	12.1%																													8.56	2,487	1,752	29.5%	7.55	6.63	12.1%
PBMP A4b	Apple Creek		11.84	3,984	3,813		3,813	4.3%	0	8.02	7.68		7.68	4.3%															0.03	12	6	48.1%	0.03	0.02	44.0%								11.88	3,995	3,819	4.4%	8.05	7.70	4.4%
PBMP A11	Apple Creek		38.71	13,091	12,762		12,762	2.5%	0	25.54	24.94		24.94	2.3%															4.50	1,297	1,132	12.7%	6.46	5.63	12.9%								43.22	14,388	13,894	3.4%	32.00	30.57	4.5%
PBMP A13b	Apple Creek		1.88	126	126		126	0.0%	0	0.90	0.90		0.90	0.0%																													1.88	126	126	0.0%	0.90	0.90	0.0%
PBMP A13c1	Apple Creek		2.65	177	177		177	0.0%	0	1.27	1.27		1.27	0.0%															0.43	114	114	0.0%	0.66	0.66	0.0%								3.08	291	291	0.0%	1.93	1.93	0.0%
PBMP A14a2	Apple Creek		9.95	708	708		708	0.0%	0	4.81	4.81		4.81	0.0%																													9.95	708	708	0.0%	4.81	4.81	0.0%
PBMP A16a	Apple Creek		3.10	507	434		434	14.3%	0	2.11	1.94		1.94	7.9%																													3.10	507	434	14.3%	2.11	1.94	7.9%
EBMP F1b4	Fox River		2.76	439	439		439	0.0%	0	1.55	1.55		1.55	0.0%																													2.76	439	439	0.0%	1.55	1.55	0.0%
EBMP F1d	Fox River		92.94	28,156	26,212		26,212	6.9%	0	61.24	57.99		57.99	5.3%															1.51	1,027	833	18.9%	2.81	2.37	15.6%	0.63	173	167	3.2%	0.94	0.92	1.7%	95.08	29,356	27,212	7.3%	64.99	61.28	5.7%
EBMP F5d1	Fox River	Lamplighter Apartments Pond	12.40	2,236	1,858	73.5%	592	73.5%	1,265	8.19	7.32	53.9%	3.78	53.9%															0.06	33	9	73.5%	0.10	0.05	53.9%	0.09	23	6	73.5%	0.14	0.06	53.9%	12.55	2,292	607	73.5%	8.43	3.88	53.9%
EBMP F5d13	Fox River	Rose Tree Villas Bio Retention Devices	3.35	809	809	63.5%	295	63.5%	514	2.28	2.28	35.0%	1.48	35.0%																													3.35	809	295	63.5%	2.28	1.48	35.0%
EBMP F13b1	Fox River	Hurkman Heights South Pond	15.38	2,757	2,291	76.4%	650	76.4%	1,641	11.16	10.09	53.9%	5.15	53.9%																													15.38	2,757	650	76.4%	11.16	5.15	53.9%
EBMP F13b4	Fox River	Wildenberg Estates South Pond	7.34	1,363	1,115	75.6%	333	75.6%	782	5.23	4.66	51.3%	2.54	51.3%																													7.34	1,363	333	75.6%	5.23	2.54	51.3%
EBMP F23d1	Fox River	Autumn Court Pond	2.56	421	349	93.0%	30	93.0%	319	1.69	1.52	45.4%	0.92	45.4%															0.02	6	0	93.0%	0.04	0.02	45.4%								2.59	428	30	93.0%	1.72	0.94	45.4%
EBMP F23e	Fox River	Camden Way Pond	4.54	494	381	57.6%	209	57.6%	172	2.26	2.00	57.6%	0.96	57.6%																													4.54	494	209	57.6%	2.26	0.96	57.6%
EBMP F23f1	Fox River	Fenway Court Pond	2.30	271	271	93.3%	18	93.3%	253	1.52	1.52	64.0%	0.55	64.0%																													2.30	271	18	93.3%	1.52	0.55	64.0%
EBMP F23f2	Fox River	Fenway Court Pond	7.67	1,762	1,391	93.3%	118	93.3%	1,273	6.48	5.63	64.0%	2.33	64.0%																													7.67	1,762	118	93.3%	6.48	2.33	64.0%
EBMP F24e6	Fox River	Andrea Michelle Court Pond	3.70	750	604	89.1%	82	89.1%	522	2.91	2.58	63.0%	1.08	63.0%																													3.70	750	82	89.1%	2.91	1.08	63.0%
EBMP F24g	Fox River	Meadowview South Pond	19.74	2,989	2,539	75.4%	736	75.4%	1,803	12.36	11.32	48.7%	6.34	48.7%																													19.74	2,989	736	75.4%	12.36	6.34	48.7%
EBMP F24k	Fox River	Whitewolf Lane Pond Revision	42.65	8,401	6,878	80.0%	1,680	80.0%	5,197	32.64	29.12	57.0%	14.03	57.0%																													42.65	8,401	1,680	80.0%	32.64	14.03	57.0%
EBMP F26b	Fox River	Company Woods Pond Reconstruction	43.83	4,773	4,217	76.1%	1,140	76.1%	3,077	23.27	21.97	50.7%	11.47	50.7%															4.04	2,628	1,415	46.2%	7.99	6.63	17.0%								47.87	7,401	2,555	65.5%	31.27	18.10	42.1%
EBMP F27c4	Fox River	Softball Diamond #2 Bio Retention Device	1.21	579	579	77.4%	131	77.4%	448	1.72	1.72	35.0%	1.12	35.0%																													1.21	579	131	77.4%	1.72	1.12	35.0%
None	Fox River		531.09	43,305	40,743		40,743	5.9%	0	219.91	213.61		213.61	2.9%								106.46	18,374	18,332	0.2%	52.60	52.51	0.2%	9.82	2,726	2,618	4.0%	15.12	14.93	1.2%	3.66	1,240	1,191	3.9%	4.60	4.34	5.5%	651.03	65,645	62,884	4.2%	292.23	285.40	2.3%
PBMP C2a	Fox River		4.83	1,323	1,025		1,025	22.5%	0	4.68	4.00		4.00	14.7%																													4.83	1,323	1,025	22.5%	4.68	4.00	14.7%
PBMP C2b	Fox River		5.80	741	654		654	11.7%	0	3.44	3.24		3.24	5.8%															0.54	354	191	46.2%	1.08	0.89	17.0%								6.34	1,095	844	22.9%	4.52	4.14	8.5%
PBMP C2c	Fox River		1.97	478	377		377	21.1%	0	1.75	1.52		1.52	13.2%															0.68	440	237	46.2%	1.34	1.11	17.0%								2.65	918	614	33.1%	3.09	2.63	14.9%
PBMP C4	Fox River		4.34	516	516		516	0.0%	0	2.61	2.61		2.61	0.0%															0.65	422	227	46.2%	1.28	1.07	17.0%								4.99	939	744	20.8%	3.90	3.68	5.6%
PBMP F2a	Fox River																																			0.35	92	0	99.7%	0.53	0.00	99.7%	0.35	92	0	99.7%	0.53	0.00	99.7%
PBMP F2b1	Fox River		0.96	131	26		26	80.3%	0	0.49	0.11		0.11	78.2%																						0.12	32	6	80.3%	0.18	0.04	78.2%	1.08	162	32	80.3%	0.67	0.15	78.2%
PBMP F2b2	Fox River																																			0.03	9	0	99.7%	0.05	0.00	99.7%	0.03	9	0	99.7%	0.05	0.00	99.7%
PBMP F3	Fox River		6.67	2,771	2,771		2,771	0.0%	0	4.16	4.16		4.16	0.0%																													6.67	2,771	2,771	0.0%	4.16	4.16	0.0%
PBMP F4b2	Fox River		4.49	1,125	874		874	22.3%	0	4.01	3.44		3.44	14.4%																													4.49	1,125	874	22.3%	4.01	3.44	14.4%
PBMP F4b3	Fox River		13.90	1,257	763		763	39.3%	0	6.27	4.30		4.30	31.4%																													13.90	1,257	763	39.3%	6.27	4.30	31.4%
PBMP F4c1	Fox River		12.79	897	897		897	0.0%	0	4.39	4.39		4.39	0.0%																													12.79	897	897	0.0%	4.39	4.39	0.0%
PBMP F4c2	Fox River		12.12	1,304	733		733	43.8%	0	5.81	3.78		3.78	34.9%																													12.12	1,304	733	43.8%	5.81	3.78	34.9%
PBMP F5b	Fox River		3.81	439	398		398	9.4%	0	2.10	2.01		2.01	4.5%																													3.81	439	398	9.4%	2.10	2.01	4.5%
PBMP F5c	Fox River		0.78	177	138		138	21.9%	0	0.65	0.57		0.57	13.6%																													0.78	177	138	21.9%	0.65	0.57	13.6%
PBMP F5d2	Fox River		23.17	2,406	2,340		2,340	2.7%	0	11.76	11.61		11.61	1.3%															0.03	2	2	0.0%	0.01	0.01	0.0%	0.05	13	13	0.0%	0.08	0.08	0.0%	23.25	2,421	2,355	2.7%	11.85	11.70	1.3%
PBMP F5d3	Fox River		3.22	850	658		658	22.6%	0	3.01	2.57		2.57	14.7%															0.04	25	14	46.8%	0.08	0.06	18.5%								3.26	876	672	23.3%	3.09	2.63	14.8%
PBMP F5d4	Fox River		7.26	1,480	1,111		1,111	24.9%	0	5.72	5.16		5.16	9.8%																						0.42	220	135	38.6%	0.77	0.67	12.4%	7.68	1,699	1,247	26.6%	6.48	5.83	10.1%
PBMP F5d5	Fox River		0.47	36	36		36	0.0%	0	0.19	0.19		0.19	0.0%															0.71	433	232	46.4%	1.33	1.08	18.2%								1.18	469	268	42.8%	1.52	1.28	15.9%
PBMP F5d6	Fox River		8.51	1,493	1,256		1,256	15.9%	0	6.02	5.47		5.47	9.1%															0.77	501	269	46.3%	1.53	1.26	17.2%								9.28	1,995	1,525	23.5%	7.54	6.73	10.7%
PBMP F5d7	Fox River		1.55	388	259		259	33.3%	0	1.42	1.27		1.27	10.3%																													1.55	388	259	33.3%	1.42	1.27	10.3%
PBMP F5d8	Fox River		8.48	1,444	1,219		1,219	15.5%	0	5.84	5.32		5.32	8.8%															0.41	267	143	46.5%	0.81	0.67	17.7%								8.89	1,711	1,362	20.4%	6.65	5.99	9.9%
PBMP F5d9	Fox River		2.11	416	300		300	27.8%	0	1.63	1.50		1.50	8.0%																													2.11	416	300	27.8%	1.63	1.50	8.0%
PBMP F5d10	Fox River		7.86	1,450	1,203		1,203	17.0%	0	5.71	5.14		5.14	9.9%															0.55	359	191	46.8%	1.09	0.89	18.5%								8.41	1,809	1,394	22.9%	6.80	6.03	11.3%
PBMP F5d11	Fox River		4.39	1,227	904		904	26.3%	0	4.33	3.72		3.72	14.2%																													4.39	1,227	904	26.3%	4.33	3.72	14.2%
PBMP F5d12	Fox River		9.28	1,520	1,293		1,293	14.9%	0	6.19	5.67		5.67	8.4%															0.02	10	5	46.8%	0.03	0.03	18.5%								9.29	1,530	1,299	15.1%	6.22	5.69	8.5%
PBMP F5d14	Fox River		4.71	1,261	913		913	27.6%	0	4.36	3.76		3.76	13.8%															0.29	186	99	46.8%	0.57	0.46	18.5%								5.00	1,448	1,012	30.1%	4.93	4.22	14.3%
PBMP F5d15	Fox River		2.14	574	374		374	34.8%	0	2.04	1.80		1.80	11.7%																													2.14	574	374	34.8%	2.04	1.80	11.7%
PBMP F5e1	Fox River		64.66	20,149	17,703		17,703	12.1%	0	45.91	41.46		41.46	9.7%															11.16	4,050	3,152	22.2%	15.83	13.42	15.2%	1.45	827	581	29.7%	2.60	1.97	24.1%	77.27	25,026	21,437	14.3%	64.34	56.86	11.6%
PBMP F5e2	Fox River		8.05	2,707	2,353		2,353	13.1%	0	6.69	6.04		6.04	9.7%																													8.05	2,707	2,353	13.1%	6.69	6.04	9.7%
PBMP F5e3	Fox River		2.58	717	495		495	30.9%	0	2.44	2.07		2.07	15.1%																													2.58	717	495	30.9%	2.44	2.07	15.1%
PBMP F5e4	Fox River		15.29	4,357	3,696		3,696	15.2%	0	11.98	10.73		10.73	10.4%																						0.36	236	120	49.0%	0.71	0.57	19.0%	15.64	4,593	3,816	16.9%	12.69	11.31	10.9%
PBMP F5e5	Fox River		5.73	1,300	951		951	26.8%	0	4.65	4.04		4.04	13.1%																													5.73	1,300	951	26.8%	4.65	4.04	13.1%
PBMP F5e6	Fox River		4.06	770	630		630	18.2%	0	2.96	2.64		2.64	10.8%																													4.06	770	630	18.2%	2.96	2.64	10.8%
PBMP F5e7	Fox River		5.78	1,209	978		978	19.1%	0	4.23	3.84		3.84	9.2%															1.00	648	345	46.8%	1.97	1.61	18.5%								6.78	1,857	1,323	28.8%	6.20	5.45	12.1%
PBMP F5e8	Fox River		1.70	819	571		571	30.2%	0	2.31	2.02		2.02	12.8%															0.00	2	1	46.8%	0.01	0.00	18.5%								1.70	820	572	30.2%	2.32	2.02	12.8%
PBMP F5e9	Fox River		6.18	1,454	1,130		1,130	22.3%	0	4.71	4.23		4.23	10.2%																													6.18	1,454	1,130	22.3%	4.71	4.23	10.2%
PBMP F5e10	Fox River		3.96	841	780		780	7.2%	0	2.76	2.62		2.62	5.1%																													3.96	841	780	7.2%	2.76	2.62	5.1%
PBMP F5e11	Fox River		4.30	1,223	913		913	25.4%	0	4.20	3.55		3.55	15.5%																													4.30	1,223	913	25.4%	4.20	3.55	15.5%
PBMP F5e12	Fox River		3.69	337	337		337	0.0%	0	1.83	1.83		1.83	0.0%																													3.69	337	337	0.0%	1.83	1.83	0.0%
PBMP F5e13	Fox River		8.08	1,489	1,224		1,224	17.8%	0	5.86	5.26		5.26	10.4%																													8.08	1,489	1,224	17.8%	5.86	5.26	10.4%
PBMP F5e14	Fox River		5.27	1,368	973		973	28.9%	0	4.75	4.05		4.05	14.6%																													5.27	1,368	973	28.9%	4.75	4.05	14.6%
PBMP F5e15	Fox River		1.67	357	287		287	19.7%	0	1.35	1.19		1.19	12.0%																													1.67	357	287	19.7%	1.35	1.19	12.0%
PBMP F5e16	Fox River		10.75	1,037	1,033		1,033	0.4%	0	5.30	5.29		5.29	0.2%																													10.75	1,037	1,033	0.4%	5.30	5.29	0.2%
PBMP F5f	Fox River		1.34	383	295		295	23.1%	0	1.34	1.14		1.14	15.2%																													1.34	383	295	23.1%	1.34	1.14	15.2%
PBMP F5g1	Fox River		13.71	412	412		412	0.0%	0	3.80	3.80		3.80	0.0%																													13.71	412	412	0.0%	3.80	3.80	0.0%
PBMP F5g2	Fox River		7.25	221	221		221	0.0%	0	1.96	1.96		1.96	0.0%																													7.25	221	221	0.0%	1.96	1.96	0.0%
PBMP F5g3	Fox River		8.68	579	579		579	0.0%	0	3.42	3.42		3.42	0.0%																													8.68	579	579	0.0%	3.42	3.42	0.0%
PBMP F5h1	Fox River		13.06	3,359	2,685		2,685	20.0%	0	11.22	9.81		9.81	12.6%																													13.06	3,359	2,685	20.0%	11.22	9.81	12.6%
PBMP F5h2	Fox River		5.17	371	371		371	0.0%	0	2.31	2.31		2.31	0.0%																													5.17	371	371	0.0%	2.31	2.31	0.0%
PBMP F5h3	Fox River		2.85	690	542		542	21.4%	0	2.37	2.04		2.04	13.7%																													2.85	690	542	21.4%	2.37	2.04	13.7%
PBMP F7	Fox River		3.82	769	619		619	19.5%	0	2.95	2.60		2.60	11.7%																													3.82	769	619	19.5%	2.95	2.60	11.7%
PBMP F8a1a	Fox River	Catherine Pond	19.30	7,200	5,340	54.3%	3,292	54.3%	2,047	19.29	16.56	40.4%	11.50	40.4%																													19.30	7,200	3,292	54.3%	19.29	11.50	40.4%
PBMP F8a1b	Fox River		11.56	2,337	1,733		1,733	25.8%	0	9.79	8.41		8.41	14.2%																													11.56	2,337	1,733	25.8%	9.79	8.41	14.2%
PBMP F8a2	Fox River		3.85	1,212	1,212		1,212	0.0%	0	2.76	2.76		2.76	0.0%																													3.85	1,212	1,212	0.0%	2.76	2.76	0.0%
PBMP F9a1	Fox River		7.45	4,165	2,375		2,375	43.0%	0	12.05	9.41		9.41	22.0%																													7.45	4,165	2,375	43.0%	12.05	9.41	22.0%
PBMP F9a2	Fox River	Catherine Pond	1.27	115	115	54.3%	53	54.3%	62	0.50	0.50	40.4%	0.30	40.4%																													1.27	115	53	54.3%	0.50	0.30	40.4%
PBMP F11	Fox River		65.17	17,197	13,394		13,394	22.1%	0	56.37	49.05		49.05	13.0%																													65.17	17,197	13,394	22.1%	56.37	49.05	13.0%
PBMP F12	Fox River		23.87	6,383	4,946		4,946	22.5%	0	21.27	18.87		18.87	11.3%																													23.87	6,383	4,946	22.5%	21.27	18.87	11.3%
PBMP F13a	Fox River		9.95	2,507	1,959		1,959	21.9%	0	9.09	7.83		7.83	13.8%																													9.95	2,507	1,959	21.9%	9.09	7.83	13.8%
PBMP F13b2	Fox River		17.59	3,536	2,915		2,915	17.6%	0	13.63	12.20		12.20	10.5%																													17.59	3,536	2,915	17.6%	13.63	12.20	10.5%
PBMP F13b3	Fox River		28.47	6,518	5,354		5,354	17.9%	0	23.81	21.16		21.16	11.1%																													28.47	6,518	5,354	17.9%	23.81	21.16	11.1%
PBMP F13b5	Fox River		30.14	6,347	5,053		5,053	20.4%	0	21.39	18.45		18.45	13.7%																													30.14	6,347	5,053	20.4%	21.39	18.45	13.7%
PBMP F13b6	Fox River		11.22	2,699	2,137		2,137	20.8%	0	9.44	8.14		8.14	13.7%																													11.22	2,699	2,137	20.8%	9.44	8.14	13.7%
PBMP F13b7	Fox River		6.60	1,927	1,792		1,792	7.0%	0	5.12	4.87		4.87	4.9%															2.05	450	444	1.4%	2.49	2.48	0.4%								8.65	2,377	2,236	6.0%	7.61	7.35	3.4%
PBMP F13b8	Fox River		1.39	176	161		161	8.5%	0	0.79	0.76		0.76	4.4%																													1.39	176	161	8.5%	0.79	0.76	4.4%
PBMP F13b12	Fox River		3.15	326	326		326	0.0%	0	1.58	1.58		1.58	0.0%															1.25	308	289	6.3%	1.53	1.50	2.0%								4.40	635	615	3.0%	3.11	3.08	1.0%
PBMP F13b14	Fox River		1.71	452	326		326	27.8%	0	1.62	1.41		1.41	12.7%																													1.71	452	326	27.8%	1.62	1.41	12.7%
PBMP F13b16	Fox River		4.64	1,241	821		821	33.8%	0	4.44	3.94		3.94	11.2%																													4.64	1,241	821	33.8%	4.44	3.94	11.2%
PBMP F13b17	Fox River		5.76	543	541		541	0.3%	0	2.89	2.88		2.88	0.1%																													5.76	543	541	0.3%	2.89	2.88	0.1%
PBMP F13b18	Fox River		9.83	2,848	2,228		2,228	21.8%	0	9.50	8.12		8.12	14.5%																													9.83	2,848	2,228	21.8%	9.50	8.12	14.5%
PBMP F17b1	Fox River														1.22	488	488	0.0%	0.69	0.69	0.0%																						1.22	488	488	0.0%	0.69	0.69	0.0%
PBMP F17b2	Fox River		2.30	751	751		751	0.0%	0	1.13	1.13		1.13	0.0%	23.14	9,115	9,115	0.0%	12.92	12.92	0.0%																						25.44	9,866	9,866	0.0%	14.05	14.05	0.0%
PBMP F17b3	Fox River														5.55	2,226	2,225	0.0%	3.14	3.14	0.0%	6.33	2,586	2,586	0.0%	3.73	3.73	0.0%															11.88	4,812	4,811	0.0%	6.87	6.87	0.0%
PBMP F17c1	Fox River		0.00	1	1		1	43.6%	0	0.00	0.00		0.00	21.9%																													0.00	1	1	43.6%	0.00	0.00	21.9%
PBMP F17c2	Fox River		1.37	999	681		681	31.8%	0	2.16	1.80		1.80	16.9%	4.00	1,606	1,604	0.1%	2.27	2.27	0.1%																						5.37	2,605	2,286	12.3%	4.43	4.07	8.3%
PBMP F17d	Fox River														1.83	733	733	0.0%	1.03	1.03	0.0%																						1.83	733	733	0.0%	1.03	1.03	0.0%
PBMP F17e	Fox River		0.21	179	179		179	0.0%	0	0.41	0.41		0.41	0.0%	1.83	734	734	0.0%	1.04	1.04	0.0%																						2.04	913	913	0.0%	1.45	1.45	0.0%
PBMP F17f	Fox River		0.07	62	62					0.14	0.14				0.47	189	189	0.0%	0.27	0.27	0.0%																						0.55	252	189	24.7%	0.41	0.27	34.9%
PBMP F17g	Fox River						0								2.37	950	950	0.0%	1.34	1.34	0.0%																						2.37	950	950	0.0%	1.34	1.34	0.0%
PBMP F17h	Fox River		1.41	45	42		42	7.1%	0	0.27	0.26		0.26	1.4%	19.77	7,728	7,686	0.5%	11.17	11.14	0.2%																						21.17	7,774	7,728	0.6%	11.44	11.41	0.3%
PBMP F17i	Fox River														0.41	163	163	0.0%	0.23	0.23	0.0%																						0.41	163	163	0.0%	0.23	0.23	0.0%
PBMP F17j	Fox River		1.47	1,208	1,208		1,208	0.0%	0	2.75	2.75		2.75	0.0%	2.76	1,155	1,155	0.0%	1.71	1.71	0.0%																						4.22	2,363	2,363	0.0%	4.46	4.46	0.0%
PBMP F17k	Fox River		0.23	184	184		184	0.0%	0	0.41	0.41		0.41	0.0%	2.17	892	892	0.0%	1.29	1.29	0.0%																						2.41	1,076	1,076	0.0%	1.70	1.70	0.0%
PBMP F17l	Fox River		0.17	139	139		139	0.0%	0	0.31	0.31		0.31	0.0%	0.69	277	277	0.0%	0.39	0.39	0.0%																						0.86	415	415	0.0%	0.70	0.70	0.0%
PBMP F17m	Fox River		2.20	1,692	1,400		1,400	17.2%	0	3.75	3.41		3.41	9.0%	0.84	338	338	0.0%	0.48	0.48	0.0%																						3.05	2,030	1,739	14.4%	4.22	3.89	8.0%
PBMP F17n	Fox River		1.54	632	632		632	0.0%	0	0.92	0.92		0.92	0.0%	6.29	2,521	2,521	0.0%	3.56	3.56	0.0%																						7.83	3,153	3,153	0.0%	4.47	4.47	0.0%
PBMP F17o	Fox River		3.65	1,687	1,472		1,472	12.7%	0	2.85	2.60		2.60	8.7%	0.17	109	74	31.8%	0.22	0.20	9.9%																						3.82	1,796	1,547	13.9%	3.07	2.80	8.8%
PBMP F17p	Fox River		4.31	1,657	1,607		1,607	3.0%	0	2.55	2.49		2.49	2.3%																													4.31	1,657	1,607	3.0%	2.55	2.49	2.3%
PBMP F17q	Fox River		0.66	269	265		265	1.3%	0	0.39	0.38		0.38	1.0%																													0.66	269	265	1.3%	0.39	0.38	1.0%
PBMP F17r	Fox River		4.18	1,974	1,725		1,725	12.6%	0	3.31	3.03		3.03	8.7%																													4.18	1,974	1,725	12.6%	3.31	3.03	8.7%

City of Kaukauna
SWMP Plan of Action Update
McM No. K0006 - 09-23-00107
October 2023

III. Total Maximum Daily Load (TMDL) Water Quality Analysis: 2023 Condition: 2012 Land Use; High Effeciency Street Sweeper - Frequency of 4 times per week, WPC - Downtown Areas, 2 times per week, WPC - main arterial roadways, 1 time per week, WPC - STH 55 and Industrial / Business Parks, and twice per month, WPC - remaining areas. A parking control ordinance will be required for "remaining areas". A maintenance agreement with Outagamie County and the State of Wisconsin for water quality benefits of their grass swale conveyance system will be obtained.

City of Kaukauna

Drainage System	Sub-Watershed	BMP Name	UPB (Excludes Undeveloped Areas over 5 ac, Other MS4 Jurisdictions, Agricultural Areas & Waters of the State)											
				Total Suspended Solids (TSS)						Total Phosphorus (TP)				
			Area (acres)	Before Drain System (lbs/yr)	After Drain System (lbs/yr)	BMP Reduct (%)	After Outfall Control (lbs/yr)	Total Load Reduct (%)	Net Gain (lbs/yr)	Before Drain System (lbs/yr)	After Drain System (lbs/yr)	BMP Reduct (%)	After Outfall Control (lbs/yr)	Total Load Reduct (%)
PBMP F18b	Fox River		1.39	1,159	1,085		1,085	6.4%	0	2.42	2.33		2.33	3.5%
PBMP F20a	Fox River		1.82	598	443		443	25.9%	0	2.02	1.66		1.66	17.7%
PBMP F20c	Fox River		10.04	2,255	1,801		1,801	20.1%	0	8.45	7.40		7.40	12.4%
PBMP F23b	Fox River		5.61	1,274	1,016		1,016	20.2%	0	4.75	4.16		4.16	12.5%
PBMP F23c	Fox River		23.08	4,730	3,825		3,825	19.1%	0	18.28	16.19		16.19	11.4%
PBMP F23d2	Fox River		4.02	163	163		163	0.0%	0	1.15	1.15		1.15	0.0%
PBMP F23d3	Fox River		5.40	979	811		811	17.1%	0	3.96	3.58		3.58	9.7%
PBMP F23d4	Fox River		9.58	1,964	1,596		1,596	18.8%	0	7.58	6.73		6.73	11.2%
PBMP F23d5	Fox River		12.34	1,269	1,028		1,028	19.0%	0	6.86	5.80		5.80	15.4%
PBMP F24a	Fox River		2.37	316	231		231	27.0%	0	1.45	1.15		1.15	20.7%
PBMP F24c	Fox River		1.62	164	121		121	26.2%	0	0.84	0.67		0.67	20.3%
PBMP F24d	Fox River		19.87	4,673	3,713		3,713	20.5%	0	17.25	15.04		15.04	12.8%
PBMP F24e1	Fox River		36.68	5,349	4,311		4,311	19.4%	0	22.48	19.48		19.48	13.4%
PBMP F24f	Fox River		17.83	3,782	3,059		3,059	19.1%	0	14.40	12.74		12.74	11.6%
PBMP F26a	Fox River		8.55	1,388	1,162		1,162	16.3%	0	5.89	5.36		5.36	8.9%
PBMP F27b	Fox River		3.61	163	117		117	28.0%	0	1.20	0.96		0.96	20.2%
PBMP F27c1	Fox River		22.42	3,093	2,631		2,631	14.9%	0	13.81	12.75		12.75	7.7%
PBMP F27c2	Fox River		8.02	1,045	936		936	10.4%	0	4.58	4.33		4.33	5.5%
PBMP F27c3	Fox River		2.80	211	211		211	0.0%	0	1.04	1.04		1.04	0.0%
PBMP F27d	Fox River		1.67	134	106		106	20.8%	0	0.68	0.55		0.55	18.1%
PBMP F27e	Fox River		5.46	412	412		412	0.0%	0	2.03	2.03		2.03	0.0%
PBMP F29	Fox River		3.51	924	619		619	33.0%	0	3.02	2.34		2.34	22.4%
PBMP F32	Fox River		2.89	679	677		677	0.3%	0	2.39	2.39		2.39	0.1%
PBMP F34a	Fox River		1.61	803	568		568	29.2%	0	1.71	1.34		1.34	21.5%
PBMP F34b	Fox River		2.86	631	594		594	5.8%	0	1.84	1.78		1.78	3.3%
PBMP F34c	Fox River		3.74	1,150	945		945	17.9%	0	3.13	2.72		2.72	12.9%
PBMP F35a	Fox River		2.99	726	726		726	0.0%	0	2.04	2.04		2.04	0.0%
PBMP F36b	Fox River		3.20	1,186	773		773	34.9%	0	3.25	2.49		2.49	23.4%
PBMP F36c1	Fox River		3.02	648	507		507	21.7%	0	2.40	2.08		2.08	13.5%
PBMP F36c2	Fox River		1.41	266	210		210	21.2%	0	1.01	0.88		0.88	12.9%
PBMP F36c3	Fox River		2.43	370	265		265	28.4%	0	1.35	1.15		1.15	15.3%
PBMP F36c4	Fox River		4.27	1,769	1,485		1,485	16.1%	0	3.96	3.54		3.54	10.6%
PBMP F36c5	Fox River		1.84	653	546		546	16.4%	0	1.38	1.21		1.21	12.1%
PBMP F36c6	Fox River		6.61	2,004	1,493		1,493	25.5%	0	6.73	5.62		5.62	16.5%
PBMP F36c7	Fox River		10.95	3,562	2,691		2,691	24.4%	0	11.32	9.41		9.41	16.9%
PBMP F36c8	Fox River		1.65	541	400		400	26.0%	0	1.80	1.48		1.48	18.0%
PBMP F36c9	Fox River		10.49	2,861	2,151		2,151	24.8%	0	9.72	8.13		8.13	16.4%
PBMP F36c10	Fox River		6.08	1,662	1,189		1,189	28.5%	0	5.26	4.36		4.36	17.1%
PBMP F36c11	Fox River		3.00	1,279	852		852	33.4%	0	3.05	2.38		2.38	21.9%
PBMP F36c12	Fox River		2.05	373	337		337	9.7%	0	1.27	1.18		1.18	6.6%
PBMP F36c13	Fox River		3.70	1,111	933		933	16.1%	0	2.95	2.62		2.62	11.2%
PBMP F36c14	Fox River		4.31	1,961	1,258		1,258	35.9%	0	4.75	3.59		3.59	24.2%
PBMP F36c15	Fox River		4.79	2,000	1,336		1,336	33.2%	0	4.86	3.83		3.83	21.3%
PBMP F36c16	Fox River		10.61	3,191	2,339		2,339	26.7%	0	10.56	9.07		9.07	14.1%
PBMP F36c17	Fox River		4.36	1,728	1,191		1,191	31.0%	0	4.96	4.23		4.23	14.7%
PBMP F36c18	Fox River		8.42	1,799	1,476		1,476	17.9%	0	5.91	5.37		5.37	9.1%
PBMP F36c19	Fox River		6.70	872	867		867	0.6%	0	3.14	3.13		3.13	0.2%
PBMP F36c20	Fox River		6.05	2,475	1,629		1,629	34.2%	0	7.50	6.40		6.40	14.6%
PBMP F36c21	Fox River		9.72	2,143	2,026		2,026	5.5%	0	7.58	7.32		7.32	3.4%
PBMP F38a	Fox River		3.76	1,012	879		879	13.2%	0	2.88	2.61		2.61	9.3%
PBMP F39	Fox River		12.04	3,852	2,872		2,872	25.4%	0	12.94	10.68		10.68	17.5%
PBMP F40b1	Fox River		3.31	955	722		722	24.3%	0	3.28	2.74		2.74	16.3%
PBMP F41b	Fox River		6.32	1,519	1,190		1,190	21.7%	0	5.54	4.78		4.78	13.7%
PBMP F42a1	Fox River		16.68	2,484	2,129		2,129	14.3%	0	10.68	9.86		9.86	7.7%
PBMP F43a	Fox River		2.64	756	581		581	23.2%	0	2.65	2.24		2.24	15.2%
PBMP F43b	Fox River		1.64	170	165		165	2.4%	0	0.86	0.85		0.85	1.1%
EBMP G2a	Garners Creek	Moon Ridge Court Pond	5.08	1,119	900	86.7%	149	86.7%	752	4.17	3.67	57.9%	1.76	57.9%
EBMP G3d	Garners Creek	Jonen Park Bio Retention Device	0.49	44	44	66.6%	15	66.6%	29	0.31	0.23	35.0%	0.20	35.0%
EBMP G3h	Garners Creek	Newton Lane Court Pond	16.66	3,035	2,503	86.7%	403	86.7%	2,099	11.97	10.74	62.7%	4.46	62.7%
EBMP G3k	Garners Creek	Jonen Park Wet Pond	2.65	238	238	77.3%	54	77.3%	184	1.25	1.25	54.8%	0.57	54.8%
EBMP G4a	Garners Creek	Coriander Court Pond	8.05	1,848	1,470	84.1%	293	84.1%	1,176	6.88	6.01	60.2%	2.74	60.2%
EBMP G4b	Garners Creek	Lemongrass Way Pond	34.02	7,175	6,171	79.9%	1,445	79.9%	4,726	25.82	23.51	55.9%	11.40	55.9%
None	Garners Creek		3.32	651	532		532	18.2%	0	2.41	2.15		2.15	10.8%
PBMP G1	Garners Creek		26.63	5,061	3,979		3,979	21.4%	0	20.09	17.31		17.31	13.9%
PBMP G2b	Garners Creek		6.12	1,260	1,110		1,110	11.9%	0	4.47	4.12		4.12	7.7%
PBMP G3a1	Garners Creek		20.16	5,044	3,983		3,983	21.0%	0	18.12	15.71		15.71	13.3%
PBMP G3a2	Garners Creek		2.92	819	637		637	22.3%	0	2.84	2.42		2.42	14.8%
PBMP G3b	Garners Creek		1.14	300	234		234	22.0%	0	1.07	0.92		0.92	14.2%
PBMP G3c	Garners Creek		5.97	1,140	985		985	13.6%	0	4.30	3.95		3.95	8.3%
PBMP G3e	Garners Creek		1.18	353	270		270	23.5%	0	1.22	1.03		1.03	15.6%
PBMP G3f	Garners Creek		8.96	1,648	1,366		1,366	17.1%	0	6.61	5.96		5.96	9.8%
PBMP G3g	Garners Creek		11.33	2,902	2,271		2,271	21.7%	0	10.47	9.02		9.02	13.9%
PBMP G3l	Garners Creek		21.26	2,097	2,080		2,080	0.8%	0	10.67	10.63		10.63	0.4%
PBMP G4c	Garners Creek		17.12	2,594	2,539		2,539	2.1%	0	9.92	9.78		9.78	1.5%
EBMP K1a2	Kankapot Creek	Softball Diamond #1 Bio Retention Device	1.11	526	526	77.7%	117	77.7%	408	1.44	1.44	35.0%	0.93	35.0%
EBMP K4	Kankapot Creek	Horseshoe Park Pond	666.78	144,233	117,842	50.0%	72,116	50.0%	45,726	529.59	473.53	35.1%	343.55	35.1%
EBMP K4m24	Kankapot Creek	Ann Street Underground Pond	31.11	7,130	5,825	50.0%	3,565	50.0%	2,260	26.58	23.77	35.1%	17.24	35.1%
EBMP K7c2	Kankapot Creek	Piggly Park Pond	15.54	5,856	5,510	79.1%	1,222	79.1%	4,288	12.65	12.11	61.4%	4.88	61.4%
EBMP K7d	Kankapot Creek	Coffee Hill Pond	19.24	3,524	3,410	56.7%	1,527	56.7%	1,883	11.96	11.70	41.7%	6.97	41.7%
None	Kankapot Creek		170.81	11,486	10,760		10,760	6.3%	0	62.65	61.05		61.05	2.6%
PBMP K1a1	Kankapot Creek		10.70	1,601	1,381		1,381	13.7%	0	6.74	6.24		6.24	7.5%
PBMP K2b	Kankapot Creek		0.59	50	50		50	0.0%	0	0.26	0.26		0.26	0.0%
PBMP K2d	Kankapot Creek		0.86	76	76		76	0.0%	0	0.40	0.40		0.40	0.0%
PBMP K2e1	Kankapot Creek		9.47	3,627	2,809		2,809	22.6%	0	9.84	8.30		8.30	15.6%
PBMP K2e2	Kankapot Creek		3.95	1,193	893		893	25.2%	0	3.84	3.21		3.21	16.3%
PBMP K2e3	Kankapot Creek		8.51	2,445	1,848		1,848	24.4%	0	8.39	7.02		7.02	16.4%
PBMP K2e4	Kankapot Creek		6.59	403	351		351	12.8%	0	2.26	2.14		2.14	5.3%
PBMP K2f	Kankapot Creek		2.75	217	217		217	0.0%	0	1.25	1.25		1.25	0.0%
PBMP K3a1	Kankapot Creek		2.34	834	665		665	20.2%	0	2.40	2.08		2.08	13.4%
PBMP K5b	Kankapot Creek		6.48	1,108	997		997	10.0%	0	4.51	4.26		4.26	5.7%
PBMP K5e1	Kankapot Creek		2.57	738	567		567	23.2%	0	2.58	2.19		2.19	15.3%
PBMP K5e2	Kankapot Creek		10.33	2,411	1,919		1,919	20.4%	0	8.92	7.79		7.79	12.7%
PBMP K5e3	Kankapot Creek		10.79	1,855	1,530		1,530	17.5%	0	7.76	7.01		7.01	9.7%
PBMP K5e4	Kankapot Creek		2.50	726	556		556	23.4%	0	2.53	2.14		2.14	15.5%
PBMP K5e5	Kankapot Creek		17.24	946	941		941	0.6%	0	6.05	6.03		6.03	0.2%
PBMP K5f1	Kankapot Creek		10.29	2,580	2,026		2,026	21.5%	0	9.35	8.07		8.07	13.7%
PBMP K5f2	Kankapot Creek		2.14	679	508		508	25.2%	0	2.31	1.92		1.92	17.1%
PBMP K5f3	Kankapot Creek		7.27	331	309		309	6.8%	0	2.14	2.09		2.09	2.4%
PBMP K6b1	Kankapot Creek		8.84	2,260	1,842		1,842	18.5%	0	7.67	6.75		6.75	12.0%
PBMP K6b2	Kankapot Creek		5.01	2,136	1,595		1,595	25.3%	0	5.85	5.21		5.21	10.9%
PBMP K6b3	Kankapot Creek		4.89	1,966	1,964		1,964	0.1%	0	3.08	3.07		3.07	0.2%
PBMP K6b4	Kankapot Creek		5.34	1,537	1,283		1,283	16.5%	0	5.00	4.42		4.42	11.7%
PBMP K6b5	Kankapot Creek		6.69	1,484	1,228		1,228	17.2%	0	5.39	4.81		4.81	10.7%
PBMP K6b6	Kankapot Creek		8.42	857	844		844	1.6%	0	4.27	4.24		4.24	0.7%
PBMP K6b7	Kankapot Creek		3.47	1,003	771		771	23.1%	0	3.51	2.97		2.97	15.3%
PBMP K6b8	Kankapot Creek		4.50	1,009	810		810	19.7%	0	3.77	3.31		3.31	12.1%
PBMP K6c	Kankapot Creek		1.31	307	242		242	21.0%	0	1.14	0.99		0.99	13.0%
PBMP K6d	Kankapot Creek		0.60	195	145		145	25.7%	0	0.66	0.55		0.55	17.4%
PBMP K6e	Kankapot Creek		7.99	695	611		611	12.1%	0	3.47	3.28		3.28	5.6%
PBMP K7b	Kankapot Creek		7.89	1,388	1,160		1,160	16.4%	0	5.64	5.12		5.12	9.3%
PBMP K7c3	Kankapot Creek		5.66	2,341	2,083		2,083	11.0%	0	5.34	4.93		4.93	7.6%
PBMP K8a13	Kankapot Creek		54.80	11,635	9,416		9,416	19.1%	0	44.30	39.18		39.18	11.6%
PBMP K8a15	Kankapot Creek		3.09	785	501		501	36.1%	0	2.85	2.49		2.49	12.6%
PBMP K8b2	Kankapot Creek		2.04	601	481		481	20.0%	0	1.58	1.35		1.35	14.7%
PBMP K8b3	Kankapot Creek		2.23	708	567		567	20.0%	0	1.80	1.53		1.53	14.7%
PBMP K8c1	Kankapot Creek		0.14	40	32		32	20.0%	0	0.11	0.09		0.09	14.7%
PBMP K8d	Kankapot Creek		2.00	369	369		369	0.0%	0	1.42	1.42		1.42	0.0%
PBMP K8e	Kankapot Creek		26.10	5,579	5,579		5,579	0.0%	0	20.97	20.97		20.97	0.0%
PBMP K8f	Kankapot Creek	Loderbauer Pond Revision	1.02	211	172	80.0%	42	80.0%	130	0.81	0.72	57.0%	0.35	57.0%
PBMP K9a	Kankapot Creek		7.79	1,743	1,443		1,443	17.2%	0	5.87	5.25		5.25	10.6%
PBMP K9b1	Kankapot Creek													
PBMP K9b2	Kankapot Creek		0.15	47	34		34	27.4%	0	0.17	0.13		0.13	22.3%
PBMP K9c	Kankapot Creek		11.37	3,870	3,800		3,800	1.8%	0	7.28	7.05		7.05	3.1%
PBMP K10a	Kankapot Creek		6.07	2,563	2,038		2,038	20.5%	0	3.94	3.26		3.26	17.2%
None	Plum Creek		9.35	1,057	876		876	17.1%	0	5.12	4.50		4.50	12.2%

Drainage System	Expera Specialty Solutions							Riparian							County HWY							State HWY						
		TSS Provided			TP Provided				TSS Provided			TP Provided				TSS Provided			TP Provided				TSS Provided			TP Provided		
	Area (acres)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Area (acres)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Area (acres)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Area (acres)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)
PBMP F18b	0.00	2	1	43.6%	0.00	0.00	12.1%																					
PBMP F20a																												
PBMP F20c																												
PBMP F23b															0.67	432	233	46.2%	1.32	1.09	17.0%							
PBMP F23c															0.79	512	276	46.2%	1.56	1.29	17.0%							
PBMP F23d2																												
PBMP F23d3																												
PBMP F23d4																												
PBMP F23d5															2.29	602	409	32.1%	3.48	2.56	26.4%							
PBMP F24a															0.95	251	185	26.1%	1.45	1.16	20.1%							
PBMP F24c															1.31	346	256	26.2%	2.00	1.59	20.3%							
PBMP F24d															0.00	1	1	0.0%	0.01	0.01	0.0%							
PBMP F24e1															6.46	1,756	1,262	28.1%	8.65	7.26	16.1%							
PBMP F24f																												
PBMP F26a																												
PBMP F27b															0.83	220	158	28.0%	1.27	1.01	20.2%							
PBMP F27c1															0.18	76	52	30.7%	0.30	0.28	8.9%							
PBMP F27c2															1.59	1,035	533	48.5%	3.15	2.55	19.1%							
PBMP F27c3															0.15	76	76	0.0%	0.27	0.27	0.0%							
PBMP F27d															0.63	166	119	28.2%	0.96	0.72	25.1%							
PBMP F27e															0.01	4	4	0.0%	0.01	0.01	0.0%							
PBMP F29																												
PBMP F32																												
PBMP F34a																												
PBMP F34b																												
PBMP F34c																												
PBMP F35a																												
PBMP F36b																												
PBMP F36c1																												
PBMP F36c2																												
PBMP F36c3																												
PBMP F36c4																												
PBMP F36c5																												
PBMP F36c6																												
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PBMP F36c9																												
PBMP F36c10																												
PBMP F36c11																												
PBMP F36c12																												
PBMP F36c13																												
PBMP F36c14																												
PBMP F36c15																												
PBMP F36c16															0.00	1	0	51.3%	0.00	0.00	20.1%							
PBMP F36c17																												
PBMP F36c18															1.68	1,093	532	51.3%	3.32	2.65	20.1%							
PBMP F36c19																												
PBMP F36c20																												
PBMP F36c21																												
PBMP F38a																												
PBMP F39																												
PBMP F40b1																												
PBMP F41b																												
PBMP F42a1															1.98	1,289	694	46.2%	3.92	3.25	17.0%							
PBMP F43a																												
PBMP F43b																												
EBMP G2a																												
EBMP G3d																												
EBMP G3h																												
EBMP G3k																												
EBMP G4a																												
EBMP G4b																												
None															3.69	837	630	24.8%	4.79	3.85	19.7%							
PBMP G1															1.42	375	280	25.4%	2.17	1.74	19.8%							
PBMP G2b															0.48	102	102	0.0%	0.58	0.58	0.0%							
PBMP G3a1																												
PBMP G3a2																												
PBMP G3b																												
PBMP G3c																												
PBMP G3e																												
PBMP G3f																												
PBMP G3g																												
PBMP G3l															0.06	12	12	0.0%	0.07	0.07	0.0%							
PBMP G4c															1.48	390	264	32.3%	2.25	1.65	26.9%							
EBMP K1a2																												
EBMP K4															22.43	6,920	3,460	50.0%	31.09	20.17	35.1%							
EBMP K4m24																												
EBMP K7c2																												
EBMP K7d															0.09	19	8	56.7%	0.11	0.06	41.7%							
None															13.54	3,252	2,437	25.1%	17.09	13.88	18.8%	1.89	497	432	13.1%	2.87	2.58	10.2%
PBMP K1a1															2.68	1,743	929	46.7%	5.30	4.37	17.6%							
PBMP K2b																												
PBMP K2d																												
PBMP K2e1																												
PBMP K2e2																												
PBMP K2e3																												
PBMP K2e4																												
PBMP K2f																												
PBMP K3a1																												
PBMP K5b															1.46	947	510	46.2%	2.88	2.39	17.0%							
PBMP K5e1																												
PBMP K5e2																												
PBMP K5e3																												
PBMP K5e4																												
PBMP K5e5																												
PBMP K5f1																												
PBMP K5f2																												
PBMP K5f3																												
PBMP K6b1																												
PBMP K6b2																												
PBMP K6b3																												
PBMP K6b4																												
PBMP K6b5																												
PBMP K6b6																												
PBMP K6b7																												
PBMP K6b8																												
PBMP K6c																												
PBMP K6d																												
PBMP K6e																												
PBMP K7b																												
PBMP K7c3																												
PBMP K8a13																						0.01	3	3	0.0%	0.02	0.02	0.0%
PBMP K8a15															3.08	652	545	16.5%	3.72	3.27	12.1%	1.64	1,209	638	47.3%	3.69	3.05	17.3%
PBMP K8b2																												
PBMP K8b3																												
PBMP K8c1															2.38	504	404	20.0%	2.88	2.45	14.7%	0.00	1	1	20.0%	0.00	0.00	14.7%
PBMP K8d																												
PBMP K8e															1.14	241	241	0.0%	1.37	1.37	0.0%							
PBMP K8f																												
PBMP K9a															0.71	187	129	30.7%	1.08	0.80	25.9%							
PBMP K9b1															0.01	3	3	4.8%	0.02	0.01	4.0%							
PBMP K9b2															0.33	88	64	27.4%	0.51	0.40	22.3%							
PBMP K9c																						0.37	97	70	28.2%	0.56	0.44	22.5%
PBMP K10a															0.50	132	105	20.5%	0.76	0.63	17.2%	0.28	73	58	20.5%	0.42	0.35	17.2%
None																												

Drainage System	Totals/Sums for Comparison						
		TSS Provided			TP Provided		
	Area (acres)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)
PBMP F18b	1.39	1,161	1,087	6.4%	2.42	2.34	3.5%
PBMP F20a	1.82	598	443	25.9%	2.02	1.66	17.7%
PBMP F20c	10.04	2,255	1,801	20.1%	8.45	7.40	12.4%
PBMP F23b	6.27	1,706	1,249	26.8%	6.07	5.25	13.5%
PBMP F23c	23.87	5,242	4,100	21.8%	19.84	17.48	11.9%
PBMP F23d2	4.02	163	163	0.0%	1.15	1.15	0.0%
PBMP F23d3	5.40	979	811	17.1%	3.96	3.58	9.7%
PBMP F23d4	9.58	1,964	1,596	18.8%	7.58	6.73	11.2%
PBMP F23d5	14.62	1,871	1,437	23.2%	10.34	8.37	19.1%
PBMP F24a	3.32	566	416	26.6%	2.90	2.31	20.4%
PBMP F24c	2.93	510	376	26.2%	2.84	2.26	20.3%
PBMP F24d	19.88	4,674	3,714	20.5%	17.26	15.05	12.8%
PBMP F24e1	43.14	7,105	5,573	21.6%	31.13	26.73	14.1%
PBMP F24f	17.83	3,782	3,059	19.1%	14.40	12.74	11.6%
PBMP F26a	8.55	1,388	1,162	16.3%	5.89	5.36	8.9%
PBMP F27b	4.45	383	276	28.0%	2.47	1.97	20.2%
PBMP F27c1	22.60	3,168	2,683	15.3%	14.12	13.02	7.7%
PBMP F27c2	9.62	2,080	1,469	29.4%	7.73	6.88	11.0%
PBMP F27c3	2.95	288	288	0.0%	1.31	1.31	0.0%
PBMP F27d	2.30	300	225	24.9%	1.64	1.27	22.2%
PBMP F27e	5.46	416	416	0.0%	2.04	2.04	0.0%
PBMP F29	3.51	924	619	33.0%	3.02	2.34	22.4%
PBMP F32	2.89	679	677	0.3%	2.39	2.39	0.1%
PBMP F34a	1.61	803	568	29.2%	1.71	1.34	21.5%
PBMP F34b	2.86	631	594	5.8%	1.84	1.78	3.3%
PBMP F34c	3.74	1,150	945	17.9%	3.13	2.72	12.9%
PBMP F35a	2.99	726	726	0.0%	2.04	2.04	0.0%
PBMP F36b	3.20	1,186	773	34.9%	3.25	2.49	23.4%
PBMP F36c1	3.02	648	507	21.7%	2.40	2.08	13.5%
PBMP F36c2	1.41	266	210	21.2%	1.01	0.88	12.9%
PBMP F36c3	2.43	370	265	28.4%	1.35	1.15	15.3%
PBMP F36c4	4.27	1,769	1,485	16.1%	3.96	3.54	10.6%
PBMP F36c5	1.84	653	546	16.4%	1.38	1.21	12.1%
PBMP F36c6	6.61	2,004	1,493	25.5%	6.73	5.62	16.5%
PBMP F36c7	10.95	3,562	2,691	24.4%	11.32	9.41	16.9%
PBMP F36c8	1.65	541	400	26.0%	1.80	1.48	18.0%
PBMP F36c9	10.49	2,861	2,151	24.8%	9.72	8.13	16.4%
PBMP F36c10	6.08	1,662	1,189	28.5%	5.26	4.36	17.1%
PBMP F36c11	3.00	1,279	852	33.4%	3.05	2.38	21.9%
PBMP F36c12	2.05	373	337	9.7%	1.27	1.18	6.6%
PBMP F36c13	3.70	1,111	933	16.1%	2.95	2.62	11.2%
PBMP F36c14	4.31	1,961	1,258	35.9%	4.75	3.59	24.2%
PBMP F36c15	4.79	2,000	1,336	33.2%	4.86	3.83	21.3%
PBMP F36c16	10.61	3,192	2,339	26.7%	10.56	9.07	14.1%
PBMP F36c17	4.36	1,728	1,191	31.0%	4.96	4.23	14.7%
PBMP F36c18	10.10	2,891	2,008	30.5%	9.23	8.02	13.1%
PBMP F36c19	6.70	872	867	0.6%	3.14	3.13	0.2%
PBMP F36c20	6.05	2,475	1,629	34.2%	7.50	6.40	14.6%
PBMP F36c21	9.72	2,143	2,026	5.5%	7.58	7.32	3.4%
PBMP F38a	3.76	1,012	879	13.2%	2.88	2.61	9.3%
PBMP F39	12.04	3,852	2,872	25.4%	12.94	10.68	17.5%
PBMP F40b1	3.31	955	722	24.3%	3.28	2.74	16.3%
PBMP F41b	6.32	1,519	1,190	21.7%	5.54	4.78	13.7%
PBMP F42a1	18.66	3,772	2,823	25.2%	14.60	13.11	10.2%
PBMP F43a	2.64	756	581	23.2%	2.65	2.24	15.2%
PBMP F43b	1.64	170	165	2.4%	0.86	0.85	1.1%
EBMP G2a	5.08	1,119	149	86.7%	4.17	1.76	57.9%
EBMP G3d	0.49	44	15	66.6%	0.31	0.20	35.0%
EBMP G3h	16.66	3,035	403	86.7%	11.97	4.46	62.7%
EBMP G3k	2.65	238	54	77.3%	1.25	0.57	54.8%
EBMP G4a	8.05	1,848	293	84.1%	6.88	2.74	60.2%
EBMP G4b	34.02	7,175	1,445	79.9%	25.82	11.40	55.9%
None	7.01	1,488	1,162	21.9%	7.20	6.00	16.7%
PBMP G1	28.06	5,436	4,259	21.7%	22.26	19.05	14.4%
PBMP G2b	6.60	1,362	1,212	11.0%	5.05	4.71	6.8%
PBMP G3a1	20.16	5,044	3,983	21.0%	18.12	15.71	13.3%
PBMP G3a2	2.92	819	637	22.3%	2.84	2.42	14.8%
PBMP G3b	1.14	300	234	22.0%	1.07	0.92	14.2%
PBMP G3c	5.97	1,140	985	13.6%	4.30	3.95	8.3%
PBMP G3e	1.18	353	270	23.5%	1.22	1.03	15.6%
PBMP G3f	8.96	1,648	1,366	17.1%	6.61	5.96	9.8%
PBMP G3g	11.33	2,902	2,271	21.7%	10.47	9.02	13.9%
PBMP G3l	21.32	2,109	2,092	0.8%	10.74	10.70	0.4%
PBMP G4c	18.59	2,984	2,803	6.1%	12.17	11.42	6.2%
EBMP K1a2	1.11	526	117	77.7%	1.44	0.93	35.0%
EBMP K4	689.21	151,153	75,576	50.0%	560.69	363.72	35.1%
EBMP K4m24	31.11	7,130	3,565	50.0%	26.58	17.24	35.1%
EBMP K7c2	15.54	5,856	1,222	79.1%	12.65	4.88	61.4%
EBMP K7d	19.33	3,543	1,535	56.7%	12.07	7.04	41.7%
None	186.24	15,235	13,629	10.5%	82.62	77.51	6.2%
PBMP K1a1	13.39	3,343	2,310	30.9%	12.04	10.61	11.9%
PBMP K2b	0.59	50	50	0.0%	0.26	0.26	0.0%
PBMP K2d	0.86	76	76	0.0%	0.40	0.40	0.0%
PBMP K2e1	9.47	3,627	2,809	22.6%	9.84	8.30	15.6%
PBMP K2e2	3.95	1,193	893	25.2%	3.84	3.21	16.3%
PBMP K2e3	8.51	2,445	1,848	24.4%	8.39	7.02	16.4%
PBMP K2e4	6.59	403	351	12.8%	2.26	2.14	5.3%
PBMP K2f	2.75	217	217	0.0%	1.25	1.25	0.0%
PBMP K3a1	2.34	834	665	20.2%	2.40	2.08	13.4%
PBMP K5b	7.94	2,056	1,507	26.7%	7.39	6.65	10.1%
PBMP K5e1	2.57	738	567	23.2%	2.58	2.19	15.3%
PBMP K5e2	10.33	2,411	1,919	20.4%	8.92	7.79	12.7%
PBMP K5e3	10.79	1,855	1,530	17.5%	7.76	7.01	9.7%
PBMP K5e4	2.50	726	556	23.4%	2.53	2.14	15.5%
PBMP K5e5	17.24	946	941	0.6%	6.05	6.03	0.2%
PBMP K5f1	10.29	2,580	2,026	21.5%	9.35	8.07	13.7%
PBMP K5f2	2.14	679	508	25.2%	2.31	1.92	17.1%
PBMP K5f3	7.27	331	309	6.8%	2.14	2.09	2.4%
PBMP K6b1	8.84	2,260	1,842	18.5%	7.67	6.75	12.0%
PBMP K6b2	5.01	2,136	1,595	25.3%	5.85	5.21	10.9%
PBMP K6b3	4.89	1,966	1,964	0.1%	3.08	3.07	0.2%
PBMP K6b4	5.34	1,537	1,283	16.5%	5.00	4.42	11.7%
PBMP K6b5	6.69	1,484	1,228	17.2%	5.39	4.81	10.7%
PBMP K6b6	8.42	857	844	1.6%	4.27	4.24	0.7%
PBMP K6b7	3.47	1,003	771	23.1%	3.51	2.97	15.3%
PBMP K6b8	4.50	1,009	810	19.7%	3.77	3.31	12.1%
PBMP K6c	1.31	307	242	21.0%	1.14	0.99	13.0%
PBMP K6d	0.60	195	145	25.7%	0.66	0.55	17.4%
PBMP K6e	7.99	695	611	12.1%	3.47	3.28	5.6%
PBMP K7b	7.89	1,388	1,160	16.4%	5.64	5.12	9.3%
PBMP K7c3	5.66	2,341	2,083	11.0%	5.34	4.93	7.6%
PBMP K8a13	54.81	11,638	9,418	19.1%	44.31	39.20	11.5%
PBMP K8a15	7.81	2,646	1,684	36.4%	10.26	8.81	14.1%
PBMP K8b2	2.04	601	481	20.0%	1.58	1.35	14.7%
PBMP K8b3	2.23	708	567	20.0%	1.80	1.53	14.7%
PBMP K8c1	2.52	546	437	20.0%	2.98	2.54	14.7%
PBMP K8d	2.00	369	369	0.0%	1.42	1.42	0.0%
PBMP K8e	27.23	5,820	5,820	0.0%	22.35	22.35	0.0%
PBMP K8f	1.02	211	42	80.0%	0.81	0.35	57.0%
PBMP K9a	8.49	1,930	1,572	18.5%	6.95	6.04	13.0%
PBMP K9b1	0.01	3	3	4.8%	0.02	0.01	4.0%
PBMP K9b2	0.49	135	98	27.4%	0.68	0.53	22.3%
PBMP K9c	11.74	3,967	3,870	2.4%	7.84	7.49	4.5%
PBMP K10a	6.84	2,768	2,201	20.5%	5.13	4.25	17.2%
None	9.35	1,057	876	17.1%	5.12	4.50	12.2%

III. Total Maximum Daily Load (TMDL) Water Quality Analysis: 2023 Condition: 2012 Land Use; High Effeciency Street Sweeper - Frequency of 4 times per week, WPC - Downtown Areas, 2 times per week, WPC - main arterial roadways, 1 time per week, WPC - STH 55 and Industrial / Business Parks, and twice per month, WPC - remaining areas. A parking control ordinance will be required for "remaining areas". A maintenance agreement with Outagamie County and the State of Wisconsin for water quality benefits of their grass swale conveyance system will be obtained.

City of Kaukauna — UPB (Excludes Undeveloped Areas over 5 ac, Other MS4 Jurisdictions, Agricultural Areas & Waters of the State)

Drainage System	Sub-Watershed	BMP Name	Area (acres)	Total Suspended Solids (TSS) Before Drain System (lbs/yr)	After Drain System (lbs/yr)	BMP Reduct (%)	After Outfall Control (lbs/yr)	Total Load Reduct (%)	Net Gain (lbs/yr)	Total Phosphorus (TP) Before Drain System (lbs/yr)	After Drain System (lbs/yr)	BMP Reduct (%)	After Outfall Control (lbs/yr)	Total Load Reduct (%)
PBMP P1a1	Plum Creek		1.78	586	486		486	17.2%	0	1.98	1.74		1.74	12.2%
PBMP P2a3	Plum Creek	Kavanaugh Pond	4.37	248	248	84.4%	39	84.4%	209	1.55	1.55	57.0%	0.67	57.0%
PBMP P3c	Plum Creek	Kavanaugh Pond	17.66	3,563	2,828	84.4%	557	84.4%	2,271	13.88	11.99	57.0%	5.97	57.0%
		Total	**4,055.5**	**840,926**	**724,745**		**525,813**	**37.5%**	**198,870**	**2,736.17**	**2,500.37**		**2,086.57**	**23.7%**

City of Kaukauna — Expera Specialty Solutions / Riparian

Drainage System	Expera Area (acres)	Expera TSS Provided Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Expera TP Provided Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Riparian Area (acres)	Riparian TSS Provided Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Riparian TP Provided Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)
PBMP P1a1														
PBMP P2a3														
PBMP P3c														

City of Kaukauna — County HWY / State HWY

Drainage System	County HWY Area (acres)	County HWY TSS Provided Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	County HWY TP Provided Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	State HWY Area (acres)	State HWY TSS Provided Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	State HWY TP Provided Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)
PBMP P1a1														
PBMP P2a3														
PBMP P3c	0.28	74	52	29.8%	0.43	0.32	24.3%							

Totals/Sums for Comparison

Drainage System	Area (acres)	TSS Provided Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	TP Provided Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)
PBMP P1a1	1.78	586	486	17.2%	1.98	1.74	12.2%
PBMP P2a3	4.37	248	39	84.4%	1.55	0.67	57.0%
PBMP P3c	17.94	3,637	608	83.3%	14.31	6.29	56.0%

A-1: Results Summary

Pollutant Analysis Summary - Urban Study Area

Sub-Watershed	Area (acres)	TSS Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Total Load Reduct (lbs)	Total Load Reduct (%)	TMDL Load Redct Req'd (lbs)	TMDL Load Redct Req'd (lbs)	Addt'l Load Redct Req'd (lbs)	TMDL TSS Redct Satisfied (Y/N)
Apple Creek	794.7	221,672	93,148	128,524	58.0%	115,269	52.0%	-13,254	Y
Fox River	1,827.2	336,567	262,533	74,034	22.0%	243,001	72.2%	168,967	N
Garners Creek	193.1	37,328	22,346	14,982	40.1%	22,397	60.0%	7,415	N
Kankapot Creek	1,207.4	239,905	145,829	94,076	39.2%	124,751	52.0%	30,675	N
Plum Creek	33.2	5,454	1,957	3,497	64.1%	2,836	52.0%	-661	Y
Totals:	**4,055.5**	**840,926**	**525,813**	**315,114**	**37.5%**	**508,254**	**60.4%**	**193,141**	**N**

Pollutant Analysis Summary - Urban Study Area

Sub-Watershed	Area (acres)	TP Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Total Load Reduct (lbs)	Total Load Reduct (%)	TMDL Load Redct Req'd (lbs)	TMDL Load Redct Req'd (lbs)	Addt'l Load Redct Req'd (lbs)	TMDL TP Redct Satisfied (Y/N)
Apple Creek	794.7	519.0	317.2	201.8	38.9%	210.2	40.5%	8.4	N
Fox River	1,827.2	1,179.7	1,012.6	167.1	14.2%	477.8	40.5%	310.7	N
Garners Creek	193.1	142.6	104.1	38.5	27.0%	98.0	68.7%	59.5	N
Kankapot Creek	1,207.4	872.3	639.8	232.5	26.7%	353.3	40.5%	120.7	N
Plum Creek	33.2	22.5	12.9	9.7	42.9%	9.1	40.5%	-0.5	Y
Totals:	**4,055.5**	**2,736.2**	**2,086.6**	**649.6**	**23.7%**	**1,148.4**	**42.0%**	**498.8**	**N**

City of Kaukauna
SWMP Plan of Action
McM No. K0006-91700668
March 2018

IV. TMDL Water Quality Analysis (meeting Goals): Action Plan: 2012 Land Use; High Effeciency Street Sweeper - Frequency of 4 times per week, WPC - Downtown Areas, 2 times per week, WPC - main arterial roadways, 1 time per week, WPC - STH 55 and Industrial / Business Parks, and twice per month, WPC - remaining areas. A parking control ordinance will be required for "remaining areas". A maintenance agreement with Outagamie County and the State of Wisconsin for water quality benefits of their grass swale conveyance system will be obtained.

City of Kaukauna — UPB (Excludes Undeveloped Areas over 5 ac, Other MS4 Jurisdictions, Agricultural Areas & Waters of the State)

Drainage System	Sub-Watershed	BMP Name	Area (acres)	TSS Before Drain System (lbs/yr)	TSS After Drain System (lbs/yr)	TSS BMP Reduct (%)	TSS After Outfall Control (lbs/yr)	TSS Total Load Reduct (%)	Net Gain (lbs/yr)	TP Before Drain System (lbs/yr)	TP After Drain System (lbs/yr)	TP BMP Reduct (%)	TP After Outfall Control (lbs/yr)	TP Total Load Reduct (%)
EBMP A2b2	Apple Creek	Van Epern Pond	98.42	26,473	25,099	90.4%	2,539	90.4%	22,560	60.77	59.14	56.6%	26.35	56.6%
Future Development	Apple Creek	Van Epern Pond (Future Dev)	0.00	19,526	19,526	90.4%	1,873	90.4%	17,653	18.57	18.57	56.6%	8.05	56.6%
EBMP A5b	Apple Creek	G and G Machine Bio Retention Device	3.70	186	186	80.0%	37	80.0%	148	1.33	1.33	35.0%	0.86	35.0%
EBMP A5c	Apple Creek	Kelso Park Pond Expansion	392.58	127,841	120,303	70.0%	38,352	70.0%	81,951	268.64	257.76	55.0%	120.89	55.0%
EBMP A6d1	Apple Creek	Badger Pond (Kelso)	27.20	9,739	9,739	82.4%	1,719	82.4%	8,020	16.43	16.43	58.1%	6.89	58.1%
EBMP A6f	Apple Creek	Badger Pond (Kelso)	9.50	3,612	3,365	82.4%	637	82.4%	2,728	6.86	6.58	58.1%	2.88	58.1%
EBMP A6h2	Apple Creek	Badger Pond (Kelso)	11.42	4,172	4,172	82.4%	736	82.4%	3,436	6.83	6.83	58.1%	2.87	58.1%
Future Development	Apple Creek	Badger Pond (Kelso) (Future Dev)	0.00	14,930	14,930	82.4%	2,635	82.4%	12,295	14.20	14.20	58.1%	5.96	58.1%
EBMP A13a1	Apple Creek	Commerce Crossing 2 Pond	27.76	3,963	3,399	84.2%	628	84.2%	2,771	15.77	14.90	54.8%	7.13	54.8%
EBMP A13a2	Apple Creek	Commerce Crossing 2 Pond	17.06	3,743	2,865	84.2%	593	84.2%	2,272	11.14	9.77	54.8%	5.04	54.8%
Future Development	Apple Creek	Commerce Crossing 2 Pond (Future Dev)	0.00	30,283	30,283	84.2%	4,800	84.2%	25,483	39.38	39.38	54.8%	17.80	54.8%
EBMP A14b	Apple Creek	Commerce Crossing 3 Pond	31.50	3,036	2,493	96.1%	118	96.1%	2,375	13.00	12.15	60.0%	5.20	60.0%
EBMP A16b	Apple Creek	Wildenberg Estates North Pond	18.11	3,406	2,800	95.4%	156	95.4%	2,644	13.30	11.91	66.3%	4.48	66.3%
None	Apple Creek		80.03	13,828	11,937		11,937	13.7%	0	53.30	48.95		48.95	8.2%
PBMP A3c1	Apple Creek		0.69	594	369		369	37.8%	0	1.39	1.13		1.13	18.6%
PBMP A4a	Apple Creek		8.56	2,487	1,752		1,752	29.5%	0	7.55	6.63		6.63	12.1%
PBMP A4b	Apple Creek		11.84	3,984	3,813		3,813	4.3%	0	8.02	7.68		7.68	4.3%
PBMP A11	Apple Creek		38.71	13,091	12,762		12,762	2.5%	0	25.54	24.94		24.94	2.3%
PBMP A13b	Apple Creek		1.88	126	126		126	0.0%	0	0.90	0.90		0.90	0.0%
PBMP A13c1	Apple Creek		2.65	177	177		177	0.0%	0	1.27	1.27		1.27	0.0%
PBMP A14a2	Apple Creek		9.95	708	708		708	0.0%	0	4.81	4.81		4.81	0.0%
PBMP A16a	Apple Creek		3.10	507	434		434	14.3%	0	2.11	1.94		1.94	7.9%
Future Development	Apple Creek	Future New Development	57.24	12,011	12,011	81.0%	2,282	81.0%	9,729	46.46	46.46	55.00%	20.91	55.0%
EBMP F1b4	Fox River		2.76	439	439		439	0.0%	0	1.55	1.55		1.55	0.0%
EBMP F1d	Fox River		92.94	28,156	26,212		26,212	6.9%	0	61.24	57.99		57.99	5.3%
EBMP F5d1	Fox River	MCC Quarry Regional Pond (Lamplighter)	12.40	2,236	1,858	80.8%	430	80.8%	1,428	8.19	7.32	55.2%	3.67	55.2%
EBMP F5d13	Fox River	MCC Quarry Regional Pond (Lower Grignon)	3.35	809	809	80.8%	155	80.8%	653	2.28	2.28	55.2%	1.02	55.2%
EBMP F13b1	Fox River	Hurkman Heights South Pond	15.38	2,757	2,291	76.4%	650	76.4%	1,641	11.16	10.09	53.9%	5.15	53.9%
EBMP F13b4	Fox River	Wildenberg Estates South Pond	7.34	1,363	1,115	75.6%	333	75.6%	782	5.23	4.66	51.3%	2.54	51.3%
EBMP F23d1	Fox River	Autumn Court Pond	2.56	421	349	93.0%	30	93.0%	319	1.69	1.52	45.4%	0.92	45.4%
EBMP F23e	Fox River	Camden Way Pond	4.54	494	381	57.6%	209	57.6%	172	2.26	2.00	57.6%	0.96	57.6%
EBMP F23f1	Fox River	Fenway Court Pond	2.30	271	271	93.3%	18	93.3%	253	1.52	1.52	64.0%	0.55	64.0%
EBMP F23f2	Fox River	Fenway Court Pond	7.67	1,762	1,391	93.3%	118	93.3%	1,273	6.48	5.63	64.0%	2.33	64.0%
EBMP F24e6	Fox River	Andrea Michelle Court Pond	3.70	750	604	89.1%	82	89.1%	522	2.91	2.58	63.0%	1.08	63.0%
EBMP F24g	Fox River	Meadowview South Pond	19.74	2,989	2,539	75.4%	736	75.4%	1,803	12.36	11.32	48.7%	6.34	48.7%
EBMP F24k	Fox River	Whitewolf Lane Pond Revision	42.65	8,401	6,878	80.0%	1,680	80.0%	5,197	32.64	29.12	57.0%	14.03	57.0%
EBMP F26b	Fox River	Company Woods Expansion	43.83	4,773	4,217	77.5%	1,074	77.5%	3,143	23.27	21.97	50.9%	11.43	50.9%
EBMP F27c4	Fox River	Softball Diamond #2 Bio Retention Device	1.21	579	579	77.4%	131	77.4%	448	1.72	1.72	35.0%	1.12	35.0%
None	Fox River		531.09	43,305	40,743		40,743	5.9%	0	219.91	213.61		213.61	2.9%
PBMP C2a	Fox River		4.83	1,323	1,025		1,025	22.5%	0	4.68	4.00		4.00	14.7%
PBMP C2b	Fox River		5.80	741	654		654	11.7%	0	3.44	3.24		3.24	5.8%
PBMP C2c	Fox River		1.97	478	377		377	21.1%	0	1.75	1.52		1.52	13.2%
PBMP C4	Fox River		4.34	516	516		516	0.0%	0	2.61	2.61		2.61	0.0%
PBMP F2a	Fox River													
PBMP F2b1	Fox River		0.96	131	26		26	80.3%	0	0.49	0.11		0.11	78.2%
PBMP F2b2	Fox River													
PBMP F3	Fox River		6.67	2,771	2,771		2,771	0.0%	0	4.16	4.16		4.16	0.0%
PBMP F4b2	Fox River	MCC Quarry Regional Pond	4.49	1,125	874	80.8%	216	80.8%	658	4.01	3.44	55.2%	1.80	55.2%
PBMP F4b3	Fox River	MCC Quarry Regional Pond	13.90	1,257	763	80.8%	242	80.8%	522	6.27	4.30	55.2%	2.81	55.2%
PBMP F4c1	Fox River	MCC Quarry Regional Pond	12.79	897	897	80.8%	172	80.8%	725	4.39	4.39	55.2%	1.97	55.2%
PBMP F4c2	Fox River	MCC Quarry Regional Pond	12.12	1,304	733	80.8%	250	80.8%	483	5.81	3.78	55.2%	2.60	55.2%
PBMP F5b	Fox River		3.81	439	398		398	9.4%	0	2.10	2.01		2.01	4.5%
PBMP F5c	Fox River		0.78	177	138		138	21.9%	0	0.65	0.57		0.57	13.6%
PBMP F5d2	Fox River	MCC Quarry Regional Pond	23.17	2,406	2,340	80.8%	462	80.8%	1,878	11.76	11.61	55.2%	5.27	55.2%
PBMP F5d3	Fox River	MCC Quarry Regional Pond	3.22	850	658	80.8%	163	80.8%	495	3.01	2.57	55.2%	1.35	55.2%
PBMP F5d4	Fox River	MCC Quarry Regional Pond	7.26	1,480	1,111	80.8%	284	80.8%	827	5.72	5.16	55.2%	2.56	55.2%
PBMP F5d5	Fox River	MCC Quarry Regional Pond	0.47	36	36	80.8%	7	80.8%	29	0.19	0.19	55.2%	0.09	55.2%
PBMP F5d6	Fox River	MCC Quarry Regional Pond	8.51	1,493	1,256	80.8%	287	80.8%	969	6.02	5.47	55.2%	2.70	55.2%
PBMP F5d7	Fox River	MCC Quarry Regional Pond	1.55	388	259	80.8%	74	80.8%	184	1.42	1.27	55.2%	0.63	55.2%
PBMP F5d8	Fox River	MCC Quarry Regional Pond	8.48	1,444	1,219	80.8%	277	80.8%	942	5.84	5.32	55.2%	2.62	55.2%
PBMP F5d9	Fox River	MCC Quarry Regional Pond	2.11	416	300	80.8%	80	80.8%	220	1.63	1.50	55.2%	0.73	55.2%
PBMP F5d10	Fox River	MCC Quarry Regional Pond	7.86	1,450	1,203	80.8%	279	80.8%	925	5.71	5.14	55.2%	2.56	55.2%
PBMP F5d11	Fox River	MCC Quarry Regional Pond	4.39	1,227	904	80.8%	236	80.8%	669	4.33	3.72	55.2%	1.94	55.2%
PBMP F5d12	Fox River	MCC Quarry Regional Pond	9.28	1,520	1,293	80.8%	292	80.8%	1,001	6.19	5.67	55.2%	2.77	55.2%
PBMP F5d14	Fox River	MCC Quarry Regional Pond	4.71	1,261	913	80.8%	242	80.8%	670	4.36	3.76	55.2%	1.96	55.2%
PBMP F5d15	Fox River	MCC Quarry Regional Pond	2.14	574	374	80.8%	110	80.8%	264	2.04	1.80	55.2%	0.92	55.2%
PBMP F5e1	Fox River	MCC Quarry Regional Pond	64.66	20,149	17,703	80.8%	3,871	80.8%	13,833	45.91	41.46	55.2%	20.58	55.2%
PBMP F5e2	Fox River	MCC Quarry Regional Pond	8.05	2,707	2,353	80.8%	520	80.8%	1,833	6.69	6.04	55.2%	3.00	55.2%
PBMP F5e3	Fox River	MCC Quarry Regional Pond	2.58	717	495	80.8%	138	80.8%	358	2.44	2.07	55.2%	1.09	55.2%
PBMP F5e4	Fox River	MCC Quarry Regional Pond	15.29	4,357	3,696	80.8%	837	80.8%	2,859	11.98	10.73	55.2%	5.37	55.2%
PBMP F5e5	Fox River	MCC Quarry Regional Pond	5.73	1,300	951	80.8%	250	80.8%	701	4.65	4.04	55.2%	2.08	55.2%
PBMP F5e6	Fox River	MCC Quarry Regional Pond	4.06	770	630	80.8%	148	80.8%	482	2.96	2.64	55.2%	1.32	55.2%
PBMP F5e7	Fox River	MCC Quarry Regional Pond	5.78	1,209	978	80.8%	232	80.8%	746	4.23	3.84	55.2%	1.89	55.2%
PBMP F5e8	Fox River	MCC Quarry Regional Pond	1.70	819	571	80.8%	157	80.8%	414	2.31	2.02	55.2%	1.04	55.2%
PBMP F5e9	Fox River	MCC Quarry Regional Pond	6.18	1,454	1,130	80.8%	279	80.8%	851	4.71	4.23	55.2%	2.11	55.2%
PBMP F5e10	Fox River	MCC Quarry Regional Pond	3.96	841	780	80.8%	161	80.8%	618	2.76	2.62	55.2%	1.23	55.2%
PBMP F5e11	Fox River	MCC Quarry Regional Pond	4.30	1,223	913	80.8%	235	80.8%	678	4.20	3.55	55.2%	1.88	55.2%
PBMP F5e12	Fox River	MCC Quarry Regional Pond	3.69	337	337	80.8%	65	80.8%	272	1.83	1.83	55.2%	0.82	55.2%
PBMP F5e13	Fox River	MCC Quarry Regional Pond	8.08	1,489	1,224	80.8%	286	80.8%	938	5.86	5.26	55.2%	2.63	55.2%
PBMP F5e14	Fox River	MCC Quarry Regional Pond	5.27	1,368	973	80.8%	263	80.8%	710	4.75	4.05	55.2%	2.13	55.2%
PBMP F5e15	Fox River	MCC Quarry Regional Pond	1.67	357	287	80.8%	69	80.8%	218	1.35	1.19	55.2%	0.61	55.2%
PBMP F5e16	Fox River	MCC Quarry Regional Pond	10.75	1,037	1,033	80.8%	199	80.8%	834	5.30	5.29	55.2%	2.38	55.2%
PBMP F5f	Fox River	MCC Quarry Regional Pond	1.34	383	295	80.8%	74	80.8%	221	1.34	1.14	55.2%	0.60	55.2%
PBMP F5g1	Fox River	MCC Quarry Regional Pond	13.71	412	412	80.8%	79	80.8%	333	3.80	3.80	55.2%	1.70	55.2%
PBMP F5g2	Fox River	MCC Quarry Regional Pond	7.25	221	221	80.8%	42	80.8%	179	1.96	1.96	55.2%	0.88	55.2%
PBMP F5g3	Fox River	MCC Quarry Regional Pond	8.68	579	579	80.8%	111	80.8%	468	3.42	3.42	55.2%	1.53	55.2%
PBMP F5h1	Fox River	MCC Quarry Regional Pond	13.06	3,359	2,685	80.8%	645	80.8%	2,040	11.22	9.81	55.2%	5.03	55.2%
PBMP F5h2	Fox River	MCC Quarry Regional Pond	5.17	371	371	80.8%	71	80.8%	300	2.31	2.31	55.2%	1.04	55.2%
PBMP F5h3	Fox River	MCC Quarry Regional Pond	2.85	690	542	80.8%	132	80.8%	410	2.37	2.04	55.2%	1.06	55.2%
PBMP F7	Fox River		3.82	769	619		619	19.5%	0	2.95	2.60		2.60	11.7%
PBMP F8a1a	Fox River	Catherine Pond - Enhanced Settling	19.30	7,200	5,340	90.0%	720	90.0%	4,620	19.29	16.56	85.0%	2.89	85.0%
PBMP F8a1b	Fox River		11.56	2,337	1,733		1,733	25.8%	0	9.79	8.41		8.41	14.2%
PBMP F8a2	Fox River		3.85	1,212	1,212		1,212	0.0%	0	2.76	2.76		2.76	0.0%
PBMP F9a1	Fox River		7.45	4,165	2,375		2,375	43.0%	0	12.05	9.41		9.41	22.0%
PBMP F9a2	Fox River	Catherine Pond - Enhanced Settling	1.27	115	115	90.0%	12	90.0%	104	0.50	0.50	85.0%	0.07	85.0%
PBMP F11	Fox River		65.17	17,197	13,394		13,394	22.1%	0	56.37	49.05		49.05	13.0%
PBMP F12	Fox River		23.87	6,383	4,946		4,946	22.5%	0	21.27	18.87		18.87	11.3%
PBMP F13a	Fox River		9.95	2,507	1,959		1,959	21.9%	0	9.09	7.83		7.83	13.8%
PBMP F13b2	Fox River	Draper Street North Pond	17.59	3,536	2,915	55.1%	1,590	55.1%	1,326	13.63	12.20	38.57%	8.37	38.6%
PBMP F13b3	Fox River	Draper Street North Pond	28.47	6,518	5,354	55.1%	2,930	55.1%	2,424	23.81	21.16	38.57%	14.63	38.6%
PBMP F13b5	Fox River	Draper Street North Pond	30.14	6,347	5,053	55.1%	2,853	55.1%	2,200	21.39	18.45	38.57%	13.14	38.6%
PBMP F13b6	Fox River	Draper Street North Pond	11.22	2,699	2,137	55.1%	1,213	55.1%	924	9.44	8.14	38.57%	5.80	38.6%
PBMP F13b7	Fox River	Draper Street North Pond	6.60	1,927	1,792	55.1%	866	55.1%	926	5.12	4.87	38.57%	3.14	38.6%
PBMP F13b8	Fox River	Draper Street North Pond	1.39	176	161	55.1%	79	55.1%	82	0.79	0.76	38.57%	0.49	38.6%
PBMP F13b12	Fox River	Draper Street North Pond	3.15	326	326	55.1%	147	55.1%	180	1.58	1.58	38.57%	0.97	38.6%
PBMP F13b14	Fox River		1.71	452	326		326	27.8%	0	1.62	1.41		1.41	12.7%
PBMP F13b16	Fox River		4.64	1,241	821		821	33.8%	0	4.44	3.94		3.94	11.2%
PBMP F13b17	Fox River		5.76	543	541		541	0.3%	0	2.89	2.88		2.88	0.1%
PBMP F13b18	Fox River		9.83	2,848	2,228		2,228	21.8%	0	9.50	8.12		8.12	14.5%
PBMP F17b1	Fox River													
PBMP F17b2	Fox River		2.30	751	751		751	0.0%	0	1.13	1.13		1.13	0.0%
PBMP F17b3	Fox River													
PBMP F17c1	Fox River		0.00	1	1		1	43.6%	0	0.00	0.00		0.00	21.9%
PBMP F17c2	Fox River		1.37	999	681		681	31.8%	0	2.16	1.80		1.80	16.9%
PBMP F17d	Fox River													
PBMP F17e	Fox River		0.21	179	179		179	0.0%	0	0.41	0.41		0.41	0.0%
PBMP F17f	Fox River		0.07	62	62					0.14	0.14			
PBMP F17g	Fox River						0							
PBMP F17h	Fox River		1.41	45	42		42	7.1%	0	0.27	0.26		0.26	1.4%
PBMP F17i	Fox River													
PBMP F17j	Fox River		1.47	1,208	1,208		1,208	0.0%	0	2.75	2.75		2.75	0.0%
PBMP F17k	Fox River		0.23	184	184		184	0.0%	0	0.41	0.41		0.41	0.0%
PBMP F17l	Fox River		0.17	139	139		139	0.0%	0	0.31	0.31		0.31	0.0%
PBMP F17m	Fox River		2.20	1,692	1,400		1,400	17.2%	0	3.75	3.41		3.41	9.0%
PBMP F17n	Fox River		1.54	632	632		632	0.0%	0	0.92	0.92		0.92	0.0%

City of Kaukauna — Expera Specialty Solutions, Riparian, County HWY, State HWY

Drainage System	Sub-Watershed	Expera Area (acres)	Expera TSS Before Drain System (lbs/yr)	Expera TSS After Outfall Control (lbs/yr)	Expera TSS Load Reduct (%)	Expera TP Before Drain System (lbs/yr)	Expera TP After Outfall Control (lbs/yr)	Expera TP Load Reduct (%)	Riparian Area (acres)	Riparian TSS Before Drain System (lbs/yr)	Riparian TSS After Outfall Control (lbs/yr)	Riparian TSS Load Reduct (%)	Riparian TP Before Drain System (lbs/yr)	Riparian TP After Outfall Control (lbs/yr)	Riparian TP Load Reduct (%)	County HWY Area (acres)	County HWY TSS Before Drain System (lbs/yr)	County HWY TSS After Outfall Control (lbs/yr)	County HWY TSS Load Reduct (%)	County HWY TP Before Drain System (lbs/yr)	County HWY TP After Outfall Control (lbs/yr)	County HWY TP Load Reduct (%)	State HWY Area (acres)	State HWY TSS Before Drain System (lbs/yr)	State HWY TSS After Outfall Control (lbs/yr)	State HWY TSS Load Reduct (%)	State HWY TP Before Drain System (lbs/yr)	State HWY TP After Outfall Control (lbs/yr)	State HWY TP Load Reduct (%)
EBMP A2b2	Apple Creek															1.74	460	44	90.4%	2.65	1.15	56.6%							
Future Development	Apple Creek																												
EBMP A5b	Apple Creek																												
EBMP A5c	Apple Creek															12.65	3,124	937	70.0%	17.21	7.75	55.0%	48.80	19,698	5,910	70.0%	60.87	27.39	55.0%
EBMP A6d1	Apple Creek																												
EBMP A6f	Apple Creek																												
EBMP A6h2	Apple Creek																						0.00	4	1	82.4%	0.01	0.00	58.1%
Future Development	Apple Creek																												
EBMP A13a1	Apple Creek																						0.21	57	9	84.2%	0.33	0.15	54.8%
EBMP A13a2	Apple Creek																												
Future Development	Apple Creek																												
EBMP A14b	Apple Creek																												
EBMP A16b	Apple Creek																												
None	Apple Creek																						41.19	14,875	13,974	6.1%	47.28	44.58	5.7%
PBMP A3c1	Apple Creek																												
PBMP A4a	Apple Creek																												
PBMP A4b	Apple Creek															0.03	12	6	48.1%	0.03	0.02	44.0%							
PBMP A11	Apple Creek															4.50	1,297	1,132	12.7%	6.46	5.63	12.9%							
PBMP A13b	Apple Creek																												
PBMP A13c1	Apple Creek															0.43	114	114	0.0%	0.66	0.66	0.0%							
PBMP A14a2	Apple Creek																												
PBMP A16a	Apple Creek																												
Future Development	Apple Creek																												
EBMP F1b4	Fox River																												
EBMP F1d	Fox River															1.51	1,027	833	18.9%	2.81	2.37	15.6%	0.63	173	167	3.2%	0.94	0.92	1.7%
EBMP F5d1	Fox River															0.06	33	6	80.8%	0.10	0.04	55.2%	0.09	23	4	80.8%	0.14	0.06	55.2%
EBMP F5d13	Fox River																												
EBMP F13b1	Fox River																												
EBMP F13b4	Fox River																												
EBMP F23d1	Fox River															0.02	6	0	93.0%	0.04	0.02	45.4%							
EBMP F23e	Fox River																												
EBMP F23f1	Fox River																												
EBMP F23f2	Fox River																												
EBMP F24e6	Fox River																												
EBMP F24g	Fox River																												
EBMP F24k	Fox River																												
EBMP F26b	Fox River															4.04	2,628	1,415	46.2%	7.99	6.63	17.0%							
EBMP F27c4	Fox River																												
None	Fox River								106.46	18,374	18,332	0.2%	52.60	52.51	0.2%	9.82	2,726	2,618	4.0%	15.12	14.93	1.2%	3.66	1,240	1,191	3.9%	4.60	4.34	5.5%
PBMP C2a	Fox River																												
PBMP C2b	Fox River															0.54	354	191	46.2%	1.08	0.89	17.0%							
PBMP C2c	Fox River															0.68	440	237	46.2%	1.34	1.11	17.0%							
PBMP C4	Fox River															0.65	422	227	46.2%	1.28	1.07	17.0%							
PBMP F2a	Fox River																						0.35	92	0	99.7%	0.53	0.00	99.7%
PBMP F2b1	Fox River																						0.12	32	6	80.3%	0.18	0.04	78.2%
PBMP F2b2	Fox River																						0.03	9	0	99.7%	0.05	0.00	99.7%
PBMP F3	Fox River																												
PBMP F4b2	Fox River																												
PBMP F4b3	Fox River																												
PBMP F4c1	Fox River																												
PBMP F4c2	Fox River																												
PBMP F5b	Fox River																												
PBMP F5c	Fox River																												
PBMP F5d2	Fox River															0.03	2	2	0.0%	0.01	0.01	0.0%	0.05	13	13	0.0%	0.08	0.08	0.0%
PBMP F5d3	Fox River															0.04	25	14	46.8%	0.08	0.06	18.5%							
PBMP F5d4	Fox River																						0.42	220	135	38.6%	0.77	0.67	12.4%
PBMP F5d5	Fox River															0.71	433	232	46.4%	1.33	1.08	18.2%							
PBMP F5d6	Fox River															0.77	501	269	46.3%	1.53	1.26	17.2%							
PBMP F5d7	Fox River																												
PBMP F5d8	Fox River															0.41	267	143	46.5%	0.81	0.67	17.7%							
PBMP F5d9	Fox River																												
PBMP F5d10	Fox River															0.55	359	191	46.8%	1.09	0.89	18.5%							
PBMP F5d11	Fox River																												
PBMP F5d12	Fox River															0.02	10	5	46.8%	0.03	0.03	18.5%							
PBMP F5d14	Fox River															0.29	186	99	46.8%	0.57	0.46	18.5%							
PBMP F5d15	Fox River																												
PBMP F5e1	Fox River															11.16	4,050	3,152	22.2%	15.83	13.42	15.2%	1.45	827	581	29.7%	2.60	1.97	24.1%
PBMP F5e2	Fox River																												
PBMP F5e3	Fox River																												
PBMP F5e4	Fox River																						0.36	236	120	49.0%	0.71	0.57	19.0%
PBMP F5e5	Fox River																												
PBMP F5e6	Fox River																												
PBMP F5e7	Fox River															1.00	648	345	46.8%	1.97	1.61	18.5%							
PBMP F5e8	Fox River															0.00	2	1	46.8%	0.01	0.00	18.5%							
PBMP F5e9	Fox River																												
PBMP F5e10	Fox River																												
PBMP F5e11	Fox River																												
PBMP F5e12	Fox River																												
PBMP F5e13	Fox River																												
PBMP F5e14	Fox River																												
PBMP F5e15	Fox River																												
PBMP F5e16	Fox River																												
PBMP F5f	Fox River																												
PBMP F5g1	Fox River																												
PBMP F5g2	Fox River																												
PBMP F5g3	Fox River																												
PBMP F5h1	Fox River																												
PBMP F5h2	Fox River																												
PBMP F5h3	Fox River																												
PBMP F7	Fox River																												
PBMP F8a1a	Fox River																												
PBMP F8a1b	Fox River																												
PBMP F8a2	Fox River																												
PBMP F9a1	Fox River																												
PBMP F9a2	Fox River																												
PBMP F11	Fox River																												
PBMP F12	Fox River																												
PBMP F13a	Fox River																												
PBMP F13b2	Fox River																												
PBMP F13b3	Fox River																												
PBMP F13b5	Fox River																												
PBMP F13b6	Fox River																												
PBMP F13b7	Fox River															2.05	450	444	1.4%	2.49	2.48	0.4%							
PBMP F13b8	Fox River																												
PBMP F13b12	Fox River															1.25	308	289	6.3%	1.53	1.50	2.0%							
PBMP F13b14	Fox River																												
PBMP F13b16	Fox River																												
PBMP F13b17	Fox River																												
PBMP F13b18	Fox River																												
PBMP F17b1	Fox River	1.22	488	488	0.0%	0.69	0.69	0.0%																					
PBMP F17b2	Fox River	23.14	9,115	9,115	0.0%	12.92	12.92	0.0%																					
PBMP F17b3	Fox River	5.55	2,226	2,225	0.0%	3.14	3.14	0.0%	6.33	2,586	2,586	0.0%	3.73	3.73	0.0%														
PBMP F17c1	Fox River																												
PBMP F17c2	Fox River	4.00	1,606	1,604	0.1%	2.27	2.27	0.1%																					
PBMP F17d	Fox River	1.83	733	733	0.0%	1.03	1.03	0.0%																					
PBMP F17e	Fox River	1.83	734	734	0.0%	1.04	1.04	0.0%																					
PBMP F17f	Fox River	0.47	189	189	0.0%	0.27	0.27	0.0%																					
PBMP F17g	Fox River	2.37	950	950	0.0%	1.34	1.34	0.0%																					
PBMP F17h	Fox River	19.77	7,728	7,686	0.5%	11.17	11.14	0.2%																					
PBMP F17i	Fox River	0.41	163	163	0.0%	0.23	0.23	0.0%																					
PBMP F17j	Fox River	2.76	1,155	1,155	0.0%	1.71	1.71	0.0%																					
PBMP F17k	Fox River	2.17	892	892	0.0%	1.29	1.29	0.0%																					
PBMP F17l	Fox River	0.69	277	277	0.0%	0.39	0.39	0.0%																					
PBMP F17m	Fox River	0.84	338	338	0.0%	0.48	0.48	0.0%																					
PBMP F17n	Fox River	6.29	2,521	2,521	0.0%	3.56	3.56	0.0%																					

Totals/Sums for Comparison

Drainage System	Sub-Watershed	Area (acres)	TSS Before Drain System (lbs/yr)	TSS After Outfall Control (lbs/yr)	TSS Load Reduct (%)	TP Before Drain System (lbs/yr)	TP After Outfall Control (lbs/yr)	TP Load Reduct (%)
EBMP A2b2	Apple Creek	100.16	26,933	2,583	90.4%	63.43	27.50	56.6%
Future Development	Apple Creek							
EBMP A5b	Apple Creek	3.70	186	37	80.0%	1.33	0.86	35.0%
EBMP A5c	Apple Creek	454.03	150,664	45,199	70.0%	346.73	156.03	55.0%
EBMP A6d1	Apple Creek	27.20	9,739	1,719	82.4%	16.43	6.89	58.1%
EBMP A6f	Apple Creek	9.50	3,612	637	82.4%	6.86	2.88	58.1%
EBMP A6h2	Apple Creek	11.43	4,176	737	82.4%	6.84	2.87	58.1%
Future Development	Apple Creek							
EBMP A13a1	Apple Creek	27.97	4,019	637	84.2%	16.10	7.28	54.8%
EBMP A13a2	Apple Creek	17.06	3,743	593	84.2%	11.14	5.04	54.8%
Future Development	Apple Creek	0.00						
EBMP A14b	Apple Creek	31.50	3,036	118	96.1%	13.00	5.20	60.0%
EBMP A16b	Apple Creek	18.11	3,406	156	95.4%	13.30	4.48	66.3%
None	Apple Creek	121.22	28,702	25,911	9.7%	100.58	93.53	7.0%
PBMP A3c1	Apple Creek	0.69	594	369	37.8%	1.39	1.13	18.6%
PBMP A4a	Apple Creek	8.56	2,487	1,752	29.5%	7.55	6.63	12.1%
PBMP A4b	Apple Creek	11.88	3,995	3,819	4.4%	8.05	7.70	4.4%
PBMP A11	Apple Creek	43.22	14,388	13,894	3.4%	32.00	30.57	4.5%
PBMP A13b	Apple Creek	1.88	126	126	0.0%	0.90	0.90	0.0%
PBMP A13c1	Apple Creek	3.08	291	291	0.0%	1.93	1.93	0.0%
PBMP A14a2	Apple Creek	9.95	708	708	0.0%	4.81	4.81	0.0%
PBMP A16a	Apple Creek							
Future Development	Apple Creek	57.24	12,011	2,282	81.0%	46.46	20.91	55.0%
EBMP F1b4	Fox River	2.76	439	439	0.0%	1.55	1.55	0.0%
EBMP F1d	Fox River	95.08	29,356	27,212	7.3%	64.99	61.28	5.7%
EBMP F5d1	Fox River	12.55	2,292	440	80.8%	8.43	3.78	55.2%
EBMP F5d13	Fox River	3.35	809	155	80.8%	2.28	1.02	55.2%
EBMP F13b1	Fox River	15.38	2,757	650	76.4%	11.16	5.15	53.9%
EBMP F13b4	Fox River	7.34	1,363	333	75.6%	5.23	2.54	51.3%
EBMP F23d1	Fox River	2.59	428	30	93.0%	1.72	0.94	45.4%
EBMP F23e	Fox River	4.54	494	209	57.6%	2.26	0.96	57.6%
EBMP F23f1	Fox River	2.30	271	18	93.3%	1.52	0.55	64.0%
EBMP F23f2	Fox River	7.67	1,762	118	93.3%	6.48	2.33	64.0%
EBMP F24e6	Fox River	3.70	750	82	89.1%	2.91	1.08	63.0%
EBMP F24g	Fox River	19.74	2,989	736	75.4%	12.36	6.34	48.7%
EBMP F24k	Fox River	42.65	8,401	1,680	80.0%	32.64	14.03	57.0%
EBMP F26b	Fox River	47.87	7,401	2,489	66.4%	31.27	18.06	42.2%
EBMP F27c4	Fox River	1.21	579	131	77.4%	1.72	1.12	35.0%
None	Fox River	651.03	65,645	62,884	4.2%	292.23	285.40	2.3%
PBMP C2a	Fox River	4.83	1,323	1,025	22.5%	4.68	4.00	14.7%
PBMP C2b	Fox River	6.34	1,095	844	22.9%	4.52	4.14	8.5%
PBMP C2c	Fox River	2.65	918	614	33.1%	3.09	2.63	14.9%
PBMP C4	Fox River	4.99	939	744	20.8%	3.90	3.68	5.6%
PBMP F2a	Fox River	0.35	92	0	99.7%	0.53	0.00	99.7%
PBMP F2b1	Fox River	1.08	162	32	80.3%	0.67	0.15	78.2%
PBMP F2b2	Fox River	0.03	9	0	99.7%	0.05	0.00	99.7%
PBMP F3	Fox River	6.67	2,771	2,771	0.0%	4.16	4.16	0.0%
PBMP F4b2	Fox River	4.49	1,125	216	80.8%	4.01	1.80	55.2%
PBMP F4b3	Fox River	13.90	1,257	242	80.8%	6.27	2.81	55.2%
PBMP F4c1	Fox River	12.79	897	172	80.8%	4.39	1.97	55.2%
PBMP F4c2	Fox River	12.12	1,304	250	80.8%	5.81	2.60	55.2%
PBMP F5b	Fox River	3.81	439	398	9.4%	2.10	2.01	4.5%
PBMP F5c	Fox River	0.78	177	138	21.9%	0.65	0.57	13.6%
PBMP F5d2	Fox River	23.25	2,421	477	80.3%	11.85	5.36	54.8%
PBMP F5d3	Fox River	3.26	876	177	79.8%	3.09	1.41	54.3%
PBMP F5d4	Fox River	7.68	1,699	419	75.3%	6.48	3.23	50.1%
PBMP F5d5	Fox River	1.18	469	239	49.1%	1.52	1.17	22.9%
PBMP F5d6	Fox River	9.28	1,995	556	72.1%	7.54	3.96	47.5%
PBMP F5d7	Fox River	1.55	388	74	80.8%	1.42	0.63	55.2%
PBMP F5d8	Fox River	8.89	1,711	420	75.4%	6.65	3.28	50.6%
PBMP F5d9	Fox River	2.11	416	80	80.8%	1.63	0.73	55.2%
PBMP F5d10	Fox River	8.41	1,809	469	74.0%	6.80	3.45	49.3%
PBMP F5d11	Fox River	4.39	1,227	236	80.8%	4.33	1.94	55.2%
PBMP F5d12	Fox River	9.29	1,530	297	80.6%	6.22	2.80	55.0%
PBMP F5d14	Fox River	5.00	1,448	341	76.4%	4.93	2.42	51.0%
PBMP F5d15	Fox River	2.14	574	110	80.8%	2.04	0.92	55.2%
PBMP F5e1	Fox River	77.27	25,026	7,604	69.6%	64.34	35.97	44.1%
PBMP F5e2	Fox River	8.05	2,707	520	80.8%	6.69	3.00	55.2%
PBMP F5e3	Fox River	2.58	717	138	80.8%	2.44	1.09	55.2%
PBMP F5e4	Fox River	15.64	4,593	957	79.2%	12.69	5.94	53.2%
PBMP F5e5	Fox River	5.73	1,300	250	80.8%	4.65	2.08	55.2%
PBMP F5e6	Fox River	4.06	770	148	80.8%	2.96	1.32	55.2%
PBMP F5e7	Fox River	6.78	1,857	577	68.9%	6.20	3.50	43.5%
PBMP F5e8	Fox River	1.70	820	158	80.7%	2.32	1.04	55.1%
PBMP F5e9	Fox River	6.18	1,454	279	80.8%	4.71	2.11	55.2%
PBMP F5e10	Fox River	3.96	841	161	80.8%	2.76	1.23	55.2%
PBMP F5e11	Fox River	4.30	1,223	235	80.8%	4.20	1.88	55.2%
PBMP F5e12	Fox River	3.69	337	65	80.8%	1.83	0.82	55.2%
PBMP F5e13	Fox River	8.08	1,489	286	80.8%	5.86	2.63	55.2%
PBMP F5e14	Fox River	5.27	1,368	263	80.8%	4.75	2.13	55.2%
PBMP F5e15	Fox River	1.67	357	69	80.8%	1.35	0.61	55.2%
PBMP F5e16	Fox River	10.75	1,037	199	80.8%	5.30	2.38	55.2%
PBMP F5f	Fox River	1.34	383	74	80.8%	1.34	0.60	55.2%
PBMP F5g1	Fox River	13.71	412	79	80.8%	3.80	1.70	55.2%
PBMP F5g2	Fox River	7.25	221	42	80.8%	1.96	0.88	55.2%
PBMP F5g3	Fox River	8.68	579	111	80.8%	3.42	1.53	55.2%
PBMP F5h1	Fox River	13.06	3,359	645	80.8%	11.22	5.03	55.2%
PBMP F5h2	Fox River	5.17	371	71	80.8%	2.31	1.04	55.2%
PBMP F5h3	Fox River	2.85	690	132	80.8%	2.37	1.06	55.2%
PBMP F7	Fox River	3.82	769	619	19.5%	2.95	2.60	11.7%
PBMP F8a1a	Fox River	19.30	7,200	720	90.0%	19.29	2.89	85.0%
PBMP F8a1b	Fox River	11.56	2,337	1,733	25.8%	9.79	8.41	14.2%
PBMP F8a2	Fox River	3.85	1,212	1,212	0.0%	2.76	2.76	0.0%
PBMP F9a1	Fox River	7.45	4,165	2,375	43.0%	12.05	9.41	22.0%
PBMP F9a2	Fox River	1.27	115	12	90.0%	0.50	0.07	85.0%
PBMP F11	Fox River	65.17	17,197	13,394	22.1%	56.37	49.05	13.0%
PBMP F12	Fox River	23.87	6,383	4,946	22.5%	21.27	18.87	11.3%
PBMP F13a	Fox River	9.95	2,507	1,959	21.9%	9.09	7.83	13.8%
PBMP F13b2	Fox River	17.59	3,536	1,590	55.1%	13.63	8.37	38.6%
PBMP F13b3	Fox River	28.47	6,518	2,930	55.1%	23.81	14.63	38.6%
PBMP F13b5	Fox River	30.14	6,347	2,853	55.1%	21.39	13.14	38.6%
PBMP F13b6	Fox River	11.22	2,699	1,213	55.1%	9.44	5.80	38.6%
PBMP F13b7	Fox River	8.65	2,377	1,310	44.9%	7.61	5.62	26.1%
PBMP F13b8	Fox River	1.39	176	79	55.1%	0.79	0.49	38.6%
PBMP F13b12	Fox River	4.40	635	436	31.3%	3.11	2.47	20.5%
PBMP F13b14	Fox River	1.71	452	326	27.8%	1.62	1.41	12.7%
PBMP F13b16	Fox River	4.64	1,241	821	33.8%	4.44	3.94	11.2%
PBMP F13b17	Fox River	5.76	543	541	0.3%	2.89	2.88	0.1%
PBMP F13b18	Fox River	9.83	2,848	2,228	21.8%	9.50	8.12	14.5%
PBMP F17b1	Fox River	1.22	488	488	0.0%	0.69	0.69	0.0%
PBMP F17b2	Fox River	25.44	9,866	9,866	0.0%	14.05	14.05	0.0%
PBMP F17b3	Fox River	11.88	4,812	4,811	0.0%	6.87	6.87	0.0%
PBMP F17c1	Fox River	0.00	1	1	43.6%	0.00	0.00	21.9%
PBMP F17c2	Fox River	5.37	2,605	2,286	12.3%	4.43	4.07	8.3%
PBMP F17d	Fox River	1.83	733	733	0.0%	1.03	1.03	0.0%
PBMP F17e	Fox River	2.04	913	913	0.0%	1.45	1.45	0.0%
PBMP F17f	Fox River	0.55	252	189	24.7%	0.41	0.27	34.9%
PBMP F17g	Fox River	2.37	950	950	0.0%	1.34	1.34	0.0%
PBMP F17h	Fox River	21.17	7,774	7,728	0.6%	11.44	11.41	0.3%
PBMP F17i	Fox River	0.41	163	163	0.0%	0.23	0.23	0.0%
PBMP F17j	Fox River	4.22	2,363	2,363	0.0%	4.46	4.46	0.0%
PBMP F17k	Fox River	2.41	1,076	1,076	0.0%	1.70	1.70	0.0%
PBMP F17l	Fox River	0.86	415	415	0.0%	0.70	0.70	0.0%
PBMP F17m	Fox River	3.05	2,030	1,739	14.4%	4.22	3.89	8.0%
PBMP F17n	Fox River	7.83	3,153	3,153	0.0%	4.47	4.47	0.0%

City of Kaukauna
SWMP Plan of Action
McM No. K0006-91700668
March 2018

IV. TMDL Water Quality Analysis (meeting Goals): Action Plan: 2012 Land Use; High Effeciency Street Sweeper - Frequency of 4 times per week, WPC - Downtown Areas, 2 times per week, WPC - main arterial roadways, 1 time per week, WPC - STH 55 and Industrial / Business Parks, and twice per month, WPC - remaining areas. A parking control ordinance will be required for "remaining areas". A maintenance agreement with Outagamie County and the State of Wisconsin for water quality benefits of their grass swale conveyance system will be obtained.

			City of Kaukauna																																								Totals/Sums for Comparison						
			UPB (Excludes Undeveloped Areas over 5 ac, Other MS4 Jurisdictions, Agricultural Areas & Waters of the State)												Expera Specialty Solutions							Riparian							County HWY							State HWY													
				Total Suspended Solids (TSS)						Total Phosphorus (TP)						TSS Provided			TP Provided				TSS Provided			TP Provided				TSS Provided			TP Provided				TSS Provided			TP Provided				TSS Provided			TP Provided		
Drainage System	Sub-Watershed	BMP Name	Area (acres)	Before Drain System (lbs/yr)	After Drain System (lbs/yr)	BMP Reduct (%)	After Outfall Control (lbs/yr)	Total Load Reduct (%)	Net Gain (lbs/yr)	Before Drain System (lbs/yr)	After Drain System (lbs/yr)	BMP Reduct (%)	After Outfall Control (lbs/yr)	Total Load Reduct (%)	Area (acres)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Area (acres)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Area (acres)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Area (acres)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Area (acres)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)
PBMP F17o	Fox River		3.65	1,687	1,472		1,472	12.7%	0	2.85	2.60		2.60	8.7%	0.17	109	74	31.8%	0.22	0.20	9.9%																						3.82	1,796	1,547	13.9%	3.07	2.80	8.8%
PBMP F17p	Fox River		4.31	1,657	1,607		1,607	3.0%	0	2.55	2.49		2.49	2.3%																													4.31	1,657	1,607	3.0%	2.55	2.49	2.3%
PBMP F17q	Fox River		0.66	269	265		265	1.3%	0	0.39	0.38		0.38	1.0%																													0.66	269	265	1.3%	0.39	0.38	1.0%
PBMP F17r	Fox River		4.18	1,974	1,725		1,725	12.6%	0	3.31	3.03		3.03	8.7%																													4.18	1,974	1,725	12.6%	3.31	3.03	8.7%
PBMP F18b	Fox River		1.39	1,159	1,085		1,085	6.4%	0	2.42	2.33		2.33	3.5%	0.00	2	1	43.6%	0.00	0.00	12.1%																						1.39	1,161	1,087	6.4%	2.42	2.34	3.5%
PBMP F20a	Fox River		1.82	598	443		443	25.9%	0	2.02	1.66		1.66	17.7%																													1.82	598	443	25.9%	2.02	1.66	17.7%
PBMP F20c	Fox River		10.04	2,255	1,801		1,801	20.1%	0	8.45	7.40		7.40	12.4%																													10.04	2,255	1,801	20.1%	8.45	7.40	12.4%
PBMP F23b	Fox River		5.61	1,274	1,016		1,016	20.2%	0	4.75	4.16		4.16	12.5%															0.67	432	233	46.2%	1.32	1.09	17.0%								6.27	1,706	1,249	26.8%	6.07	5.25	13.5%
PBMP F23c	Fox River	Winchester East Pond	23.08	4,730	3,825	78.0%	1,043	78.0%	2,782	18.28	16.19	55.16%	8.20	55.2%															0.79	512	276	46.2%	1.56	1.29	17.0%								23.87	5,242	1,319	74.8%	19.84	9.49	52.2%
PBMP F23d2	Fox River		4.02	163	163		163	0.0%	0	1.15	1.15		1.15	0.0%																													4.02	163	163	0.0%	1.15	1.15	0.0%
PBMP F23d3	Fox River		5.40	979	811		811	17.1%	0	3.96	3.58		3.58	9.7%																													5.40	979	811	17.1%	3.96	3.58	9.7%
PBMP F23d4	Fox River		9.58	1,964	1,596		1,596	18.8%	0	7.58	6.73		6.73	11.2%																													9.58	1,964	1,596	18.8%	7.58	6.73	11.2%
PBMP F23d5	Fox River		12.34	1,269	1,028		1,028	19.0%	0	6.86	5.80		5.80	15.4%															2.29	602	409	32.1%	3.48	2.56	26.4%								14.62	1,871	1,437	23.2%	10.34	8.37	19.1%
PBMP F24a	Fox River		2.37	316	231		231	27.0%	0	1.45	1.15		1.15	20.7%															0.95	251	185	26.1%	1.45	1.16	20.1%								3.32	566	416	26.6%	2.90	2.31	20.4%
PBMP F24c	Fox River		1.62	164	121		121	26.2%	0	0.84	0.67		0.67	20.3%															1.31	346	256	26.2%	2.00	1.59	20.3%								2.93	510	376	26.2%	2.84	2.26	20.3%
PBMP F24d	Fox River		19.87	4,673	3,713		3,713	20.5%	0	17.25	15.04		15.04	12.8%															0.00	1	1	0.0%	0.01	0.01	0.0%								19.88	4,674	3,714	20.5%	17.26	15.05	12.8%
PBMP F24e1	Fox River		36.68	5,349	4,311		4,311	19.4%	0	22.48	19.48		19.48	13.4%															6.46	1,756	1,262	28.1%	8.65	7.26	16.1%								43.14	7,105	5,573	21.6%	31.13	26.73	14.1%
PBMP F24f	Fox River		17.83	3,782	3,059		3,059	19.1%	0	14.40	12.74		12.74	11.6%																													17.83	3,782	3,059	19.1%	14.40	12.74	11.6%
PBMP F26a	Fox River		8.55	1,388	1,162		1,162	16.3%	0	5.89	5.36		5.36	8.9%																													8.55	1,388	1,162	16.3%	5.89	5.36	8.9%
PBMP F27b	Fox River		3.61	163	117		117	28.0%	0	1.20	0.96		0.96	20.2%															0.83	220	158	28.0%	1.27	1.01	20.2%								4.45	383	276	28.0%	2.47	1.97	20.2%
PBMP F27c1	Fox River		22.42	3,093	2,631		2,631	14.9%	0	13.81	12.75		12.75	7.7%															0.18	76	52	30.7%	0.30	0.28	8.9%								22.60	3,168	2,683	15.3%	14.12	13.02	7.7%
PBMP F27c2	Fox River		8.02	1,045	936		936	10.4%	0	4.58	4.33		4.33	5.5%															1.59	1,035	533	48.5%	3.15	2.55	19.1%								9.62	2,080	1,469	29.4%	7.73	6.88	11.0%
PBMP F27c3	Fox River		2.80	211	211		211	0.0%	0	1.04	1.04		1.04	0.0%															0.15	76	76	0.0%	0.27	0.27	0.0%								2.95	288	288	0.0%	1.31	1.31	0.0%
PBMP F27d	Fox River		1.67	134	106		106	20.8%	0	0.68	0.55		0.55	18.1%															0.63	166	119	28.2%	0.96	0.72	25.1%								2.30	300	225	24.9%	1.64	1.27	22.2%
PBMP F27e	Fox River		5.46	412	412		412	0.0%	0	2.03	2.03		2.03	0.0%															0.01	4	4	0.0%	0.01	0.01	0.0%								5.46	416	416	0.0%	2.04	2.04	0.0%
PBMP F29	Fox River		3.51	924	619		619	33.0%	0	3.02	2.34		2.34	22.4%																													3.51	924	619	33.0%	3.02	2.34	22.4%
PBMP F32	Fox River		2.89	679	677		677	0.3%	0	2.39	2.39		2.39	0.1%																													2.89	679	677	0.3%	2.39	2.39	0.1%
PBMP F34a	Fox River		1.61	803	568		568	29.2%	0	1.71	1.34		1.34	21.5%																													1.61	803	568	29.2%	1.71	1.34	21.5%
PBMP F34b	Fox River		2.86	631	594		594	5.8%	0	1.84	1.78		1.78	3.3%																													2.86	631	594	5.8%	1.84	1.78	3.3%
PBMP F34c	Fox River		3.74	1,150	945		945	17.9%	0	3.13	2.72		2.72	12.9%																													3.74	1,150	945	17.9%	3.13	2.72	12.9%
PBMP F35a	Fox River		2.99	726	726		726	0.0%	0	2.04	2.04		2.04	0.0%																													2.99	726	726	0.0%	2.04	2.04	0.0%
PBMP F36b	Fox River		3.20	1,186	773		773	34.9%	0	3.25	2.49		2.49	23.4%																													3.20	1,186	773	34.9%	3.25	2.49	23.4%
PBMP F36c1	Fox River	Riverview Pond	3.02	648	507	60.0%	259	60.0%	248	2.40	2.08	55.0%	1.08	55.0%																													3.02	648	259	60.0%	2.40	1.08	55.0%
PBMP F36c2	Fox River	Riverview Pond	1.41	266	210	60.0%	106	60.0%	103	1.01	0.88	55.0%	0.45	55.0%																													1.41	266	106	60.0%	1.01	0.45	55.0%
PBMP F36c3	Fox River	Riverview Pond	2.43	370	265	60.0%	148	60.0%	117	1.35	1.15	55.0%	0.61	55.0%																													2.43	370	148	60.0%	1.35	0.61	55.0%
PBMP F36c4	Fox River	Riverview Pond	4.27	1,769	1,485	60.0%	708	60.0%	777	3.96	3.54	55.0%	1.78	55.0%																													4.27	1,769	708	60.0%	3.96	1.78	55.0%
PBMP F36c5	Fox River	Riverview Pond	1.84	653	546	60.0%	261	60.0%	285	1.38	1.21	55.0%	0.62	55.0%																													1.84	653	261	60.0%	1.38	0.62	55.0%
PBMP F36c6	Fox River	Riverview Pond	6.61	2,004	1,493	60.0%	802	60.0%	692	6.73	5.62	55.0%	3.03	55.0%																													6.61	2,004	802	60.0%	6.73	3.03	55.0%
PBMP F36c7	Fox River	Riverview Pond	10.95	3,562	2,691	60.0%	1,425	60.0%	1,267	11.32	9.41	55.0%	5.10	55.0%																													10.95	3,562	1,425	60.0%	11.32	5.10	55.0%
PBMP F36c8	Fox River	Riverview Pond	1.65	541	400	60.0%	216	60.0%	184	1.80	1.48	55.0%	0.81	55.0%																													1.65	541	216	60.0%	1.80	0.81	55.0%
PBMP F36c9	Fox River	Riverview Pond	10.49	2,861	2,151	60.0%	1,144	60.0%	1,007	9.72	8.13	55.0%	4.37	55.0%																													10.49	2,861	1,144	60.0%	9.72	4.37	55.0%
PBMP F36c10	Fox River	Riverview Pond	6.08	1,662	1,189	60.0%	665	60.0%	524	5.26	4.36	55.0%	2.37	55.0%																													6.08	1,662	665	60.0%	5.26	2.37	55.0%
PBMP F36c11	Fox River	Riverview Pond	3.00	1,279	852	60.0%	512	60.0%	340	3.05	2.38	55.0%	1.37	55.0%																													3.00	1,279	512	60.0%	3.05	1.37	55.0%
PBMP F36c12	Fox River	Riverview Pond	2.05	373	337	60.0%	149	60.0%	187	1.27	1.18	55.0%	0.57	55.0%																													2.05	373	149	60.0%	1.27	0.57	55.0%
PBMP F36c13	Fox River	Riverview Pond	3.70	1,111	933	60.0%	445	60.0%	488	2.95	2.62	55.0%	1.33	55.0%																													3.70	1,111	445	60.0%	2.95	1.33	55.0%
PBMP F36c14	Fox River	Riverview Pond	4.31	1,961	1,258	60.0%	784	60.0%	473	4.75	3.59	55.0%	2.14	55.0%																													4.31	1,961	784	60.0%	4.75	2.14	55.0%
PBMP F36c15	Fox River	Riverview Pond	4.79	2,000	1,336	60.0%	800	60.0%	536	4.86	3.83	55.0%	2.19	55.0%																													4.79	2,000	800	60.0%	4.86	2.19	55.0%
PBMP F36c16	Fox River	Riverview Pond	10.61	3,191	2,339	60.0%	1,276	60.0%	1,063	10.56	9.07	55.0%	4.75	55.0%															0.00	1	0	51.3%	0.00	0.00	20.1%								10.61	3,192	1,277	60.0%	10.56	4.75	55.0%
PBMP F36c17	Fox River	Riverview Pond	4.36	1,728	1,191	60.0%	691	60.0%	500	4.96	4.23	55.0%	2.23	55.0%																													4.36	1,728	691	60.0%	4.96	2.23	55.0%
PBMP F36c18	Fox River	Riverview Pond	8.42	1,799	1,476	60.0%	719	60.0%	756	5.91	5.37	55.0%	2.66	55.0%															1.68	1,093	532	51.3%	3.32	2.65	20.1%								10.10	2,891	1,252	56.7%	9.23	5.31	42.4%
PBMP F36c19	Fox River	Riverview Pond	6.70	872	867	60.0%	349	60.0%	518	3.14	3.13	55.0%	1.41	55.0%																													6.70	872	349	60.0%	3.14	1.41	55.0%
PBMP F36c20	Fox River	Riverview Pond	6.05	2,475	1,629	60.0%	990	60.0%	639	7.50	6.40	55.0%	3.37	55.0%																													6.05	2,475	990	60.0%	7.50	3.37	55.0%
PBMP F36c21	Fox River	Riverview Pond	9.72	2,143	2,026	60.0%	857	60.0%	1,168	7.58	7.32	55.0%	3.41	55.0%																													9.72	2,143	857	60.0%	7.58	3.41	55.0%
PBMP F38a	Fox River		3.76	1,012	879		879	13.2%	0	2.88	2.61		2.61	9.3%																													3.76	1,012	879	13.2%	2.88	2.61	9.3%
PBMP F39	Fox River		12.04	3,852	2,872		2,872	25.4%	0	12.94	10.68		10.68	17.5%																													12.04	3,852	2,872	25.4%	12.94	10.68	17.5%
PBMP F40b1	Fox River		3.31	955	722		722	24.3%	0	3.28	2.74		2.74	16.3%																													3.31	955	722	24.3%	3.28	2.74	16.3%
PBMP F41b	Fox River		6.32	1,519	1,190		1,190	21.7%	0	5.54	4.78		4.78	13.7%																													6.32	1,519	1,190	21.7%	5.54	4.78	13.7%
PBMP F42a1	Fox River		16.68	2,484	2,129		2,129	14.3%	0	10.68	9.86		9.86	7.7%															1.98	1,289	694	46.2%	3.92	3.25	17.0%								18.66	3,772	2,823	25.2%	14.60	13.11	10.2%
PBMP F43a	Fox River		2.64	756	581		581	23.2%	0	2.65	2.24		2.24	15.2%																													2.64	756	581	23.2%	2.65	2.24	15.2%
PBMP F43b	Fox River		1.64	170	165		165	2.4%	0	0.86	0.85		0.85	1.1%																																			
Fut Dev (grass remove)	Fox River	Future New Development (remove grass area)	-9.64	-657	-657		-657	0.0%	0	-4.73	-4.73		-4.73	0.0%																																			
Future Development	Fox River	Future New Development	53.51	10,395	10,395	81.0%	1,975	81.0%	8,420	41.07	41.07	55.0%	18.48	55.0%																													53.51	10,395	1,975	81.0%	41.07	18.48	55.0%
EBMP G2a	Garners Creek	Moon Ridge Court Pond - Enhanced Settling	5.08	1,119	900	90.0%	112	90.0%	788	4.17	3.67	85.0%	0.63	85.0%																													5.08	1,119	112	90.0%	4.17	0.63	85.0%
EBMP G3d	Garners Creek	Jonen Park Bio Retention Device	0.49	44	44	66.6%	15	66.6%	29	0.31	0.23	35.0%	0.20	35.0%																													0.49	44	15	66.6%	0.31	0.20	35.0%
EBMP G3h	Garners Creek	Newton Lane Court Pond - Enhanced Settling	16.66	3,035	2,503	85.0%	455	90.0%	2,047	11.97	10.74	85.0%	1.80	85.0%																													16.66	3,035	455	85.0%	11.97	1.80	85.0%
EBMP G3k	Garners Creek	Jonen Park Wet Pond - Enhanced Settling	2.65	238	238	77.3%	54	90.0%	184	1.25	1.25	85.0%	0.19	85.0%																													2.65	238	54	77.3%	1.25	0.19	85.0%
EBMP G4a	Garners Creek	Coriander Court Pond - Enhanced Settling	8.05	1,848	1,470	85.0%	277	90.0%	1,193	6.88	6.01	85.0%	1.03	85.0%																													8.05	1,848	277	85.0%	6.88	1.03	85.0%
EBMP G4b	Garners Creek	Lemongrass Way Pond - Enhanced Settling	34.02	7,175	6,171	85.0%	1,076	90.0%	5,095	25.82	23.51	85.0%	3.87	85.0%																													34.02	7,175	1,076	85.0%	25.82	3.87	85.0%
None	Garners Creek		3.32	651	532		532	18.2%	0	2.41	2.15		2.15	10.8%															3.69	837	630	24.8%	4.79	3.85	19.7%								7.01	1,488	1,162	21.9%	7.20	6.00	16.7%
PBMP G1	Garners Creek	CTH HH Pond - Enhanced Settling	26.63	5,061	3,979	90.0%	506	90.0%	3,473	20.09	17.31	85.0%	3.01	85.0%															1.42	375	280	25.4%	2.17	1.74	19.8%								28.06	5,436	786	85.5%	22.26	4.75	78.7%
PBMP G2b	Garners Creek	Bio Retention / Rain Gardens	6.12	1,260	1,110	80.0%	252	90.0%	858	4.47	4.12	35.0%	2.91	35.0%															0.48	102	102	0.0%	0.58	0.58	0.0%								6.60	1,362	354	74.0%	5.05	3.49	31.0%
PBMP G3a1	Garners Creek	Fieldcrest Ponds - Enhanced Settling	20.16	5,044	3,983	90.0%	504	90.0%	3,479	18.12	15.71	85.0%	2.72	85.0%																													20.16	5,044	504	90.0%	18.12	2.72	85.0%
PBMP G3a2	Garners Creek	Bio Retention / Rain Gardens	2.92	819	637	80.0%	164	80.0%	473	2.84	2.42	35.0%	1.85	35.0%																													2.92	819	164	80.0%	2.84	1.85	35.0%
PBMP G3b	Garners Creek	Bio Retention / Rain Gardens	1.14	300	234	80.0%	60	80.0%	174	1.07	0.92	35.0%	0.70	35.0%																													1.14	300	60	80.0%	1.07	0.70	35.0%
PBMP G3c	Garners Creek	Bio Retention / Rain Gardens	5.97	1,140	985	80.0%	228	80.0%	757	4.30	3.95	35.0%	2.80	35.0%																													5.97	1,140	228	80.0%	4.30	2.80	35.0%
PBMP G3e	Garners Creek	Bio Retention / Rain Gardens	1.18	353	270	80.0%	71	80.0%	199	1.22	1.03	35.0%	0.79	35.0%																													1.18	353	71	80.0%	1.22	0.79	35.0%
PBMP G3f	Garners Creek	Bio Retention / Rain Gardens	8.96	1,648	1,366	80.0%	330	80.0%	1,036	6.61	5.96	35.0%	4.30	35.0%																													8.96	1,648	330	80.0%	6.61	4.30	35.0%
PBMP G3g	Garners Creek	Sunny Meadows Pond - Enhanced Settling	11.33	2,902	2,271	90.0%	290	90.0%	1,981	10.47	9.02	85.0%	1.57	85.0%																													11.33	2,902	290	90.0%	10.47	1.57	85.0%
PBMP G3l	Garners Creek	Bio Retention / Rain Gardens	21.26	2,097	2,080	80.0%	419	80.0%	1,661	10.67	10.63	35.0%	6.93	35.0%															0.06	12	12	0.0%	0.07	0.07	0.0%								21.32	2,109	431	79.5%	10.74	7.00	34.8%
PBMP G4c	Garners Creek	Bio Retention / Rain Gardens	17.12	2,594	2,539	80.0%	519	80.0%	2,020	9.92	9.78	35.0%	6.45	35.0%																																			
Future Development	Garners Creek	Future New Development (remove grass area)	-6.74	-460	-460		-460	0.0%	0	-3.31	-3.31		-3.31	0.0%																																			
Future Development	Garners Creek	Future New Development	26.62	7,619	7,619	81.0%	1,448	81.0%	6,171	23.41	23.41	63.10%	8.64	63.1%															1.48	390	264	32.3%	2.25	1.65	26.9%								28.10	8,008	1,711	78.6%	25.66	10.28	59.9%
EBMP K1a2	Kankapot Creek	Softball Diamond #1 Bio Retention Device	1.11	526	526	77.7%	117	77.7%	408	1.44	1.44	35.0%	0.93	35.0%																													1.11	526	117	77.7%	1.44	0.93	35.0%
EBMP K4	Kankapot Creek	Horseshoe Park Pond - Enhanced Settling	697.89	151,363	123,668	90.0%	15,136	90.0%	108,531	556.17	497.29	85.0%	83.43	85.0%															22.43	6,920	692	90.0%	31.09	4.66	85.0%								720.32	158,283	15,828	90.0%	587.27	88.09	85.0%
EBMP K7c2	Kankapot Creek	Piggly Park Pond	15.54	5,856	5,510	79.1%	1,222	79.1%	4,288	12.65	12.11	61.4%	4.88	61.4%																													15.54	5,856	1,222	79.1%	12.65	4.88	61.4%
EBMP K7d	Kankapot Creek	Coffee Hill Pond	19.24	3,524	3,410	56.7%	1,527	56.7%	1,883	11.96	11.70	41.7%	6.97	41.7%															0.09	19	8	56.7%	0.11	0.06	41.7%								19.33	3,543	1,535	56.7%	12.07	7.04	41.7%
None	Kankapot Creek		170.81	11,486	10,760		10,760	6.3%	0	62.65	61.05		61.05	2.6%															13.54	3,252	2,437	25.1%	17.09	13.88	18.8%	1.89	497	432	13.1%	2.87	2.58	10.2%	186.24	15,235	13,629	10.5%	82.62	77.51	6.2%
PBMP K1a1	Kankapot Creek		10.70	1,601	1,381		1,381	13.7%	0	6.74	6.24		6.24	7.5%															2.68	1,743	929	46.7%	5.30	4.37	17.6%								13.39	3,343	2,310	30.9%	12.04	10.61	11.9%
PBMP K2b	Kankapot Creek		0.59	50	50		50	0.0%	0	0.26	0.26		0.26	0.0%																													0.59	50	50	0.0%	0.26	0.26	0.0%
PBMP K2d	Kankapot Creek		0.86	76	76		76	0.0%	0	0.40	0.40		0.40	0.0%																													0.86	76	76	0.0%	0.40	0.40	0.0%
PBMP K2e1	Kankapot Creek		9.47	3,627	2,809		2,809	22.6%	0	9.84	8.30		8.30	15.6%																													9.47	3,627	2,809	22.6%	9.84	8.30	15.6%
PBMP K2e2	Kankapot Creek		3.95	1,193	893		893	25.2%	0	3.84	3.21		3.21	16.3%																													3.95	1,193	893	25.2%	3.84	3.21	16.3%
PBMP K2e3	Kankapot Creek		8.51	2,445	1,848		1,848	24.4%	0	8.39	7.02		7.02	16.4%																													8.51	2,445	1,848	24.4%	8.39	7.02	16.4%
PBMP K2e4	Kankapot Creek		6.59	403	351		351	12.8%	0	2.26	2.14		2.14	5.3%																													6.59	403	351	12.8%	2.26	2.14	5.3%
PBMP K2f	Kankapot Creek		2.75	217	217		217	0.0%	0	1.25	1.25		1.25	0.0%																													2.75	217	217	0.0%	1.25	1.25	0.0%
PBMP K3a1	Kankapot Creek		2.34	834	665		665	20.2%	0	2.40	2.08		2.08	13.4%																													2.34	834	665	20.2%	2.40	2.08	13.4%
PBMP K5b	Kankapot Creek		6.48	1,108	997		997	10.0%	0	4.51	4.26		4.26	5.7%															1.46	947	510	46.2%	2.88	2.39	17.0%								7.94	2,056	1,507	26.7%	7.39	6.65	10.1%
PBMP K5e1	Kankapot Creek		2.57	738	567		567	23.2%	0	2.58	2.19		2.19	15.3%																													2.57	738	567	23.2%	2.58	2.19	15.3%
PBMP K5e2	Kankapot Creek		10.33	2,411	1,919		1,919	20.4%	0	8.92	7.79		7.79	12.7%																													10.33	2,411	1,919	20.4%	8.92	7.79	12.7%
PBMP K5e3	Kankapot Creek		10.79	1,855	1,530		1,530	17.5%	0	7.76	7.01		7.01	9.7%																													10.79	1,855	1,530	17.5%	7.76	7.01	9.7%
PBMP K5e4	Kankapot Creek		2.50	726	556		556	23.4%	0	2.53	2.14		2.14	15.5%																													2.50	726	556	23.4%	2.53	2.14	15.5%
PBMP K5e5	Kankapot Creek		17.24	946	941		941	0.6%	0	6.05	6.03		6.03	0.2%																													17.24	946	941	0.6%	6.05	6.03	0.2%
PBMP K5f1	Kankapot Creek		10.29	2,580	2,026		2,026	21.5%	0	9.35	8.07		8.07	13.7%																													10.29	2,580	2,026	21.5%	9.35	8.07	13.7%
PBMP K5f2	Kankapot Creek		2.14	679	508		508	25.2%	0	2.31	1.92		1.92	17.1%																													2.14	679	508	25.2%	2.31	1.92	17.1%
PBMP K5f3	Kankapot Creek		7.27	331	309		309	6.8%	0	2.14	2.09		2.09	2.4%																													7.27	331	309	6.8%	2.14	2.09	2.4%
PBMP K6b1	Kankapot Creek		8.84	2,260	1,842		1,842	18.5%	0	7.67	6.75		6.75	12.0%																													8.84	2,260	1,842	18.5%	7.67	6.75	12.0%
PBMP K6b2	Kankapot Creek		5.01	2,136	1,595		1,595	25.3%	0	5.85	5.21		5.21	10.9%																													5.01	2,136	1,595	25.3%	5.85	5.21	10.9%
PBMP K6b3	Kankapot Creek		4.89	1,966	1,964		1,964	0.1%	0	3.08	3.07		3.07	0.2%																													4.89	1,966	1,964	0.1%	3.08	3.07	0.2%
PBMP K6b4	Kankapot Creek		5.34	1,537	1,283		1,283	16.5%	0	5.00	4.42		4.42	11.7%																													5.34	1,537	1,283	16.5%	5.00	4.42	11.7%
PBMP K6b5	Kankapot Creek		6.69	1,484	1,228		1,228	17.2%	0	5.39	4.81		4.81	10.7%																													6.69	1,484	1,228	17.2%	5.39	4.81	10.7%
PBMP K6b6	Kankapot Creek		8.42	857	844		844	1.6%	0	4.27	4.24		4.24	0.7%																													8.42	857	844	1.6%	4.27	4.24	0.7%
PBMP K6b7	Kankapot Creek		3.47	1,003	771		771	23.1%	0	3.51	2.97		2.97	15.3%																													3.47	1,003	771	23.1%	3.51	2.97	15.3%
PBMP K6b8	Kankapot Creek		4.50	1,009	810		810	19.7%	0	3.77	3.31		3.31	12.1%																													4.50	1,009	810	19.7%	3.77	3.31	12.1%
PBMP K6c	Kankapot Creek		1.31	307	242		242	21.0%	0	1.14	0.99		0.99	13.0%																													1.31	307	242	21.0%	1.14	0.99	13.0%
PBMP K6d	Kankapot Creek		0.60	195	145		145	25.7%	0	0.66	0.55		0.55	17.4%																													0.60	195	145	25.7%	0.66	0.55	17.4%
PBMP K6e	Kankapot Creek		7.99	695	611		611	12.1%	0	3.47	3.28		3.28	5.6%																													7.99	695	611	12.1%	3.47	3.28	5.6%
PBMP K7b	Kankapot Creek		7.89	1,388	1,160		1,160	16.4%	0	5.64	5.12		5.12	9.3%																													7.89	1,388	1,160	16.4%	5.64	5.12	9.3%
PBMP K7c3	Kankapot Creek		5.66	2,341	2,083		2,083	11.0%	0	5.34	4.93		4.93	7.6%																													5.66	2,341	2,083	11.0%	5.34	4.93	7.6%
PBMP K8a13	Kankapot Creek		54.80	11,635	9,416		9,416	19.1%	0	44.30	39.18		39.18	11.6%																						0.01	3	3	0.0%	0.02	0.02	0.0%	54.81	11,638	9,418	19.1%	44.31	39.20	11.5%
PBMP K8a15	Kankapot Creek		3.09	785	501		501	36.1%	0	2.85	2.49		2.49	12.6%															3.08	652	545	16.5%	3.72	3.27	12.1%	1.64	1,209	638	47.3%	3.69	3.05	17.3%	7.81	2,646	1,684	36.4%	10.26	8.81	14.1%
PBMP K8b2	Kankapot Creek		2.04	601	481		481	20.0%	0	1.58	1.35		1.35	14.7%																													2.04	601	481	20.0%	1.58	1.35	14.7%
PBMP K8b3	Kankapot Creek		2.23	708	567		567	20.0%	0	1.80	1.53		1.53	14.7%																													2.23	708	567	20.0%	1.80	1.53	14.7%
PBMP K8c1	Kankapot Creek		0.14	40	32		32	20.0%	0	0.11	0.09		0.09	14.7%															2.38	504	404	20.0%	2.88	2.45	14.7%	0.00	1	1	20.0%	0.00	0.00	14.7%	2.52	546	437	20.0%	2.98	2.54	14.7%
PBMP K8d	Kankapot Creek		2.00	369	369		369	0.0%	0	1.42	1.42		1.42	0.0%																													2.00	369	369	0.0%	1.42	1.42	0.0%
PBMP K8e	Kankapot Creek		26.10	5,579	5,579		5,579	0.0%	0	20.97	20.97		20.97	0.0%															1.14	241	241	0.0%	1.37	1.37	0.0%								27.23	5,820	5,820	0.0%	22.35	22.35	0.0%

City of Kaukauna
SWMP Plan of Action
McM No. K0006-91700668
March 2018

IV. TMDL Water Quality Analysis (meeting Goals): Action Plan: 2012 Land Use; High Effeciency Street Sweeper - Frequency of 4 times per week, WPC - Downtown Areas, 2 times per week, WPC - main arterial roadways, 1 time per week, WPC - STH 55 and Industrial / Business Parks, and twice per month, WPC - remaining areas. A parking control ordinance will be required for "remaining areas". A maintenance agreement with Outagamie County and the State of Wisconsin for water quality benefits of their grass swale conveyance system will be obtained.

			City of Kaukauna											
			UPB (Excludes Undeveloped Areas over 5 ac, Other MS4 Jurisdictions, Agricultural Areas & Waters of the State)											
				Total Suspended Solids (TSS)						Total Phosphorus (TP)				
Drainage System	Sub-Watershed	BMP Name	Area (acres)	Before Drain System (lbs/yr)	After Drain System (lbs/yr)	BMP Reduct (%)	After Outfall Control (lbs/yr)	Total Load Reduct (%)	Net Gain (lbs/yr)	Before Drain System (lbs/yr)	After Drain System (lbs/yr)	BMP Reduct (%)	After Outfall Control (lbs/yr)	Total Load Reduct (%)
PBMP K8f	Kankapot Creek	Loderbauer Pond Revision	1.02	211	172	80.0%	42	80.0%	130	0.81	0.72	57.0%	0.35	57.0%
PBMP K9a	Kankapot Creek	Starwood Acres Pond	7.79	1,743	1,443	79.2%	362	79.2%	1,081	5.87	5.25	57.0%	2.52	57.0%
PBMP K9b1	Kankapot Creek	Starwood Acres Pond												
PBMP K9b2	Kankapot Creek	Starwood Acres Pond	0.15	47	34	79.2%	10	79.2%	24	0.17	0.13	57.0%	0.07	57.0%
PBMP K9c	Kankapot Creek	Starwood Acres Pond	11.37	3,870	3,800	79.2%	804	79.2%	2,997	7.28	7.05	57.0%	3.13	57.0%
PBMP K10a	Kankapot Creek		6.07	2,563	2,038		2,038	20.5%	0	3.94	3.26		3.26	17.2%
Future Development	Kankapot Creek	Future New Development (remove grass area)	-8.76	-597	-597	81.0%	-114	81.0%	-484	-4.30	-4.30	55.00%	-1.94	55.0%
Future Development	Kankapot Creek	Future New Development	25.42	5,333	5,333	81.0%	1,013	81.0%	4,320	20.63	20.63	55.00%	9.28	55.0%
None	Plum Creek		9.35	1,057	876		876	17.1%	0	5.12	4.50		4.50	12.2%
PBMP P1a1	Plum Creek		1.78	586	486		486	17.2%	0	1.98	1.74		1.74	12.2%
PBMP P2a3	Plum Creek	Kavanaugh Pond	4.37	248	248	84.4%	39	84.4%	209	1.55	1.55	57.0%	0.67	57.0%
PBMP P3c	Plum Creek	Kavanaugh Pond	17.66	3,563	2,828	84.4%	557	84.4%	2,271	13.88	11.99	57.0%	5.97	57.0%
		Total	**4,193.1**	**939,308**	**823,127**		**376,470**	**59.9%**	**446,594**	**2,927.55**	**2,691.75**		**1,608.57**	**45.1%**

	City of Kaukauna													
	Expera Specialty Solutions							Riparian						
		TSS Provided			TP Provided				TSS Provided			TP Provided		
Drainage System	Area (acres)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Area (acres)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)
PBMP K8f														
PBMP K9a														
PBMP K9b1														
PBMP K9b2														
PBMP K9c														
PBMP K10a														
Future Development														
Future Development														
None														
PBMP P1a1														
PBMP P2a3														
PBMP P3c														

	City of Kaukauna													
	County HWY							State HWY						
		TSS Provided			TP Provided				TSS Provided			TP Provided		
Drainage System	Area (acres)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Area (acres)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)
PBMP K8f														
PBMP K9a	0.71	187	129	30.7%	1.08	0.80	25.9%							
PBMP K9b1	0.01	3	3	4.8%	0.02	0.01	4.0%							
PBMP K9b2	0.33	88	64	27.4%	0.51	0.40	22.3%							
PBMP K9c								0.37	97	70	28.2%	0.56	0.44	22.5%
PBMP K10a														
Future Development														
Future Development	0.50	132	105	20.5%	0.76	0.63	17.2%	0.28	73	58	20.5%	0.42	0.35	17.2%
None														
PBMP P1a1														
PBMP P2a3														
PBMP P3c	0.28	74	52	29.8%	0.43	0.32	24.3%							

	Totals/Sums for Comparison						
		TSS Provided			TP Provided		
Drainage System	Area (acres)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Load Reduct (%)
PBMP K8f	1.02	211	42	80.0%	0.81	0.35	57.0%
PBMP K9a	8.49	1,930	491	74.5%	6.95	3.32	52.2%
PBMP K9b1	0.01	3	3	4.8%	0.02	0.01	4.0%
PBMP K9b2	0.49	135	74	45.3%	0.68	0.47	31.1%
PBMP K9c	11.74	3,967	874	78.0%	7.84	3.56	54.5%
PBMP K10a							
Future Development							
Future Development	26.19	5,538	1,176	78.8%	21.81	10.26	52.9%
None	9.35	1,057	876	17.1%	5.12	4.50	12.2%
PBMP P1a1	1.78	586	486	17.2%	1.98	1.74	12.2%
PBMP P2a3	4.37	248	39	84.4%	1.55	0.67	57.0%
PBMP P3c	17.94	3,637	608	83.3%	14.31	6.29	56.0%

A-1: Results Summary

Pollutant Analysis Summary - Urban Study Area									
		TSS							
Sub-Watershed	Area (acres)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Total Load Reduct (lbs)	Total Load Reduct (%)	TMDL Load Redct Req'd (lbs)	TMDL Load Redct Req'd (lbs)	Addt'l Load Redct Req'd (lbs)	TMDL TSS Redct Satisfied (Y/N)
Apple Creek	851.9	298,422	89,186	209,236	70.1%	155,179	52.0%	-54,057	Y
Fox River	1,871.1	346,304	196,393	149,911	43.3%	250,032	72.2%	100,121	N
Garners Creek	212.9	44,487	6,853	37,634	84.6%	26,692	60.0%	-10,942	Y
Kankapot Creek	1,224.0	244,641	82,082	162,559	66.4%	127,213	52.0%	-35,346	Y
Plum Creek	33.2	5,454	1,957	3,497	64.1%	2,836	52.0%	-661	Y
Totals:	**4,193.1**	**939,308**	**376,470**	**562,838**	**59.9%**	**561,952**	**59.8%**	**-885**	**Y**

Pollutant Analysis Summary - Urban Study Area									
		TP							
Sub-Watershed	Area (acres)	Before Drain System (lbs/yr)	After Outfall Control (lbs/yr)	Total Load Reduct (lbs)	Total Load Reduct (%)	TMDL Load Redct Req'd (lbs)	TMDL Load Redct Req'd (lbs)	Addt'l Load Redct Req'd (lbs)	TMDL TP Redct Satisfied (Y/N)
Apple Creek	851.9	637.6	333.6	304.0	47.7%	258.2	40.5%	-45.8	Y
Fox River	1,871.1	1,216.1	849.9	366.2	30.1%	492.5	40.5%	126.3	N
Garners Creek	212.9	162.7	49.2	113.5	69.8%	111.8	68.7%	-1.7	Y
Kankapot Creek	1,224.0	888.6	363.0	525.6	59.1%	359.9	40.5%	-165.7	Y
Plum Creek	33.2	22.5	12.9	9.7	42.9%	9.1	40.5%	-0.5	Y
Totals:	**4,193.1**	**2,927.5**	**1,608.6**	**1,319.0**	**45.1%**	**1,231.5**	**42.1%**	**-87.4**	**Y**

City of Kaukauna TMDL Stormwater Plan of Action
Capital Improvement Plan (CIP)
McM No. K0006-9-17-00668
Updated - October 4, 2023

		Rate	7.5			8	9.8		10			10.5			11		12			14					16			
City of Kaukauna TMDL Stormwater Plan of Action					Beginning Balance:	$518,213																						
	Revenues	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**		**Totals**
1	Licenses & Permits	$11,000	$11,220	$11,444	$11,673	$11,907	$12,145	$12,388	$12,636	$12,888	$13,146	$13,409	$13,677	$13,951	$14,230	$14,514	$14,805	$15,101	$15,403	$15,711	$16,025	$16,345	$16,672	$17,006	$17,346	$17,693	$18,047		$359,380
2	Storm Water Utility Fees	$1,110,000	$1,190,000	$1,190,000	$1,190,000	$1,270,000	$1,398,000	$1,398,000	$1,430,000	$1,430,000	$1,430,000	$1,590,000	$1,590,000	$1,590,000	$1,670,000	$1,670,000	$1,670,000	$1,910,000	$1,910,000	$1,910,000	$2,230,000	$2,230,000	$2,230,000	$2,230,000	$2,390,000	$2,390,000	$2,390,000		$43,526,000
3	DNR Construction Grant[1]	$0	$0	$0	$0	$0	$80,000		$120,000	$0	$120,000	$0	$120,000	$120,000		$120,000	$0	$0	$120,000	$0	$120,000	$0	$0	$120,000	$0	$0	$0		$1,040,000
	Total Revenues	**$1,121,000**	**$1,201,220**	**$1,201,444**	**$1,201,673**	**$1,281,907**	**$1,490,145**	**$1,410,388**	**$1,562,636**	**$1,442,888**	**$1,563,146**	**$1,603,409**	**$1,723,677**	**$1,723,951**	**$1,684,230**	**$1,804,514**	**$1,684,805**	**$1,925,101**	**$2,045,403**	**$1,925,711**	**$2,366,025**	**$2,246,345**	**$2,246,672**	**$2,367,006**	**$2,407,346**	**$2,407,693**	**$2,408,047**		**$44,925,380**
	Expenditures	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**		**Totals**
	Capital Projects - Pond Construction / Enhancement																												
1	Company Woods Expansion	$0	$0	$0	$0	$0	$180,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$180,000
2	*Ann Street Underground Detention	$0	$0	$0	$0	$0	$1,010,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$1,010,000
3	Riverview Pond	$0	$0	$0	$0	$0	$0	$0	$2,140,925	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$2,140,925
4	Badger Pond	$0	$0	$0	$0	$0	$0	$0	$402,364	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$402,364
5	Horseshoe Park Pond with Enhanced Settling	$0	$0	$0	$0	$0	$0	$0	$0	$0	$238,664	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$238,664
6	Moon Ridge Court Pond with Enhanced Settling	$0	$0	$0	$0	$0	$0	$0	$0	$0	$33,067	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$33,067
7	Sunny Meadows Pond with Enhanced Settling	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$156,451	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$156,451
8	MCC Quarry Regional Pond	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,993,134	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$1,993,134
9	Jonen Park Wet Pond with Enhanced Settling	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$122,647	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$122,647
10	Draper Street North Pond	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$623,291	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$623,291
11	Winchester East Pond	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$244,771	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$244,771
12	Kelso Park Pond Expansion	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,720,499	$0	$0	$0	$0	$0	$0	$0	$0		$1,720,499
13	Fieldcrest Ponds with Enhanced Settling	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$433,849	$0	$0	$0	$0	$0	$0	$0		$433,849
14	Coriander Court Pond with Enhanced Settling	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$55,611	$0	$0	$0	$0	$0	$0	$0		$55,611
15	Lemongrass Way Pond with Enhanced Settling	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$151,906	$0	$0	$0	$0	$0	$0	$0		$151,906
16	Newton Lane Court Pond with Enhanced Settling	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$122,947	$0	$0	$0	$0	$0	$0	$0		$122,947
17	Starwood Acres Pond	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$250,000	$0	$0	$0	$0	$0	$0		$250,000
18	CTH HH Pond with Enhanced Settling	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$599,653	$0	$0	$0		$599,653
19	Bio Retention / Rain Gardens	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$75,529	$0	$0	$0		$75,529
20	Bio Retention / Rain Gardens	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$45,632	$0	$0	$0		$45,632
21	Bio Retention / Rain Gardens	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$29,897	$0	$0	$0		$29,897
22	Bio Retention / Rain Gardens	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$72,382	$0	$0	$0		$72,382
23	Bio Retention / Rain Gardens	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$29,897	$0	$0	$0		$29,897
24	Bio Retention / Rain Gardens	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$125,882	$0	$0	$0		$125,882
25	Bio Retention / Rain Gardens	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$287,955	$0	$0	$0		$287,955
26	Bio Retention / Rain Gardens	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$215,573	$0	$0	$0		$215,573
	Storm Sewer Annual Replacement	$520,000	$275,000	$440,000	$940,000	$50,000	$650,000	$885,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000		$10,840,000
	Pond Construction / Enhancement Totals	**$520,000**	**$275,000**	**$440,000**	**$940,000**	**$50,000**	**$1,840,000**	**$885,000**	**$2,943,289**	**$400,000**	**$671,731**	**$400,000**	**$556,451**	**$3,139,072**	**$400,000**	**$644,771**	**$400,000**	**$400,000**	**$2,120,499**	**$1,164,313**	**$650,000**	**$400,000**	**$400,000**	**$1,882,400**	**$400,000**	**$400,000**	**$400,000**		**$11,362,526**
	Capital Projects - Soil Loss Prevention																												
1	Konkapot Creek Streambank Restoration Projects	$30,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$0
2	Kelso Park Pond Bank Stabilization	$75,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$0
3	Peters Road/Lauer Outfall	$40,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$0
4	Bel Air Court Outfall	$0	$25,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$25,000
5	Gringon Park Stream	$0	$0	$0	$0	$150,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$150,000
6	Hoersch Outfall - (Not in MS4)	$0	$0	$0	$0	$0	$0	$0	$150,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$150,000
7	Other Streambank Resoration/Steam Bank Stabilization	$0	$0	$35,000	$35,000	$35,000	$35,000	$35,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000		$460,000
	Soil Loss Prevention Totals	**$145,000**	**$25,000**	**$35,000**	**$35,000**	**$185,000**	**$35,000**	**$35,000**	**$165,000**	**$15,000**	**$15,000**	**$15,000**	**$15,000**	**$15,000**	**$15,000**	**$15,000**	**$15,000**	**$15,000**	**$15,000**	**$15,000**	**$15,000**	**$15,000**	**$15,000**	**$15,000**	**$15,000**	**$15,000**	**$15,000**		**$785,000**
	Total Capital Expenditures	**$665,000**	**$300,000**	**$475,000**	**$975,000**	**$235,000**	**$1,875,000**	**$920,000**	**$3,108,289**	**$415,000**	**$686,731**	**$415,000**	**$571,451**	**$3,154,072**	**$415,000**	**$659,771**	**$415,000**	**$415,000**	**$2,135,499**	**$1,179,313**	**$665,000**	**$415,000**	**$415,000**	**$1,897,400**	**$415,000**	**$415,000**	**$415,000**		**$11,625,000**
1	Anticipated Note	$665,000	$300,000	$475,000	$975,000	$235,000	$1,875,000	$920,000	$3,108,289	$415,000	$686,731	$415,000	$571,451	$3,154,072	$415,000	$659,771	$415,000	$415,000	$2,135,499	$1,179,313	$665,000	$415,000	$415,000	$1,897,400	$415,000	$415,000	$415,000		$22,987,526
2	Bonding						$2,500,000					$5,000,000				$4,500,000					$4,800,000							$5,000,000	
	Professional Services																												
1	Street Cleaning	$169,856	$173,253	$176,718	$180,253	$183,858	$187,535	$191,285	$195,111	$199,013	$202,994	$207,054	$211,195	$215,418	$219,727	$224,121	$228,604	$233,176	$237,839	$242,596	$247,448	$252,397	$257,445	$262,594	$267,846	$273,203	$278,667		$5,549,349
2	Storm Sewer Maintenance	$128,561	$131,132	$133,755	$136,430	$139,159	$141,942	$144,781	$147,676	$150,630	$153,642	$156,715	$159,849	$163,046	$166,307	$169,634	$173,026	$176,487	$180,016	$183,617	$187,289	$191,035	$194,856	$198,753	$202,728	$206,782	$210,918		$4,200,204
3	KU Meter Reading / Billing Charges	$12,820	$13,076	$13,338	$13,605	$13,877	$14,154	$14,437	$14,726	$15,021	$15,321	$15,628	$15,940	$16,259	$16,584	$16,916	$17,254	$17,599	$17,951	$18,310	$18,676	$19,050	$19,431	$19,819	$20,216	$20,620	$21,033		$418,841
4	Administrative Costs	$92,009	$93,849	$95,726	$97,641	$99,594	$101,585	$103,617	$105,689	$107,803	$109,959	$112,158	$114,402	$116,690	$119,023	$121,404	$123,832	$126,309	$128,835	$131,412	$134,040	$136,721	$139,455	$142,244	$145,089	$147,991	$150,951		$3,006,017
5	Depreciation	$173,147	$176,610	$180,142	$183,745	$187,420	$191,168	$194,992	$198,891	$202,869	$206,927	$211,065	$215,287	$219,592	$223,984	$228,464	$233,033	$237,694	$242,448	$247,297	$252,242	$257,287	$262,433	$267,682	$273,035	$278,496	$284,066		$5,656,869
6	Non-operating Expenses		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$0
7	Debt Payments	$654,964	$582,595	$613,931	$593,524	$447,397	$446,922	$635,057	$669,417	$1,029,803	$464,186	$460,000	$715,000	$575,000	$630,000	$640,000	$840,000	$840,000	$840,000	$840,000	$840,000	$840,000	$840,000	$840,000	$840,000	$840,000	$840,000		$17,742,830
8	Long Term Pond Maintenance	$103,456	$105,525	$107,636	$114,323	$116,610	$118,942	$128,763	$131,338	$142,293	$145,139	$150,790	$153,806	$156,882	$313,785	$320,061	$401,428	$409,457	$443,048	$572,622	$584,074	$595,756	$607,671	$619,824	$632,221	$644,865	$657,762		$8,374,619
9	Engineering - General - DNR Grant Applications	$0	$0	$4,000	$0	$4,000	$0	$4,000	$0	$4,000	$0	$4,000	$0	$4,000	$0	$4,000	$0	$0	$4,000	$0	$4,000	$0	$0	$4,000	$0	$4,000	$0		$44,000
10	Engineering - General - SWMP Update	$0	$0	$0	$0	$0	$5,000	$0	$0	$30,000	$0	$0	$0	$0	$0	$0	$30,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$30,000		$95,000
	Professional Services Totals	**$1,334,813**	**$1,276,041**	**$1,325,246**	**$1,319,520**	**$1,191,913**	**$1,207,248**	**$1,416,932**	**$1,462,849**	**$1,881,432**	**$1,298,167**	**$1,317,410**	**$1,585,479**	**$1,466,888**	**$1,689,411**	**$1,724,599**	**$2,047,177**	**$2,040,721**	**$2,094,137**	**$2,235,853**	**$2,267,770**	**$2,292,245**	**$2,321,290**	**$2,354,916**	**$2,381,134**	**$2,415,957**	**$2,473,396**		**$45,087,731**
	Total Expenditures	**$1,334,813**	**$1,276,041**	**$1,325,246**	**$1,319,520**	**$1,191,913**	**$1,207,248**	**$1,416,932**	**$1,462,849**	**$1,881,432**	**$1,298,167**	**$1,317,410**	**$1,585,479**	**$1,466,888**	**$1,689,411**	**$1,724,599**	**$2,047,177**	**$2,040,721**	**$2,094,137**	**$2,235,853**	**$2,267,770**	**$2,292,245**	**$2,321,290**	**$2,354,916**	**$2,381,134**	**$2,415,957**	**$2,473,396**		**$57,235,257**
	Total Fund Balance Applied or Surplus	**($213,813)**	**($74,821)**	**($123,802)**	**($117,846)**	**$89,994**	**$282,897**	**($6,544)**	**$99,786**	**($438,543)**	**$264,979**	**$285,999**	**$138,199**	**$257,063**	**($5,181)**	**$79,915**	**($362,373)**	**($115,620)**	**($48,734)**	**($310,142)**	**$98,255**	**($45,900)**	**($74,618)**	**$12,090**	**$26,212**	**($8,264)**	**($65,349)**		
	Stormwater Utility Projected Total Funds	**$304,400**	**$229,579**	**$105,777**	**($12,069)**	**$77,925**	**$360,821**	**$354,277**	**$454,064**	**$15,520**	**$280,499**	**$566,498**	**$704,696**	**$961,759**	**$956,577**	**$1,036,493**	**$674,120**	**$558,500**	**$509,766**	**$199,624**	**$297,879**	**$251,979**	**$177,361**	**$189,451**	**$215,663**	**$207,399**	**$142,049**		

NOTE: ALL FUTURE COSTS ASSUME INFLATION RATE OF **2.00%**

NOTE: INCREASE UTILITY RATES TO MEET PROJECTED NEEDS

[1]Grant applications due April 15 of even numbered years (grant max's out at $150,000 - assumes giving 20% cost share back to score higher)

POST-CONSTRUCTION STORM WATER MANAGEMENT ZONING ORDINANCE

TABLE OF CONTENTS

SUBCHAPTER II
POST-CONSTRUCTION STORM WATER MANAGEMENT

22.02(1) AUTHORITY.

(a) This ordinance is adopted by the Common Council under the authority granted by s. 62.234, for cities, Wis. Stats. This ordinance supersedes all provisions of an ordinance previously enacted under s. 62.23, Wis. Stats., that relate to storm water management regulations. Except as otherwise specified in s. 62.234, Wis. Stats., s. 62.23, Wis. Stats., applies to this ordinance and to any amendments to this ordinance.

(b) The provisions of this ordinance are deemed not to limit any other lawful regulatory powers of the same governing body.

(c) The Common Council hereby designates the Director of Public Works or designee to administer and enforce the provisions of this ordinance.

(d) The requirements of this ordinance do not pre-empt more stringent storm water management requirements that may be imposed by any of the following:

1. Wisconsin Department of Natural Resources administrative rules, permits or approvals including those authorized under ss. 281.16 and 283.33, Wis. Stats.
2. Targeted non-agricultural performance standards promulgated in rules by the Wisconsin Department of Natural Resources under s. NR 151.004, Wis. Adm. Code.

22.02(2) FINDINGS OF FACT.

The Common Council finds that uncontrolled, post-construction runoff has a significant impact upon water resources and the health, safety and general welfare of the community and diminishes the public enjoyment and use of natural resources. Specifically, uncontrolled post-construction runoff can:

(a) Degrade physical stream habitat by increasing stream bank erosion, increasing streambed scour, diminishing groundwater recharge, diminishing stream base flows and increasing stream temperature.

(b) Diminish the capacity of lakes and streams to support fish, aquatic life, recreational and water supply uses by increasing pollutant loading of sediment, suspended solids, nutrients, heavy metals, bacteria, pathogens and other urban pollutants.

(c) Alter wetland communities by changing wetland hydrology and by increasing pollutant loads.

(d) Reduce the quality of groundwater by increasing pollutant loading.

(e) Threaten public health, safety, property and general welfare by overtaxing storm sewers, drainage ways, and other minor drainage facilities.

(f) Threaten public health, safety, property and general welfare by increasing major flood peaks and volumes.

(g) Undermine floodplain management efforts by increasing the incidence and levels of flooding.

22.02(3) PURPOSE AND INTENT.

(a) PURPOSE. The general purpose of this ordinance is to establish long-term, post-construction runoff management requirements that will diminish the threats to public health, safety, welfare and the aquatic environment. Specific purposes are to:

1. Further the maintenance of safe and healthful conditions.
2. Prevent and control the adverse effects of storm water; prevent and control soil erosion; prevent and control water pollution; protect spawning grounds, fish and aquatic life; control building sites, placement of structures and land uses; preserve ground cover and scenic beauty; and promote sound economic growth.
3. Control exceedance of the safe capacity of existing drainage facilities and receiving water bodies; prevent undue channel erosion; control increases in the scouring and transportation of particulate matter; and prevent conditions that endanger downstream property.

(b) INTENT. It is the intent of the Common Council that this ordinance regulates post-construction storm water discharges to waters of the state. This ordinance may be applied on a site-by-site basis. The Common Council recognizes, however, that the preferred method of achieving the storm water performance standards set forth in this ordinance is through the preparation and implementation of comprehensive, systems-level storm water management plans that cover hydrologic units, such as watersheds, on a municipal and regional scale. Such plans may prescribe regional storm water devices, practices or systems, any of which may be designed to treat runoff from more than one site prior to discharge to waters of the state. Where such plans are in conformance with the performance standards developed under s. 281.16, Wis. Stats., for regional storm water management measures and have been approved by the Common Council, it is the intent of this ordinance that the approved plan be used to identify post-construction management measures acceptable for the community.

22.02(4) APPLICABILITY AND JURISDICTION.

(a) APPLICABILITY.

1. Where not otherwise limited by law, this ordinance applies to all post-construction sites, unless the site is otherwise exempt under paragraph 2..

2. A post-construction site that meets any of the criteria in this paragraph is exempt from the requirements of this ordinance.

   a. 1- and 2-family residential dwellings that are not part of a larger common plan of development or sale and that result in less than 1 acre of disturbance.

   b. Non-point discharges from agricultural activity areas.

   c. Non-point discharges from silviculture activities.

   d. Mill and crush operations.

3. Notwithstanding the applicability requirements in paragraph 1., this ordinance applies to post-construction sites of any size that, in the opinion of the Director of Public Works or designee, is likely to result in runoff that exceeds the safe capacity of the existing drainage facilities or receiving body of water, that causes undue channel erosion, that increases water pollution by scouring or the transportation of particulate matter or that endangers property or public safety.

(b) JURISDICTION.

This ordinance applies to post construction sites within the boundaries and jurisdiction of the City of Kaukauna.

(c) EXCLUSIONS.

This ordinance is not applicable to activities conducted by a state agency, as defined under s. 227.01 (1), Wis. Stats., but also including the office of district attorney, which is subject to the state plan promulgated or a memorandum of understanding entered into under s. 281.33 (2), Wis. Stats.

22.02(5) DEFINITIONS.

(a) "Adequate sod, or self-sustaining vegetative cover" means maintenance of sufficient vegetation types and densities such that the physical integrity of the streambank or lakeshore is preserved. Self-sustaining vegetative cover includes grasses, forbs, sedges and duff layers of fallen leaves and woody debris.

(b) "Administering authority" means a governmental employee, or a regional planning commission empowered under s. 62.234, Wis. Stats., that is designated by the Common Council to administer this ordinance.

(c) "Agricultural activity area" means the part of the farm where there is planting, growing, cultivating and harvesting of crops for human or livestock consumption and pasturing or outside yarding of livestock, including sod farms and silviculture. Practices in this area may include waterways, drainage ditches, diversions, terraces, farm lanes, excavation, filling and similar practices. The agricultural activity area does not include the agricultural production area.

(d) "Agricultural production area" means the part of the farm where there is concentrated production activity or impervious surfaces. Agricultural production areas include buildings, driveways, parking areas, feed storage structures, manure storage structures, and other impervious surfaces. The agricultural production area does not include the agricultural activity area.

(e) “Average annual rainfall” means a calendar year of precipitation, excluding snow, which is considered typical. For purposes of this ordinance, average annual rainfall means measured precipitation in Green Bay, Wisconsin between March 29 and November 25, 1969.

(f) “Best management practice” or “BMP” means structural or non-structural measures, practices, techniques or devices employed to avoid or minimize soil, sediment or pollutants carried in runoff to waters of the state.

(g) “Business day” means a day the office of the Director of Public Works or designee, is routinely and customarily open for business.

(h) “Cease and desist order” means a court-issued order to halt land disturbing construction activity that is being conducted without the required permit.

(i) “Combined sewer system” means a system for conveying both sanitary sewage and storm water runoff.

(j) “Common plan of development or sale” means a development or sale where multiple separate and distinct land disturbing construction activities may be taking place at different times on different schedules but under one plan. A common plan of development or sale includes, but is not limited to, subdivision plats, certified survey maps, and other developments.

(k) “Connected imperviousness" means an impervious surface connected to the waters of the state via a separate storm sewer, an impervious flow path, or a minimally pervious flow path.

(l) “Construction site” means an area upon which one or more land disturbing construction activities occur, including areas that are part of a larger common plan of development or sale.

(m) “Design storm” means a hypothetical discrete rainstorm characterized by a specific duration, temporal distribution, rainfall intensity, return frequency, and total depth of rainfall. Atlas 14 MSE4 24-hour design storms for City of Kaukauna are: 1-year, 2.11 inches; 2-year, 2.42 inches; 5-year, 2.97 inches; 10-year, 3.48 inches; 25-year, 4.26 inches; and 100-year, 5.62 inches.

(n) “Development” means residential, commercial, industrial, institutional, or other land uses and associated roads.

(o) “Direct conduits to groundwater” means wells, sinkholes, swallets, fractured bedrock at the surface, sand or gravel surficial deposits, mine shafts, nonmetallic mines, tile inlets discharging to groundwater, quarries or depressional groundwater recharge areas over shallow fractured bedrock.

(p) “Division of land” means the creation from one or more parcels or building sites of additional parcels or building sites where such creation occurs at one time or through the successive partition within a 5 year period.

(q) “Effective infiltration area” means the area of the infiltration system that is used to infiltrate runoff and does not include the area used for site access, berms or pretreatment.

(r) “Erosion” means the process by which the land’s surface is worn away by the action of wind, water, ice or gravity.

(s) "Exceptional resource waters" means waters listed in s. NR 102.11, Wis. Adm. Code.

(t) “Existing development” means development in existence on October 1, 2004 or development for which a storm water permit in accordance with subch. III of Ch. NR 216, Wis. Adm. Code, was received on or before October 1, 2004.

(u) “Extraterritorial” means the unincorporated area within 3 miles of the corporate limits of a first, second, or third class city, or within 1.5 miles of a fourth class city or village.

(v) “Filtering layer” means soil that has at least a 3-foot deep layer with at least 20 percent fines; or at least a 5-foot deep layer with at least 10 percent fines; or an engineered soil with an equivalent level of protection as determined by the Director of Public Works or designee, for the site.

(w) "Final stabilization" means that all land disturbing construction activities at the construction site have been completed and that a uniform, perennial, vegetative cover has been established, with a density of at least 70% of the cover, for the unpaved areas and areas not covered by permanent structures, or that employ equivalent permanent stabilization measures.

(x) “Financial guarantee” means a performance bond, maintenance bond, surety bond, irrevocable letter of credit, or similar guarantees submitted to the Director of Public Works or designee, by the responsible party to assure that requirements of the ordinance are carried out in compliance with the storm water management plan.

(y) “Governing body” means town board of supervisors, county board of supervisors, city council, village board of trustees or village council.

(z) “Groundwater” means any of the waters of the state, as defined in s.281.01 (18), stats. occurring in a saturated subsurface geological formation of rock or soil.

(aa) “High Groundwater Level” or “Subsurface Saturation” means the higher of either the elevation to which the soil is saturated as observed as a free water surface in an unlined hole, or the elevation to which the soil has been seasonally or periodically saturated as indicated by soil color patterns throughout the soil profile. As defined in Technical Standard 1002, Site Evaluation for Stormwater Infiltration.

(bb) “Highway” has the meaning given in s. 340.01 (22), Wis. Stats.

(cc) “Highway reconditioning” has the meaning given in s. 84.013 (1)(b), Wis. Stats.

(dd) “Highway reconstruction” has the meaning given in s. 84.013(1)(c), Wis. Stats.

(ee) “Highway resurfacing” has the meaning given in s. 84.013(1)(d), Wis. Stats.

(ff) “Impervious surface” means an area that releases as runoff all or a large portion of the precipitation that falls on it, except for frozen soil. Rooftops, sidewalks, driveways, parking lots and streets are examples of surfaces that typically are impervious. Gravel surfaces are considered impervious, unless specifically designed to encourage infiltration.

(gg) “Impervious surface disturbance” means any land disturbing construction activity in which any new impervious surfaces are created or existing impervious surfaces are redeveloped.

(hh) “In-fill” means an undeveloped area of land or new development area located within an existing urban sewer service area, surrounded by development or development and natural or man-made features where development cannot occur. “In-fill” does not include any undeveloped area that was part of a larger new development for which a storm water permit in accordance with subch. III of ch. NR 216, Wis. Adm. Code, was required to be submitted after October 1, 2004 to the Wisconsin Department of Natural Resources or Wisconsin Department of Safety and Professional Services (formerly Department of Commerce).

(ii) “Infiltration” means the entry and movement of precipitation or runoff into or through soil.

(jj) “Infiltration system” means a device or practice such as a basin, trench, rain garden or swale designed specifically to encourage infiltration, but does not include natural infiltration in pervious surfaces such as lawns, redirecting of rooftop downspouts onto lawns or minimal infiltration from practices, such as swales or road side channels designed for conveyance and pollutant removal only.

(kk) “Land disturbing construction activity” or “disturbance” means any man-made alteration of the land surface resulting in a change in the topography or existing vegetative or non-vegetative soil cover, that may result in runoff and lead to an increase in soil erosion and movement of pollutants into the municipal separate storm sewer or waters of the state. Land disturbing construction activity includes clearing and grubbing, demolition, excavating, pit trench dewatering, filling and grading activities, and soil stockpiling.

(ll) “Maintenance agreement” means a legal document that provides for long-term maintenance of storm water management and best management practices.

(mm) “MEP” or “maximum extent practicable” means the highest level of performance that is achievable but is not equivalent to a performance standard identified within this ordinance. Maximum extent practicable applies when the permit applicant demonstrates to the Director of Public Works or designee’s, satisfaction that a performance standard is not achievable and that a lower level of performance is appropriate. In making the assertion that a performance standard is not achievable and that a level of performance different from the performance standard is the maximum extent practicable, the permit applicant shall take into account the best available technology, cost effectiveness, geographic features, and other competing interests such as protection of public safety and welfare, protection of endangered and threatened resources, and preservation of historic properties.

(nn) “Minor reconstruction of a highway” means reconstruction of a highway that is limited to 1.5 miles in continuous or aggregate total length of realignment and that does not exceed 100 feet in width of roadbed widening, and that does not include replacement of a vegetated drainage system with a non-vegetated drainage system except where necessary to convey runoff under a highway or private road or driveway.

(oo) “Navigable waters” and “navigable waterway” has the meaning given in s. 30.01(4m), Wis. Stats.

(pp) “New development” means that portion of a post-construction site where impervious surfaces are being created or expanded. Any disturbance where the amount of impervious area for the post-development condition is greater than the pre-development condition is classified as new development. For purposes of this ordinance, a post-construction site is classified as new development, redevelopment, routine maintenance, or some combination of these three classifications as appropriate.

(qq) “Off-site” means located outside the property boundary described in the permit application.

(rr) “On-site” means located within the property boundary described in the permit application.

(ss) "Ordinary high-water mark" has the meaning given in s. NR 115.03(6), Wis. Adm. Code.

(tt) “Outstanding resource waters” means waters listed in s. NR 102.10, Wis. Adm. Code.

(uu) “Percent fines” means the percentage of a given sample of soil, which passes through a # 200 sieve.

(vv) “Performance standard” means a narrative or measurable number specifying the minimum acceptable outcome for a facility or practice.

(ww) “Permit” means a written authorization made by the Director of Public Works or designee, to the applicant to conduct land disturbing construction activity or to discharge post-construction runoff to waters of the state.

(xx) “Permit administration fee” means a sum of money paid to the Director of Public Works or designee, by the permit applicant for the purpose of recouping the expenses incurred by the authority in administering the permit.

(yy) “Pervious surface” means an area that releases as runoff a small portion of the precipitation that falls on it. Lawns, gardens, parks, forests or other similar vegetated areas are examples of surfaces that typically are pervious.

(zz) “Pollutant” has the meaning given in s. 283.01(13), Wis. Stats.

(aaa) “Pollution” has the meaning given in s. 281.01(10), Wis. Stats.

(bbb) “Post-construction site" means a construction site following the completion of land disturbing construction activity and final site stabilization.

(ccc) “Post-development” means the extent and distribution of land cover types present after the completion of land disturbing construction activity and final site stabilization.

(ddd) “Pre-development” means the extent and distribution of land cover types present before the initiation of land disturbing construction activity, assuming that all land uses prior to development activity are managed in an environmentally sound manner.

(eee) “Preventive action limit” has the meaning given in s. NR 140.05(17), Wis. Adm. Code.

(fff) "Redevelopment ” means that portion of a post-construction site where impervious surfaces are being reconstructed, replaced, or reconfigured. Any disturbance where the amount of impervious area for the post-development condition is equal to or less than the pre-development condition is classified as redevelopment. For purposes of this ordinance, a post-construction site is classified as new development, redevelopment, routine maintenance, or some combination of these three classifications as appropriate.

(ggg) “Responsible party” means any entity holding fee title to the property or other person contracted or obligated by other agreement to implement and maintain post-construction storm water BMPs.

(hhh) “Routine maintenance” means that portion of a post-construction site where pre-development impervious surfaces are being maintained to preserve the original line and grade, hydraulic capacity, drainage pattern, configuration, or purpose of the facility. Remodeling of buildings and resurfacing of parking lots, streets, driveways, and sidewalks are examples of routine maintenance, provided the lower ½ of the impervious surface’s granular base is not disturbed. The disturbance shall be classified as redevelopment if the lower ½ of the granular base associated with the pre-development impervious surface is disturbed or if the soil located beneath the impervious surface is exposed. For purposes of this ordinance, a post-construction site is classified as new development, redevelopment, routine maintenance, or some combination of these three classifications as appropriate.

(iii) “Runoff” means storm water or precipitation including rain, snow or ice melt or similar water that moves on the land surface via sheet or channelized flow.

(jjj) “Sediment” means settleable solid material that is transported by runoff, suspended within runoff or deposited by runoff away from its original location.

(kkk) “Separate storm sewer” means a conveyance or system of conveyances including roads with drainage systems, streets, catch basins, curbs, gutters, ditches, constructed channels or storm drains, which meets all of the following criteria:

(lll) Is designed or used for collecting water or conveying runoff.

(mmm) Is not part of a combined sewer system.

(nnn) Is not part of a publicly owned wastewater treatment works that provides secondary or more stringent treatment.

(ooo) Discharges directly or indirectly to waters of the state.

(ppp) “Silviculture activities” means activities including tree nursery operations, tree harvesting operations, reforestation, tree thinning, prescribed burning, and pest and fire control. Clearing and grubbing of an area of a construction site is not a silviculture activity.

(qqq) “Site” means the entire area included in the legal description of the land on which the land disturbing construction activity occurred.

(rrr) “Stop work order” means an order issued by the Director of Public Works or designee, which requires that all construction activity on the site be stopped.

(sss) “Storm water management plan” means a comprehensive plan designed to reduce the discharge of pollutants from storm water after the site has under gone final stabilization following completion of the construction activity.

(ttt) “Storm water management system plan” is a comprehensive plan designed to reduce the discharge of runoff and pollutants from hydrologic units on a regional or municipal scale.

(uuu) “Targeted performance standard” means a performance standard that will apply in a specific area, where additional practices beyond those contained in this ordinance, are necessary to meet water quality standards. A total maximum daily load is an example of a targeted performance standard.

(vvv) "Technical standard" means a document that specifies design, predicted performance and operation and maintenance specifications for a material, device or method.

(www) “Top of the channel” means an edge, or point on the landscape, landward from the ordinary high-water mark of a surface water of the state, where the slope of the land begins to be less than 12% continually for at least 50 feet. If the slope of the land is 12% or less continually for the initial 50 feet, landward from the ordinary high-water mark, the top of the channel is the ordinary high-water mark.

(xxx) “Total maximum daily load” or “TMDL” means the amount of pollutants specified as a function of one or more water quality parameters, that can be discharged per day into a water quality limited segment and still ensure attainment of the applicable water quality standard.

(yyy) “TR-55” means the United States Department of Agriculture, Natural Resources Conservation Service (previously Soil Conservation Service), Urban Hydrology for Small Watersheds, Second Edition, Technical Release 55, June 1986, which is incorporated by reference for this ordinance.

(zzz) “Transportation facility” means a public street, a public road, a public highway, a railroad, a public mass transit facility, a public-use airport, a public trail, or any other public work for transportation purposes such as harbor improvements under s. 85.095(1)(b), Wis. Stats. “Transportation facility” does not include building sites for the construction of public buildings and buildings that are places of employment that are regulated by the Wisconsin Department of Natural Resources pursuant to s. 281.33, Wis. Stats.

(aaaa) “Type II distribution” means a rainfall type curve as established in the “United States Department of Agriculture, Soil Conservation Service, Technical Paper 149, published 1973”, which is incorporated by reference for this ordinance. The Type II curve is applicable to all of Wisconsin and represents the most intense storm pattern.

(bbbb) “Waters of the state” has the meaning given in s. 283.01 (20), Wis. Stats.

22.02(6) TECHNICAL STANDARDS.

The following methods shall be used in designing and maintaining the water quality, peak discharge, infiltration, protective area, and fueling / vehicle maintenance components of storm water practices needed to meet the water quality standards of this ordinance:

(a) Technical standards identified, developed or disseminated by the Wisconsin Department of Natural Resources under subchapter V of chapter NR 151, Wis. Adm. Code.

(b) Technical standards and guidance identified within the City of Kaukauna Storm Water Reference Guide.

(c) Where technical standards have not been identified or developed by the Wisconsin Department of Natural Resources, other technical standards may be used provided that the methods have been approved by the Director of Public Works or designee.

(d) In this ordinance, the following year and location has been selected as average annual rainfall: Green Bay, 1969 (Mar. 29-Nov. 25).

22.02(7) PERFORMANCE STANDARDS.

(a) RESPONSIBLE PARTY. The responsible party shall implement a post-construction storm water management plan that incorporates the requirements of this section.

(b) PLAN. A written storm water management plan in accordance with Section 22.02(9) shall be developed and implemented for each post-construction site.

(c) REQUIREMENTS. The storm water management plan shall meet the following minimum requirements to the maximum extent practicable:

1. WATER QUALITY. BMPs shall be designed, installed and maintained to control pollutants carried in runoff from the post-construction site. The design shall be based on the average annual rainfall, as compared to no runoff management controls.

a. For post-construction sites with 1 acre or more of land disturbance in a TMDL, the following is required:

i. Except as provided in 22.02(7)(c)(1)a.*ii.*, a pollutant reduction is required as follows:

Watershed	Total Suspended Solids (TSS) & Total Phosphorus (TP) Reduction					
	New Development		Redevelopment		Routine Maintenance	
	TSS	TP	TSS	TP	TSS	TP
Apple Creek	80%	60%	40%	30%	40%	30%
Garners Creek	80%	63.1%	49.9%	63.1%	49.9%	63.1%
Kankapot Creek	80%	60%	40%	30%	40%	30%
Lower Fox River	80%	60%	65.2%	30%	65.2%	30%
Plum Creek	80%	60%	40%	30%	40%	30%

ii. A pollutant reduction is not required for routine maintenance areas that are part of a post-construction site with less than 5 acres of disturbance.

b. For post-construction sites with less than 1 acre of disturbance, not in a TMDL watershed, reduce the pollutant load using BMPs from the City of Kaukauna Storm Water Reference Guide or other practices approved by of Public Works or designee.

c. Sites, including common plan of development sites, with a disturbance and/or cumulative addition of 20,000 square feet or greater of impervious surfaces are required to satisfy the performance standards within 22.02(7)(c)1.a.i. and ii.

d. The amount of pollutant control previously required for the site shall not be reduced as a result of the proposed development or disturbance.

e. When designing BMPs, runoff draining to the BMP from offsite areas shall be taken into account in determining the treatment efficiency of the practice. Any impact on the BMP efficiency shall be compensated for by increasing the size of the BMP accordingly. The pollutant load reduction provided by the BMP for an offsite area shall not be used to satisfy the required onsite pollutant load reduction, unless otherwise approved by the of Public Works or designee, in accordance with 22.02(7)(e).

f. If the design cannot meet the water quality performance standards of 22.02(7)(c)1.a through e., the storm water management plan shall include a written, site specific explanation of why the water quality performance standard cannot be met and why the pollutant load will be reduced only to the maximum extent practicable. Except as provided in 22.02(7)(f), the Public Works or designee may not require any person to exceed the applicable water quality performance standard to meet the requirements of maximum extent practicable.

g. *Exemptions.* The water quality performance standards do not apply to the following:

i. For municipalities that are regulated under subch. I of NR 216, Wis. Adm. Code, the water quality performance standard for a highway reconstruction project first applies January 1, 2017.

2. PEAK DISCHARGE. BMPs shall be designed, installed and maintained to control peak discharges from the post-construction site as follows:

a. For post-construction sites with 20,000 square feet or more of impervious surface disturbance and/or creation and post-construction sites with 1 acre or more of land disturbance, the following is required:

i. The peak post-development discharge rate shall not exceed the peak pre-development discharge rate for the 1-year, 2-year, 10-year, and 100-year, 24-hour design storms. These peak discharge requirements apply to new development and redevelopment areas. No peak discharge control is required for routine maintenance areas, unless runoff from the routine maintenance area discharges into a proposed peak flow control facility.

ii. TR-55 methodology shall be used for peak discharge calculations, unless the administering authority approves an equivalent methodology. The meaning of "hydrologic soil group" and "runoff curve number" are as determined in TR-55. Unless the site is currently woodland, peak pre-development discharge rates shall be determined using the following runoff curve numbers for a "meadow" vegetative cover:

Maximum Pre-Development Runoff Curve Numbers				
Vegetative Cover	Hydrologic Soil Group			
	A	B	C	D
Meadow	30	58	71	78
Woodland	30	55	70	77

b. For post-construction sites with less than 20,000 square feet of impervious surface disturbance, reduce peak post-development discharge rates using BMPs from the City of Kaukauna Storm Water Reference Guide. These sites are not required to satisfy a numeric performance standard.

c. Sites with a cumulative addition of 20,000 square feet or greater of impervious surfaces after the adoption date of this ordinance are required to satisfy the performance standards within Section 22.02(7)(c)2.a.*i*. and *ii*.

d. The amount of peak discharge control previously required for the site shall not be reduced as a result of the proposed development or disturbance.

e. When designing BMPs, runoff draining to the BMP from offsite areas shall be taken into account in determining the performance of the practice. Any impact on the BMP performance shall be compensated for by increasing the size of the BMP accordingly. The peak discharge reduction provided by the BMP for an offsite area shall not be used to satisfy the required onsite peak discharge reduction, unless otherwise approved by the Public Works or designee in accordance with 22.02(7)(e).

f. An adequate outfall shall be provided for each point of concentrated discharge from the post-construction site. An adequate outfall consists of non-erosive discharge velocities and reasonable downstream conveyance. Where possible, outfalls shall discharge to the municipal separate storm sewer system, waters of the state, or appropriate drainage easement.

g. Exemptions. The following transportation facilities are not required to meet the peak discharge requirements of this paragraph 2. provided the transportation facility is not part of a larger common plan of development or sale:

i. A transportation facility where the discharge is directly into a lake over 5,000 acres or a stream or river segment draining more than 500 square miles.

ii. Except as provided under 22.02(7)(c)2.d. to f., a highway reconstruction site.

iii. Except as provided under 22.02(7)(c)2.d. to f., a transportation facility that is part of a redevelopment project.

3. INFILTRATION. BMPs shall be designed, installed, and maintained to infiltrate runoff in accordance with the following, except as provided in subds. h. through k.

a. For post-construction sites with 20,000 square feet or more of impervious surface disturbance and post-construction sites with 1 acre or more of land disturbance, the following shall be met:

i. *Low Imperviousness.* For development up to 40 percent connected imperviousness, such as parks, cemeteries, and low density residential development, infiltrate sufficient runoff volume so that the post-development infiltration volume shall be at least 90 percent of the pre-development infiltration volume, based on an average annual rainfall. However, when designing appropriate infiltration systems to meet this requirement, no more than one percent of the post-construction site is required as an effective infiltration area.

ii. *Moderate imperviousness.* For development with more than 40 percent and up to 80 percent connected imperviousness, such as medium and high density residential, multi-family development, industrial and institutional development, and office parks, infiltrate sufficient runoff volume so that the post-development infiltration volume shall be at least 75 percent of the pre-development infiltration volume, based on an average annual rainfall. However, when designing appropriate infiltration systems to meet this requirement, no more than 2 percent of the post-construction site is required as an effective infiltration area.

iii. *High imperviousness.* For development with more than 80 percent connected imperviousness, such as commercial strip malls, shopping centers, and commercial downtowns, infiltrate sufficient runoff volume so that the post-development infiltration volume shall be at least 60 percent of the pre-development infiltration volume, based on an average annual rainfall. However, when designing appropriate infiltration systems to meet this requirement, no more than 2 percent of the post-construction site is required as an effective infiltration area.

b. Pre-development condition shall assume “good hydrologic conditions” for appropriate land covers as identified in TR-55 or an equivalent methodology approved by the administering authority. The meaning of “hydrologic soil group” and “runoff curve number” are as determined in TR-55. However, when pre-development land cover is cropland, rather than using TR-55 values for cropland, the following runoff curve numbers shall be used:

Maximum Pre-Development Runoff Curve Numbers				
Vegetative Cover	Hydrologic Soil Group			
	A	B	C	D
Woodland	30	55	70	77
Grassland	39	61	71	78
Cropland	55	69	78	83

c. For post-construction sites with less than 20,000 square feet of new impervious surfaces, infiltrate runoff volume using BMPs from the City of Kaukauna Storm Water Reference Guide. These sites are not required to satisfy a numeric performance standard.

d. Sites with a cumulative addition of 20,000 square feet or greater of impervious surfaces after the adoption date of this ordinance are required to satisfy the performance standards within Section 22.02(7)(c)3.a and b.

e. The amount of infiltration previously required for the site shall not be reduced as a result of the proposed development or disturbance.

f. Agricultural production areas shall infiltrate runoff volume using BMPs from the City of Kaukauna Storm Water Reference guide

g. When designing BMPs, runoff draining to the BMP from offsite areas shall be taken into account in determining the performance of the practice. Any impact on the BMP performance shall be compensated for by increasing the size of the BMP accordingly. The runoff volume reduction provided by the BMP for an offsite area shall not be used to satisfy the required onsite runoff volume reduction, unless otherwise approved by the Public Works or designee in accordance with 22.02(7)(e).

h. *Pretreatment.* Before infiltrating runoff, pretreatment shall be required for parking lot runoff and for runoff from road construction in commercial, industrial and institutional areas that will enter an infiltration system. The pretreatment shall be designed to protect the infiltration system from clogging prior to scheduled maintenance and to protect groundwater quality in accordance with 22.02(7)(c)3.o. Pretreatment options may include, but are not limited to, oil/grease separation, sedimentation, biofiltration, filtration, swales or filter strips.

i. *Source area prohibitions.* Runoff from the following areas may not be infiltrated and may not qualify as contributing to meeting the requirements of 22.02(7)(c)3 unless demonstrated to meet the conditions of 22.02(7)(c)3.o.

i. Areas associated with a tier 1 industrial facility identified in s. NR 216.21(2)(a), Wis. Adm. Code, including storage, loading, and parking. Rooftops may be infiltrated with the concurrence of the Public Works or designee.

ii. Storage and loading areas of a tier 2 industrial facility identified in s. NR 216.21(2)(b), Wis. Adm. Code.

iii. Fueling and vehicle maintenance areas. Rooftops of fueling and vehicle maintenance areas may be infiltrated with the concurrence of the Public Works or designee.

iv. Agricultural production areas that contain livestock, animal waste, or feed storage.

j. *Source area exemptions.* Runoff from the following areas may be credited toward meeting the requirement when infiltrated, but the decision to infiltrate runoff from these sources is optional:

i. Parking areas and access roads less than 5,000 square feet for commercial development.

ii. Parking areas and access roads less than 5,000 square feet for industrial development not subject to the prohibitions under 22.02(7)(c)3.i.

iii. Except as provided under 22.02(7)(c)3.e., redevelopment and routine maintenance areas.

iv. In-fill development areas less than 5 acres.

v. Roads in commercial, industrial and institutional land uses, and arterial residential roads.

vi. Except as provided under 22.02(7)(c)3.e., transportation facility highway reconstruction and new highways.

k. *Prohibitions.* Infiltration practices may not be located in the following areas:

i. Areas within 1,000 feet upgradient or within 100 feet downgradient of direct conduits to groundwater.

ii. Areas within 400 feet of a community water system well as specified in s. NR 811.16(4), Wis. Adm. Code, or within the separation distances listed in s. NR 812.08, Wis. Adm. Code, for any private well or non-community well for runoff infiltrated from commercial, including multi-family residential, industrial, and institutional land uses or regional devices for one- and two-family residential development.

iii. Areas where contaminants of concern, as defined in s. NR 720.03(2), Wis. Adm. Code, are present in the soil through which infiltration will occur.

l. *Separation distances.* Infiltration practices shall be located so that the characteristics of the soil and the separation distance between the bottom of the infiltration system and the elevation of seasonal high groundwater or the top of bedrock are in accordance with the following:

Separation Distances and Soil Characteristics		
Source Area	Separation Distance	Soil Characteristics
Industrial, Commercial, Institutional Parking Lots and Roads	5 feet or more	Filtering Layer
Residential Arterial Roads	5 feet or more	Filtering Layer
Roofs Draining to Subsurface Infiltration Practices	1 foot or more	Native or Engineered Soil with Particles Finer than Coarse Sand
Roofs Draining to Surface Infiltration Practices	Not Applicable	
All Other Impervious Source Areas	3 feet or more	Filtering Layer

Note: Notwithstanding 22.02(7)(c)3.l., applicable requirements for injection wells classified under ch. NR 815, Wis. Adm. Code, shall be followed.

m. *Infiltration rate exemptions.* Infiltration practices located in the following areas may be credited toward meeting the requirement under the following conditions, but the decision to infiltrate under these conditions is optional:

i. Where the infiltration rate of the soil measured at the proposed bottom of the infiltration system is less than 0.6 inches per hour using a scientifically credible field test method.

ii. Where the least permeable soil horizon to 5 feet below the proposed bottom of the infiltration system using the U.S. Department of Agriculture method of soils analysis is one of the following: sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, or clay.

n. *Alternate uses.* Where alternate uses of runoff are employed, such as for toilet flushing, laundry, irrigation or storage on green roofs where an equivalent portion of the runoff is captured permanently by rooftop vegetation, such alternate use shall be given equal credit toward the infiltration volume required by 22.02(7)(c)3.

o. *Groundwater standards.*

i. Infiltration systems designed in accordance with this 22.02(7)(c)3 shall, to the extent technically and economically feasible, minimize the level of pollutants infiltrating to groundwater and shall maintain compliance with the preventive action limit at a point of standards application in accordance with ch. NR 140, Wis. Adm. Code. However, if site specific information indicates that compliance with a preventive action limit is not achievable, the infiltration BMP may not be installed or shall be modified to prevent infiltration to the maximum extent practicable.

ii. Notwithstanding 22.02(7)(c)3.o.*i.*, the discharge from BMPs shall remain below the enforcement standard at the point of standards application.

p. Where the conditions of 22.02(7)(c)3.i. through m. limit or restrict the use of infiltration practices, the performance standard of 22.02(7)(c)3.shall be met to the maximum extent practicable.

4. PROTECTIVE AREAS.

a. “Protective area” means an area of land that commences at the top of the channel of lakes, streams and rivers, or at the delineated boundary of wetlands, and that is the greatest of the following widths, as measured horizontally from the top of the channel or delineated wetland boundary to the closest impervious surface. However, in this paragraph, “protective area” does not include any area of land adjacent to any stream enclosed within a pipe or culvert, such that runoff cannot enter the enclosure at this location.

i. For outstanding resource waters and exceptional resource waters, and for wetlands in areas of special natural resource interest as specified in s. NR 103.04, 75 feet.

ii. For perennial and intermittent streams identified on a United States geological survey 7.5-minute series topographic map, or a county soil survey map, whichever is more current, 50 feet.

iii. For lakes, 50 feet.

iv. For highly susceptible wetlands, 50 feet. Highly susceptible wetlands include the following types: fens, sedge meadows, bogs, low prairies, conifer swamps, shrub swamps, other forested wetlands, fresh wet meadows, shallow marshes, deep marshes and seasonally flooded basins.

v. For moderately susceptible wetlands, 50 feet. Moderately susceptible wetlands include, but are not limited to: shrub wetlands, floodplain forests, fresh wet meadows, deep/shallow marshes, and forested wetlands. Perennial and intermittent streams also fit in this protective area designation.

vi. For less susceptible wetlands, 10 percent of the average wetland width, but no less than 10 feet nor more than 30 feet. Less susceptible wetlands include degraded wetlands dominated by invasive species such as reed canary grass.

vii. In subd. a.*iv, v,and vi*, determinations of the extent of the protective area adjacent to wetlands shall be made on the basis of the sensitivity and runoff susceptibility of the wetland in accordance with the standards and criteria in s. NR 103.03.

viii. Wetlands shall be delineated. Wetland boundary delineations shall be made in accordance with s. NR 103.08(1m). 22.02(7)(c)4.a. does not apply to wetlands that have been completely filled in accordance with all applicable state and federal regulations. The protective area for wetlands that have been partially filled in accordance with all applicable state and federal regulations shall be measured from the wetland boundary delineation after fill has been placed. Where there is a legally authorized wetland fill, the protective area standard need not be met in that location.

xi. For concentrated flow channels with drainage areas greater than 130 acres, 10 feet.

b. 22.02(7)(c)4 applies to all post-construction sites located within a protective area, except those areas exempted pursuant to subd. e. below.

c. The following requirements shall be met:

i. Impervious surfaces shall be kept out of the protective area to the maximum extent practicable. The storm water management plan shall contain a written site-specific explanation for any parts of the protective area that are disturbed during construction.

ii. Where land disturbing construction activity occurs within a protective area, and where no impervious surface is present, adequate sod or self-sustaining vegetative cover of 70% or greater shall be established and maintained. The adequate sod or self-sustaining vegetative cover shall be sufficient to provide for bank stability, maintenance of fish habitat and filtering of pollutants from upslope overland flow areas under sheet flow conditions. Non-vegetative materials, such as rock riprap, may be employed on the bank as necessary to prevent erosion, such as on steep slopes or where high velocity flows occur.

iii. Best management practices, such as filter strips, swales, or wet detention basins, which are designed to control pollutants from non-point sources, may be located in the protective area.

d. A protective area established or created after the adoption date of this ordinance shall not be eliminated or reduced, except as allowed in e. *ii*, *iii*, or *iv* below.

e. Exemptions. The following areas are not required to meet the protective area requirements of 22.02(7)(c)4.:

i. Redevelopment and routine maintenance areas provided the minimum requirements within in subd. d. above are satisfied.

ii. Structures that cross or access surface waters such as boat landings, bridges and culverts.

iii. Structures constructed in accordance with s. 59.692(1v), Wis. Stats.

iv. Post-construction sites from which runoff does not enter the surface water, including wetlands, without first being treated by a BMP to meet the requirements of 22.02(7)(c)1 and 2, except to the extent that vegetative ground cover is necessary to maintain bank stability.

5. FUELING AND VEHICLE MAINTENANCE AREAS. Fueling and vehicle maintenance areas shall, to the maximum extent practicable, have BMPs designed, installed and maintained to reduce petroleum within runoff, such that the runoff that enters waters of the state contains no visible petroleum sheen.

6. SWALE TREATMENT FOR TRANSPORTATION FACILITIES. This Section 22.02 (7)(c)6. is not applicable to transportation facilities that are part of a larger common plan of development or sale.

a. Requirements. Except as provided in subd. b., transportation facilities that use swales for runoff conveyance and pollutant removal are exempt from the requirements of 22.02(7)(c)1., 2., and 3., if the swales are designed to do all of the following to the maximum extent practicable:

i. Swales shall be vegetated. However, where appropriate, non-vegetative measures may be employed to prevent erosion or provide for runoff treatment, such as rock riprap stabilization or check dams.

ii. Swales shall comply with the Wisconsin Department of Natural Resources Technical Standard 1005, "Vegetated Infiltration Swale", except as otherwise authorized in writing by the Wisconsin Department of Natural Resources.

b. Alternate Requirements. The Director of Public Works or designee may, consistent with water quality standards, require other provisions of this section be met on a transportation facility with an average daily travel of vehicles greater than 2500 and where the initial surface water of the state that the runoff directly enters is any of the following:

i. An outstanding resource water.

ii. An exceptional resource water.

iii. Waters listed in s. 303(d) of the Federal Clean Water act that are identified as impaired in whole or in part, due to nonpoint source impacts.

iv. Waters where targeted performance standards are developed under s. NR 151.004, Wis. Adm. Code, to meet water quality standards.

7. EXEMPTIONS. The following areas are not required to meet the performance standards within Section 22.02(7)(c):

a. Underground utility construction such as water, sewer, gas, electric, telephone, cable television, and fiber optic lines. This exemption does not apply to the construction of any above ground structures associated with utility construction.

b. The following transportation facilities are exempt, provided the transportation facility is not part of a larger common plan of development or sale.

i. A transportation facility with less than 10% connected imperviousness based on complete development of the transportation facility, provided the cumulative area of all parking lots and rooftops is less than one acre.

this exemption, the protective area requirements of 22.02(7)(c)4 still apply.

ii. Reconditioning or resurfacing of a highway.

iii. Minor reconstruction of a highway. Notwithstanding this exemption, the protective area requirements within 22.02(7)(c)4 apply to minor reconstruction of a highway.

iv. Routine maintenance for transportation facilities that have less than 5 acres of land disturbance if performed to maintain the original line and grade, hydraulic capacity or original purpose of the facility.

v. Routine maintenance if performed for storm water conveyance system cleaning.

(d) GENERAL CONSIDERATIONS FOR ON-SITE AND OFF-SITE STORM WATER MANAGEMENT MEASURES. The following considerations shall be observed in managing runoff:

1. Natural topography and land cover features such as natural swales, natural depressions, native soil infiltrating capacity, and natural groundwater recharge areas shall be preserved and used, to the extent possible, to meet the requirements of this section.
2. Emergency overland flow for all storm water facilities shall be provided to prevent exceeding the safe capacity of downstream drainage facilities and prevent endangerment of downstream property or public safety.

(e) LOCATION AND REGIONAL TREATMENT OPTIONS.

1. To comply with the performance standards required unde3r 22.02(7) of this ordinance, BMPs may be located on-site or off-site as part of a regional storm water device, practice or system, but shall be installed in accordance with s. NR 151.003 Wis. Adm. Code and ch. 30, Wis, Stats.
2. The Director of Public Works or designee may approve off-site management measures provided that all of the following conditions are met:
   a. The Director of Public Works or designee determines that the post-construction runoff is covered by a storm water management system plan that is approved by the City of Kaukauna and that contains management requirements consistent with the purpose and intent of this ordinance.
   b. The off-site facility meets all of the following conditions:
      i. The facility is in place.
      ii. The facility is designed and adequately sized to provide a level of storm water control equal to or greater than that which would be afforded by on-site practices meeting the performance standards of this ordinance.

iii. The facility has a legally obligated entity responsible for its long-term operation and maintenance.

3. Where a regional treatment option exists such that the Director of Public Works or designee exempts the applicant from all or part of the minimum on-site storm water management requirements, the applicant shall be required to pay a fee in an amount determined in negotiation with the Director of Public Works or designee. In determining the fee for post-construction runoff, the Director of Public Works or designee shall consider an equitable distribution of the cost for land, engineering design, construction, and maintenance of the regional treatment option.

4. To comply with 22.02(7)(c)1. performance standards, the Director of Public Works or designee, may authorize credit for water quality trading provided all of the following conditions are satisfied:

    1. The treatment practices associated with a water quality trade shall be in place, effective and operational before credit can be authorized.

    2. The water quality trade shall comply with applicable trading ratios established by the Wisconsin Department of Natural Resources or the City of Kaukauna.

    3. The water quality trade shall comply with applicable regulations, standards, and guidance developed by the Wisconsin Department of Natural Resources or the City of Kaukauna.

    4. The responsible party shall furnish a copy of executed water quality trading agreements or other related information deemed necessary by the Director of Public Works or designee in order to authorize credit.

(f) TARGETED PERFORMANCE STANDARDS. The Director of Public Works or designee may establish numeric water quality requirements that are more stringent than those set forth in 22.02(7)(c) in order to meet targeted performance standards, total maximum daily loads, and/or water quality standards for a specific water body or area. The numeric water quality requirements may be applicable to any permitted site, regardless of the size of land disturbing construction activity.

(g) ALTERNATE REQUIREMENTS. The Director of Public Works or designee may establish storm water management requirements more stringent than those set forth in this section if the Director of Public Works or designee determines that an added level of protection is needed to protect sensitive resources. Also, the Director of Public Works or designee may establish storm water management requirements less stringent than those set forth in this section if the Director of Public Works or designee determines that less protection is needed to protect sensitive resources and provide reasonable flood protection. However, the alternative requirements shall not be less

stringent than those requirements promulgated in rules by Wisconsin Department of Natural Resources under NR 151 Wisconsin Administrative Code.

22.02(8) PERMITTING REQUIREMENTS, PROCEDURES AND FEES.

(a) PERMIT REQUIRED. No responsible party may undertake a land disturbing construction activity without receiving a post-construction runoff permit from the Director of Public Works or designee prior to commencing the proposed activity.

(b) PERMIT APPLICATION AND FEES. Unless specifically excluded by this ordinance, any responsible party desiring a permit shall submit to the Director of Public Works or designee a permit application made on a form provided by the Director of Public Works or designee for that purpose.

1. Unless otherwise excepted by this ordinance, a permit application must be accompanied by a storm water management plan, a maintenance agreement and a non-refundable permit administration fee.
2. The storm water management plan shall be prepared to meet the requirements of Sections 22.02 (7) and (9), the maintenance agreement shall be prepared to meet the requirements of Section 22.02(10), the financial guarantee shall meet the requirements of Section 22.02(11), and fees shall be those established by the Common Council as set forth in Section 22.02(12).

(c) REVIEW AND APPROVAL OF PERMIT APPLICATION. The Director of Public Works or designee shall review any permit application that is submitted with a storm water management plan, maintenance agreement, and the required fee. The following approval procedure shall be used:

1. Within 20 business days of the receipt of a complete permit application, including all items as required by sub. (b), the Director of Public Works or designee shall inform the applicant whether the application, plan and maintenance agreement are approved or disapproved based on the requirements of this ordinance.
2. If the storm water permit application, plan and maintenance agreement are approved, or if an agreed upon payment of fees in lieu of storm water management practices is made, the Director of Public Works or designee shall issue the permit.
3. If the storm water permit application, plan or maintenance agreement is disapproved, the Director of Public Works or designee shall detail in writing the reasons for disapproval.
4. The Director of Public Works or designee may request additional information from the applicant. If additional information is submitted, the Director of Public Works or designee

shall have 20 business days from the date the additional information is received to inform the applicant that the plan and maintenance agreement are either approved or disapproved.

5. Failure by the Director of Public Works or designee to inform the permit applicant of a decision within 20 business days of a required submittal shall be deemed to mean approval of the submittal and the applicant may proceed as if a permit had been issued.

(d) PERMIT REQUIREMENTS. All permits issued under this ordinance shall be subject to the following conditions, and holders of permits issued under this ordinance shall be deemed to have accepted these conditions. The Director of Public Works or designee may suspend or revoke a permit for violation of a permit condition, following written notification of the responsible party. An action by the Director of Public Works or designee to suspend or revoke this permit may be appealed in accordance with Section 22.02(14).

1. Compliance with this permit does not relieve the responsible party of the responsibility to comply with other applicable federal, state, and local laws and regulations.
2. The responsible party shall design and install all structural and non-structural storm water management measures in accordance with the approved storm water management plan and this permit.
3. The responsible party shall notify the Director of Public Works or designee at least 10 business days before commencing any work in conjunction with the storm water management plan, and within 10 business days upon completion of the storm water management practices. If required as a special condition under sub. (e), the responsible party shall make additional notification according to a schedule set forth by the Director of Public Works or designee so that practice installations can be inspected during construction.
4. Practice installations required as part of this ordinance shall be certified "as built" by a licensed professional engineer. Completed storm water management practices must pass a final inspection by the Director of Public Works or designee or its designee to determine if they are in accordance with the approved storm water management plan and ordinance. The Director of Public Works or designee or its designee shall notify the responsible party in writing of any changes required in such practices to bring them into compliance with the conditions of this permit.
5. The responsible party shall notify the Director of Public Works or designee of any significant modifications it intends to make to an approved storm water management plan. The Director of Public Works or designee may require that the proposed modifications be submitted to it for approval prior to incorporation into the storm water management plan and execution by the responsible party.

6. The responsible party shall maintain all storm water management practices in accordance with the storm water management plan until the practices either become the responsibility of the Common Council, or are transferred to subsequent private owners as specified in the approved maintenance agreement.

7. The responsible party shall inspect BMPs annually and after runoff events in accordance with stormwater management plan reference in section 22.02(9). The responsible party shall have a licensed professional submit a stamped written inspection report to Director of Public Works or designee for review and approval every five years. All reports shall accompany the stamped report.

8. The responsible party authorizes the Director of Public Works or designee to perform any work or operations necessary to bring storm water management measures into conformance with the approved storm water management plan, and consents to a special assessment or charge against the property as authorized under subch. VII of ch. 66, Wis. Stats., or to charging such costs against the financial guarantee posted under Section 22.02(11).

9. If so directed by the Director of Public Works or designee, the responsible party shall repair at the responsible party's own expense all damage to adjoining municipal facilities and drainage ways caused by runoff, where such damage is caused by activities that are not in compliance with the approved storm water management plan.

10. The responsible party shall permit property access to the Director of Public Works or designee or its designee for the purpose of inspecting the property for compliance with the approved storm water management plan and this permit.

11. Where site development or redevelopment involves changes in direction, increases in peak rate and/or total volume of runoff from a site, the Director of Public Works or designee may require the responsible party to make appropriate legal arrangements with affected property owners concerning the prevention of endangerment to property or public safety.

12. The responsible party is subject to the enforcement actions and penalties detailed in Section 22.02(13), if the responsible party fails to comply with the terms of this permit.

13. The permit applicant shall post the “Certificate of Permit Coverage” in a conspicuous location at the construction site.

(e) PERMIT CONDITIONS. Permits issued under this subsection may include conditions established by Director of Public Works or designee in addition to the requirements needed to meet the performance standards in Section 22.02(7) or a financial guarantee as provided for in Section 22.02(11).

(f) PERMIT DURATION. Permits issued under this section shall be valid from the date of issuance through the date the Director of Public Works or designee notifies the responsible party that all storm water management practices have passed the final inspection required under sub. (d)4.

(g) ALTERNATE REQUIREMENTS. The Director of Public Works or designee may prescribe alternative requirements for applicants seeking an exemption to on-site storm water management performance standards under Section 22.02(7)(e) or for applicants seeking a permit for a post-construction site with less than 20,000 square feet of impervious surface disturbance.

22.02(9) STORM WATER MANAGEMENT PLAN.

(a) PLAN REQUIREMENTS. The storm water management plan required under Section 22.02(8)(b) shall comply with the City of Kaukauna Storm Water Reference Guide and contain at a minimum the following information:

1. Name, address, and telephone number of the landowner and responsible parties.
2. A legal description of the property proposed to be developed.
3. Pre-development site map with property lines, disturbed limits, and drainage patterns.
4. Post-development site map with property lines, disturbed limits, and drainage patterns.
    a. Total area of disturbed impervious surfaces within the site.
    b. Total area of new impervious surfaces within the site.
    c. Performance standards applicable to site.
    d. Proposed best management practices.
    e. Groundwater, bedrock, and soil limitations.
    f. Separation distances. Storm water management practices shall be adequately separated from wells to prevent contamination of drinking water.
5. Inspection and maintenance schedules of stormwater BMPs.

(b) ALTERNATE REQUIREMENTS. The Director of Public Works or designee may prescribe alternative submittal requirements for applicants seeking an exemption to on-site storm water management performance standards under Section 22.02(7)(e) or for applicants seeking a permit for a post-construction site with less than 20,000 square feet of impervious surface disturbance.

22.02(10) MAINTENANCE AGREEMENT.

(a) MAINTENANCE AGREEMENT REQUIRED. The maintenance agreement required under Section 22.02(8)(b) for storm water management practices shall be an agreement between the Director of Public Works or designee and the responsible party to provide for maintenance of

storm water practices beyond the duration period of this permit. The maintenance agreement shall be filed with the County Register of Deeds as a property deed restriction so that it is binding upon all subsequent owners of the land served by the storm water management practices.

(b) AGREEMENT PROVISIONS. The maintenance agreement shall contain the following information and provisions and be consistent with the maintenance plan required by Section 22.02(9)(a)6.:

1. Identification of the storm water facilities and designation of the drainage area served by the facilities.
2. A schedule for regular maintenance of each aspect of the storm water management system consistent with the storm water management plan required under Section 22.02(8)(b).
3. Identification of the responsible party(s), organization or city, county, town or village responsible for long term maintenance of the storm water management practices identified in the storm water management plan required under Section22.02(8)(b).
4. Requirement that the responsible party(s), organization, or city, county, town or village shall maintain storm water management practices in accordance with the schedule included in par. 2.
5. Authorization for the Director of Public Works or designee to access the property to conduct inspections of storm water management practices as necessary to ascertain that the practices are being maintained and operated in accordance with the agreement.
6. A requirement on the Director of Public Works or designee to maintain public records of the results of the site inspections, to inform the responsible party responsible for maintenance of the inspection results, and to specifically indicate any corrective actions required to bring the storm water management practice into proper working condition.
7. Agreement that the party designated under par. 3., as responsible for long term maintenance of the storm water management practices, shall be notified by the Director of Public Works or designee of maintenance problems which require correction. The specified corrective actions shall be undertaken within a reasonable time frame as set by the Director of Public Works or designee.
8. Authorization of the Director of Public Works or designee to perform the corrected actions identified in the inspection report if the responsible party designated under par. 3. does not make the required corrections in the specified time period. The Director of Public Works or designee shall enter the amount due on the tax rolls and collect the money as a special charge against the property pursuant to subch. VII of ch. 66, Wis. Stats.

(c) ALTERNATE REQUIREMENTS. The Director of Public Works or designee may prescribe alternative requirements for applicants seeking an exemption to on-site storm water management

performance standards under Section 22.02(7)(e) or for applicants seeking a permit for a post-construction site with less than 20,000 square feet of impervious surface disturbance.

22.02(11) FINANCIAL GUARANTEE.

(a) ESTABLISHMENT OF THE GUARANTEE. The Director of Public Works or designee may require the submittal of a financial guarantee, the form and type of which shall be acceptable to the Director of Public Works or designee. The financial guarantee shall be in an amount determined by the Director of Public Works or designee to be the estimated cost of construction and the estimated cost of maintenance of the storm water management practices during the period which the designated party in the maintenance agreement has maintenance responsibility. The financial guarantee shall give the Director of Public Works or designee the authorization to use the funds to complete the storm water management practices if the responsible party defaults or does not properly implement the approved storm water management plan, upon written notice to the responsible party by the Director of Public Works or designee that the requirements of this ordinance have not been met.

(b) CONDITIONS FOR RELEASE. Conditions for the release of the financial guarantee are as follows:

1. The Director of Public Works or designee shall release the portion of the financial guarantee established under this section, less any costs incurred by the Director of Public Works or designee to complete installation of practices, upon submission of "as built plans" by a licensed professional engineer. The Director of Public Works or designee may make provisions for a partial pro-rata release of the financial guarantee based on the completion of various development stages.
2. The Director of Public Works or designee shall release the portion of the financial guarantee established under this section to assure maintenance of storm water practices, less any costs incurred by the Director of Public Works or designee, at such time that the responsibility for practice maintenance is passed on to another entity via an approved maintenance agreement.

(c) ALTERNATE REQUIREMENTS. The Director of Public Works or designee may prescribe alternative requirements for applicants seeking an exemption to on-site storm water management performance standards under Section 22.02(7)(e) or for applicants seeking a permit for a post-construction site with less than 20,000 square feet of impervious surface disturbance.

22.02(12) FEE SCHEDULE.

The fees referred to in other sections of this ordinance shall be established by the Common Council and may from time to time be modified by resolution. A schedule of the fees established by the Common Council shall be available for review in City Hall.

22.02(13) ENFORCEMENT.

(a) Any land disturbing construction activity or post-construction runoff initiated after the effective date of this ordinance by any person, firm, association, or corporation subject to the ordinance provisions shall be deemed a violation unless conducted in accordance with the requirements of this ordinance.

(b) The Director of Public Works or designee shall notify the responsible party by certified mail of any non-complying land disturbing construction activity or post-construction runoff. The notice shall describe the nature of the violation, remedial actions needed, a schedule for remedial action, and additional enforcement action which may be taken.

(c) Upon receipt of written notification from the Director of Public Works or designee under sub. (b), the responsible party shall correct work that does not comply with the storm water management plan or other provisions of this permit. The responsible party shall make corrections as necessary to meet the specifications and schedule set forth by the Director of Public Works or designee in the notice.

(d) If the violations to a permit issued pursuant to this ordinance are likely to result in damage to properties, public facilities, or waters of the state, the Director of Public Works or designee may enter the land and take emergency actions necessary to prevent such damage. The costs incurred by the Director of Public Works or designee plus interest and legal costs shall be billed to the responsible party.

(e) The Director of Public Works or designee is authorized to post a stop work order on all land disturbing construction activity that is in violation of this ordinance, or to request the municipal attorney to obtain a cease and desist order in any court with jurisdiction.

(f) The Director of Public Works or designee may revoke a permit issued under this ordinance for non-compliance with ordinance provisions.

(g) Any permit revocation, stop work order, or cease and desist order shall remain in effect unless retracted by the Director of Public Works or designee or by a court with jurisdiction.

(h) The Director of Public Works or designee is authorized to refer any violation of this ordinance, or of a stop work order or cease and desist order issued pursuant to this ordinance, to the municipal attorney for the commencement of further legal proceedings in any court with jurisdiction.

(i) Any person, firm, association, or corporation who does not comply with the provisions of this ordinance shall be subject to a forfeiture of not less than $25 dollars or more than $500 dollars

per offense, together with the costs of prosecution. Each day that the violation exists shall constitute a separate offense.

(j) Compliance with the provisions of this ordinance may also be enforced by injunction in any court with jurisdiction. It shall not be necessary to prosecute for forfeiture or a cease and desist order before resorting to injunctional proceedings.

(k) When the Director of Public Works or designee determines that the holder of a permit issued pursuant to this ordinance has failed to follow practices set forth in the storm water management plan, or has failed to comply with schedules set forth in said storm water management plan, the Director of Public Works or designee or a party designated by the Director of Public Works or designee may enter upon the land and perform the work or other operations necessary to bring the condition of said lands into conformance with requirements of the approved plan. The Director of Public Works or designee shall keep a detailed accounting of the costs and expenses of performing this work. These costs and expenses shall be deducted from any financial security posted pursuant to Section 22.02(11) of this ordinance. Where such a security has not been established, or where such a security is insufficient to cover these costs, the costs and expenses shall be entered on the tax roll as a special charge against the property and collected with any other taxes levied thereon.

22.02(14) APPEALS.

(a) BOARD OF APPEALS. The board of appeals, created pursuant to s. 62.23(7)(e), Wis. Stats, shall hear and decide appeals where it is alleged that there is error in any order, decision or determination made by the Director of Public Works or designee in administering this ordinance. The board shall also use the rules, procedures, duties, and powers authorized by statute in hearing and deciding appeals. Upon appeal, the board may authorize variances from the provisions of this ordinance that are not contrary to the public interest, and where owing to special conditions a literal enforcement of the ordinance will result in unnecessary hardship.

(b) WHO MAY APPEAL. Appeals to the board of appeals may be taken by any aggrieved person or by an officer, department, board, or bureau of the City of Kaukauna affected by any decision of the Director of Public Works or designee.

22.02(15) SEVERABILITY.

(a) If any section, clause, provision or portion of this ordinance is judged unconstitutional or invalid by a court of competent jurisdiction, the remainder of the ordinance shall remain in force and not be affected by such judgment.

ORDINANCE NO. 1771

ORDINANCE AMENDING SECTION 7.12 (1) OF THE KAUKAUNA MUNICIPAL CODE TO PROHIBIT PARKING ON PUBLIC STREETS DURING STREET SWEEPING AND FALL LEAF PICKUP

WHEREAS, motor vehicle parking on public streets impedes the City of Kaukauna's High Efficiency Street Sweeping program and reduces the efficiency and effectiveness of the program in removing solids and pollutants that migrate into the municipal separate storm sewer system; and

WHEREAS, according to Storm Water Pollution Prevention modeling, street sweeping effectiveness will significantly increase upon enactment of a city wide parking prohibition during street sweeping and fall leaf pick up; and

WHEREAS, the increase in street sweeping effectiveness will reduce the number, size, and overall expense of storm water best management practices needed, including ponds, to meet the Wisconsin Department of Natural Resources Total Maximum Daily Load requirements and mandated load allocation limits for Total Suspended Solids and Total Phosphorus for the Lower Fox River, Apple Creek, Konkapot Creek, Plum Creek, and Garners Creek; and

WHEREAS, the Common Council of the City of Kaukauna has determined that the public interest, welfare, and safety would be served by adoption of an ordinance to restrict parking during street sweeping and fall leaf pick up;

NOW THEREFORE, it is ordained by the Common Council of the City of Kaukauna that Section 7.12(1) of the Kaukauna Municipal Code is amended to include the following:

7.12 (1) (au) Parking Prohibited During Street Sweeping and Fall Leaf Pickup

(1) Duration. Beginning April 1st of each year and continuing through September 30th of each year, parking restrictions shall be in effect for the City of Kaukauna for the purpose of street sweeping. Beginning October 1st through the Friday prior to Thanksgiving of each year parking restrictions shall be in effect for the City of Kaukauna for the purpose of fall leaf pickup.

(2) Street Sweeping and Fall Leaf Pickup Maps. Street Sweeping and Fall Leaf Pickup maps shall be prepared and maintained by the Director of Public Works and kept on file as public records in the office of the City Engineer, copies of which shall be distributed to the members of the Council and filed with the Council.

(3) Districts for Street Sweeping and Fall Leaf Pickup. The Street Sweeping and Fall Leaf Pickup maps shall divide the City into areas or districts in which Street Sweeping and Fall Leaf Pickup shall be conducted on the days of the week herein specified. No vehicles shall be parked on the street between the hours of 7:00 a.m. and 3:00 p.m. during Street Sweeping and Fall Leaf Pickup for the streets set forth herein, and as more specifically described below:

District 1. No parking on Mondays during Street Sweeping and Fall Leaf Pickup on any residential street North of the Fox River and including Island Street, Maple Street, Elm Street, Oak Street, and Schultheis Street:

District 2. No parking on Tuesdays during Street Sweeping and Fall Leaf Pickup on any residential street in the area bounded by the following:

South of the Fox River; North of and including Henry Street; West of Crooks Avenue to the City Limits.

And South of the Fox River; North of and including 20th Street; East of Crooks Avenue to Konkapot Creek.

District 3. No parking on Wednesdays during Street Sweeping and Fall Leaf Pickup on any residential street in the area bounded by the following:

South of the Fox River; North of CTH CE; East of Konkapot Creek to Haas Road; but excluding Haas Road, Olde Country Circle, Manchester Drive, Fenway Court and Camden Way.

And South of Henry Street; North of CTH KK; West of Konkapot Creek to the City Limits.

District 4. No parking on Thursdays during Street Sweeping and Fall Leaf Pickup on any residential street in the area bounded by the following:

South of CTH CE; North of CTH KK; East of Konkapot Creek to City Limits

And South of the Fox River; North of CTH CE; East of Haas Road to City Limits; and including Haas Road, Olde Country Circle, Manchester Drive, Fenway Court and Camden Way.

(4) Notice. The Director of Public Works shall post signs identifying the street sweeping regulations applicable to each particular area or district.

(5) Citations. Citations may be issued if a vehicle is parked in violation of this ordinance.

This ordinance shall be in full force and effect from and after its adoption and publication.

APPROVED: _____
Eugene J. Rosin, Mayor

ATTEST: _____
Susan J. Duda, Clerk/Treasurer

Adopted: 2-21-18
Published: 3-7-18