

**STORM WATER  
MANAGEMENT PLAN**

*University of Wisconsin*

**WHITEWATER**

DSF Project No. 04B2C



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## ***EXECUTIVE SUMMARY***

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## **Executive Summary**

The University of Wisconsin (UW) – Whitewater campus is planning several facility development projects, which may affect storm water quantity and quality. Several state and local storm water regulations may also require the UW-Whitewater campus to address compliance issues. The regulations focus on water quality and quantity for current and future conditions. Storm water management, then, becomes a critical aspect of campus-wide master planning. The purpose of this plan is to provide a storm water management-planning guide for UW staff to use in facility planning.

This plan summarizes applicable state, regional, and local storm water regulations; existing storm water and facility planning related information; and a storm water quantity model. This information was used to make recommendations for resolving existing storm water related problems, regulatory compliance issues, and for anticipated storm water efforts related to facilities development. It should be noted that details presented in this document are based on information made available during the course of the study and are based solely upon the above described activities. Information such as development plans could change and therefore potentially affect the conclusions and recommendations presented in this plan.

**Chapter 1** discusses the purpose of the report and the scope of coverage

**Chapter 2** summarizes storm water-related regulations issued by pertinent regulatory bodies, including the Wisconsin Department of Natural Resources (WDNR), Jefferson and Walworth Counties, City of Whitewater, and the Town of Cold Spring.

**Chapter 3** discusses existing site characteristics of the UW-Whitewater campus including geography, satellite facilities, land use, hydrologic features, storm water conveyance and drainage patterns, soils, floodplains, and environmental corridors.

**Chapter 4** documents existing storm water management practices and permits.

**Chapter 5** includes a review of the anticipated campus and off-campus physical development. The six-year facilities development schedule discusses plans to add one educational facility and remodel or raze existing facilities, but the developments are in the planning stage and designs are not available for use in evaluating the effect on the existing

storm water system. Improvement projects occurring during the last four years included provisions to address major storm water quantity problems. Thereby, there are no major storm water projects planned for the next six years. Any pending storm sewer system upgrades will be considered when future development projects are designed. The City of Whitewater does not anticipate that their future developments will affect flows entering the campus's storm sewer system.

**Chapter 6** interprets pertinent regulations and discusses anticipated storm water management efforts in reference to UW-Whitewater. The following recommendations are made:

- In order to comply with regulations, it is recommended that the campus:
  - Anticipate submitting an NOI to obtain municipal WPDES permit coverage and adhere to the permit requirements.
  - Submit an NOI for construction WPDES permit coverage for facility development projects that disturb one or more acres of land.
  - Discharge cooling tower water into the sanitary sewer system and remove abandoned chillers that drain into the storm sewer system.
  - Adhere to the City of Whitewater's erosion control and storm water management ordinance during the planning and design phases of future developments so that both parties are designing to the same set of standards.
- It is recommended to complete the following modeling and associated data collection:
  - Pollutant load modeling to assess storm water quality.
  - Site-specific storm water models to be prepared during proposed facility design to implement the most suitable and cost effective storm water BMPs.
  - Updated surveys of the campus property boundary, topography, storm sewer system, and other hydrologic features.
- The following BMPs are recommended to improve storm water quality. They should be implemented after pollutant load modeling and site-specific investigations are completed:

- Apply structural BMPs at parking lots and roads discharging into the storm sewer system. These include modular water quality filtration systems, detention basins, trench drains with drainage swales, and/or inlet filters.
- Continue applying BMPs already practiced by both the campus and the City of Whitewater. These include sweeping streets and parking lots, cleaning catch basins and storm sewer grates, removing litter, and limiting use of fertilizers and pesticides.
- In addition to improving storm water quality, it is recommended to add BMPs to reduce the quantity of storm water. Their implementation should include a detailed soil analysis to determine their suitability:
  - Considering incorporating detention ponds in future designs in the northern campus away from highly impervious areas.
  - Include grassed swales in parking lot design.
- The campus should anticipate paying fees for WPDES permits and for implementing BMPs. WPDES permit costs are determined by the WDNR, and costs to apply BMPs are dependent on building square footage and the level of benefit needed by a implementing a BMP. BMP costs should be determined after facility design and detailed storm water quality and quantity modeling are complete.

**Chapter 7** summarizes conclusions and recommendations for the campus' existing storm water system and future developments.



# *CHAPTER ONE*

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## **INTRODUCTION**

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## Chapter 1 Introduction

### 1.1 Purpose

The purpose of this plan is to develop a storm water management planning guide for the University of Wisconsin (UW)-Whitewater campus to be used by the campus, the UW System Administration (UWSA), and the Division of State Facilities (DSF) as a tool to document and evaluate existing storm water conditions, the effect of future development on the existing storm water conditions, the effort required to correct any existing storm water problems, and the effort to bring the campus's storm water system into compliance with state and local regulations.

### 1.2 Scope

To develop a storm water management-planning guide, the project was organized into three phases: information gathering, existing condition analysis, and application to the campus.

This document serves as a summary of the work completed during the three phases.

- *Phase One* entailed fact-finding, and included interviews with campus, City of Whitewater, and state staff, review of pertinent files and reports, and site visits to the campus. It includes a review information provided by the campus regarding proposed development, existing storm sewer system, known stormwater drainage problems, existing stormwater management plans and calculations, and past stormwater project plans and calculations.
- *Phase Two* evaluated the campus's existing storm water condition. This included preparing maps showing storm water-related features, a pervious/impervious map, a drainage basin map, and runoff calculations. The information gathered from *Phase One* was used for *Phase Two*.
- *Phase Three* identified and recommended solutions to any existing storm water problems, provided recommendations and considerations for future developments, provided recommendations to bring the campus in compliance with state and local regulations, and provided budgetary considerations. The recommendations for future developments did not include stormwater quality or quantity modeling. The

stormwater BMPs recommended will require future modeling and site specific investigations to determine their overall effectiveness to achieve compliance with stormwater regulations.

### **1.3 Location of Study Area**

The UW-Whitewater campus is located in northwestern corner of Walworth County on the border with Jefferson County. The campus is located in both counties. The campus is located within the City of Whitewater. Figure 1-1 shows the campus location.

### **1.4 Stormwater Regulations**

The UW-Whitewater campus is subject to NR 216 and NR 151. As a state institution it is not subject to county or local ordinances. However, as a good neighbor, Walworth and Jefferson County and City of Whitewater ordinances will be considered by the campus.

### **1.5 Abbreviations and Definitions Key**

The following abbreviations and definitions are used throughout the report. They are provided here as a reference for the reader.

#### **Abbreviations and Acronyms**

AST	Aboveground Storage Tank
Campus	University of Wisconsin-Parkside Campus
BMP	Best Management Practice
Comm	Wisconsin Department of Commerce
Corps	U.S. Army Corps of Engineers
DOA	Wisconsin Department of Administration
DSF	Division of State Facilities
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
H/H	Hydrologic/Hydraulic
HSG	Hydrologic Soil Group
MEP	Maximum Extent Practicable
MS4s	Municipal Separate Storm Sewer Systems

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***Abbreviations and Acronyms (continued)***

MSL	Mean Sea Level
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollution Discharge Elimination System
NRCS	Natural Resource Conservation Service
POTW	Publicly Owned Treatment Facility
SEWRPC	Southeastern Wisconsin Regional Planning Commission
SLAMM	Source Loading and Management Modeling
SPCC	Spill Prevention Control and Countermeasure
SWPP	Storm Water Pollution Prevention
TSS	Total Suspended Solids
UW	University of Wisconsin
UWSA	UW System Administration
WAC	Wisconsin Administrative Code
WDNR	Wisconsin Department of Natural Resources
WDPES	Wisconsin Pollutant Discharge Elimination System

**Definitions**

*Best Management Practices* – Best management practices, or BMPs, refer to measures taken to improve the quality and/or quantity of stormwater runoff. BMPs can be structural or non-structural.

*Catch Basin* – an underground structure to which stormwater pipes exit to convey stormwater further downstream. A catch basin can have inlet pipes as well. A catch basin, unlike a manhole or inlet, has a sump below the elevation of the outlet pipe. The sump is designed to catch sediment and prevent it from leaving the catch basin and being conveyed downstream.

*Curve Number* – a number assigned to a soil type and land use by the Soil Conservation Service. The curve number can be used as a method to determine stormwater runoff when the soil type and land use is known.

*Design Storm* – a theoretical storm defined by a duration, total depth of rainfall, rainfall distribution and recurrence interval. A design storm is used to determine the size of stormwater structures.

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*Detention Basin* – a stormwater management device to temporarily store stormwater runoff and discharge to surface water.

*Drainage Basin* – the area that contributes stormwater runoff to a specific point.

*Erosion* – the process by which soil, rocks, natural debris, etc are moved by water or wind.

*Final stabilization* – the time in a construction project when all land disturbing activities are complete and a vegetative cover has been established with at least 70-percent coverage on pervious surfaces.

*Illicit discharge* – any discharge to a municipal separate storm sewer system that is not composed entirely of stormwater or uncontaminated groundwater. It excludes discharges authorized by a WPDES permit or discharges that do not require a permit.

*Impervious Surface* – any ground cover that does not allow water to infiltrate through it. Examples include, rooftops, concrete and asphalt pavements.

*In-fill development* – development that occurs in an undeveloped area which is surrounded by a developed area.

*Infiltration* – the act by which rainwater enters into the ground through pores in the soil.

*Inlet* – a structure that serves to collect stormwater runoff and then conveys it downstream via a pipe.

*Manhole* – an underground structure to which stormwater pipes exit to convey stormwater further downstream. A manhole can have inlet pipes as well. Unlike a catch basin, a manhole does not have a sump to retain sediment.

*Maximum extent practicable* – a response to achieve a performance standard or objective given the considerations of cost, technology, and other competing factors.

*New development* – development that occurs in an undeveloped area or agricultural areas.

*Outfall* – the point at which water leaves the confined stormwater conveyance network and enters the surrounding environment.

*Performance standard* – a measurable number indicating the minimum acceptable level of success or result for a specific practice or device.

*Recurrence interval* – expressed in either years or percent, the probability that a given rainfall event will occur in any given year. For example, a 100-year rainfall event has a one-percent chance of occurring in a given year. Similarly, a 10-year rainfall event has a ten percent chance of occurring in a given year.

*Redevelopment* – development that occurs in an area that has been previously development.

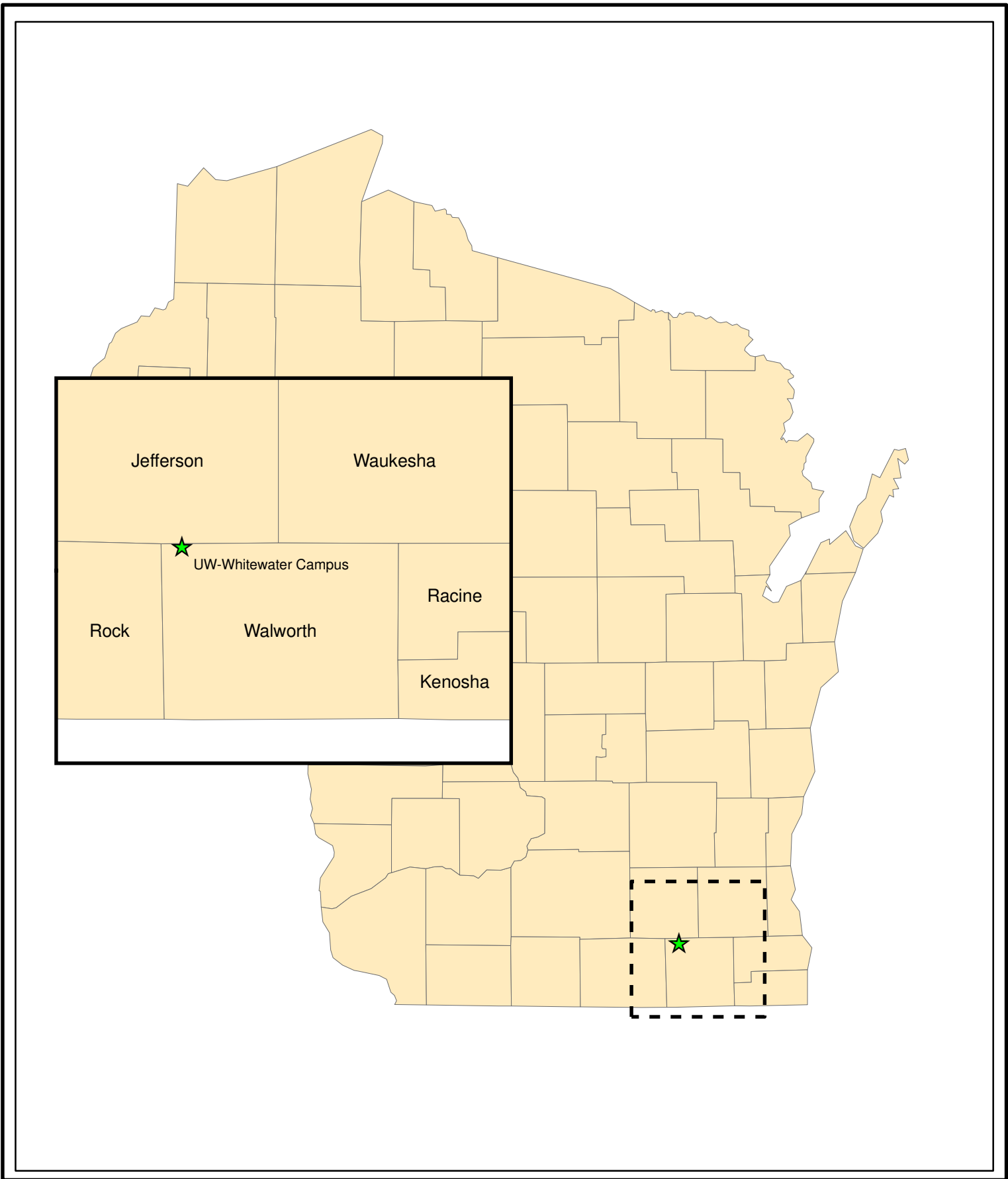
*Retention basin* – a stormwater management structure that captures stormwater and does not discharge to surface water.

*Separate storm sewer system* – a system of structures, pipes, gutters, streets, ditches, and constructed channels that is designed to collect and convey stormwater runoff to waters of the U.S. It does not include combined sewer systems designed to convey both sanitary sewerage and stormwater runoff.

*Sheet flow* – the term used to describe water flowing across a surface a in a thin layer.

*Subbasin* – smaller geographical areas that when combined define a drainage basin.

*Time of concentration* – the time for water to travel from the hydraulically most remote point in a watershed to a point of interest.



## UW-Whitwater Campus Location

Storm Water Management Plan  
University of Wisconsin-Whitwater  
Whitewater, Wisconsin



Engineers, Scientists, Planners

Figure 1-1

## *CHAPTER TWO*

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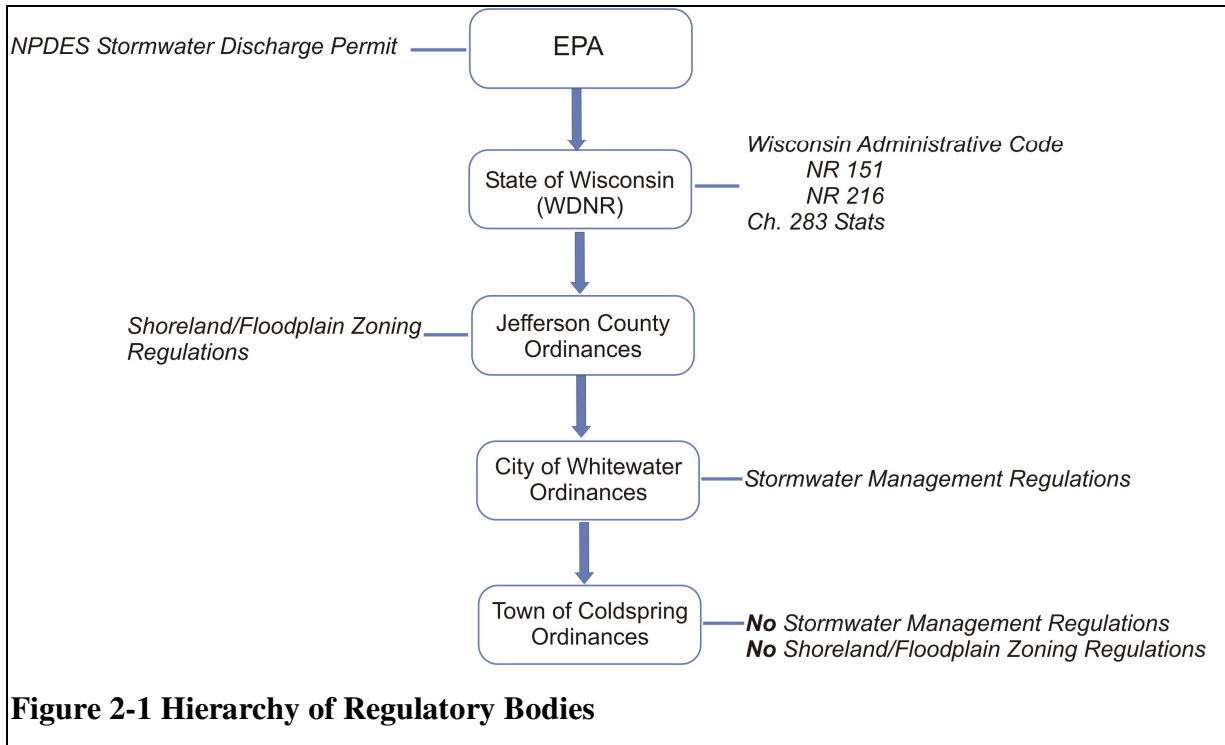
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### **PERTINENT CODES**



## Chapter 2 Pertinent Codes

The campus is subjected to several codes and regulations. Figure 2-1 presents a hierarchy of regulations that will affect the campus. A more detailed description of Federal, State, County, and Town ordinances is provided in the following sections.



### 2.1 EPA’s Storm Water Phase II Final Rule

The EPA’s National Pollutant Discharge Elimination System (NPDES) permit program is a two-phased program that regulates the discharge of point and non-point source pollutants into the waters of the United States. Phase I of the program began in 1990 and required large and medium size municipal separate stormwater systems (MS4s) to operate their MS4s under the guidance of stormwater discharge permit. Phase II of the program extends coverage of the NPDES storm water program to include small MS4s, or those that contain a population of at least 10,000 and a population density of at least 1,000 people per square mile. In addition, Phase II requires that MS4s covered under this rule implement programs and practices to control polluted storm water runoff. These practices are also known as Best Management Practices or BMPs. Phase II regulations took effect in March 2003.

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The State of Wisconsin implemented the Wisconsin Pollutant Discharge Elimination System (WPDES) to administer the NPDES program. The State of Wisconsin and local government bodies have developed codes and ordinances pertaining to storm water management. Any requirements detailed in the regulations must be considered during planning and construction stages of campus improvements to remain in compliance. The following reviews applicable codes and ordinances that may affect storm water management planning for the campus. Full copies of the regulations can be obtained from the regulating agencies.

## **2.2 US Army Corps of Engineers (Corps)**

The US Army Corps of Engineers (Corps) Regulatory Program includes Section 404 of the Clean Water Act. Under Section 404, a Corps permit is required for the discharge of dredged or fill material into connected waterways or wetlands of the United States.

## **2.3 State of Wisconsin**

At the state level, Wisconsin's non-point source administrative rules address the control of polluted runoff from urban and rural land use activities. Of the eight rules written by the Wisconsin Department of Natural Resources (WDNR), chapters NR 151 (Performance Standards and Prohibitions) and NR 216 (Storm Water Discharge Permits) of the Wisconsin Administrative Code (WAC) and chapter 283 (Pollution Discharge Elimination) of the Wisconsin Statutes will affect UW-Whitewater's storm water management planning.

### ***2.3.1 Ch. NR 151: Runoff Management, Subchapter III***

Chapter NR 151, Subchapter III of the Wisconsin Administrative Code (WAC) reviews non-agricultural performance standards. These standards apply if undergoing any construction activities that will disturb more than once acre of land (see Tables 2-1 thru 2-3). This chapter establishes storm water runoff pollution performance standards designed to improve water quality for facilities such as the Parkside campus. The campus is already required to comply with the construction site standards (NR 151.11) and post-construction site standards (NR 151.12). The campus should also anticipate complying with Subchapter III, Developed Urban Area Performance Standards (NR 151.13) for permitted MS4s as explained below.

### ***2.3.2 Ch. NR 216: Storm Water Discharge Permits, Subchapters I and III***

The intent of Chapter NR 216 is to regulate urban runoff volume, discharge rates, and water quality. In order to discharge storm water into state waters, an “entity” must have an approved permit from the WDNR. Subchapter I regulates storm water discharges from MS4s that enter into state waters. Subchapter III regulates discharges from construction sites. Ch. NR 216 refers to the performance standards given in Ch. NR 151 to regulate volume, flows, and quality of storm water discharges. As a separate MS4 facility, UW-Whitewater will likely be required to obtain a storm water discharge permit according to correspondence with WDNR. See Table 2-4 for a summary of the NR 216 requirements.

### ***2.3.3 Ch. 283: Pollution Discharge Elimination***

Chapter 283 of the Wisconsin Statutes gives the WDNR the authority to establish, administer, and maintain the state pollutant discharge elimination system. It also requires the campus to obtain WPDES permits for point source discharge, which is not described in NR 216. The campus has a WPDES permit for their swimming pool discharge as required by Ch. 283.

### ***2.3.4 Department of Commerce***

Public buildings and buildings that are places of employment are regulated by the Department of Commerce (Comm.). Stormwater discharges from construction sites for these buildings is regulated by Comm. It is likely that all construction projects on the campus would be considered public buildings or places of employment.

**Table 2-1 NR 151 Construction Site Standards**

NR 151.11 - Construction Site Standards For New Development And Redevelopment
<p>For construction site &gt; 1 ac. of land disturbing activity</p> <ul style="list-style-type: none"> <li>• Plan requirements (the written plan may be part of the erosion control plan or other plan) (NR 151.11 (6)): <ul style="list-style-type: none"> <li>◆ Reducing the average annual sediment load by 80%, to the maximum extent practicable (MEP)</li> <li>◆ Sediment controls that: <ul style="list-style-type: none"> <li>• Minimizing tracking</li> <li>• Protecting sewer inlets</li> <li>• Minimizing sediment discharge from de-watering</li> </ul> </li> <li>◆ The proper use and storage of chemicals, cement, and other compounds</li> </ul> </li> <li>• The location of the BMPs to be located prior to runoff entering waters of the state (NR 151.11 (7))</li> </ul>

**Table 2-2 NR 151 Developed Urban Area Performance Standards**

NR 151.13 - Developed Urban Area Performance Standard
<p>Permitted Municipalities</p> <ul style="list-style-type: none"> <li>• Stage 1 requirements: <ul style="list-style-type: none"> <li>◆ Implementation by March 10, 2008, ( NR 151.13 (2) (1))</li> <li>◆ A public information and education program, ( NR 151.13 (1) (b)(1))</li> <li>◆ A municipal program for the collection and management of leaf and grass clippings (NR 151.13 (1)(b)(2))</li> <li>◆ The application of lawn and garden fertilizers on municipally controlled properties, with pervious surface over 5 acres each (NR 151.13 (1)(b)(3))</li> <li>◆ Detection and elimination of illicit discharges to storm sewers (NR 151.13 (1)(b)(4))</li> <li>◆ To the maximum extent practicable, a 20% reduction in total suspended solids in runoff that enters waters of the state as compared to no controls (NR 151.13 (2)(1)(b))</li> </ul> </li> <li>• Stage 2 requirements: <ul style="list-style-type: none"> <li>◆ Implementation by March 10, 2013, ( NR 151.13 (2)(2))</li> <li>◆ To the maximum extent practicable, a 40% reduction in total suspended solids in runoff that enters waters of the state as compared to no controls (NR 151.13 (2)(1)(b))</li> <li>◆ BMPs may be located on-site or off-site (NR 151.13 (2)(2)(c))</li> </ul> </li> </ul>

**Table 2-3 NR 151 Post Construction Site Standards**

NR 151.12 - Post-Construction Site Standard For New Development And Redevelopment
<p>Sites that were also regulated by NR 151.11</p> <ul style="list-style-type: none"> <li>• Exceptions: <ul style="list-style-type: none"> <li>◆ A post-construction site with no increase in exposed parking lots or roads</li> <li>◆ A post-construction site &lt;10% connected impervious, if cumulative surface is less than 1 ac. (i.e., rooftops and parking lots)</li> </ul> </li> <li>• Storm water management plan (NR 151.12 (5)): <ul style="list-style-type: none"> <li>◆ Total Suspended Solids (TSS) <ul style="list-style-type: none"> <li>• For new development TSS reduce by 80%</li> <li>• For redevelopment TSS reduce by 40%</li> <li>• For in-fill development &lt; 5 acres &amp; before 10/1/2012, reduce TSS by 40%</li> <li>• For in-fill development after 10/1/2012 reduce TSS by 80%</li> </ul> </li> <li>◆ Peak discharge <ul style="list-style-type: none"> <li>• Maintain or reduce the peak runoff discharge rate of the 2-year 24-hour design storm</li> <li>• Redevelopment and infill development sites that contain less than five acres are exempt from this standard</li> </ul> </li> <li>◆ Infiltration <ul style="list-style-type: none"> <li>• Infiltration of at least 60% of the pre-development infiltration volume or 10% of the 2-year 24-hour design storm</li> <li>• Only 2% of the project site (includes rooftops and parking lot areas) is required as an effective infiltration area</li> <li>• Infiltration is not required in the following areas: <ul style="list-style-type: none"> <li>▪ If infiltration rate &lt; 0.6 in./hr, with &lt; 5,000 sf of parking lot or roads</li> <li>▪ Commercial and industrial development</li> <li>▪ Redevelopment areas</li> <li>▪ In-fill areas less than 5 acres, and</li> <li>▪ Roads in commercial, industrial, and institutional land uses, and arterial residential roads</li> </ul> </li> </ul> </li> <li>◆ Protective Areas <ul style="list-style-type: none"> <li>• Areas that require protection from pollutants and erosion including lakes, streams, and wetlands</li> </ul> </li> <li>◆ Fueling and Maintenance Areas <ul style="list-style-type: none"> <li>• Areas that required to reduce petroleum pollution in runoff, to the MEP by implementing and maintaining BMPs</li> </ul> </li> <li>◆ Location <ul style="list-style-type: none"> <li>• BMPs may be located on-site or off-site as part of a regional storm water device, practice or system.</li> </ul> </li> <li>◆ Timing <ul style="list-style-type: none"> <li>• The BMPs should be installed before the construction site has undergone final stabilization</li> </ul> </li> </ul> </li> </ul>

**Table 2-4 Ch. NR 216: Storm Water Discharge Permits - Subchapters I and III Summary**

<b>Storm Water Discharge Permits</b>	
<b>Subchapter I - Municipal Storm Water Discharge Permits</b>	<b>Subchapter III - Construction Site Storm Water Discharge Permits</b>
<ul style="list-style-type: none"> <li>■ Owners or operators of MS4s that are required to obtain a WPDES permit:                             <ul style="list-style-type: none"> <li>■ Communities that operate an MS4 and serve populations <math>\geq 100,000</math> (NR 216.02(1)).</li> <li>■ Owners and operators of MS4s notified by the DNR prior to August 1, 2004 of the need for permit coverage (NR 216.02(2)).</li> <li>■ Urbanized areas with residential population <math>\geq 50,000</math> and an overall population density of at least 1,000 people/mi<sup>2</sup> (NR 216.02(3))</li> <li>■ MS4s serving populations <math>\geq 10,000</math> and a population density of at least 1,000 mi<sup>2</sup> (NR 216.02(4)).</li> </ul> </li> <li>■ Application Requirements:                             <ul style="list-style-type: none"> <li>■ Minimum Control Measure Information                                     <ul style="list-style-type: none"> <li>• Public education and outreach. (NR 216.07 (1))</li> <li>• Public involvement and participation. (NR 216.07 (2))</li> <li>• Illicit discharge detection and elimination (i.e., non-storm water discharges or flows such as landscape irrigation (NR 216.07(3)).</li> <li>• Construction site pollution control. A program to reduce pollutants in runoff from construction sites. (NR 216.07 (4))</li> <li>• Post-construction site storm water management. A program to reduce pollutants in runoff from post-construction sites (NR 216.07 (5)).</li> <li>• Pollution prevention for municipal operation and maintenance areas. (NR 216.07 (6) (a))</li> </ul> </li> <li>■ Storm Sewer System Map (NR 216.07 (7))</li> <li>■ Annual Report: first permit term of 5 years (NR 216.07 (8))</li> <li>■ Schedule Of Compliance: within 5 years after initial permit coverage is granted (NR 216.07 (9))</li> </ul> </li> <li>■ Urbanized area exemption (NR 216.023)</li> <li>■ Non-urbanized area exemption (NR 216.024)</li> <li>■ Designation criteria (NR 216.025)</li> </ul>	<ul style="list-style-type: none"> <li>■ Definition of construction site activities that constitute discharges needing a WPDES storm water permit                             <ul style="list-style-type: none"> <li>■ A NOI needs to be filed with the DNR when construction sites of <math>\geq 1</math> acre of land is disturbed (NR 216.43)</li> <li>■ Exceptions:                                     <ul style="list-style-type: none"> <li>• Agriculture</li> <li>• Silviculture</li> <li>• Commercial buildings: Storm water discharges from construction sites for public buildings and buildings that are places of employment regulated by the department of commerce* (NR 216.42(4)).</li> <li>• Department of transportation projects</li> <li>• Other environmental programs</li> <li>• Mill and crush operation</li> <li>• Routine maintenance</li> <li>• One- and two-family dwellings</li> <li>• Oil and gas industry</li> <li>• Quarter mile separation</li> </ul> </li> <li>■ A NOI deadline (NR 215.44)                                     <ul style="list-style-type: none"> <li>• The NOI needs to be received by DNR at least 14 working days prior to the commencement of any land disturbing construction activities.</li> <li>• A site-specific erosion control and storm water management plan needs to be completed by the landowner prior to submitting the NOI to DNR.</li> <li>• If the construction site is located in an area regulated by an authorized local program the landowner needs to apply for storm water discharge approval to the authorized local program.</li> </ul> </li> </ul> </li> <li>■ Erosion control plan requirements (NR 216.46)</li> <li>■ Storm water management plan requirements (NR 216.47)</li> <li>■ Reporting and monitoring requirements (NR 216.48)</li> <li>■ Conformance with other applicable regulations (NR 216.49)</li> <li>■ Notice of termination (NR 216.55)                             <ul style="list-style-type: none"> <li>• After the site has been fully stabilized</li> </ul> </li> </ul>

\* Projects which have received authorization from Commerce for construction site storm water discharges are exempt from the requirement to submit an NOI to the DNR pursuant to s. NR 216.42 (4) and (5), Wis. Adm. Code; therefore, UW-Whitewater is a public building regulated under Dept. of Commerce and is exempt.

**Note:** The new federal regulations require that other storm sewer systems that are classified as MS4s including certain universities may require permit coverage. It is expected that campuses of the UW system will also be required to submit a notice of intent or application for general permit coverage to WDNR.

## **2.4 County, City, and Town Ordinances**

State owned facilities such as UW-Whitewater do not fall under the jurisdiction of county, city, and the town for storm water management ordinances. However, to maintain a strong and good working relationship with the neighboring communities, it would be beneficial for the campus to follow applicable local ordinances and guidelines for storm water management and design of storm water conveyance systems.

### **2.4.1 County Ordinances**

#### **Jefferson County**

Jefferson County currently does not have any storm water ordinances or guidelines, but County Ordinances No. 11 and 14 cover shorelines and floodplains, respectively. The shoreline ordinance will not apply to the campus, because it pertains to unincorporated areas within Jefferson County. The floodplain ordinance applies to all lands within the corporate limits of the County that would be inundated by a regional flood. A regional flood is defined as having a flood frequency of once every 100 years meaning that there is a 1% chance that a flood of equal or greater magnitude would occur in any given year. A discussion and corresponding map of the flood plain boundaries in relation to the campus is presented in chapter 3.9 of this report.

#### **Walworth County**

Chapter 26, Article II of Walworth County's Code of Ordinances defines requirements for storm water management, and Chapter 74, Article II of the County's ordinances includes requirements for floodplain and shoreline zoning. The Walworth County Zoning District also has produced a map detailing flood plain limits. However, the ordinances pertain to unincorporated lands, and the campus is outside the jurisdiction of the County.

### **2.4.2 City and Town Ordinances**

#### **City of Whitewater**

The City's storm water management regulations are defined in the City of Whitewater Storm water Management and Construction Site Erosion Control Ordinances (refer to Appendix B).

The City's ordinances are considered in this study, since the campus is located within the City limits and relies on the City's storm and sanitary sewer system. Although they are exempt, the UW does try to meet the intent of local ordinances.

### **Town of Cold Spring**

The Town of Cold Spring borders the campus to the north in Jefferson County. The Town does not have any storm water, zoning, floodplain, or shoreline ordinances or guidelines.

## **2.5 Other Regulatory Factors**

In general, City and/or Town ordinances are more stringent in their storm water planning and erosion control requirements than those outlined by the State. For instance, the City of Whitewater requires a peak discharge summary for the 2-, 5-, 10-, 25-, 50-, and 100-year storm events, which is more comprehensive modeling than the State requires in NR 151. In addition, the City's ordinance provides criteria for designing storm sewers, culverts, and ditches, which are not specified by the State. Given that runoff from parts of the campus enters into the City's storm sewer system, it would be beneficial for both the campus and the City to design their storm sewer systems using the same set of standards. Additionally, any work completed along Whitewater Creek may require a ch. 30 permit from WDNR.

## **2.6 Recommended Stormwater Guidelines**

We recommend that the UW-Whitewater campus adopt stormwater guidelines that meet and/or exceed the NR 151 requirements for erosion control and stormwater management.



## *CHAPTER THREE*

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### **EXISTING CAMPUS FEATURES**

## **Chapter 3 Existing Campus Features**

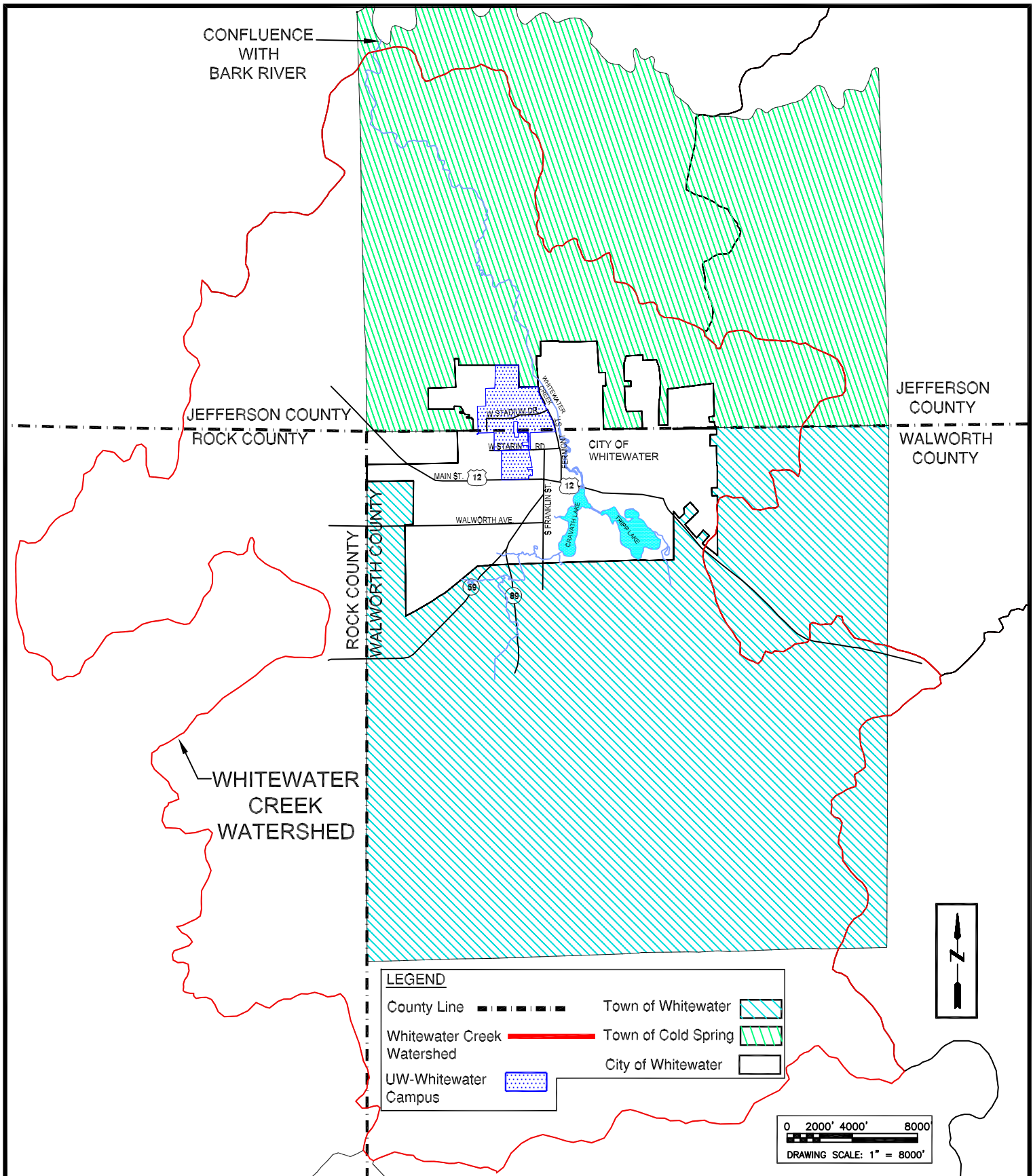
Before an assessment of storm water management needs can be made, an evaluation of an area's existing conditions and features should be completed. This chapter summarizes the conditions and features on the campus, which form the basis for identifying storm water problem areas and potential effects of future development on the existing system.

Information used to evaluate existing conditions and features was collected from the UW-Whitewater campus, City of Whitewater, Town of Cold Spring, Walworth County, Jefferson County, Southeastern Wisconsin Regional Planning Commission, the WDNR, the Natural Resource Conservation Service (NRCS), Federal Emergency Management Agency (FEMA), and the U.S. EPA.

### **3.1 Physical Features**

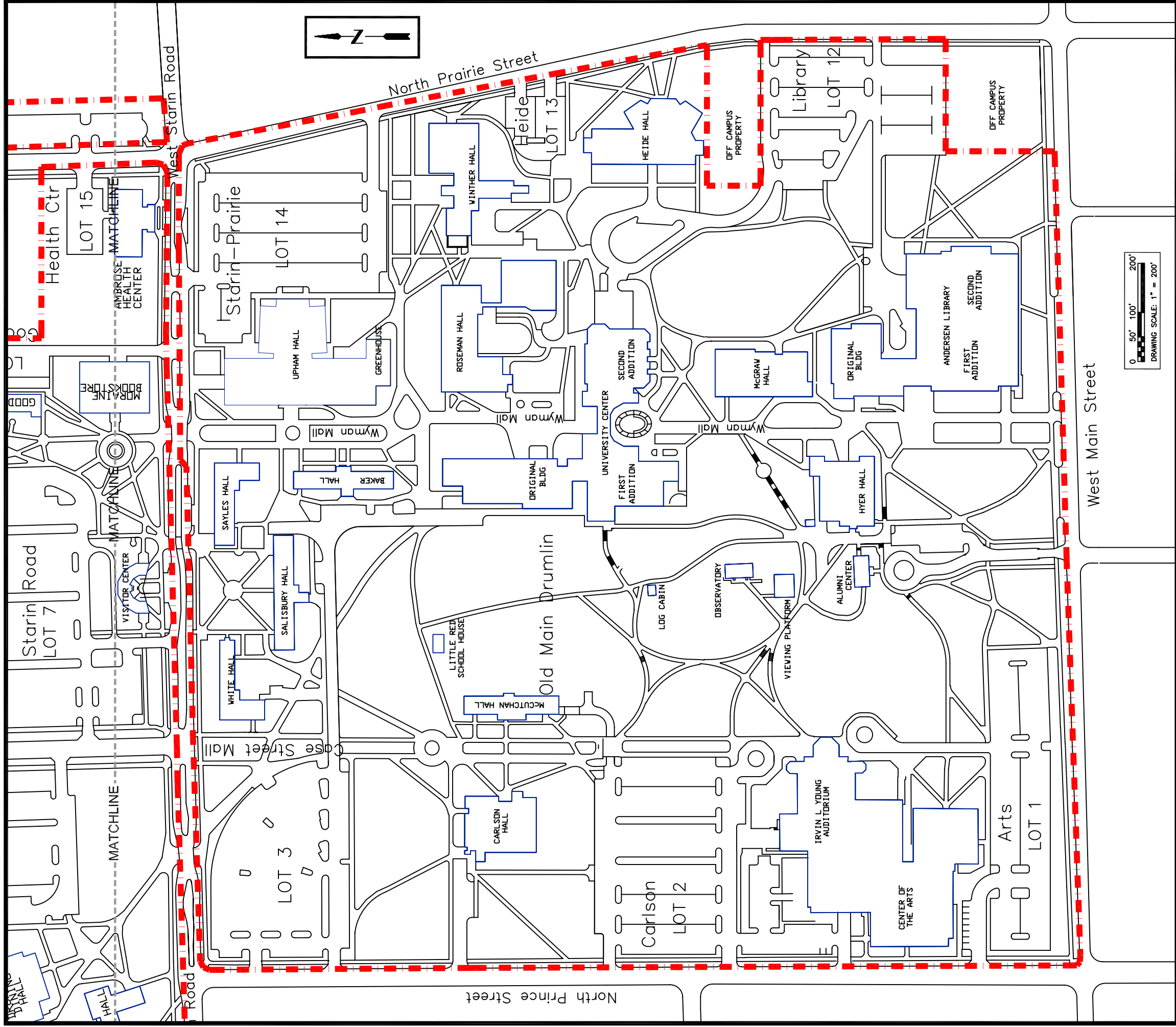
The northern portion of the campus, comprising approximately 270 acres, is located within Township 5 North, Range 15 East, Sections 32 and 33 in Jefferson County, and the southern portion of the campus, approximately 130 acres, is located within Township 4 North, Range 15 East, Section 5 in Walworth County (see Figure 3-1). The entire campus is located within the City of Whitewater. The Town of Cold Spring borders the City of Whitewater and the campus to the north in Jefferson County. It should be noted that the campus property boundary depicted in the figures presented in this report is approximated and not based on a survey.

The campus measures approximately 400 acres in area and, in general terms, is divided between the southern academic core (Figure 3-2) and the north campus (Figure 3-3 and 3-4). The academic core, which contains all but one of the academic buildings, measures approximately 74 acres and is located south of Starin Road within Walworth County. The academic core is situated between West Starin Road to the north, North Prairie Street to the east, U.S. Hwy 12/89 – West Main Street to the south, and North Prince Street to the west.



**UW-Whitwater Municipal Boundaries and Watersheds**

Storm Water Management Plan  
University of Wisconsin-Whitewater  
Whitewater, Wisconsin



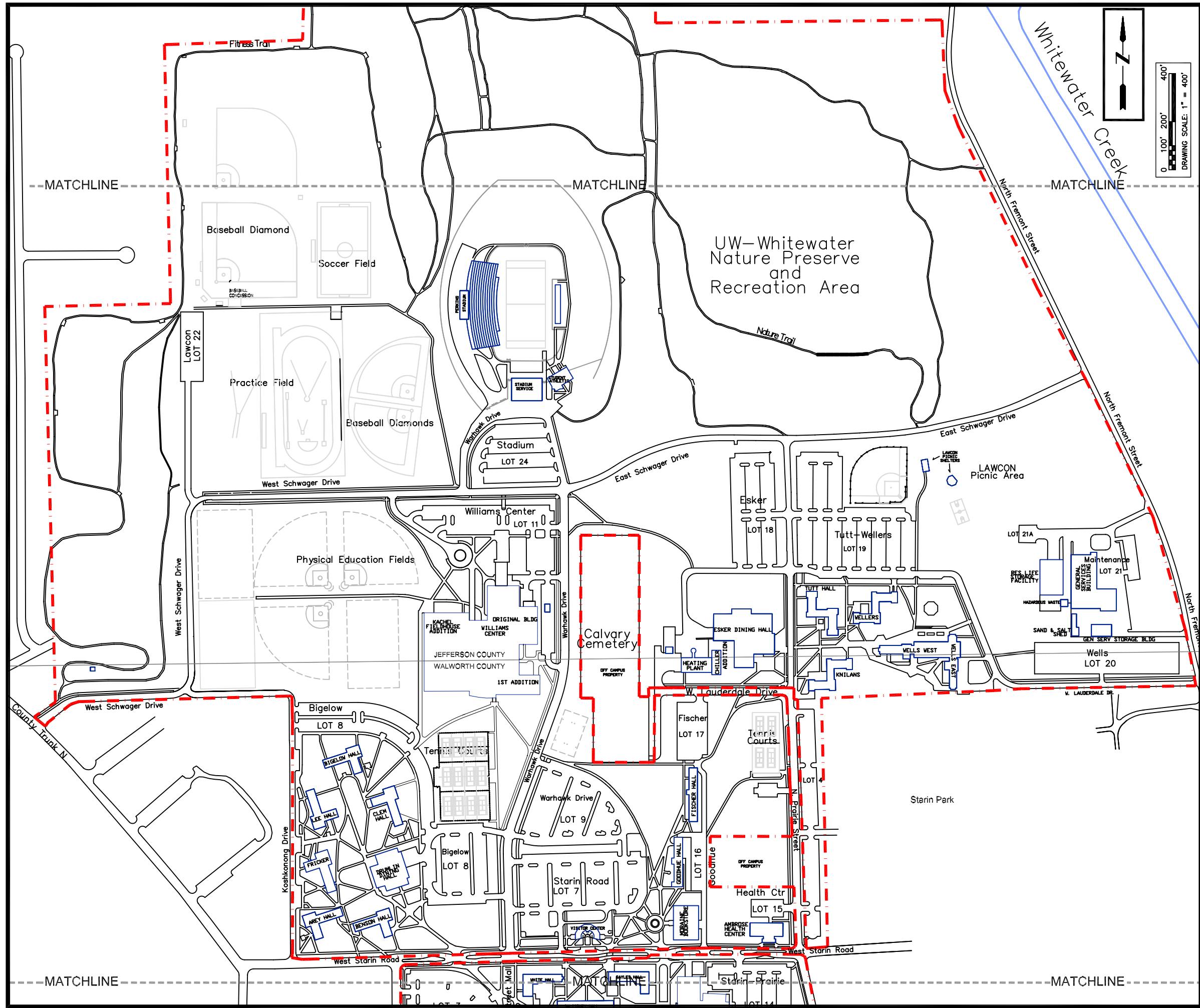
# UW-Whitewater Campus Academic Core

Storm Water Management Plan  
University of Wisconsin-Whitewater  
Whitewater, Wisconsin



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Figure 3-2



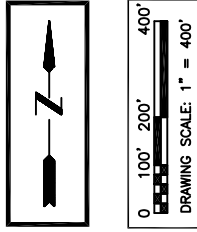
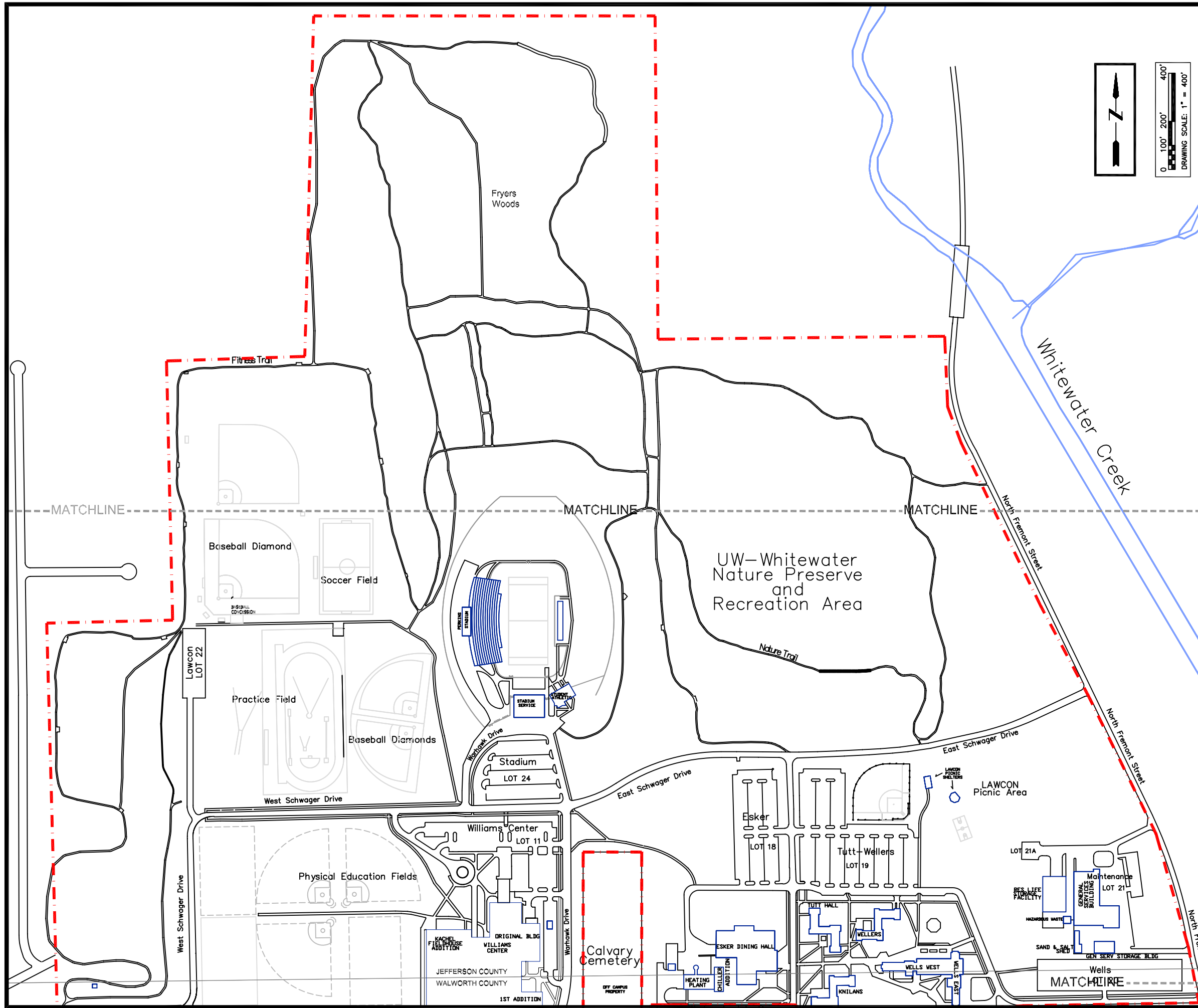
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Figure 3-3

# UW-Whitewater Campus Central

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 University of Wisconsin-Whitewater  
 Whitewater, Wisconsin





**N**  
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Figure 3-4

**UW-Whitewater Campus Upper (North)**  
Storm Water Management Plan  
University of Wisconsin-Whitewater  
Whitewater, Wisconsin

The 326-acre north campus, located north of Starin Road, lies within both Jefferson and Walworth Counties and contains one academic building, outdoor fields, general recreation and intercollegiate athletic facilities, and a nature preserve including a forested area named Fryers Woods and a prairie restoration. The General Services Building and Heating Plant are also located in the north campus. The outdoor fields measure approximately 112 acres, and about 110 acres of the north campus are included in the nature preserve. The preserve was set aside and developed using a federal (U.S. Department of the Interior) and state (WDNR) matching grant program named the Land and Water Conservation (LAWCON) fund. Land undergoing a native prairie restoration measures approximately 55 acres. The north campus is bordered by private lands to the north, North Fremont Street and residential properties to the east, West Starin Road to the south, and Koshkonong Drive, West Schwager Drive, and residential properties to the west.

There are a few land holdings within the above-described boundary that are not controlled by the campus. The Calvary Cemetery and the portion of Lauderdale Drive leading to the cemetery are owned and maintained by the City. Parcels located at 134, 344, and 366 North Prairie Street are privately owned. One parcel located on the northwest corner of North Prairie Street and Main Street is also privately owned.

In general, the campus maintains about 4 miles of roadways and service drives. The City maintains North Fremont Street, North Prairie Street, the portion of West Lauderdale Drive

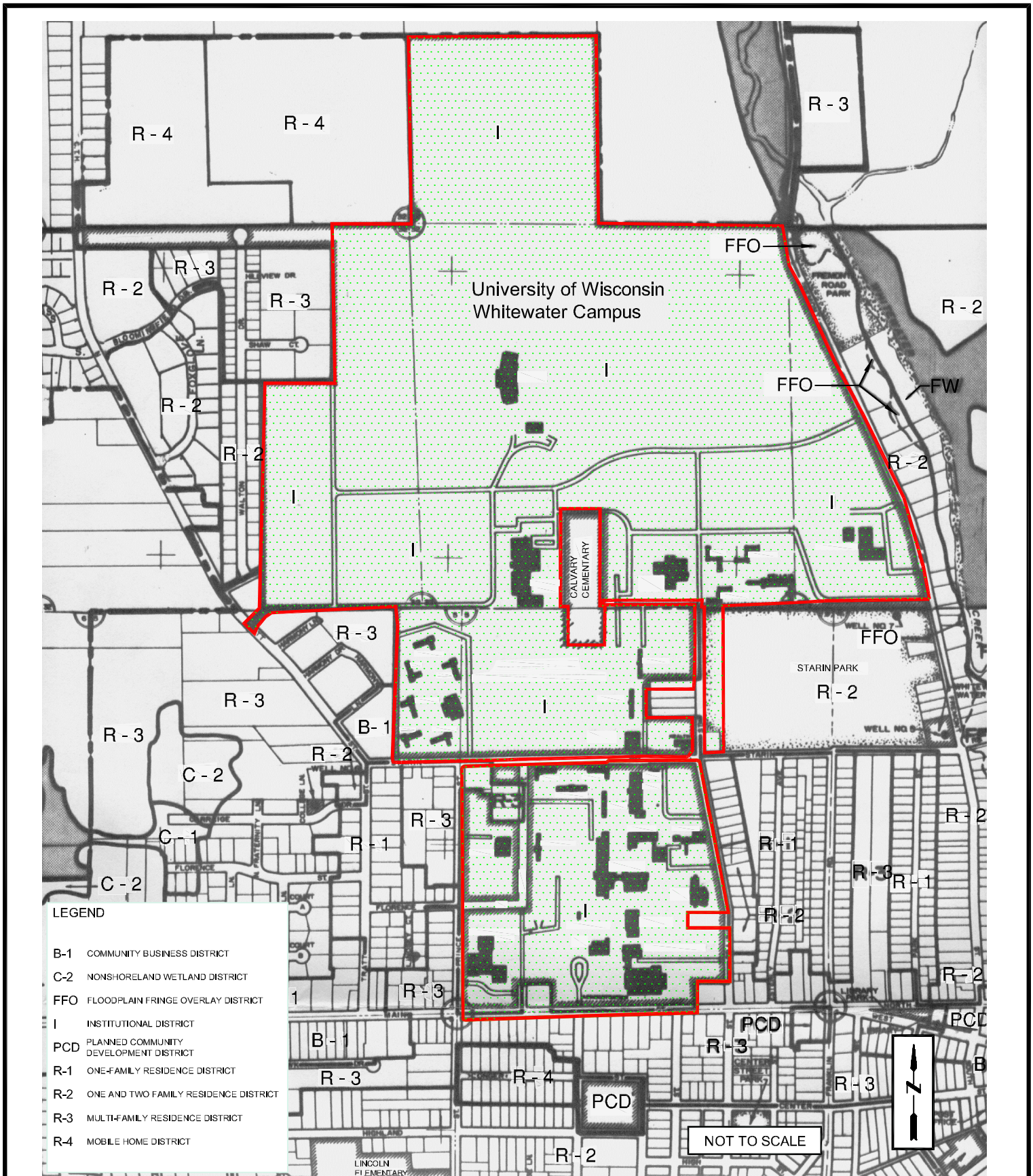
Glacial-derived features dominate the surface topography of southeastern Wisconsin, and these features shape the campus in its topography, subsurface, surface water features, and general aesthetics. Five drumlins cross the campus in a general north to south direction. An esker crosses Starin Park, a City owned park located due east of the campus. The resulting drainage patterns lead to the formation of on-campus wetlands and the neighboring Whitewater Creek.

### **3.2 Land Use**

In accordance with City of Whitewater Zoning Ordinance Chapter 19.48 and the Zoning Map of the City of Whitewater dated October 4, 2002, the campus is categorized as institutional use. Institutional facilities include universities and their associated residential, educational, and service facilities. There are no storm water facility or best management requirements written in the chapter in regards to institutional facilities. Surrounding land uses include floodplain fringe overlay districts (FFO) along Whitewater Creek, one- and two-family residence districts (R-2), multi-family residence districts (R-3), a community business district (B-1), and a mobile home district (R-4). Refer to Figure 3-5 for their respective locations. Land use north of the campus and within the Town of Cold Spring is agricultural.

Land use within the campus boundary, as presented in the Six-Year Physical Development Plan for 2005-2011, consists of a nature preserve, parking, student services & housing, academic areas, physical education & athletics, infrastructure service, and open space (Figure 3-6).





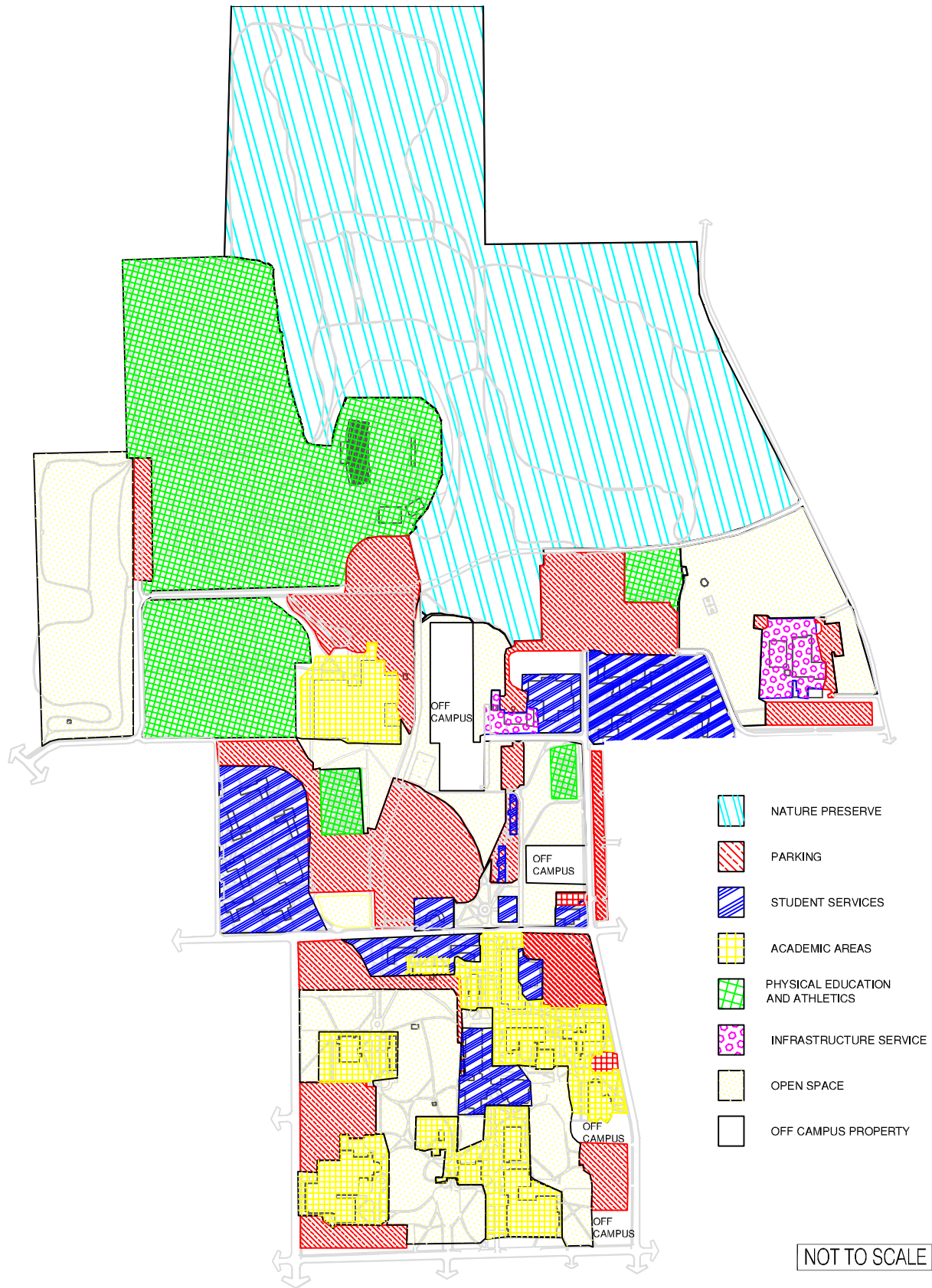
## UW-Whitwater Existing City Land Use

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 University of Wisconsin-Whitewater  
 Whitewater, Wisconsin



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Figure 3-5



## UW-Whitewater Campus Existing Land Use

Storm Water Management Plan  
 University of Wisconsin-Whitewater  
 Whitewater, Wisconsin



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Figure 3-6



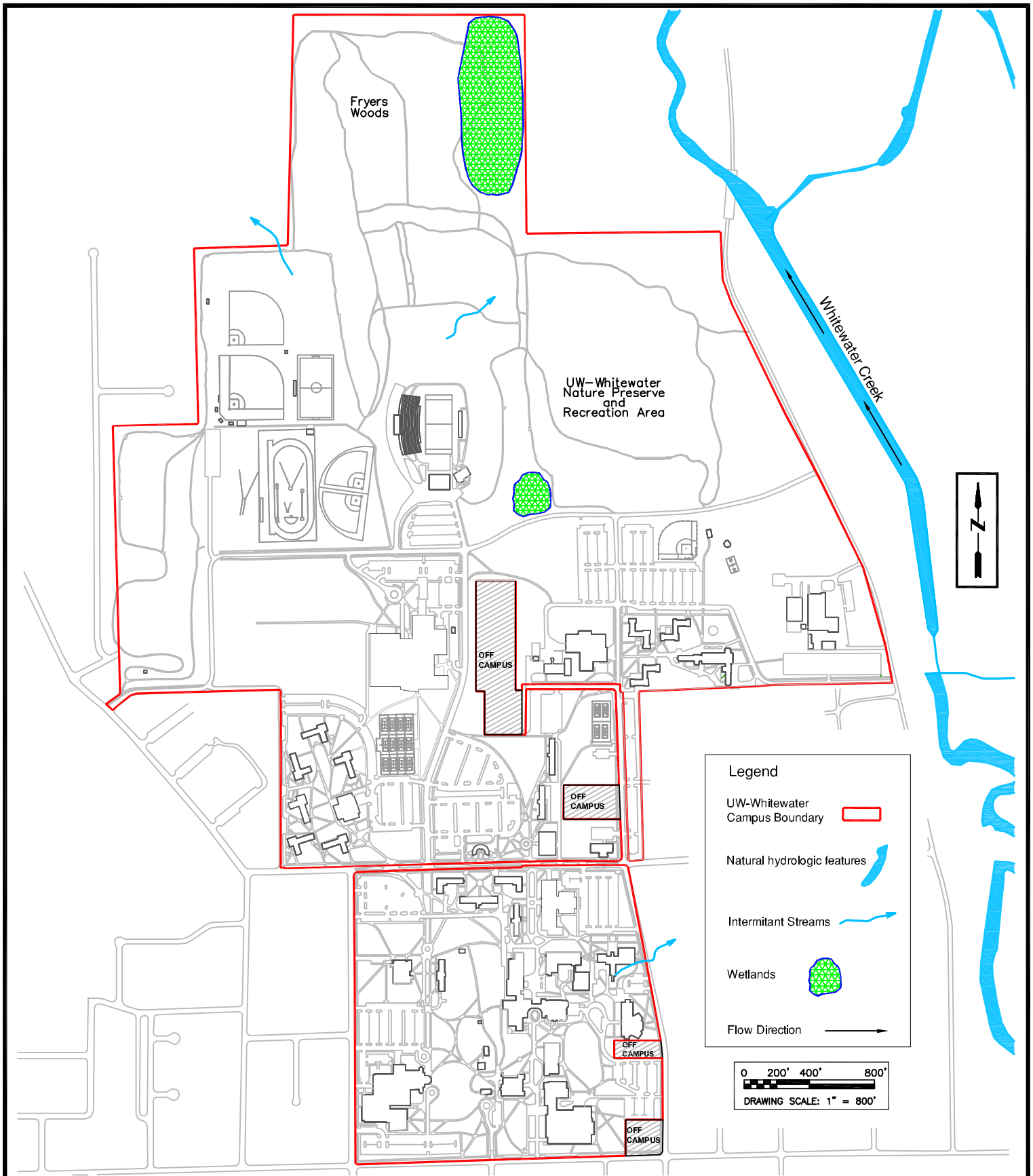
### **3.3 Natural Topographic and Surface Water Features**

The topography shaped by the drumlins and esker directed the development of certain drainage patterns. These resulting natural surface water features on and near the campus include Whitewater Creek, wetlands, and several intermittent streams (Figure 3-7).

Whitewater Creek flows in a general south to north direction and is located east of the campus. The campus is separated from the creek by North Fremont Street, several residential properties, and Fremont Road Park. The creek measures 16 miles in length from its origin at Whitewater Lake, located about 4 miles south of the City of Whitewater in Walworth County, to its confluence with the Bark River, located about another 4 miles north of the City in Jefferson County. The creek flows through the Town of Whitewater and then the City of Whitewater before flowing east of the campus. The City's wastewater treatment facility discharges to the Creek down stream of the campus.

A review of soil maps obtained from the NRCS soil manuals for Jefferson and Walworth counties indicates the presence of a "marsh or swamp" (a wetland) in the northeastern to eastern portion of Fryers Woods. The wetland is still present and has not been physically altered since the University acquired the land, with the exception of an elevated boardwalk that allows access to the wetland. Any runoff to the wetland would originate from Fryers Woods nature preserve and off-campus agricultural land lying to the north and east.

A second wetland area is located north and west of the North Prairie Street and East Schwager Drive intersection. It was formed in part by being a low-lying area receiving runoff from the stadium, nature preserve areas and from East Schwager Drive.



# UW-Whitewater Natural Hydrologic Features

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University of Wisconsin-Whitewater  
Whitewater, Wisconsin



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Figure 3-7

Several intermittent streams were also shown on the soil maps. One stream, in the academic core, appears to start at Winther Hall, crosses Starin Park, and flows to Whitewater Creek in a northeasterly direction. Another intermittent stream appears north of Perkins Stadium and rounds the northern end of the drumlin toward the prairie in a northeasterly direction. A third intermittent stream appears to begin north of the baseball and soccer fields in the far northwestern portion of the campus. The stream flows off campus in a general northerly direction and west of Fryers Woods.

Other surface water drainage features include ditches along North Fremont Street, East Schwager Drive, and North Prairie Street as it approaches East Schwager Drive.

Re-grading and construction of a retaining wall at Winther Hall, completed in 2004 as part of the Winther-Heide Plaza Development project, have alleviated previous flooding problems of the first floor of Winther Hall.

### **3.4 Assessment of Storm Sewer System**

The City of Whitewater owns and maintains separate storm sewers located under Main Street, North Prince Street, West Starin Road, North Prairie Street, and Lauderdale Drive. The campus maintains all other storm sewers located within its boundary. Figure 3-8 presents the campus' electronic version of the storm sewer system. The information provided on the map provides limited information. Invert elevations appear to use different data, sewers do not necessarily connect, and flow directions, manholes, inlets, pipe sizes, and general elevations are not given. Thereby, several other maps showing storm sewers were reviewed to augment the information provided. These maps (included in Appendix C) are:

- Campus storm sewer maps dating to 1970 (sheet numbers 2, 3, and 4) and record drawings of the West Campus Development project provided by the campus,
- Proposed design for the Winther-Heide Plaza Development project provided through communication by Ken Saiki Design, Inc. of Madison, Wisconsin with permission from the campus, and
- The City's current sewer map, provided by the City of Whitewater Department of Public Works.

Conversations with both City and campus representatives mention that there is no formal document pertaining to the division of the storm sewers between the campus and the City. The division is currently “understood” by both parties. However, there is a comfort level expressed by both parties, as was evidenced with the West Starin Road project, where both the campus and City participated and funded the project.

Several improvements have been made to the storm sewer system in the past few years, including sewers under West Starin Road and sewers in the West Development area, both constructed in 2001. The West Development area comprises an area of the intramural fields near Kachel Fieldhouse, the residence halls along Koshkonong Drive, parking lots to the east of the residence halls, and a parking lot on the corner of West Starin Road and North Prince Street. Any sewer improvements in the West Development area were completed to upgrade the system in accordance with the newly constructed facilities.

There are four major storm sewers to which on-campus runoff will flow, and all four lead east to outfalls at Whitewater Creek. The northern most sewer, maintained by the campus, collects runoff from areas generally lying north of West Lauderdale Drive, and includes lines at Perkins Stadium. This sewer leads east beyond the intersection of West Lauderdale Drive and North Fremont Drive where it ends at the outfall.

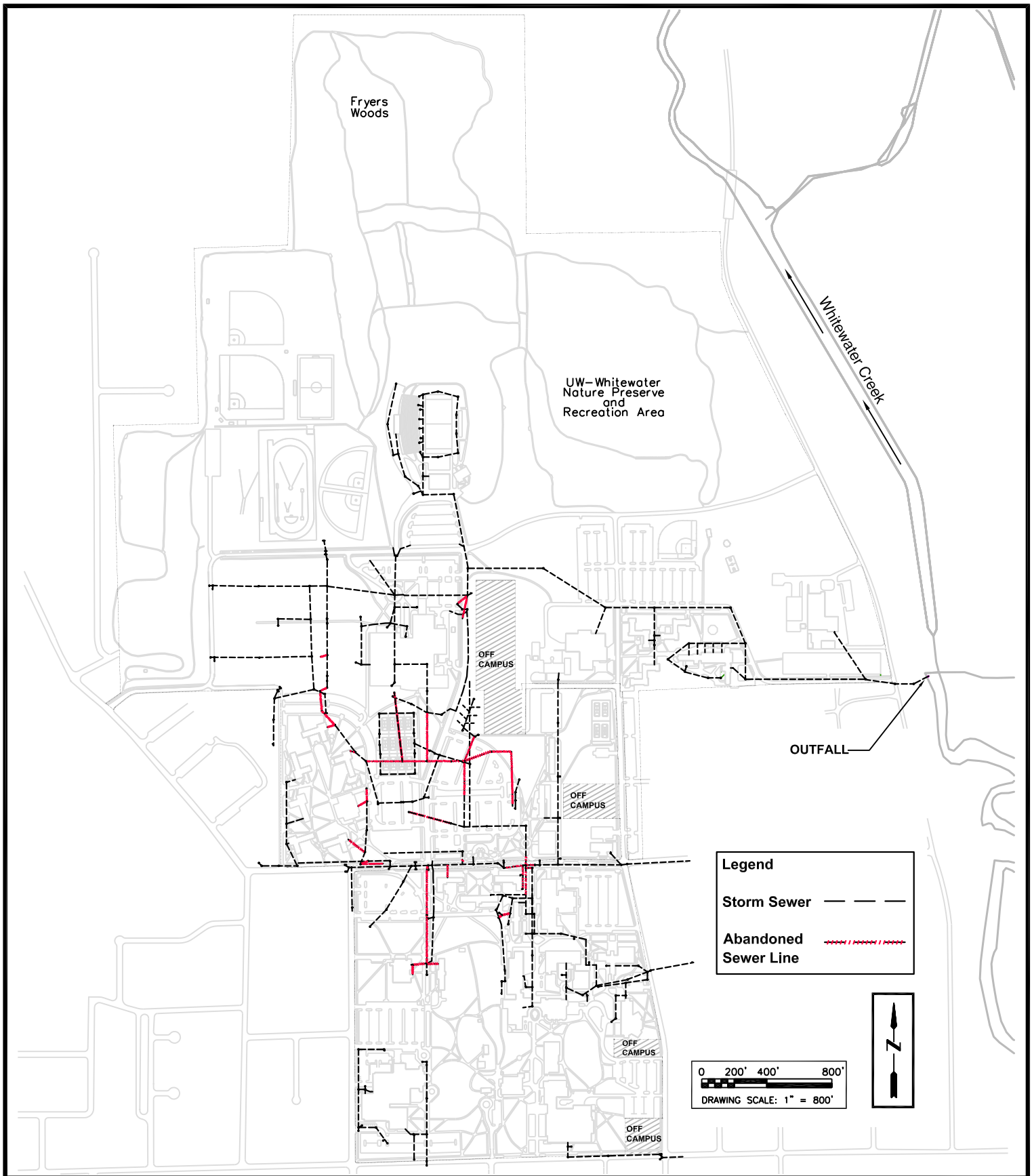
A centrally located storm sewer, maintained by the campus and the City, lies under West Starin Road. The sewer continues east beyond the campus property and ends at an outfall in Whitewater Creek. Sewers located in the intramural fields west of the Kachel Fieldhouse and sewers to the south of the Fieldhouse and West Lauderdale Drive flow south to West Starin Road. Sewers located within the academic core flow north to West Starin Road, with the exception of one sewer flowing south of Anderson Library to West Main Street.

A third storm sewer follows the path of the intermittent stream that started near Winther Hall. The sewer leads into the residential area east of North Prairie Street and eventually connects to the West Starin Road sewer east of the campus property. The City maintains this sewer.

The campus connects to a fourth storm sewer located under West Main Street. The southern flowing line at Anderson Library is the only direct connection to the West Main Street sewer. The City maintains this sewer.

A culvert is placed at the North Prairie Street and East Schwager Drive intersection and directs storm water from the south side to the north side of East Schwager Drive. The storm water then flows to low lying areas for infiltration. Runoff from two parking lots located on the south side of the intersection flows into drainage ditches running along North Prairie Street and is directed into the culvert.

The campus provided roof plans for each facility building, and the plans include roof drain locations. However, the plans, in addition to storm sewer maps, do not indicate if the roof drains are connected to a storm sewer lateral or a downspout that discharges onto the land surface.



## UW-Whitewater Storm Sewer System

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Figure 3-8



### **3.5 Off-site Storm Water Sources/Sewers**

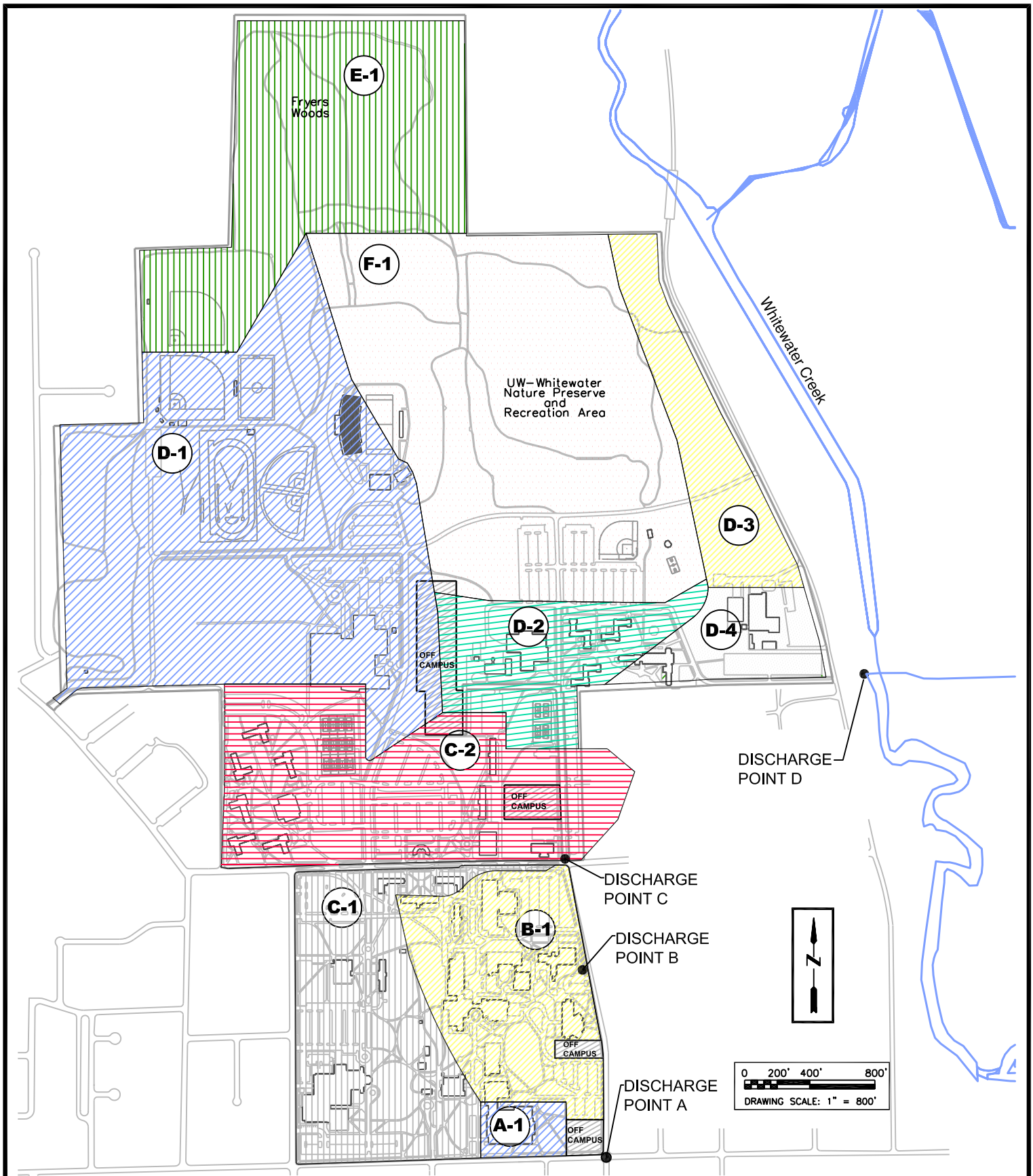
On the northeastern portion of the campus, there is runoff from the undeveloped land to the north and east of Fryers Woods that enters the wetland bordering the campus. Water entering the wetland evapotranspires, evaporates, or infiltrates into the soil and does not enter into the campus's storm sewer system. In addition, runoff from the southwestern portion of Starin Park flows to Parking Lot #4. There appears to be no off-site sources flowing into the campus' storm sewer system, with the exception of the storm sewer entering Starin Road from the west. The general direction of on-campus runoff is toward campus boundaries. Therefore, the streets bordering the campus on the east, south, and western sides collect campus storm water and direct it into storm sewers. The streets limit the ability of storm water originating from adjacent properties to flow onto the campus.

### **3.6 Drainage Basins**

The campus lies within the Whitewater Creek Watershed (Refer to Figure 3-1) contained within the Lower Rock River Basin, which eventually drains into the Mississippi River. Based on the natural topography of the site, hydrologic features, and the storm water conveyance system, the campus can be divided into ten drainage basins (Figure 3-9) with four points where water discharges off the campus property and one with no discharge off the campus. For purposes of this study, the basins are organized according to the four discharge points and the one non-discharge area, which are labeled A, B, C, D, and F.

Runoff from the academic core discharges from the campus property at three main points, A, B, and C, and is divided into three basins, A-1, B-1, and C-1. Basin A-1 is a small area in the far southeastern corner of the campus and includes part of Anderson Library. Storm water from the basin discharges to the West Main Street storm sewer. Runoff within Basin B-1 flows east to North Prairie Street, where it enters the City of Whitewater storm sewer, and flows into an outfall in Whitewater Creek. Basin C-1 runoff flows north to the West Starin Road storm sewer, enters the City of Whitewater sewer at the intersection of North Prairie Street and West Starin Road, and then flows to an outfall in Whitewater Creek.

The northern portion of the campus has seven drainage basins that either discharge or do not have a discharge off the campus property. There are two main discharge points, C and D, that accept storm water from five basins (C-2, D-1, D-2, D-3, and D-4). Basin E –1 does not discharge into a sewer but has overland flow directed off the campus, and Basin F-1 does not discharge off-campus. Basin C-2 comprises an area due north of West Starin Road, to which it drains, and includes a portion of Starin Park, located east of Parking Lot #4 along North Prairie Street. Basin D-1 runoff either infiltrates or enters the campus's storm sewer underlying the intramural fields and Perkins Stadium. Water that enters the campus's storm sewer system is conveyed through Basins D-2 and D-4 and eventually discharges to the West Lauderdale Drive sewer. This sewer discharges at an outfall in Whitewater Creek that is located east of the West Lauderdale Drive and North Fremont Drive intersection. Basin D-2 and D-4 runoff flows into the campus' storm sewer system at West Lauderdale Drive. Basin D-3 either infiltrates or overland flows into the drainage ditch along North Fremont Street. Runoff that does not infiltrate within Basin E-1 flows in a general northerly direction and off-campus. Basin F-1 runoff infiltrates into on-campus pervious areas and does not discharge off the campus property.



## UW-Whitewater Drainage Basins

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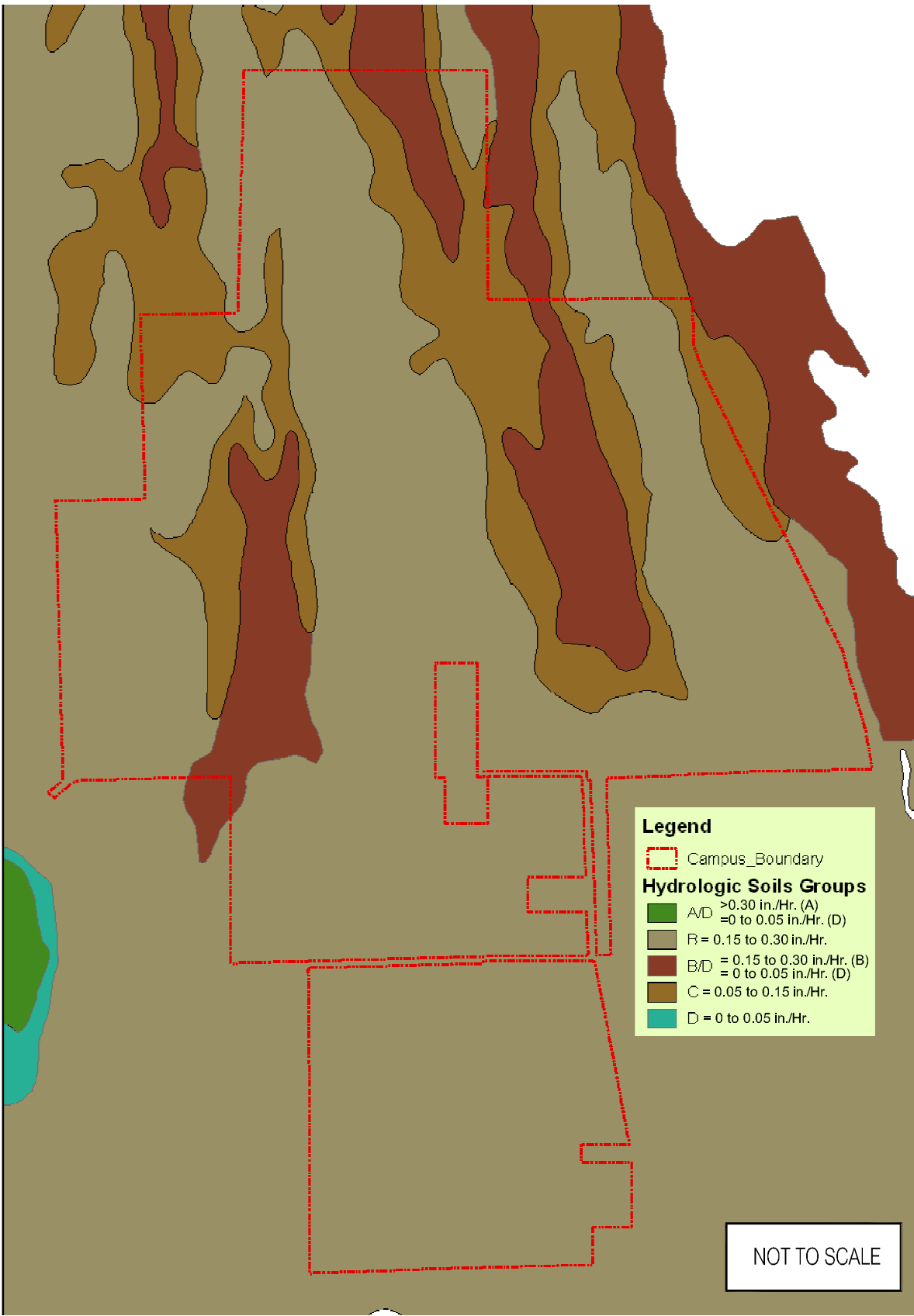
Figure 3-9

### **3.7 Soils and Infiltration**

Soils within the campus property have been given several types of hydrologic soil groups (HSGs). HSGs are a type of soil classification that indicates the rate of water infiltration when a soil is not protected by vegetation, is thoroughly wet, and receives precipitation from long-duration storms. The HSGs are applied in storm water modeling. The HSGs on campus vary from B, B/D, to C (Figure 3-10). Soils within Jefferson County that are at elevated areas are described as having a B HSG, which is a moderate infiltration rate of 0.15 – 0.30 in/hr. Soils within the wetland by Fryers Woods, the prairie, and west of Perkins Stadium are assigned group B/D or C. B/D HSGs indicate that the soils are assigned a B HSG when they are drained or a D HSG when they are not drained. D HSGs have a very low infiltration rate of 0 – 0.05 in/hr. Soils assigned group C indicate they have a low infiltration rate of 0.05 – 0.15 in/hr. All on-campus soils lying within Walworth County are in HSG B.

### **3.8 Floodplains**

As shown on Figure 3-11, there are no floodplains mapped within the campus boundary, according to FEMA maps and references to City of Whitewater, Jefferson County, and Walworth County zoning. However, only North Fremont Street separates the campus from the City's floodplain fringe overlay district (FFO) and FEMA's zone B designation, which is defined by FEMA as areas between limits of the 100-year and 500-year flood. Appendix K contains a FEMA regional flood insurance rate map.



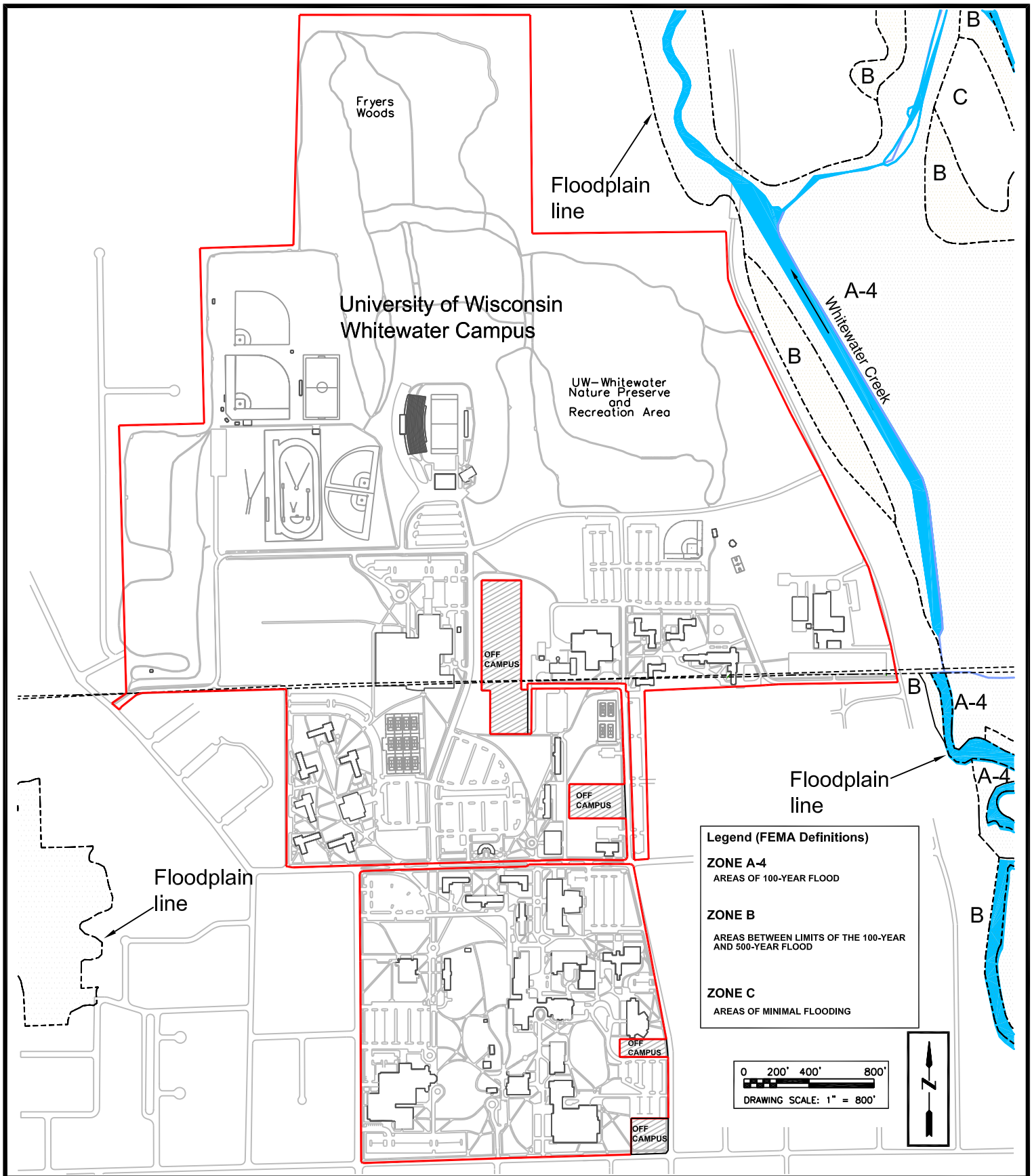
## UW-Whitewater Hydrologic Soil Groups

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University of Wisconsin-Whitewater  
Whitewater, Wisconsin



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Figure 3-10



## UW-Whitwater Floodplains

Storm Water Management Plan  
University of Wisconsin-Whitewater  
Whitewater, Wisconsin



Engineers, Scientists, Planners

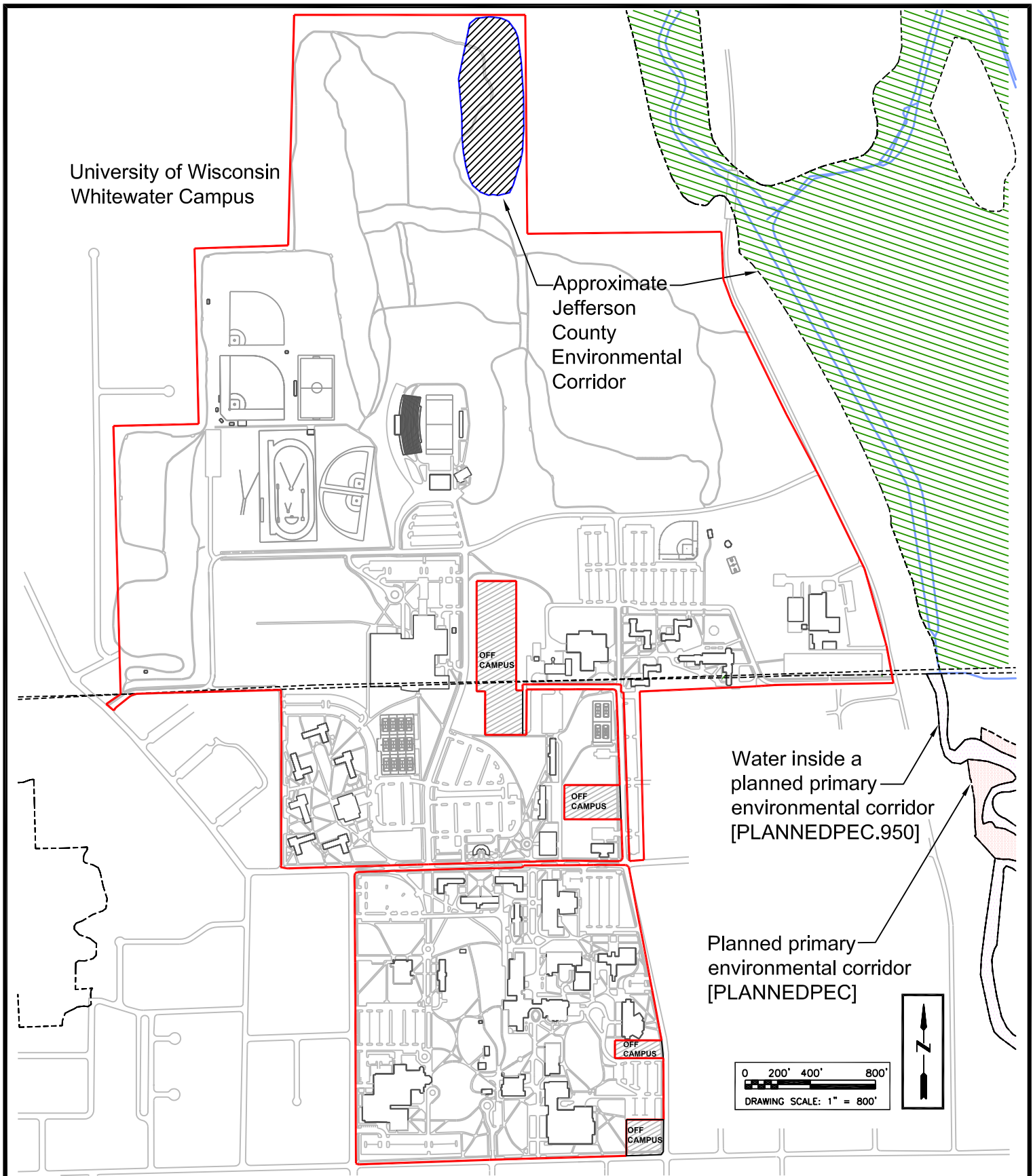
Figure 3-11

### **3.9 Environmental Corridors**

Environmental corridors are areas containing high value natural, scenic, historic, scientific and recreational features. In Southeastern Wisconsin, they generally lie along major streams, valleys, around major lakes, and in the Kettle Moraine area. They contain the best remaining woodlands and wetlands, wildlife habitats, undeveloped shorelands and flood lands, groundwater recharge and discharge areas, and steeply sloped lands.

Both Jefferson and Walworth Counties have areas designated as environmental corridors. Environmental corridors identified for Jefferson County are presented in a report titled, Land and Water Resource Management Plan for 2000-2005, written by the Jefferson County Land and Water Conservation Department. Information on Walworth County's corridor planning was obtained through SEWRPC and includes primary and secondary corridors and isolated natural resource areas. Primary environmental corridors (PEC) contain concentrations of the most significant natural resources and are at least 400 acres in size, at least two miles long, and at least 200 feet wide. Secondary environmental corridors (SEC) contain significant but smaller concentrations of natural resources and are at least 100 acres in size and at least one mile long, unless serving to link primary corridors. Isolated natural resource areas (INRA) also contain significant resources. They are at least five acres in size and at least 200 feet wide.

Jefferson County has designated one environmental corridor within the campus property, which is present in the vicinity of the nature preserve (Figure 3-12). If any development were to take place in this area, the City of Whitewater's zoning would take precedence over Jefferson County's because the area is within city limits. In addition, the nature preserve is part of the LAWCON program, which has additional development constraints. In Walworth County, SEWRPC designated sections of Whitewater Creek as Planned Primary Environmental Corridor (PLANNEDPEC) and as water inside a Planned Primary Environmental Corridor (PLANNEDPEC.950). These latter designations do not include campus property.



## UW-Whitwater Environmental Corridors

Storm Water Management Plan  
 University of Wisconsin-Whitwater  
 Whitwater, Wisconsin



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Figure 3-12



### **3.10 Runoff Analysis and Assessment**

To analyze and assess runoff and its contribution to storm water quantity and quality, pervious and impervious areas were assessed. Pervious areas are those that generally improve the runoff water quality by biological processes, reduce the peak discharge by slowing the runoff, and reduce runoff volume by infiltration of water into the subsurface and by evapotranspiration. Examples of these areas include lawns, landscaped areas, and wetlands. By contrast, impervious areas impede infiltration and are known to degrade surface water quality, which can affect stream morphology and the receiving bionetwork. Streets, parking lots, sidewalks, and roofs are considered impervious. Other key changes that occur as impervious levels increase include:

- higher flow rates
- increased sedimentation
- an increase in magnitude and frequency of floods
- reduced base flow levels
- stream channel enlargement
- more tree falls from eroded banks
- declination in water quality
- degradation of stream habitats
- increases in stream temperatures and an overall reduction in aquatic diversity.

The following discusses the predicted peak discharge calculations and water quality assessment.

#### ***3.10.1 Runoff Analysis***

Basin drainage boundaries, pervious/impervious cover, time of concentration, and rainfall parameters are all factors in developing a discharge vs. time relation, or hydrograph, for a basin. The peak discharge is the maximum flow rate contributed by the basin and is a primary design variable in the design of storm water conveyance systems such as storm sewers, storm inlets and culverts, and small open channels. Peak discharge is a function of time of concentration and pervious/impervious areas within the drainage basin. The time of

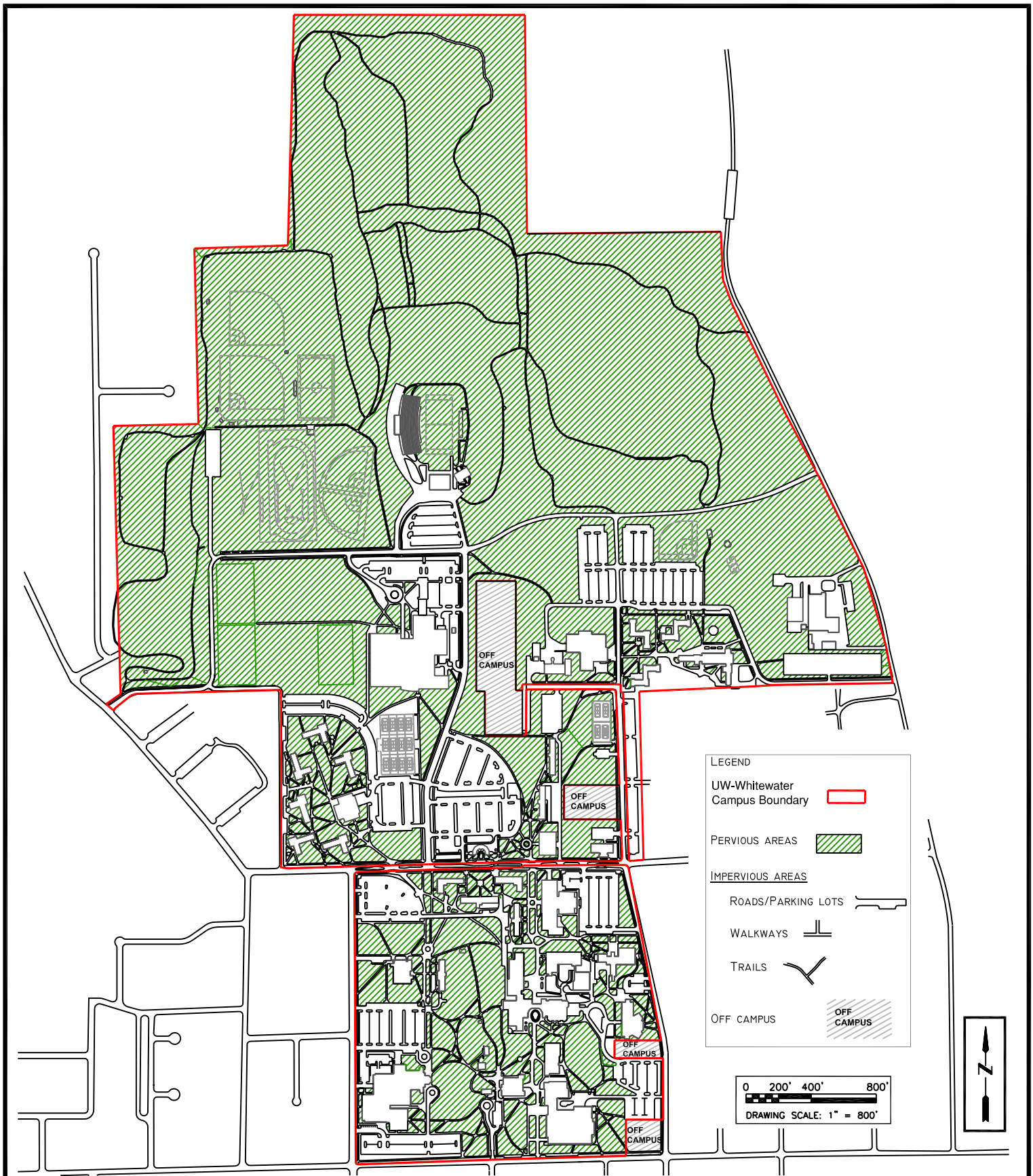
concentration is the time required for water to flow from the most hydrologically remote point of the drainage basin to the outlet once the soil has become saturated and minor depressions are filled.

The pervious/impervious acreages and peak discharges were calculated for the ten drainage basins. The area designations are displayed on Figure 3-13 and results of the pervious/impervious acreage calculations are summarized in Table 3-1.

**Table 3-1 Summary of Drainage Basin Areas**

Basin No.	Area [acres]			% Impervious
	Pervious	Impervious	Total	
A-1	1.5	2.0	3.5	58
B-1	13.1	17.0	30.1	57
C-1	21.7	15.3	37.0	41
C-2	22.9	29.0	51.9	56
D-1	83.2	20.9	104.1	20
D-2	9.1	8.2	17.3	47
D-3	17.8	0.87	18.6	5
D-4	5.7	6.1	11.8	52
E-1	54.6	0.1	54.7	0.1
F-1	82.2	8.6	90.8	9
<b>Campus Total</b>	<b>311.7</b>	<b>108.1</b>	<b>419.8</b>	<b>26</b>

Note: The basin areas include off-site areas draining onto the campus.



## UW-Whitwater Pervious/Impervious Areas

Storm Water Management Plan  
University of Wisconsin-Whitwater  
Whitwater, Wisconsin



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Figure 3-13

Publicly available TR-55 modeling software (developed by the NRCS) was used to prepare a preliminary hydrologic/hydraulic model using the widely accepted NRCS runoff curve number method. The NRCS recommended 24-hr Type II synthetic rainfall distribution was used. The model was run for a 2-, 5-, 10-, 25-, 50-, and 100-year recurrence interval storm, as outlined in the City of Whitewater's storm water management performance standards, using SEWRPC recommended rainfall depths. The 2-yr and 10-yr analyses are representative of frequently occurring storm events and are critical from the perspectives of storm water quality, minor storm conveyance system design, and detention pond outlet configuration. The 100-yr storm analysis is critical for detention basin sizing.

The peak discharge model results are summarized in Table 3-2 for basins that have single discharge points. The results present the amount of runoff that would occur at the outlet from a basin. Basins E-1 and F-1 are not included in the modeling because Basin E-1 discharges at several points off the campus property in a general northerly direction via overland flow, and Basin F-1 runoff does not have a discharge point but rather infiltrates.

**Table 3-2 Summary of Peak Discharges**

Basin No.	Peak Discharge [cfs]						Total Area [acres]
	2-year	5-year	10-year	25-year	50-year	100-year	
A-1	7	10	12	16	20	24	3.5
Composite Hydrograph Peak	7	10	12	16	20	24	3.5
B-1	45	64	80	106	131	158	30.1
Composite Hydrograph Peak	45	64	80	106	131	158	30.1
C-1	36	54	69	96	120	148	37.0
C-2	100	139	174	232	284	343	51.9
Composite Hydrograph Peak	121	172	218	295	364	441	88.8
D-1	67	106	143	209	273	346	104.1
D-2	19	28	35	48	60	73	20.4
D-3	8	14	19	30	40	52	18.6
D-4	21	30	38	51	63	76	11.8
Composite Hydrograph Peak	102	161	215	313	408	515	154.9

Note: The composite hydrograph peak flow may not coincide with the individual hydrograph peak flows.

Discharges from basins A-1, B-1, C-1, and C-2 enter into the City of Whitewater’s storm sewer system. In a 100-year storm event, a peak discharge of 24 cubic feet per second (cfs) will enter into the City’s West Main Street storm sewer from Basin A-1, a peak discharge of 158 cfs will enter into the City’s sewer at North Prairie Street from Basin B-1 and flow to the West Starin Road sewer, and a composite peak discharge of 441 cfs from Basins C-1 and C-2 will enter into the West Starin Road sewer.

The composite peak discharge from basins D-1, D-2, D-3, and D-4 is 515 cfs in a 100-year storm. This discharge flows through the campus’s storm sewer system and ends at an outfall

in Whitewater Creek beyond the West Lauderdale Drive and North Fremont Street intersection.

### **3.10.2 Water Quality Assessment**

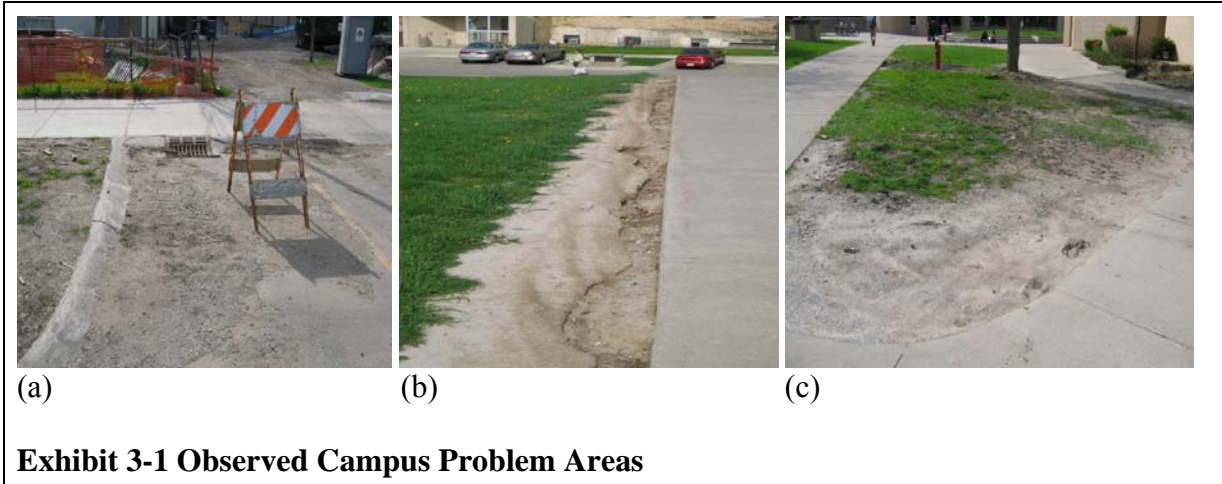
Storm water runoff quality is affected by the pollutant buildup on the pervious and impervious areas. These pollutants are washed off by rain and are dumped into the nearest water body. Total suspended solids (TSS), gasoline/oil leaks from automobiles, litter, etc. are some common water quality pollutants. The WDNR measures the water quality as the amount of TSS in storm water runoff. Rooftops, parking lots, sidewalks, and roads make up the impervious areas in the campus. The majority of the impervious areas are connected to the storm sewer system, with the exception of a few parking lots. Thus, runoff from these areas flows into either the campus' storm sewer or into the City's storm sewer, both of which lead to Whitewater Creek.

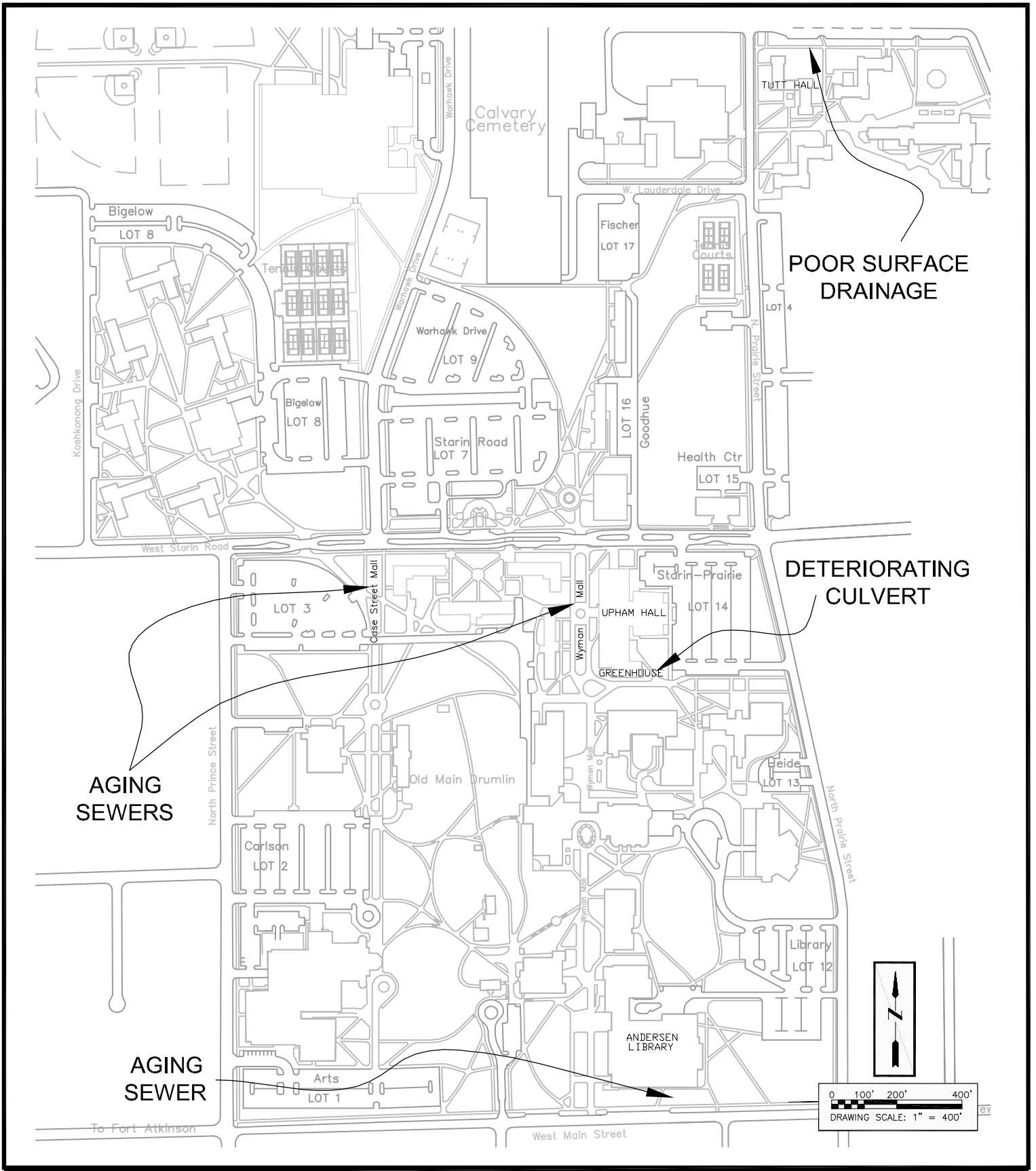
### **3.11 Existing Problem Areas**

The campus contains a few problem areas that should be addressed. These problem areas are, in several cases, associated with old sewer lines. There are two sections of 1,750-foot concrete sewers below Case Mall and Wyman Mall that are one hundred years old. Sections in these sewers have periodically failed. A 300-foot stretch of the sewer below Wyman Mall due south of Starin Road was sleeved in 2001. The storm sewer for Anderson Library is similarly old and is expected to fail in some places. A culvert type storm line extending west and connecting to Upham Hall through the greenhouse is in poor condition. East Lauderdale Street east of Prairie Street and north of Tutt Hall has some flooding problems when more than two inches of rain fall. Finally, the storm sewers north of Starin Road serve the existing needs, but they will need to be upgraded as future development occurs in this area. Figure 3-14 displays the locations of the existing problem areas.

There is a concern that runoff on campus is significant enough to create erosion problems around the campus, predominantly in the parking lots. Exhibit 3-1 displays problem areas noted on a campus tour: (a) construction dirt and parking lot debris in the vicinity of an unprotected storm water inlet in the Starin-Prarie parking lot, (b) erosion adjacent to a

sidewalk leading downhill from the Old Main Drumlins towards Baker Hall, and (c) trampled grass with sediment near the University Center.





## UW-Whitwater Problem Areas

Storm Water Management Plan  
 University of Wisconsin-Whitwater  
 Whitewater, Wisconsin



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Figure 3-14



## *CHAPTER FOUR*

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### **EXISTING STORM WATER MANAGEMENT PRACTICES**

## **Chapter 4 Existing Storm Water Management Practices**

This chapter reviews storm water management practices that are currently employed at the campus. The information was gathered from UW-Whitewater and City of Whitewater representatives and from the WDNR.

### **4.1 Permits**

In August 2000, the campus submitted an NOI application to the WDNR for the West Campus Site Development project. The WDNR then issued one ch. NR 216 WPDES General Permit No. 0067831 for storm water discharges associated with construction activities disturbing five or more acres of land. The coverage was then terminated on December 13, 2001 after construction was completed. Documentation is included in Appendix D. No other NOI's in regards to construction have been applied for at the campus.

No other permits have been obtained in regards to storm water from the WDNR or the City of Whitewater. As stated in Chapter 2.2.2, the campus will likely be required to obtain a storm water discharge permit.

### **4.2 Missed Filings**

The campus has not missed filings in regards to subchapter III of ch. NR 216 for construction sites. As previously stated, the campus received a General Permit No. WI-0067861-1 for construction disturbing five or more acres on the West Campus Development project in August 2000, and a subsequent permit termination letter was received in December 2001. In July 2004, the size limit for projects requiring a permit under subchapter III of ch. NR 216 was reduced from construction activities disturbing five or more acres to activities disturbing one or more acres. The Winther-Heide Plaza Development project constructed in 2004 has project limits that appear to be greater than one acre, meeting the new criteria for required permitting. However, construction at the site had already begun in the summer of 2004, before the rule change.

### **4.3 Management of Batch Discharges**

The campus contains a swimming pool facility, three cooling towers, and several boilers and chillers. The following summarizes the destination of the batch discharges.

The campus has two swimming pools and eight whirlpools. The swimming pools contain 138,000 gallons and 144,000 gallons of water. All the pools are periodically drained into the sanitary sewer system. Discharges to the sanitary sewers does not require a WPDES permit.

The campus currently has three cooling towers located in the Power Plant. The construction of a fourth tower is in progress. The towers bleed into the sanitary sewer system. However, water released from the towers during their annual flushing and cleaning is released as runoff over the parking lot. It then flows down Lauderdale Street and enters the storm sewer system at the intersection of Prairie and Lauderdale Streets. The towers each contain 1,500 gallons of water in addition to a general mix of biocides contained in the water. The biocides are obtained from Fremont Industries and are administered to the cooling water through the use of a meter. The pH of the water is maintained at 8.2 – 8.3. The towers are cleaned annually in November or December to remove any sediment build-up. Cleaning is accomplished by releasing the contained water and then adding an undetermined amount of flushing water from a fire hose to clean the system. The towers are then filled with fresh water and the meter is re-attached to dispense biocide to the fresh tower water.

The campus does not have a WPDES permit to discharge water from the cooling towers and chillers into the storm sewer system. Ch. 283, stats. covers WPDES permits from point sources, including those originating from cooling towers and chillers. The general permit for a MS4 will not cover cooling tower water containing additives such as biocides. The WDNR has suggested three options for the discharge to come into compliance with ch. 283. One option is to drain the cooling water and associated flushing water into the sanitary sewer system, as long as the discharge does not violate the City of Whitewater's sewer use ordinance. Another potential option would be to split the draining of the cooling water and flushing water. This would involve draining the cooling tower water into the sanitary sewer and then obtaining a one-time WPDES permit for the flushing water to enter the storm sewer system. Filter traps would be placed at storm grates to collect pollutants, followed by their proper disposal. A third option is to apply for an individual WPDES permit.

Any discharges from campus boilers enter the sanitary sewer system. However, the majority of on-campus boilers are no longer in use because the campus uses steam purchased from the

Whitewater Cogeneration Plant in place of boilers. The campus does keep one boiler placed on “stand-by” in case problems arise in obtaining steam from the Cogeneration Plant. The steam line is not connected to the storm sewer system. Condensates from air compressors and air conditioners enter the sanitary sewer system. Likewise, water used to clean the equipment is also discharged into the sanitary system. It should be noted that there are several abandoned and emptied chillers/air conditioners located at the following buildings: two at Anderson Library and one each at Moraine Book Store, Drumlin Hall, Center of the Arts, and Carlson Hall. A few of the chillers are located on rooftops and drain as storm water when they are in use.

#### **4.4 Spill Prevention, Control, and Countermeasure Plan (SPCCP)**

A revised spill prevention control and countermeasure plan (SPCCP) was prepared for the campus in August 2004 by the consulting firm BT<sup>2</sup>, Inc. of Madison, Wisconsin. The SPCCP was written in order to recommend and implement measures to prevent oil discharge into navigable waters as well as to outline spill response actions. The plan indicates where any oil spill may enter the storm water system. Included in the plan is a summary of where each oil storing container is located on campus, the contents and size of the containers, spill pathways, spill prevention measures, and spill countermeasures. The following presents a summary of sources that may affect the storm system. Refer to the SPCCP, available through campus staff, for more discussion of spill prevention and spill response actions.

In total, the campus has about 18,270 gallons of above-ground oil storage capacity in containers of 55-gallons or more. There is one 9,000-gallon tank and one 300-gallon outdoor above-ground storage tank (AST) both located in the north parking lot of the General Services Building. There is also one 500-gallon AST located southwest of the General Services Building. The tanks contain used oil and fuel for fleet vehicles. A large release from these tanks could flow across the adjacent pavement to a storm drain located in the southern edge of the General Services Building parking lot.

There are four 400-gallon ASTs used to store cooking oil that are located at Esker Hall, University Center, and Drumlin Hall. If a large spill were to occur, a release may flow onto the adjacent pavement and into storm drains. A large spill from two transformers located

northwest of Esker Hall and one transformer located south of the Williams Center may enter storm drains.

Other items discussed in the SPCCP include one above-ground and five underground grease traps located at Drumlin Hall, Esker Hall, and the University Center. However, the traps empty into the sanitary sewer. Spills from indoor oil storage at the General Services Building, Heating and Cooling Plant, and the General Services Fleet Garage drain into the sanitary sewer. There is one 30,000-gallon underground storage tank (UST) located west of the cooling plant, but the UST is exempt from requirements of the SPCC program and is not further discussed in the plan.

#### **4.5 Best Management Practices**

Best management practices, or BMPs, are schedules of activities, prohibitions of practices, maintenance procedures, treatment requirements, operating procedures, and other management practices to decrease runoff, or prevent or reduce the pollution of bodies of water.<sup>1</sup> BMPs are either structural or non-structural. Structural BMPs are physical devices that mitigate or prevent runoff or filter and potentially prevent pollutants from entering runoff. Non-structural BMPs achieve this reduction in runoff and pollutants not through physical structures but through management, education, and outreach programs.

Both the campus and the City of Whitewater apply BMP techniques to the campus property. The City's application is generally limited to the streets, whereas the campus applies BMPs to the campus grounds and associated parking lots.

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<sup>1</sup> EPA terminology Reference System (March 2004). Retrieved January 21, 2005 from <http://www.epa.gov/trs/>.

### ***Structural BMPs***

The campus does have one structural BMP: the University Green functions as a detention basin and is able to store a 25-year storm event. There are no other detention or retention features at the campus.



**Exhibit 4-1 University Green**

### ***Non-Structural BMPs***

The campus uses a combination of non-structural BMPs across the campus grounds, streets, and parking lots. On a daily basis, litter is removed from the campus grounds and any litter observed in ditches is also removed. A private contractor is hired to sweep the parking lots once a year around April 1 – 15. Grass clippings are left on the lawns. The City of Whitewater will sweep the streets four times a year and clean storm sewer inlets once during the spring and once during the autumn. The inlets also have sumps to contain debris before it enters the storm sewer. The City also cleans storm grates and flushes fire hydrants. The campus does not pay sewer fees or maintenance fees to the City. The campus only pays a water consumption usage fee.

### ***Fertilizer/pesticide management***

Fertilizers are applied to flower, shrub, and tree beds twice a year, once during spring and once during autumn. About 1,400 lbs of a 10-10-10 fertilizer and about 1,400 lbs of 9-23-30 fertilizers are used annually. The herbicide Round-Up (manufactured by the Monsanto Company) is used across the campus grounds through a spot application process. No other herbicides and pesticides were applied to grass areas during the year 2004. These areas have applications made to them on a 3-year rotation, but applications were not made during 2004 due to budget priorities.

As previously discussed in Chapter 4.4, the campus has a SPCCP. According to the Facilities Management, there is no animal waste that needs to be disposed. There are no deicer

management plans, hazardous waste management plans, or illicit discharge detection practices in place.

## *CHAPTER FIVE*

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### **PROPOSED/ANTICIPATED CAMPUS DEVELOPMENT**



## Chapter 5 Proposed/Anticipated Campus Development

The following is a summary of proposed/anticipated development plans for the UW-Whitewater campus and their implications on storm water management. The information presented comes from conversations with campus and City employees, the UW-Whitewater 6-Year Physical Development Plan for 2005 – 2011, and the City of Whitewater’s West Whitewater Neighborhood Development Plan.

### 5.1 Six-Year Plan Improvements

The campus has several improvement projects that may occur between the years 2005 and 2013 that could potentially affect storm water management planning. These projects are summarized in Table 5-1.

**Table 5-1 Proposed Campus Development Timetable**

<b>Year</b>	<b>Location</b>	<b>Description</b>
2005 - 2007	Business and Economics Building	Planning & Construction
	University Center Addition	Planning & Construction
2007 - 2009	New Residence Hall	Planning & Construction
2009 - 2011	University Center Addition	Construction

Table 5-2 lists other improvement projects that were discussed in the 6-Year plan but were not given a completion timeline. If these projects were to go forward, their result may also have changes in pervious/impervious areas.

**Table 5-2 Discussed Projects in the Six-Year Plan Without a Timeline**

<b>Location</b>	<b>Description</b>
Baseball Parking Lot	Resurface the lot - 1/2 asphalt & 1/2 gravel

## **5.2 Utility Improvements**

The campus has six utility repair and renovation projects included in the all-agency project requests for 2005 - 2007. They include:

- the west campus steam/condensate replacement,
- constructing a restroom facility at the athletic field with sanitary sewer, water, and electrical services,
- a fiber optic backbone upgrade,
- a wireless local area network,
- emergency generator replacement for the heating plant, and
- a steam and condensate loop connection.

From a storm water management perspective, conflicts arising due to these improvement projects are not anticipated, other than erosion control during construction.

## **5.3 Land Use Changes**

The campus does not plan to change the current land use layout for the campus grounds.

## **5.4 Storm Sewer System Improvements**

The major storm water problems that required immediate attention were resolved during the West Starin Road, West Campus Development, and the Winther-Heide Plaza Development projects completed between 2001 and 2004. Conversations with campus representatives indicate that currently there is one known flooding problem remaining at the campus. (north of Tutt Hall and East Lauderdale Street). Any pending sewer system upgrades will be considered when designs for future building development projects are being completed. Table 5-3 summarizes areas where the storm sewer system needs upgrades, with comments taken from the Six-Year Plan.

**Table 5-3 Impending Storm Sewer Improvements**

<b>Location</b>	<b>Description</b>
1 Case St. Mall	~1,750 feet of concrete sewer is more than 100 years old
2 North of Starin Rd.	Sewers are small, will need to improve with future development
3 Upham Hall	Storm line extending west & connecting to Upham Hall through greenhouse (~350') is a culvert type, looking to replace
4 Wyman Mall	~1,750 feet of concrete sewer is more than 100 years old, have sleeved 300-foot section due south of Starin Rd. in 2001, need to replace or continue sleeve
5 Anderson Library	Original storm sewer expected to fail in some places

**5.5 Offsite Storm Water**

Potential development areas surrounding the campus lie to the northeast, northwest, and west. Given the location, drainage patterns, and limited available design plans, it appears that the developments should not affect the campus’s storm water management. However, a final determination of how the off-campus developments will affect the campus’ storm water should be evaluated when designs are made available for review.

The City is planning to place a senior center northeast of campus. The site is currently undeveloped, and storm water runoff flows east towards North Fremont Road and Whitewater Creek and west to the wetland area northeast of Fryer’s Woods. The City anticipates that storm water from the development will be directed east. However, a final determination of the storm water runoff patterns cannot be made until designs are available for review.

To the northwest of the campus lies a mobile home development. Storm water from the mobile home area flows north and away from the campus. Therefore, if further development were to occur, it should not affect the campus storm water management.

The City’s West Whitewater Neighborhood Development Plan presents recommendations for developing lands west of the campus, and includes zoning, park and open space planning, and transportation planning. The Plan was adopted by the City’s Plan and Architectural

Review Commission in December 2001 and was prepared by the consulting firm Vandewalle and Associates of Madison, Wisconsin. The report proposes adding a new road, named University Avenue, to start near the proposed Highway 12 Bypass and travel east along the Jefferson-Walworth County line. The road would enter the campus near West Schwager Drive and County Highway N. West of the proposed intersection, the report recommends zoning the land for university-orientated mixed residential use. The City currently has not established a timeline to complete these plans. However, the City anticipates that storm water resulting from these developments will flow to the low lying areas west of County Highway N and that future development should not affect flows entering West Starin Road.

### **5.6 Purchase/Acquisitions of Land or Properties**

The campus is planning to purchase three properties that are contiguous to and surrounded by its current location. The properties are located at 164, 344, and 366 North Prairie Street. A recent attempt has been made to acquire the privately owned 164 North Prairie Street property. The campus planned to use the property for parking and green space. However, an agreement for purchase was not established. The Archdiocese of Milwaukee currently owns the 344 North Prairie Street property. The campus does not plan to acquire the property as long as the Archdiocese continues to provide ministry services. The 366 North Prairie Street property is privately owned, and the campus plans to use the property as green space. There is no established schedule for its acquisition.

Storm water originating from the properties is currently directed to the existing storm water conveyance system. Acquisition of the properties in their present form should not affect the management of storm water. However, storm water management of the properties should be re-assessed, if the campus acquires the properties and alters the development such that the impervious area increases.

## *CHAPTER SIX*

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### **ANTICIPATED STORM WATER MANAGEMENT EFFORTS**

## **Chapter 6 Anticipated Storm Water Management Efforts**

This chapter examines and recommends storm water management needs for the campus, based on the interpretations of the codes, regulations and ordinances presented in chapter 2, assessment of existing conditions presented in chapter 3, existing storm water management practices reviewed in chapter 4, and proposed campus development plans presented in chapter 5.

As previously stated, it is anticipated that the campus will be required to obtain a Phase II MS4 permit, and this chapter is based on meeting the NR 216 and NR 151 standards required by this permit. This plan will provide solutions for dealing with the existing problem areas as noted in Chapter 3 and will provide planning options for the proposed campus developments with the new regulations in mind. Given that it is expected that both the campus and the City of Whitewater will need to obtain general WPDES permits for operating MS4s, they may have an opportunity to combine resources to fulfill permit requirements.

### **6.1 Storm Water Action Items to Comply with NR 216**

The WDNR recently adapted a new general permit to cover MS4s under the requirements of subchapter I of ch. NR 216. The campus should expect to receive an NOI to obtain permit coverage. At issue is how educational state facilities are dealt with in the new changes to NR 216. Additionally, NR 216.02 states that a city, village, or town is not responsible for a county, state, and federally operated MS4 that lies within its jurisdiction, meaning that the City of Whitewater WPDES permit will not include the campus's MS4. Table 2-4 contains a summary of NR 216 storm water permits.

Permitted MS4s are required to submit storm sewer system maps and annual reports and to establish the following minimum control measures from NR 216.07:

- Public education and outreach,
- Public involvement and participation,
- Illicit discharge detection and elimination,
- Construction site pollutant control,
- Post-construction site storm water management,
- Pollution prevention

The permit process will require the operator of the MS4 to provide details on how they will incorporate or implement the items mentioned above. The following provides further detail, but is not a complete response for the permit.

### ***Public Education and Outreach***

The intent of this requirement is to increase the public's awareness of the importance of storm water management and the consequences of not implementing new storm water management plans. In the public's education, it is critical to emphasize how activities from the general public can have an effect on storm water quality. Examples include fertilizer application, washing automobiles, and dealing with pet wastes. This requirement can be accomplished in many ways, including, but not limited to, informational websites, articles in the campus newspapers, campus wide e-mails, and posters. Because UW-Whitewater is part of the larger UW system, all of which will likely be required to submit an NOI for permit coverage, it is highly recommended to coordinate the public education and outreach materials and information with other campuses.

### ***Public Involvement and Participation***

The success of program depends in part on the participation of not just the university officials and planners, but also on the public's participation in the program. This effort will need to be sustained and is closely tied with the Public Education and Outreach.

### ***Illicit Discharge Detection and Elimination***

This plan must use a legal measure to prevent any illicit discharges to the sewer system from occurring. The plan should provide a regular testing schedule of the storm sewers to detect any illicit discharges and have procedures in place of how to respond when an illicit discharge has been detected. It is critical to test during dry conditions to determine if there are any unexplained flows in the storm sewer system.

### ***Construction Site Pollutant Control***

If any future construction activity in the campus will disturb one or more acres of land, a NOI should be submitted to WDNR to obtain a construction site storm water WPDES permit in accordance with subchapter III of ch. NR 216. Pollution control elements must comply with

NR 151 standards. Examples of pollution controls include, but are not limited to, erosion and sediment control BMPs. The campus should create a bylaw to enforce these standards using available examples.

### ***Post-construction Site Storm Water Management***

Construction activity that disturbed one or more acres of land must comply with NR 151 in the post construction condition. The campus should create a bylaw to enforce these standards using available examples.

### ***Pollution Prevention***

The storm water management program should implement pollution controls to reduce the discharge of pollutants from the system in compliance with NR 151 regulations. To meet these requirements, the program should incorporate roadway maintenance (regular street sweeping and minimal deicing to remain safe), leaf and grass collection, fertilizer management, and installing BMPs appropriate for the campus. Include in this effort internal operating procedures outlining maintenance scheduling and record keeping of quantities used (e.g. pounds of salt applied, frequency of street sweeping, etc.)

### ***Storm Sewer Map***

A storm sewer map must be submitted that contains in sufficient detail the drainage basins, watersheds, MS4s, municipal boundaries, outfall locations, pipe dimensions, and park and recreation areas. In the discussion on improved water quality results in Chapter 6.2, improved mapping efforts are recommended.

### ***Annual Report***

Finally, an annual report must be submitted to detail the status in meeting the permit requirements.

The items in the NOI to apply for coverage should be measurable. WDNR wants to see metrics for performance. An example of a measurable goal for public education is: reach out to 80% of faculty members during campus informational sessions. An example of a metric for pollution prevention is: reduce the amount of fertilizer applied by 20%.



## 6.2 Storm Water Action Items to Comply with NR 151

As a permitted MS4 the campus will also be required to comply with NR 151, subch III. This subchapter contains the construction site performance standards and the post-construction performance standards. Tables 2-1 through 2-3 summarize the runoff requirements of NR 151. When identified as a permitted municipality, the campus will also be subjected to the standards of NR 151.13 for a developed urban area. This additional set of regulations requires the campus to be in compliance by March 10, 2008. The specifics of the regulations are contained in NR 151.13 and were included in Table 2-2, and summarized in Table 6-1.

**Table 6-1 Additional NR 151 Requirements for Permitted MS4s  
NR 151.13 – Developed Urban Area Performance Standard**

Permitted Municipalities

- Stage 1 requirements:
  - ◆ A public information and education program (NR 151.13 (1)(b)(1))
  - ◆ A municipal program for the collection and management of leaf and grass clippings (NR 151.13 (1)(b)(2))
  - ◆ The application of lawn and garden fertilizers on municipally controlled properties, with pervious surface over 5 acres each (NR 151.13 (1)(b)(3))
  - ◆ Detection and elimination of illicit discharges to storm sewers (NR 151.13 (1)(b)(4))
  - ◆ To the maximum extent practicable, a 20% reduction in total suspended solids in runoff that enters waters of the state as compared to no controls (NR 151.13 (2)(1)(b))
- Stage 2 requirements:
  - ◆ To the maximum extent practicable, a 40% reduction in total suspended solids in runoff that enters waters of the state as compared to no controls (NR 151.13 (2)(1)(b))
  - ◆ BMPs may be located on-site or off-site (NR 151.13 (2)(2)(c))

### **6.3 Recommended Modeling and Associated Data Needed for Modeling**

Further storm water modeling will be required for the design of future development projects. The modeling and calculations completed as part of Chapter 3 of this study were done at the drainage basin scale, which is too large for acquiring the necessary level of detail for individual development projects. In addition, the modeling was completed using baseline information and associated data originating from a variety of sources and software programs. For improved modeling results, more accurate baseline information will be needed. The following paragraphs provide recommendations for modeling and associated data.

#### **6.3.1 Models**

As a part of the existing conditions analysis presented in chapter 3, a hydrologic/hydraulic (H/H) model to assess campus drainage was prepared using NRCS's TR-55 model. TR-55 is a very simple hydrologic model that assesses storm water quantities and is applicable to small, urban watersheds. It is limited in its ability to model complex H/H scenarios existing on the campus. Commercially available software, such as Haestad Method's "PondPack" and similar software using TR-55 methodology, offer tools to model complex H/H systems. In particular, they allow the modeling of conveyance systems, ponds, interconnected ponds, complex outlets, tail water analysis, infiltration rates, and "what-if" scenarios. When BMPs are designed for existing and new facilities, these software programs should be applied. The BMP should be designed to maintain or reduce the peak discharge rate to the maximum extent practicable as compared to pre-development conditions for the 2- through 100-year design storms, per the City of Whitewater storm water management requirements.

A pollutant load model for the campus should be developed to assess the quality of storm water entering the Whitewater Creek outfall and water entering the City's storm sewer system. The NR 151 Total Suspended Solids (TSS) control standard requires, to the maximum extent practicable, a reduction of TSS load by 80% for a new development site, 40% for a redevelopment site, 40% for in-fill development before October 1, 2012 or 80% for in-fill development after October 1, 2012. This is based on an average annual rainfall as compared to no runoff management controls. Pollutant loading models such as SLAMM or P8 (developed by the U.S. Geological Survey and William W. Walker, Jr., respectively) are

approved by WDNR to analyze runoff water quality. The baseline pollutant model should have no runoff controls (ponds, swales, street sweeping, parking lot sweeping, litter control, and other structural or non-structural BMPs that improve runoff water quality). The TSS reduction target should be calculated by applying the BMPs to the baseline pollutant-loading model.

### **6.3.2 Associated Data**

To improve the accuracy of the storm water models, the accuracy of the information used as inputs to the models should be improved. This includes the following:

- Survey of detention and retention ponds and outlet structures to develop stage-storage curves
- Storm sewer system survey providing invert elevations, outfall elevations, inlet locations, manhole locations, catch basin locations, and pipe sizes
- Survey of hydrologic/hydraulic features (culvert locations and size, drainage ditch and dimensions.)
- Update topographic survey

Many of the above data are currently available, but the level of exactness varies across the campus. Some of the data needs to be updated to include recent campus development. The data should then be placed in electronic file format.

As the above surveys are completed and the data entered into the model, the accuracy of model results will increase. As new physical facilities or expansion projects are constructed, the data will help implement the most suitable and cost-effective storm water BMPs. It should also be noted that when the WDNR notifies the campus that they need to submit an NOI as an operator of an MS4, they would need to prepare the above listed surveys. The City of Whitewater would also need to prepare the same material should they be required to submit an NOI.

## **6.4 Best Management Practices (BMPs)**

Recommendation, selection, and implementation of proper BMPs is critical for the campus to comply with ch. NR 216. The campus will need to address its existing storm water quality,

since it discharges to the Whitewater Creek. When determining locations for structural BMPs, it should be noted that it is more efficient and less expensive to control pollution closer to its origin rather than once it has traveled away and dispersed.

The following paragraphs consist of recommendations for BMPs associated with planned campus development. Specific sizing of BMPs is directly related to the volume of runoff (and thus the surface area of development) and the desired water quality goals. The recommendations and costs associated with are based on 2005 dollars.

#### **6.4.1 General BMPs for All Construction Projects**

All construction projects disturbing one or more acres need to implement measures to reduce the sediment load carried off site. The construction site should have controls in place to minimize the amount of sediment exiting from the site. Exhibit 6-1 displays three control measures to accomplish this goal: (a) gravel bags to protect storm sewer inlets, (b) stabilized construction entrance with tracking pads to minimize sediment transport from vehicles entering and exiting the site, and (c) silt fences placed around the construction site.



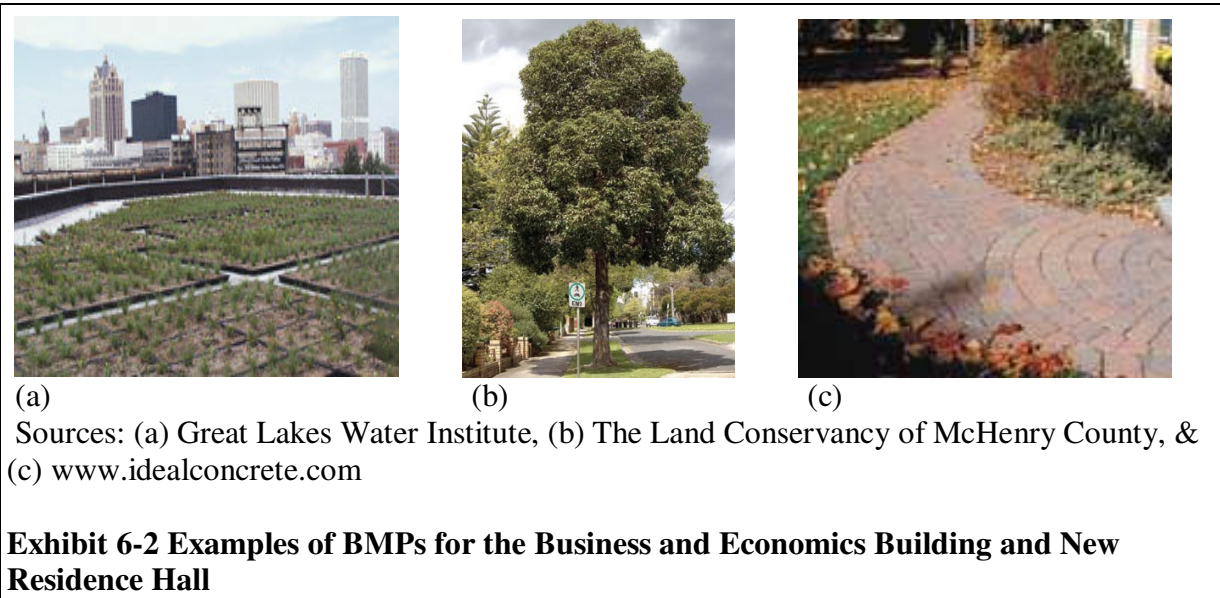
Generally speaking, all construction projects incorporate these three BMPs. Storm water inlets impacted by the project and those inlets within a certain distance from the construction site access points should receive some form of inlet protection. Construction site access points should incorporate a means to limit the sediment transport from construction traffic. Lastly, silt fencing should be placed around the construction site limits.

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#### **6.4.2 BMPs for the Business and Economics Building and New Residence Hall**

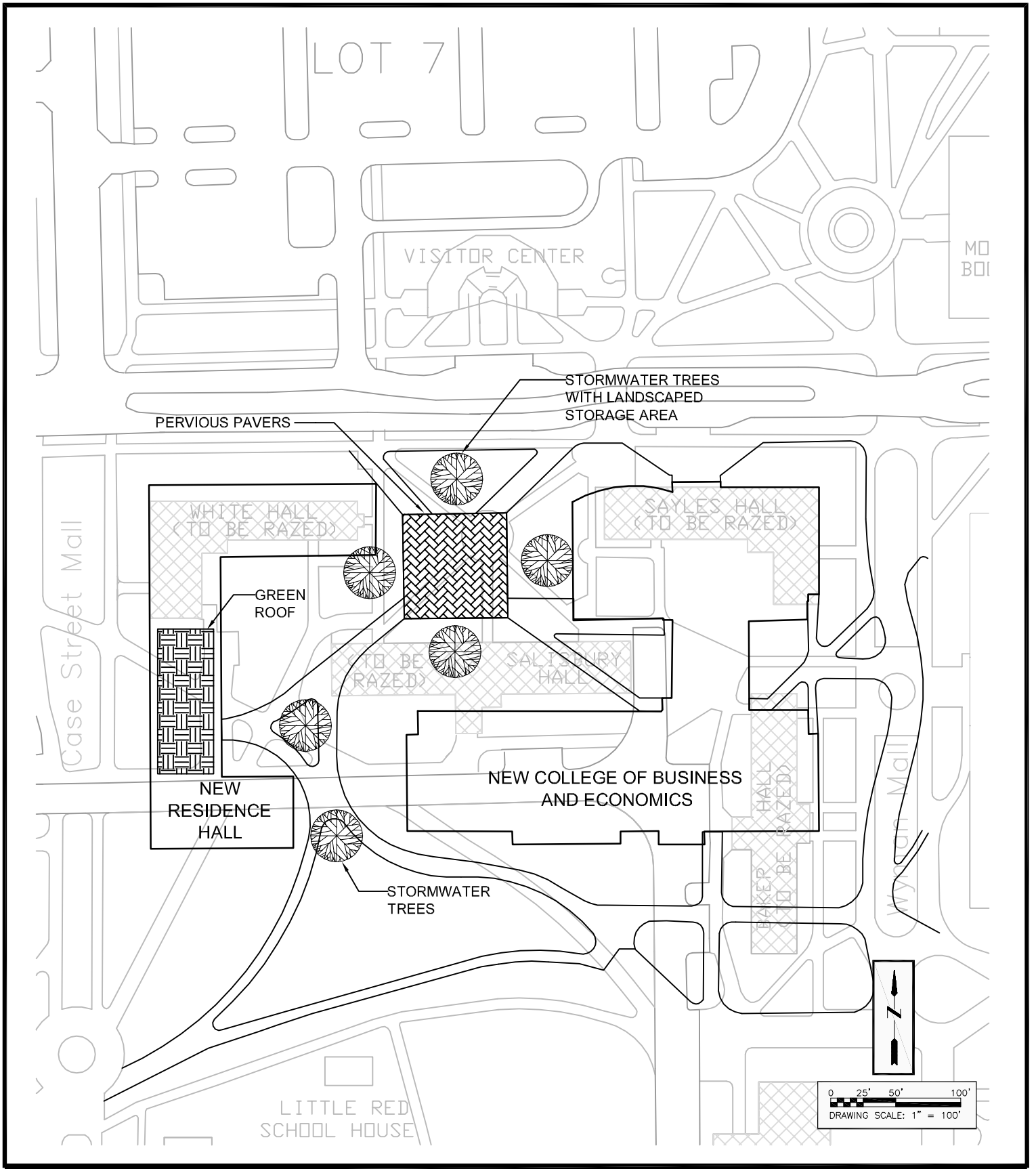
This paragraph represents an example of how the campus can apply BMPs to new structures. BMPs should be incorporated into the planning of the Business and Economics Building and New Residence Hall early on in the design process. Post-construction BMPs must be factored into the redevelopment plans to allot sufficient space. There are numerous BMPs that can be applied; however, not all BMPs are best suited for a particular climate, a soil type, or a location on the premises. For instance, although a rain garden may aide in improving water quality, it may not fair well in poorly drained soils without first improving the soil's drainage capacity. Detailed soil analysis will be required prior to implementing structural BMPs.

There are opportunities to incorporate BMPs in new construction that might not be feasible to do after construction. The campus should consider a green roof for the new residence hall. The green roof will reduce the roof's runoff volume, add aesthetic value, and help to save on energy costs by reducing temperature extremes. The building design must be able to support the roof's weight. Other BMPs are feasible anytime after construction. The campus can also add aesthetic value by placing stormwater trees in the vicinity of impervious surfaces. The stormwater trees reduce runoff by evapotranspiration (evaporation and transpiration). Finally, sidewalks could be made of pavers instead of concrete. Pavers provide a hard surface, but unlike concrete, the spaces between pavers allows for infiltration. Exhibit 6-2 shows construction BMP options for the Business and Economics Building and New Residence Hall: (a) green roof, (b) a stormwater tree, and (c) pavers. Table 6-2 provides an opinion of probable costs and Figure 6-1 displays recommends BMPs for the Business and Economics Building and New Residence Hall.



**Table 6-2 Opinion of Probable Costs – Business and Economics Building and New Residence Hall**

Opinion of Probable Costs – Business and Economics Building and New Residence Hall	
Item	Costs
Erosion Control	\$5,600
Pervious Pavers	\$96,000
Green Roof	\$72,600
Stormwater Trees	\$1,000
<b>Total</b>	<b>\$176,600</b>



UW-Whitwater Recommended Business and Economics Building  
 And New Residence Hall BMPs  
 Storm Water Management Plan  
 University of Wisconsin-Whitwater  
 Whitewater, Wisconsin



Figure 6-1

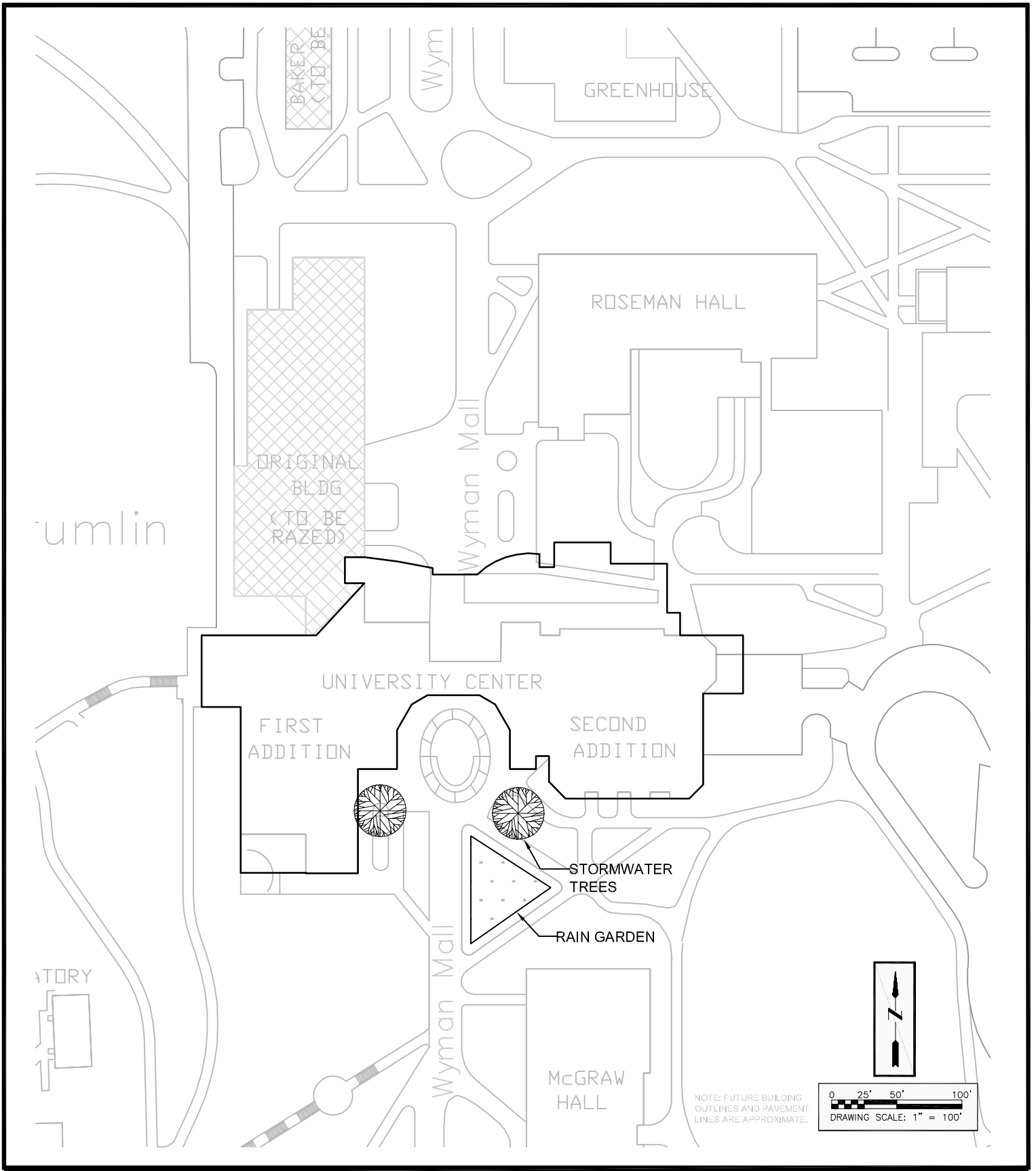
**6.4.3 BMPs for the University Center Addition**

This paragraph represents an example of how the campus can apply BMPs to the University Center Addition. Figure 6-2 shows potential BMPs for the building. A rain garden could be incorporated into a triangular grass area south of the building. Grading alterations may be required to help direct runoff towards the area. Stormwater trees could also be added south of the building. Table 6-3 provides an opinion of probable costs associated with these two BMPs.

**Table 6-3 Opinion of Probable Costs – University Center Addition**

Opinion of Probable Costs – University Center Addition	
Item	Costs
Erosion Control	\$1,500
Rain Garden	\$37,500
Stormwater Trees	\$1,000
<b>Total</b>	<b>\$40,000</b>





UW-Whitewater Recommended University Center Addition BMPs

Storm Water Management Plan  
 University of Wisconsin-Whitewater  
 Whitewater, Wisconsin



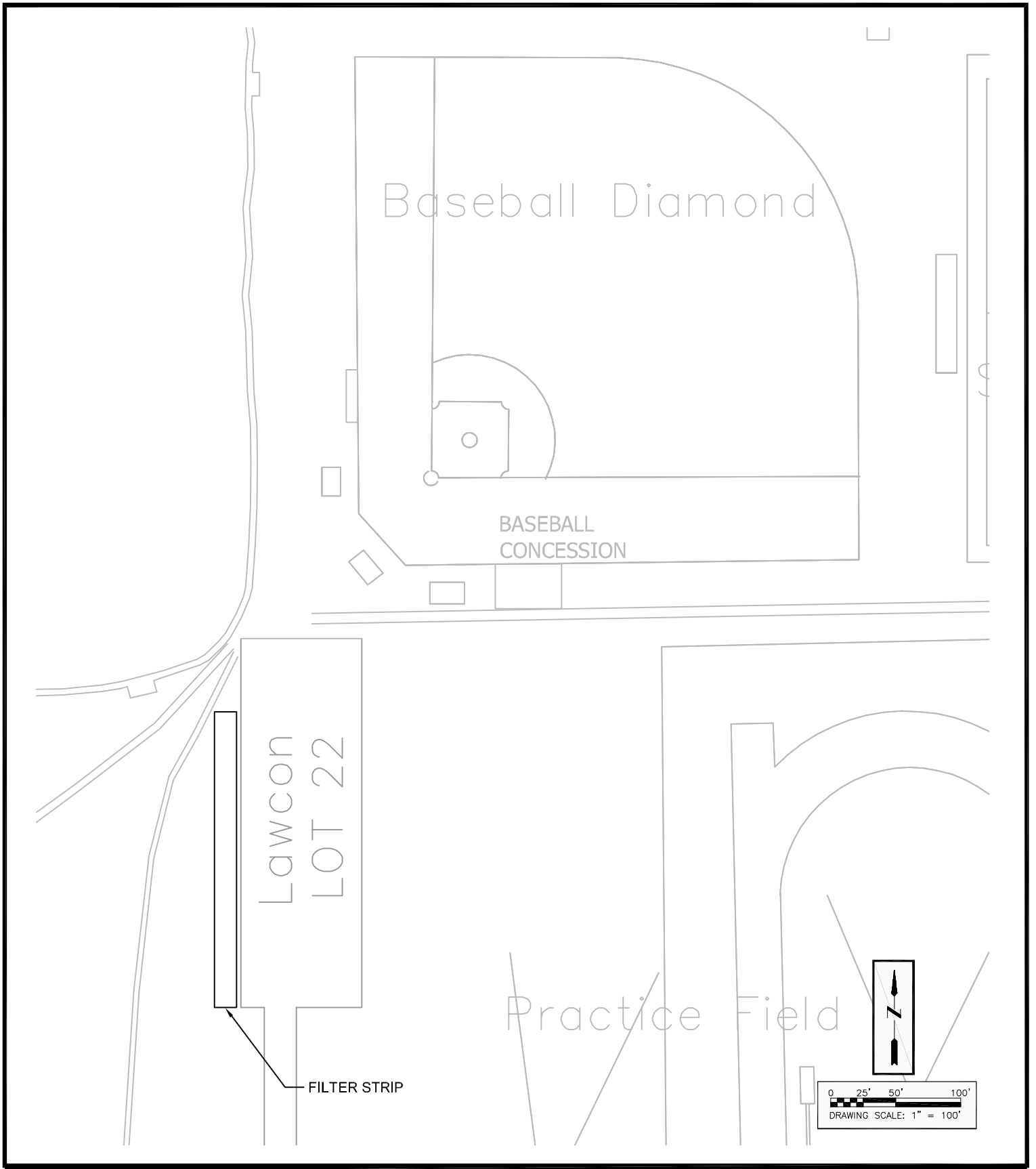
Figure 6-2

**6.4.4 BMPs for the Baseball Parking Lot Repaving Project**

This paragraph represents an example of how the campus can apply BMPs to the baseball parking lot repaving project. A conceptual BMP for this project is to incorporate a filter strip into the design. Runoff would be directed to the filter strip which may require grading alterations. The filter strip is designed to receive runoff as sheet flow, not concentrated flow. Figure 6-3 shows a concept for the Baseball Parking Lot and Table 6-4 provides an opinion of probable costs.

**Table 6-4 Opinion of Probable Costs – Baseball Parking Lot Repaving Project**

Opinion of Probable Costs – Baseball Parking Lot Repaving Project	
Item	Costs
Erosion Control	\$1,000
Filter Strips	\$7,600
<b>Total</b>	<b>\$8,600</b>



UW-Whitewater Recommended Baseball Parking Lot BMPs

Storm Water Management Plan  
 University of Wisconsin-Whitewater  
 Whitewater, Wisconsin



Figure 6-3

**6.4.5 Other Future Developments**

As additional projects are added to the campus planned development list, stormwater BMPs should be considered early on in the design process. The following is a list of recommended structural and non-structural BMPs that the campus could incorporate into their planning efforts to meet storm water goals. These BMPs can provide benefits in terms of improving storm water quality, reducing storm water quantity, and providing educational opportunities.

**Table 6-5 Structural BMPs and Their Associated Benefits**

**Structural BMPs and Their Associated Benefits**

<i>Water Quality</i>	<i>Water Quantity</i>	<i>Infiltration</i>
<ul style="list-style-type: none"> <li>• Detention basin</li> <li>• In-line treatment device</li> <li>• Filter strips</li> <li>• Grass swales</li> <li>• Green roofs</li> <li>• Vegetative buffer</li> <li>• Catch basin</li> </ul>	<ul style="list-style-type: none"> <li>• Detention basin</li> <li>• Wetlands</li> <li>• Rain gardens</li> <li>• Cisterns</li> <li>• Green roofs</li> <li>• Storm water trees</li> </ul>	<ul style="list-style-type: none"> <li>• Infiltration basin</li> <li>• Infiltration trench</li> <li>• Rain gardens</li> <li>• Grass swales</li> <li>• Pervious pavers</li> <li>• Storm water trees</li> <li>• </li> </ul>

**Table 6-6 Non-structural BMPs and Their Application**

**Non-structural BMPs and Their Application**

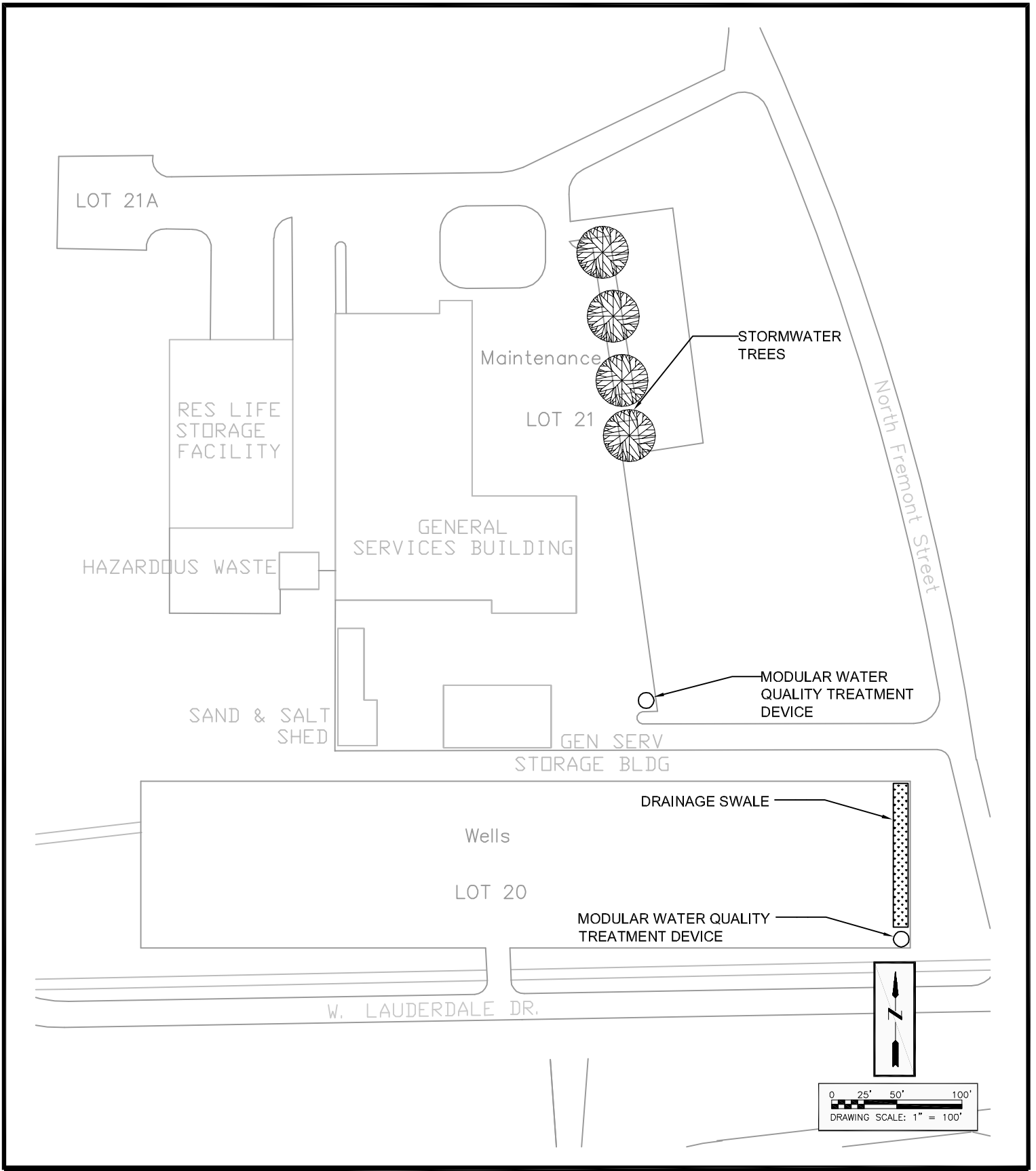
<i>Maintenance Practices</i>	<i>Construction Practices</i>	<i>Landscape Practices</i>
<ul style="list-style-type: none"> <li>• Proper road salt storage</li> <li>• Clean inlets &amp; catch basins</li> <li>• Clean drainage swales &amp; culverts</li> <li>• Routine street &amp; parking lot sweeping</li> </ul>	<ul style="list-style-type: none"> <li>• Minimize soil compaction</li> <li>• Minimize area disturbed</li> <li>• Following construction, quickly plant seed on exposed soil</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid excessive plant watering</li> <li>• Avoid overuse of pesticides</li> <li>• Avoid spread of fertilizer to paved surfaces</li> <li>• Prevent grass clippings &amp; leaves from entering sewers</li> <li>• Plant deep rooted vegetation</li> </ul>

A maintenance plan should be developed that would include guidelines on implementing the practices, the frequency of these practices, and their inspection. It should include tracking quantities (e.g., pounds of fertilizer used, amount of sediment cleaned from inlets, etc.). This helps the campus to see the effectiveness of their efforts.

The process of incorporating BMPs for planned development can also include campus maintenance jobs, such as a parking lot resurfacing. One way to start addressing storm water quality is to focus on areas that add the most pollution to storm water. For the campus, parking lots and roads are the main contributors of pollutants to storm water. The following discussion contains potential structural BMPs that may improve storm water quality for existing campus parking lots. Exhibit 6-3 displays: (a) a swale in a parking lot, and (b) an modular water quality treatment device. Table 6-7 provides an opinion of probable costs for the storm water BMPs. Figure 6-4 shows locations recommended for implementing these structural BMPs. It should be noted that detailed investigations of storm water quality and detailed existing soil conditions should be initiated before any recommendations are implemented.

**Table 6-7 Opinion of Probable Costs – General Services Area and Lot 20**

Opinion of Probable Costs – General Services Area and Lot 20	
Item	Costs
Erosion Control	\$2,400
Drainage Swale	\$1,300
Modular Water Quality Treatment Device	\$20,000
Stormwater Trees	\$2,000
<b>Total</b>	<b>\$25,700</b>



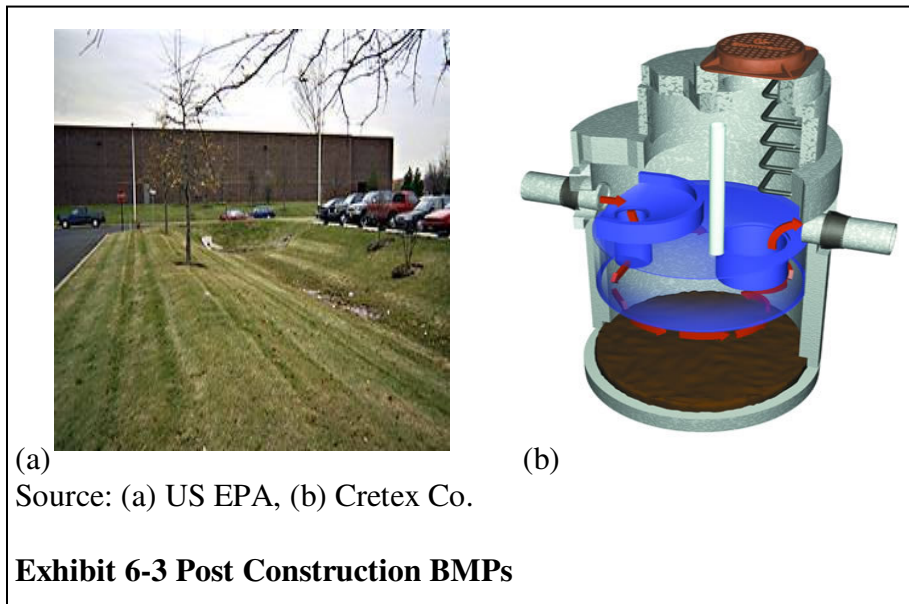
UW-Whitewater Recommended General Services Area and Lot 20 BMPs

Storm Water Management Plan  
 University of Wisconsin-Whitewater  
 Whitewater, Wisconsin



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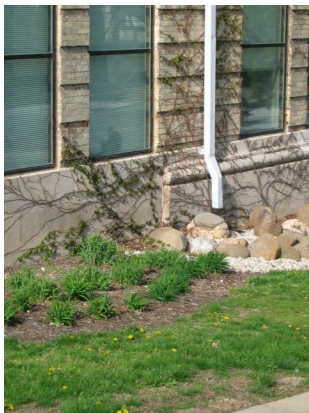
Figure 6-4



**Parking Lot #20** – This lot is located on the northwest corner of the North Fremont Street and West Lauderdale Drive intersection. Storm water quality should be addressed from this lot because runoff from parking lots contains a variety of pollutants (oil, heavy metals, sediments, salt, and debris), and the lot is in close proximity to the outfall at Whitewater Creek. Options to address storm water quality include: (1) add a modular water quality treatment system or a catch basin where the runoff collects on the parking lot, and (2) a drainage swale could be incorporated along with grading alterations to convey runoff to the modular water quality device.

**General Services Area** – This area should be addressed in regards to storm water pollution because of its proximity to the outfall and the amount of pollution sources located in the area, i.e. parking lot, ASTs, and fleet maintenance. As the SPCCP describes, runoff flows to a storm sewer grate located on the southern edge of the lot. One option to best address this location by removing parking lot pollutants and inhibiting spills from entering the storm sewer and eventually the outfall is to add a modular water quality treatment system capable of separating oils from the storm water runoff. Storm water trees could also be added to the area to

This paragraph highlights how the campus could incorporate BMPs for existing buildings. On various buildings, including Hyer Hall, downspouts are present which discharge onto a slightly vegetative surface. This BMP can be improved by discharging into cisterns to use the runoff for other purposes and/or a landscaped rain garden. In addition, the University should either construct additional walkways with pervious pavers or plant vegetation to block ‘shortcuts’ between sidewalks and buildings. These shortcuts are highly compacted stretches of soil caused by pedestrian traffic. Exhibit 6-4 displays: (a) a downspout at Hyer Hall, (b) a cistern, and (c) a rain garden next to an adjacent building.



(a)



(b)



(c)

**Source (b) & (c): Pennsylvania Department of Environmental Protection**

**Exhibit 6-4 Examples of BMPs for Existing Buildings**



UW-Whitewater has the opportunity to expand its BMP efforts in combination with the City and, ultimately, transform these efforts into educational exercises that include the general public. The University could consider hosting the above-recommended BMPs as demonstration projects so that the public may learn of the benefits of storm water BMPs. Demonstration projects allow University staff and students to become directly involved with the implementation of BMPs. Students and faculty may utilize the campus as a laboratory where they can experiment with and witness the effects of storm water BMPs. In addition, implementing these BMPs will aid the campus to be in compliance with state regulations.

### 6.5 Campus Problem Areas

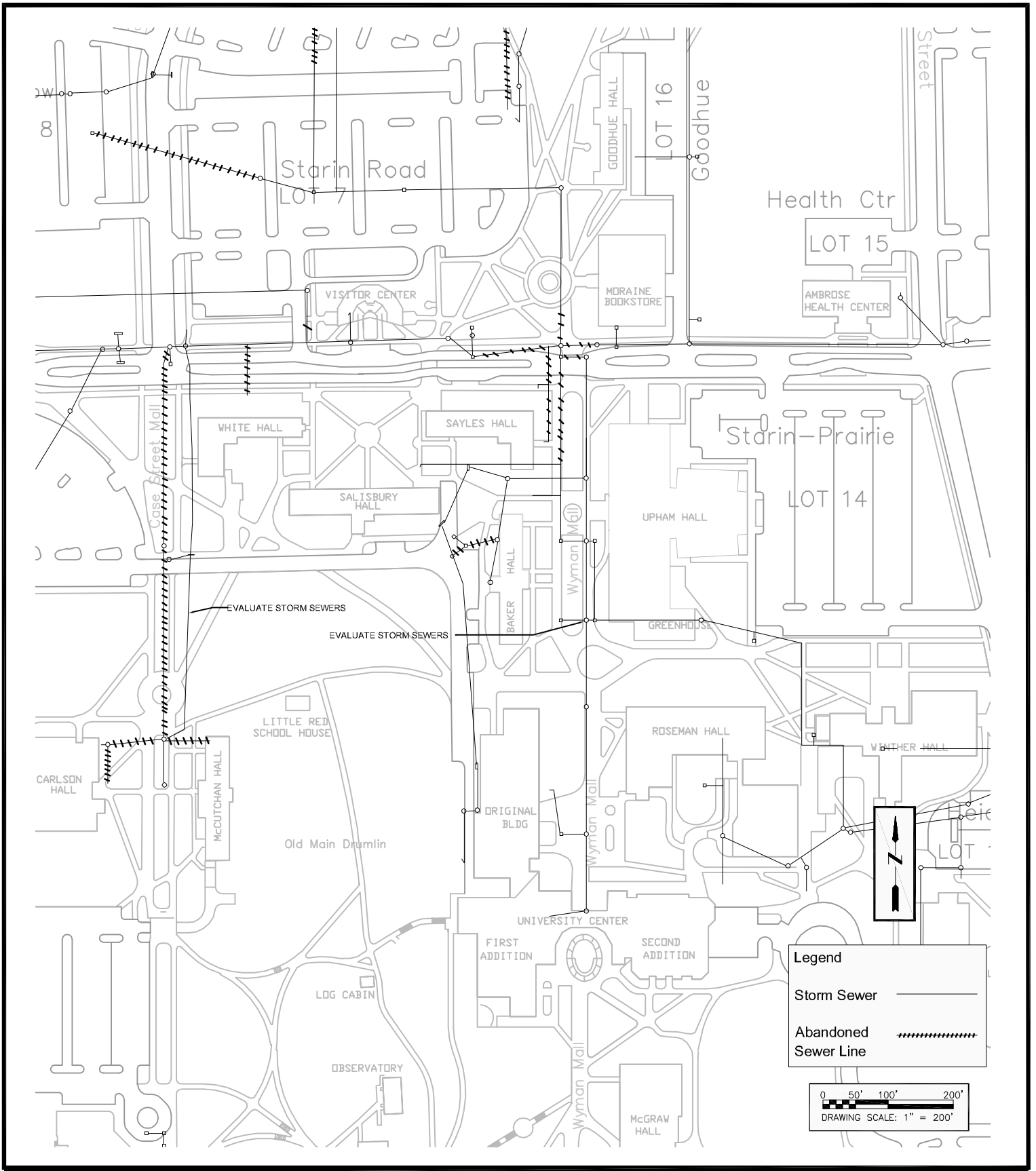
The campus is experiencing several problems related to stormwater. These problem areas are, in several cases, associated with old sewer lines. There are two sections of 1,750-foot concrete sewers below Case Mall and Wyman Mall that are one hundred years old. Sections in these sewers have periodically failed. A 300-foot stretch of the sewer below Wyman Mall south of Starin Road was sleeved in 2001. The storm sewer for Anderson Library is similarly old and is expected to fail in some places. A culvert type storm line extending west and connecting to Upham Hall through the greenhouse is in poor condition. These sewers should be televised to better assess their condition and determine the need and timetable for repair. Figures 6-5 through 6-6 show the locations of the sewers discussed above. Tables 6-8 and 6-9 provide an opinion of probable costs for storm sewer televising and replacement costs.

**Table 6-8 Opinion of Probable Costs – Case and Wyman Malls**

<b>Opinion of Probable Costs – Case and Wyman Malls</b>	
<b>Item</b>	<b>Costs</b>
<b>Sewer Televising</b>	<b>\$2,000</b>
<b>Storm Sewer Replacement</b>	<b>\$175,000</b>
<b>Total</b>	<b>\$177,000</b>

**Table 6-9 Opinion of Probable Costs – Anderson Library**

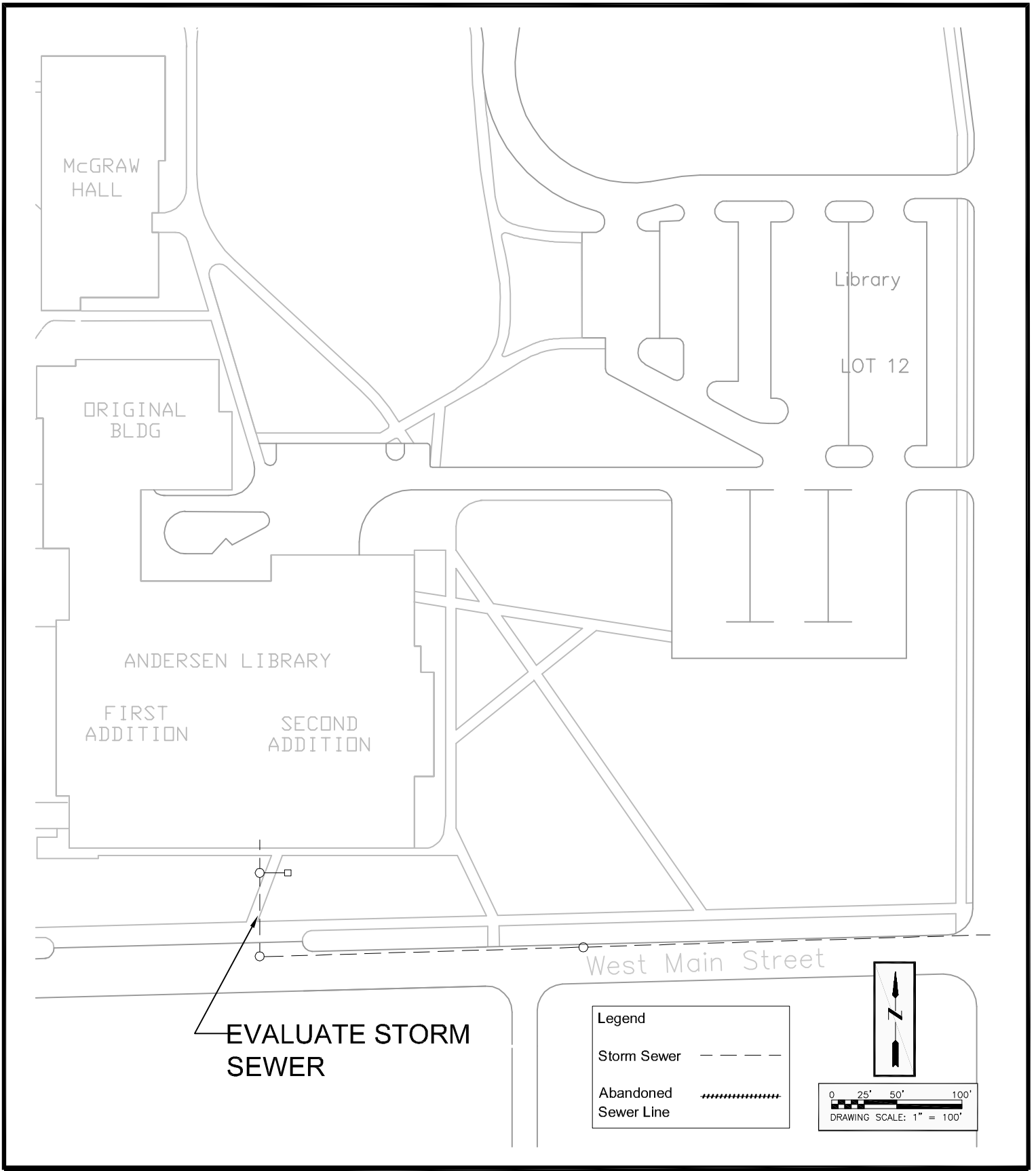
<b>Opinion of Probable Costs – Anderson Library</b>	
<b>Item</b>	<b>Costs</b>
<b>Sewer Televising</b>	<b>\$200</b>
<b>Storm Sewer Replacement</b>	<b>\$12,000</b>
<b>Total</b>	<b>\$12,200</b>



UW-Whitwater Campus Problem Area Recommendations  
 Case and Wyman Malls  
 Storm Water Management Plan  
 University of Wisconsin-Whitwater  
 Whitewater, Wisconsin



Figure 6-5



UW-Whitewater Campus Problem Area Recommendations - Anderson Library

Storm Water Management Plan  
 University of Wisconsin-Whitewater  
 Whitewater, Wisconsin



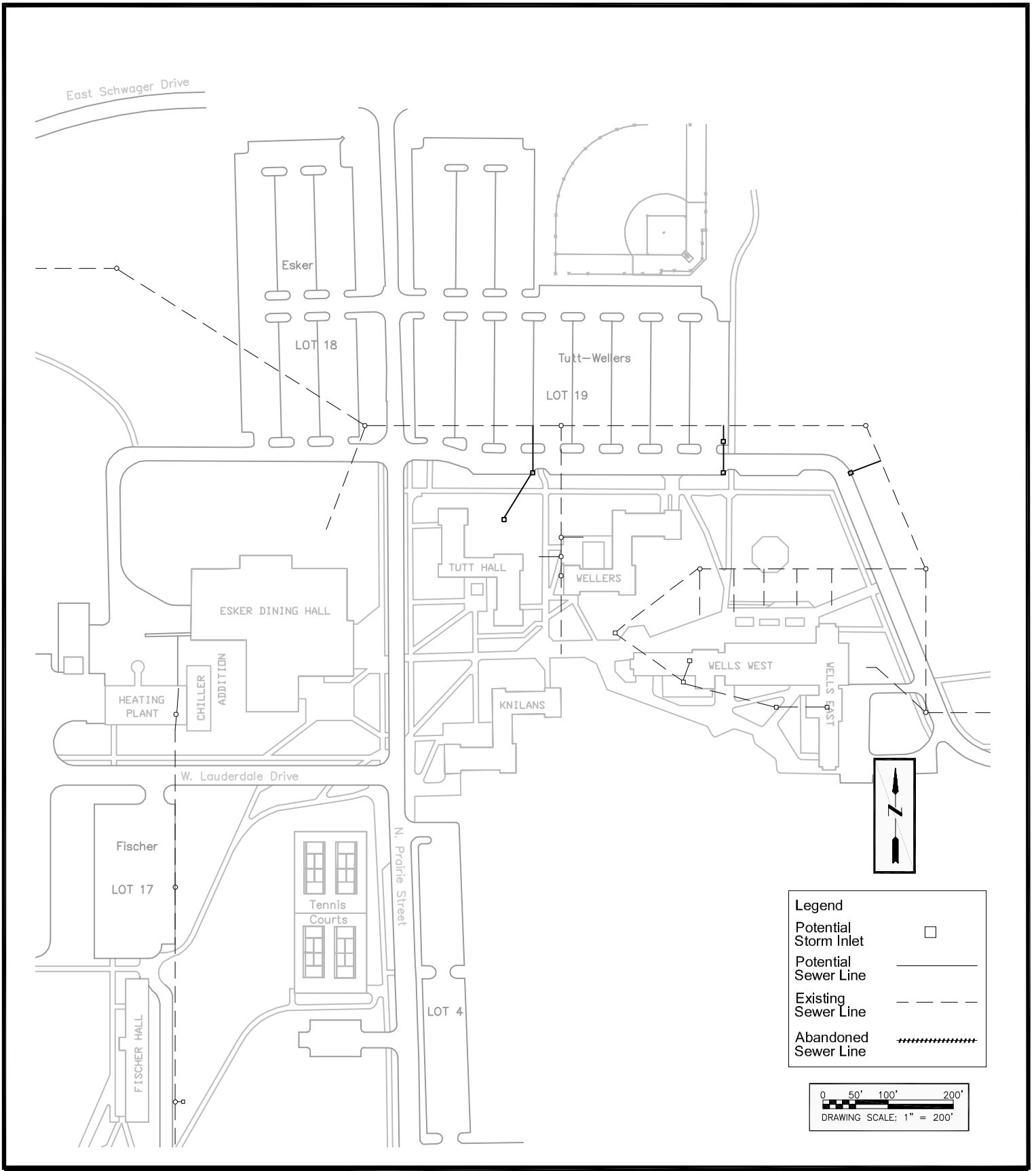
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Figure 6-6

Tutt Hall and East Lauderdale Street (east of Praire Street) have some flooding problems when more than two inches of rain fall. Figure 6-7 provides a conceptual plan to increase the storm water drainage in this area by adding additional storm sewer inlets and connecting to an existing storm water pipe. Table 6-10 provides an opinion of probable costs for this recommendation.

**Table 6-10 Opinion of Probable Costs – Tutt Hall and East Lauderdale Street**

<b>Opinion of Probable Costs – Anderson Library</b>	
<b>Item</b>	<b>Costs</b>
<b>Additional Storm Sewer</b>	<b>\$22,000</b>
<b>Additional Storm Inlets and Catch Basins</b>	<b>\$15,000</b>
<b>Total</b>	<b>\$37,000</b>



## UW-Whitwater Campus Problem Area Recommendations - Tutt Hall

Storm Water Management Plan  
 University of Wisconsin-Whitwater  
 Whitwater, Wisconsin



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Figure 6-7

## **6.6 Associated Budgetary Costs**

The physical development plan does not lay out the location and building footprint of all proposed facilities. Storm water BMP sizing and cost is in direct proportion to the building square footage; hence, it is not possible to give complete cost estimates. In addition, pollutant load modeling should be conducted before determining which structural BMPs recommended in chapter 6.4 would best improve storm water quality in regards to efficiency and economy. Table 6-11 provides unit costs of the recommended structural BMPs and can be used as a guide for factoring construction costs.

Other budgetary considerations include state regulatory fees associated with WPDES permits. The campus may be subject to the fees shown in Table 6-12.

Table 6-13 and 6-14 give cost estimates for compliance with NR 151 and NR 216. Table 6-13 represents costs estimates to comply with the NR 151 performance standards. The data in this table is based on the estimated square footage for planned development. The values are estimates only. The minimum value for the post construction site BMP is a cistern, and the high value is based on a partial green roof. Table 6-14 represents costs associated with implementing the requirements of NR 216 for a MS4. The UW-Whitewater campus cost is an average of the two communities based on size and capabilities.

Table 6-15 provides a summary of costs associated with becoming a permitted municipality and stormwater BMPs associated with planned campus development.

**Table 6-11 Estimated Costs Associated with Recommended BMPs**

<b>BMP</b>	<b>Unit Cost</b>	<b>Benefits</b>	<b>Limitations</b>
Trench Drain	\$10 to \$40/ square foot <sup>1</sup>	<ul style="list-style-type: none"> <li>• Reduces peak discharge and volume</li> <li>• Low maintenance</li> </ul>	<ul style="list-style-type: none"> <li>• Performance issues in low flow and high flow</li> </ul>
Drainage Swale	\$1.00/square foot <sup>2</sup>	<ul style="list-style-type: none"> <li>• TSS, hydrocarbons (oils) removal</li> <li>• Can convey high flows</li> </ul>	<ul style="list-style-type: none"> <li>• May require more right-of-way</li> <li>• Soil infiltration rate should be 0.5 – 5.0 inches per hour</li> </ul>
Detention Basins	\$200,000 for a 10-acre site runoff control <sup>2</sup>	<ul style="list-style-type: none"> <li>• TSS, hydrocarbons (oils), metals removal</li> <li>• Peak discharge and volume control</li> </ul>	<ul style="list-style-type: none"> <li>• Sediment disposal has to be scheduled on a regular basis</li> <li>• Large foot print needed</li> </ul>
Modular Water Quality Treatment System	\$10,000 and greater <sup>2</sup>	<ul style="list-style-type: none"> <li>• TSS, hydrocarbons (oils) removal</li> <li>• Small foot print</li> </ul>	<ul style="list-style-type: none"> <li>• Performance issues in low flow and high flow</li> </ul>
Inlet Filter	\$300/filter <sup>3</sup>	<ul style="list-style-type: none"> <li>• TSS, hydrocarbons (oils) removal</li> </ul>	<ul style="list-style-type: none"> <li>• Require regular maintenance</li> </ul>
Rain Gardens	\$11-\$15/ square foot <sup>3</sup>	<ul style="list-style-type: none"> <li>• Filter runoff pollution</li> <li>• Recharge local groundwater</li> </ul>	<ul style="list-style-type: none"> <li>• Not recommended for areas with steep slopes</li> <li>• They work best in areas with well-drained soils</li> <li>• Ineffective in large storms</li> </ul>

- References:
1. Low-Impact Development Center/[http://www.lid-stormwater.net/bioretention/bio\\_costs.htm](http://www.lid-stormwater.net/bioretention/bio_costs.htm)
  2. U.S. EPA NPDES BMPs/<http://cfpub.epa.gov/npdes/stormwater/menuofbmps/post.cfm>
  3. WDNR Natural Resources Magazine/<http://www.wnrmag.com/supps/2003/feb03/run.htm>



**Table 6-12 Fees Associated with WPDES Permit Coverage**

<b>Permit Type</b>	<b>Fee</b>	<b>Frequency</b>
Subchapter I, ch. NR 216/Phase II MS4	\$500	Annual
Subchapter III, ch. NR 216/Construction Site		
disturb 1 or more and less than 5 acres	\$140	One-time with NOI
disturb 5 or more and less than 25 acres	\$235	One-time with NOI
disturb more than 25 acres	\$350	One-time with NOI

Table 6-13 UW-Whitewater Estimated Cost To Comply With Non-Agricultural Performance Standards (NR 151)

Year of compliance	Performance Standard Category	Total acres disturbed		BMP costs		
<b>NR 151 Category 1. Construction Site</b>						
2006-2007	Erosion Control: a reduction of 80% of the sediment load carried in runoff for sites over 1 acre (Cost for 1 acre = from \$360 to \$1080 )	3.0	ac	\$1,080 - \$3,240		
2008-2012	Erosion Control: a reduction of 80% of the sediment load carried in runoff for sites over 1 acre (Cost for 1 acre = from \$360 to \$1080 )	4.5	ac	\$1,620 - \$4,860		
2013	No new construction					
<b>NR 151 Category 2. Post-construction Site</b>						
2006-2007	Use of BMPs to reduce TSS by 80% post construction	3.0	ac	\$5000* - \$300000**		
2008-2012	Use of BMPs to reduce TSS by 20% post construction as compared to no controls	4.5	ac	\$5000* - \$300000**		
2013	No new construction					
<b>NR 151 Category 3. Developed Urban Area</b>						
		<b>BMP</b>		<b>Unit Costs</b>	<b>Total Costs</b>	<b>Frequency</b>
2006-2007	Use of BMPs to reduce TSS by 20% that enters state controls	Street sweeping:		\$45-143/ac	\$3,870 -	\$12,298
2008 and beyond	Use of BMPs to reduce TSS by 40% that enters state controls	Street sweeping:		\$45-143/ac	\$3,870 -	\$12,298 annually
		Stormceptor Install:		\$6000/unit***		\$12,000 one-time
		Stormceptor Cleaning:		\$640***		\$640 annually
2013	Annual maintenance costs to maintain 40% in TSS	Street sweeping:		\$45-143/ac	\$3,870 -	\$12,298 annually
		Stormceptor Cleaning:		\$640***		\$640 annually

\* Based on a cistern

\*\* Based on a green roof

\*\*\* Requirement for this BMP will be determined by a water quality model.

Note: (1) Cost is determined by the BMP selected. These costs are estimates only. (2) There were no construction footprints available beyond the new business building and new student residence hall

**Table 6-14 UW-Whitewater Associated Costs for Information and Education Performance Standards**

Communities	Community 1*			Community 2**		Average Between Communities 1 and 2***
	Cost (1999)	Adjusted Cost(2005)		Cost (1999)	Adjusted Cost(2005)	Adjusted Cost(2005)
<b>First 5year Permit Period (March 10, 2008 )</b>						
1 - Public Education	\$0.39	<b>\$0.49</b>		\$ 1.24	<b>\$1.56</b>	\$1.02
2 - Public Involvement	\$0.21	<b>\$0.26</b>		\$ 0.62	<b>\$0.78</b>	\$0.52
3 - Illicit Connections	\$0.24	<b>\$0.30</b>		\$ 1.77	<b>\$2.22</b>	\$1.26
4 - Construction Site Pollutant Control	\$0.20	<b>\$0.25</b>		\$ 0.96	<b>\$1.21</b>	\$0.73
5 - Post Construction Site Storm Water Management	\$0.14	<b>\$0.18</b>		\$ 5.78	<b>\$7.26</b>	\$3.72
6 - Housekeeping	\$0.15	<b>\$0.19</b>		\$ 0.59	<b>\$0.74</b>	\$0.46
Totals		<b>\$1.67</b>			<b>\$13.76</b>	<b>\$7.72</b>
Population of Whitewater <sup>29</sup>	11654					
Annual Cost		\$19,466.48			\$160,415.49	<b>\$89,940.99</b>
<b>Total for five years</b>		<b>\$97,332.39</b>			<b>\$802,077.47</b>	<b>\$449,704.93</b>
<b>Subsequent 5-year Permit Periods</b>						
	Cost (1999)	Adjusted Cost(2005)		Cost (1999)	Adjusted Cost(2005)	Adjusted Cost(2005)
1 - Public Education	\$0.36	<b>\$0.45</b>		\$ 1.40	<b>\$1.76</b>	\$1.11
2 - Public Involvement	\$0.24	<b>\$0.30</b>		\$ 0.51	<b>\$0.64</b>	\$0.47
3 - Illicit Connections	\$0.10	<b>\$0.13</b>		\$ 1.16	<b>\$1.46</b>	\$0.79
4 - Construction Site Pollutant Control	\$0.18	<b>\$0.23</b>		\$ 1.10	<b>\$1.38</b>	\$0.80
5 - Post Construction Site Storm Water Management	\$0.13	<b>\$0.16</b>		\$ 1.26	<b>\$1.58</b>	\$0.87
6 - Housekeeping	\$0.10	<b>\$0.13</b>		\$ 0.20	<b>\$0.25</b>	\$0.19
Totals		<b>\$1.39</b>			<b>\$7.07</b>	\$4.23
Population of Whitewater <sup>29</sup>	11654					
Annual Cost		\$16,246.46			\$82,403.21	<b>\$49,324.84</b>
<b>Total for five years</b>		<b>\$81,232.30</b>			<b>\$412,016.07</b>	<b>\$246,624.18</b>

\* Small Community: This community doesn't have an engineering or planning staff; rather, it relies on a city administrator and hired consultants.

\*\*Medium-Sized Community: This community has a staff engineer/facilities management staff, road maintenance staff, and other municipal capabilities and resources. It also has a growing stormwater quantity program and wishes to bring quality together with quantity in a comprehensive and integrated approach. It wants to take advantage of its GIS database and capability.

\*\*\*While Whitewater contains a small population, it's capabilities and resources more closely match that of Community 2.

**References**

- 28. NPDES Phase II Cost Estimates. Retrieved on 4/10/06. [http://www.waterboards.ca.gov/losangeles/html/programs/stormwater/la\\_ms4\\_final/03\\_0113Appendices/Reese.pdf](http://www.waterboards.ca.gov/losangeles/html/programs/stormwater/la_ms4_final/03_0113Appendices/Reese.pdf)
- 29. University of Wisconsin - Whitewater. Retrieved on 4/5/06 <http://www.uww.edu/uwwfacts.html>

**Table 6-15 UW-Whitewater Opinion of Probably Storm Water Management Costs**

Activity	Current Status		2005-2007	2008	Opinion of Probable Annual Costs				
	Planning	Implementation			2009	2010	2011	2012	2013
<b>Public Education/Outreach</b>									
Submit Program	In Report				\$500				
Implementation of Program	In Report	Ongoing			\$12,000	\$12,000	\$12,000	\$12,000	\$12,000
<b>Public Involvement/Participation</b>									
Submit Program	In Report				\$500				
Implementation of Program	In Report	Ongoing			\$6,000	\$6,000	\$6,000	\$6,000	\$6,000
<b>Illicit Discharge Detection Program</b>									
Submit Ordinance	In Report	2008		\$2,000					
Response Procedures	In Report	2008		\$500					
Initial Field Screening	In Report	2008		\$15,000					
Ongoing Field Screening	In Report	Ongoing			\$15,000	\$15,000	\$15,000	\$15,000	\$15,000
<b>Construction Site Erosion Control</b>									
Ordinance/Guidelines	In Report	2008		\$500					
Inspection/Enforcement	In Report	Ongoing		\$8,000	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000
<b>Postconstruction Stormwater Management</b>									
Ordinance/Guidelines	In Report	2008		\$500					
Inspection/Enforcement	In Report	Ongoing		\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000
<b>Pollution Prevention Program</b>									
SWPPP Programs	In Report			\$1,000					
O&M for SWPPP Programs	In Report	Ongoing	\$75,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
<b>Stormwater Quality Management</b>									
Evaluation of Flood Control Structures	In Report	2011							
Assessment of Compliance	In Report	2011				\$7,500	\$7,500	\$7,500	\$7,500
<b>Storm Sewer Map</b>									
Submit Storm Sewer System Map	In Report	2008		\$500					
Storm System Map Upgrades	In Report	2008		\$15,000					
Storm System Map Maintenance	In Report	Annual			\$1,500	\$1,500	\$1,500	\$1,500	\$1,500
<b>Annual Report</b>									
Submittal of NOI	In Report	2008		\$5,000					
Record Keeping	In Report	Annual		\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Prepare Annual Report	In Report	Annual		\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Permit Fee	In Report	Annual		\$500	\$500	\$500	\$500	\$500	\$500
<b>Capital Improvements and Planning</b>									
Stormwater Management at Proposed Buildings:									
University Center Addition		2005~2007	\$40,000						
Business and Economics Building		2007~2009			\$104,600				
New Residence Hall		2007~2009			\$72,000				
Baseball Parking Lot		TBD							
Water Quality Improvements to meet 20% and 40% TSS		TBD					\$30,000		
Water Quantity Modeling and Study for Flooding Locations		TBD					\$30,000		
Improvements for Flooding Locations		TBD							\$226,000
SUM TOTAL			\$155,000	\$92,500	\$264,600	\$94,500	\$154,500	\$94,500	\$320,500

Notes:

1. Capital Improvement costs are opinions based on conceptual building areas from 2006.
2. Greater design details will determine the final opinion of probable costs.
3. Assumes Phase 2 permit issued in 2008.
4. Capital Improvements are based on campus input provided in 2006.
5. Associated costs for non-capital improvements and planning based on NPDES Phase II Cost Estimates. Retrieved on 4/10/06. [http://www.waterboards.ca.gov/losangeles/html/programs/stormwater/la\\_ms4\\_final/03\\_0113Appendices/Reese.pdf](http://www.waterboards.ca.gov/losangeles/html/programs/stormwater/la_ms4_final/03_0113Appendices/Reese.pdf)

## *CHAPTER SEVEN*

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### **CONCLUSIONS AND RECOMMENDATIONS**

## **Chapter 7 Conclusions & Recommendations**

### **7.1 Compliance with Local and State Regulations**

The following summarizes conclusions and recommendations for the campus in order to come into compliance with state and local regulations:

1. Submit a Notice of Intent (NOI) to operate a separate Municipal Separate Storm Sewer System (MS4). See Chapter 6.
2. Implement the following six control measures:
  - public education and outreach,
  - public involvement and participation,
  - illicit discharge detection and elimination,
  - construction site pollutant control,
  - post-construction storm water management, and
  - pollution prevention. See Chapter 6.
3. Continue submitting NOI's for construction projects that will disturb one or more acres of land.
4. Drain cooling tower water and associated flushing water into the sanitary sewer system to come into compliance with state regulations.
5. Remove abandoned chillers or connect them into the sanitary sewer system. The chillers currently drain onto building rooftops, so removing or connecting the chillers to the sanitary sewer system may prevent any future potential storm water damage.
6. Incorporate the City of Whitewater's erosion control and storm water management ordinances during the planning and design phases of future developments so that both parties are designing to the same set of standards.

### **7.2 General Recommendations**

The following summarizes conclusions and recommendations for the campus's existing storm water system and future developments:

1. Major storm water quantity problems for the campus that required immediate attention were resolved during construction projects completed between 2001 and 2004. The Six-Year Physical Development Plan for 2005 – 2011 and campus representatives report flooding problems north of Tutt Hall.
2. The campus has several improvement projects that are to occur between 2005 and 2011 that could potentially affect storm water management planning. When designs for the improvement projects become available, the change in storm water quantity and how it will affect the existing system should be assessed. The City of Whitewater does not expect that their future developments will affect flows entering the campus's storm sewer system.
3. Pollutant load modeling should be completed to assess the quality of storm water entering Whitewater Creek from the campus's storm sewer system. In addition, site-specific modeling should be completed during facility and structural BMP design phases. Surveys of the campus property boundary, topography, storm sewer system, and other hydrologic features should be completed to increase the accuracy of the modeling.
4. Apply structural BMPs to improve storm water quality in accordance with the pollutant modeling results. These include using modular water quality filtration systems, detention basins, trench drains with drainage swales, and/or inlet filters. Continue applying the BMPs already practiced by both the campus and the City. These include sweeping streets and parking lots, cleaning catch basins and storm sewer grates, removing litter, and limiting use of fertilizers and pesticides. Additionally, track the amount of material (e.g. salt, fertilizer, etc.) applied for long-term record keeping and to meet measurable goals as discussed in Chapter 6.

### **7.3 Budgetary Recommendations**

The following summarizes conclusions and recommendations for budgetary considerations.

1. The campus should anticipate submitting a \$500 annual fee for a state permit of a municipal separate storm water sewer system.

2. The campus should anticipate submitting fees ranging from \$140 to \$305 for a state permit to cover construction sites that disturb one or more acres of land.
3. Costs to apply BMPs are dependent on building square footage and the level of benefit needed by implementing a BMP. BMP costs should be determined after facility design and detailed storm water quality and quantity modeling. See Tables 6-13 and 6-14 for estimates.

#### **7.4 Opportunities for Campus Involvement**

The campus contains only one structural BMP, which is the University Green. As the campus implements new structural BMPs, they should incorporate signage to educate passers-by of the function of the BMP. For instance, putting a rain garden in the vicinity of the new residence hall would be a highly visible location to educate the campus. Members of the Department of Biological Sciences could play a role in the plant research for the rain garden, and the Journalism and/or Marketing Departments could design the signage and play a role in the public outreach. During new faculty and student orientation, it is recommended to include a discussion on storm water perhaps incorporated with a campus walking tour.



## *APPENDIX A*

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**WISCONSIN DNR  
FACT SHEET FOR WPDES PROPOSED ISSUANCE OF  
GENERAL PERMIT FOR MUNICIPAL SEPARATE  
STORM SEWER SYSTEMS (MS4S) GENERAL PERMIT  
NO. WI-S0046523-4**

**FACT SHEET**  
**WISCONSIN DEPARTMENT OF NATURAL RESOURCES**  
**PROPOSED ISSUANCE OF GENERAL PERMIT FOR**  
**MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s)**  
**WPDES General Permit No. WI-S0046523-4**  
**October 2004**

**Purpose**

The Wisconsin Department of Natural Resources (the Department) is proposing to issue Wisconsin Pollutant Discharge Elimination System (WPDES) general permit No. WI-S050075-1, for existing and new discharge of storm water to waters of the state from municipal separate storm sewer systems (MS4s) that are regulated under subch. I of ch. NR 216, Wis. Adm. Code. This proposed permit requires the permittee (the owner or operator of the MS4) to develop and implement storm water best management practices (BMPs) to reduce pollutants that are discharged by MS4s to waters of the state. Waters of the state includes surface waters, groundwater and wetlands.

**Background**

In December 1999, the United States Environmental Protection Agency (USEPA) issued final regulations that required National Pollutant Discharge Elimination System (NPDES) permits for storm water discharges associated with small MS4s under 40 CFR part 122.

In 1976, the USEPA delegated the authority for issuing NPDES permits in Wisconsin to the Wisconsin Department of Natural Resources (DNR). The DNR exercises its storm water permitting authority through the Wisconsin Pollutant Discharge Elimination System (WPDES), authorized under ch. NR 216, Wis. Adm. Code and ch. 283, Wis. Stats. Except within Indian Country, storm water permits issued by the DNR are also recognized as federal permits.

DNR has the authority to issue two types of WPDES permits: 1) individual permits and 2) general permits. Individual permits can be tailored to include site-specific requirements that are applicable to an individual discharge situation. General permits can be just as restrictive as individual permits, however, the general permit is written to cover a broad classes of dischargers where environmental protection can be achieved through a set of general provisions that apply to all dischargers in a particular category.

**Applicability**

The new federal regulations require that about 240 Wisconsin municipalities including cities, villages, town and counties obtain storm water discharge permit coverage. There are also other storm sewer systems that are classified as MS4s (e.g. certain universities, correctional facilities, national defense facilities) which may require permit coverage. As of September 2004, about 60 MS4s are regulated under individual permits. Therefore, 180+ MS4s still require permit coverage and the DNR expects that most of them will be regulated under this general MS4 permit. The advantages of using this general permit as opposed to individual permits include:

- More efficient to issue a general permit to cover many MS4 rather than issuing many individual permits.
- Once the general permit is issued it will take only a matter of a few months to grant permit coverage as opposed to several years to develop individual permits.
- A general permit will result in a consistent set of requirements applicable to MS4 operators allowing them the opportunity to work together collectively to achieve common

goals/requirements.

The DNR retains the authority to revoke general permit coverage and issue an individual permit to MS4 operators where the general permit does not provide appropriate water quality protection of the receiving water.

### **Overview of Permit Conditions**

This proposed permit includes the conditions required by s. NR 216.07, Wis. Adm. Code, which consists of the following six categories:

- Public Education and Outreach
- Public Involvement and Participation
- Illicit Discharge Detection and Elimination
- Construction Site Pollutant Control
- Post-Construction Storm Water Management
- Pollution Prevention

This proposed permit will apply to city-owned MS4s that serve populations near 100,000 down to small towns with populations near 1000. This permit follows federal and state requirements that provide significant flexibility for a municipality to evaluate its MS4 system to help determine what type of programs are appropriate to meet the permit's requirements. This permit allows the permittees to comply with the permit requirements either individually or in collective arrangement with other municipalities. Each permittee is responsible for meeting all the applicable requirements for its own MS4. However, permittees may find that collectively pooling their resources will be a more efficient and cost-effective to comply with certain requirements. Here are a few examples:

- If a county is implementing erosion control and storm water management ordinances meeting DNR standards within a town, the town would not need to have its own ordinance.
- Public education programs, storm sewer system mapping and inspections might be financed jointly by multiple permittees.
- Storm water treatment systems might be financed collectively if the systems provide benefit to multiple permittees.

This proposed permit requires that a summary of the proposed program and measurable goals be submitted to DNR for review. Reporting summarizing progress in meeting the permit requirements is required annually. The DNR will have six months to review the proposed programs before the programs are to be implemented.

All of the six categories must be addressed by a program that is developed and implemented with measures of compliance in accordance with the permit's compliance schedule. For non-traditional MS4 permittees, such as a university or correctional facility, it may be that a certain permit requirement may not be applicable or is already addressed. The permittee will need to justify why a permit requirement is not applicable or already addressed.

This proposed permit also requires that the provisions of s. NR 151.13, Wis. Adm. Code, be achieved to the maximum extent practicable, which includes meeting a 20% reduction in the mass of total suspended solids (TSS) discharged to surface waters including wetlands from developed areas by March 10, 2008. Credit is given toward any existing TSS control that may already be in place. The TSS performance standard is raised to a 40% reduction by March 10, 2013.

**Authorized Local Program**

This proposed permit requires the permittee to adopt and implement erosion control and storm water management ordinances. However, landowners of construction sites with one acre or more of land disturbance within a permitted MS4's jurisdiction are still required to apply for construction site permit coverage from the DNR unless the municipality becomes an authorized local program (ALP) pursuant to s. NR 216.415, Wis. Adm. Code. Becoming an ALP is voluntary and is discussed in a separate DNR fact sheet.

**Additional Information**

The following web site links have information that may assist in development of programs to comply with this permit:

DNR Storm Water Homepage:

<http://dnr.wi.gov/org/water/wm/nps/stormwater.htm>

EPA Program for Regulated Small MS4s:

<http://cfpub1.epa.gov/npdes/stormwater/phase2.cfm>

DNR erosion control and storm water management model ordinance of NR 152:

<http://dnr.wi.gov/org/water/wm/nps/admrules.htm#nr152>

EPA Illicit Discharge Model Ordinance:

<http://www.epa.gov/owow/nps/ordinance/mol5.htm>

EPA National Menu of BMPs for Stormwater Phase II:

<http://cfpub1.epa.gov/npdes/stormwater/menuofbmps/menu.cfm>

**Public Notice and Public Informational Hearings**

A 30-day public comment period and public informational hearings will be held on this proposed permit. A separate Hearing Notice describes the public comment period and the locations, times and dates of informational hearings.

**For Further Information**

Contact Eric Rortvedt, Storm Water Program Coordinator, Bureau of Watershed Management at: Wisconsin DNR, Storm Water Program – WT/2, P.O. Box 7921, Madison, WI 53709-7921 or at (608) 264-6273.

***APPENDIX B***

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**CITY OF WHITEWATER MUNICIPAL CODES**

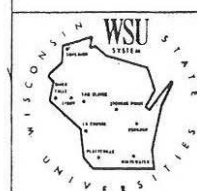
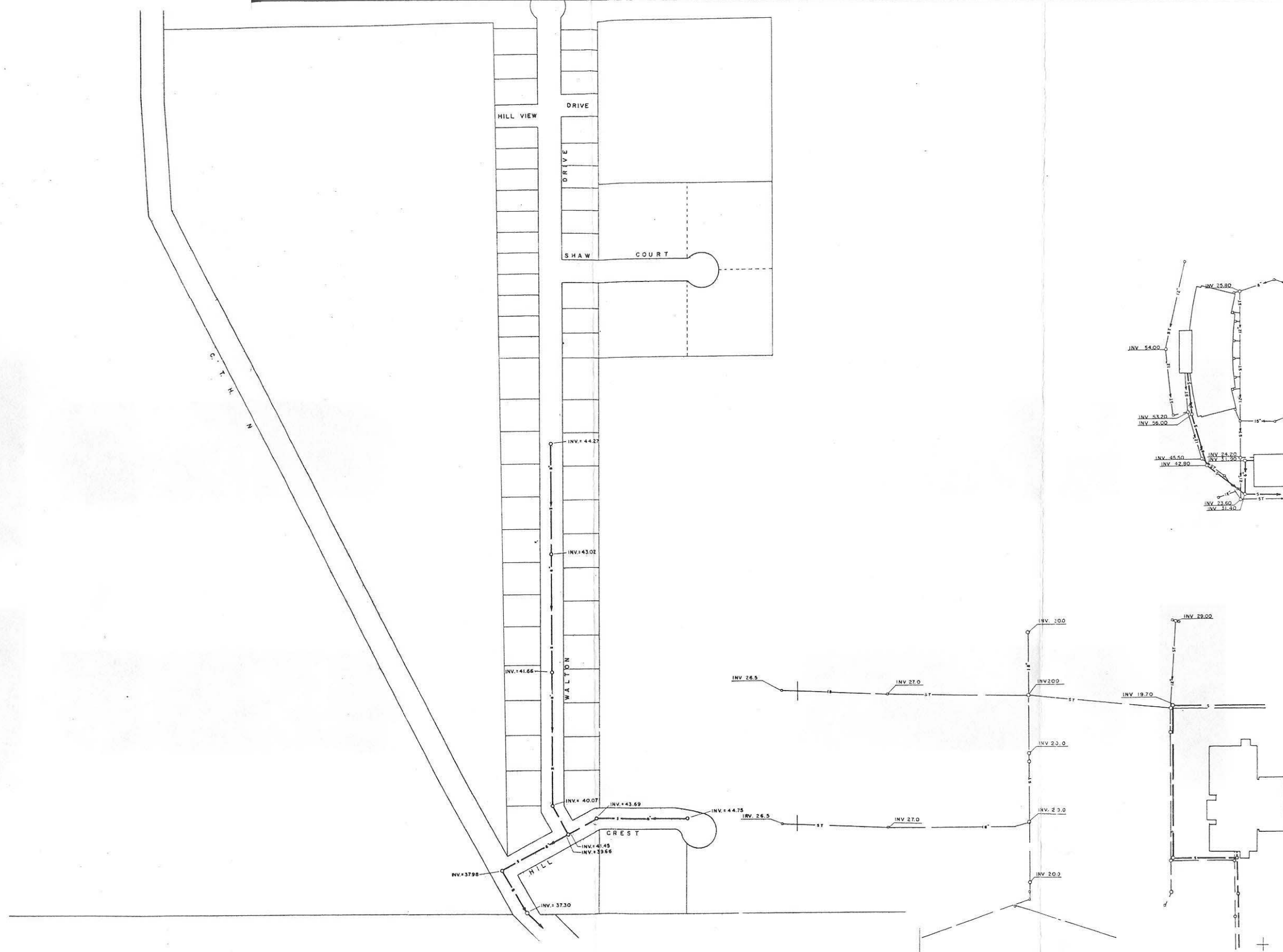
The following website link can be used to access City of Whitewater Municipal Codes. Chapter 16.16 is the code for Post-construction runoff and Chapter 16.18 is the code for Construction site erosion.

<http://municipalcodes.lexisnexis.com/codes/whitewater/>

*APPENDIX C*

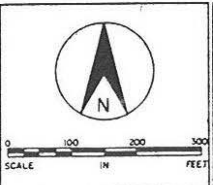
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**STORM WATER SEWER MAPS**



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GREEN Eng. Co.	5-19-64

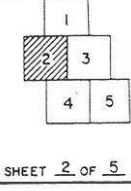


**BOARD OF REGENTS OF STATE UNIVERSITIES**

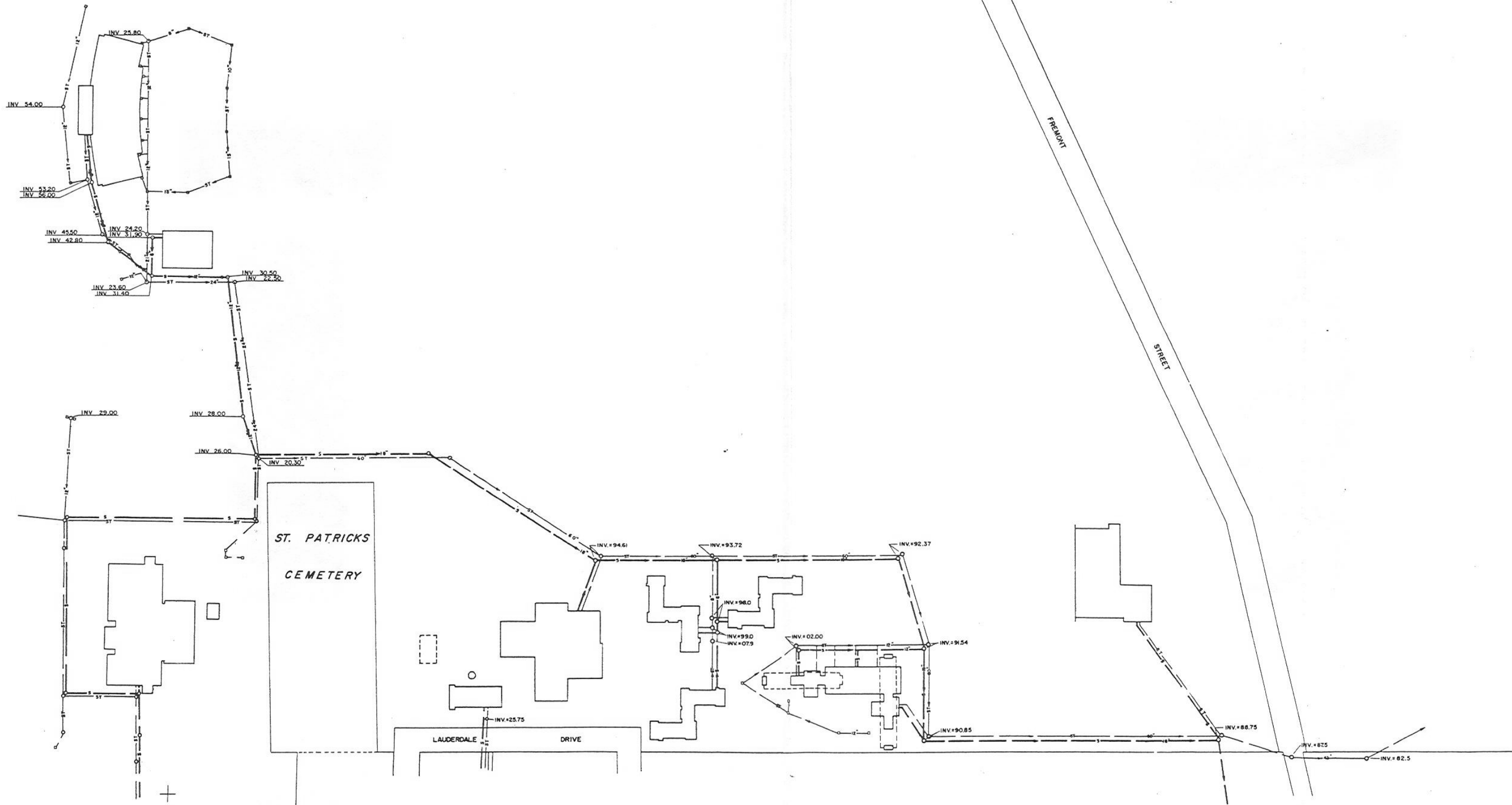
**WISCONSIN STATE UNIVERSITY WHITEWATER**

**SANITARY & STORM SEWER**

<b>LEGEND</b>	—ST— STORM SEWER	□ LIFT STATION
- - - - - SANITARY SEWER	○ INLET	
- - - - - FORCED MAIN	○ MANHOLE	

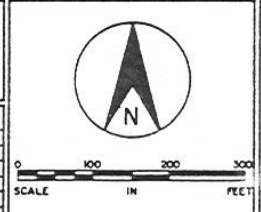






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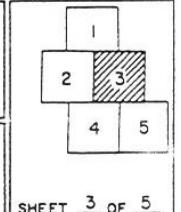


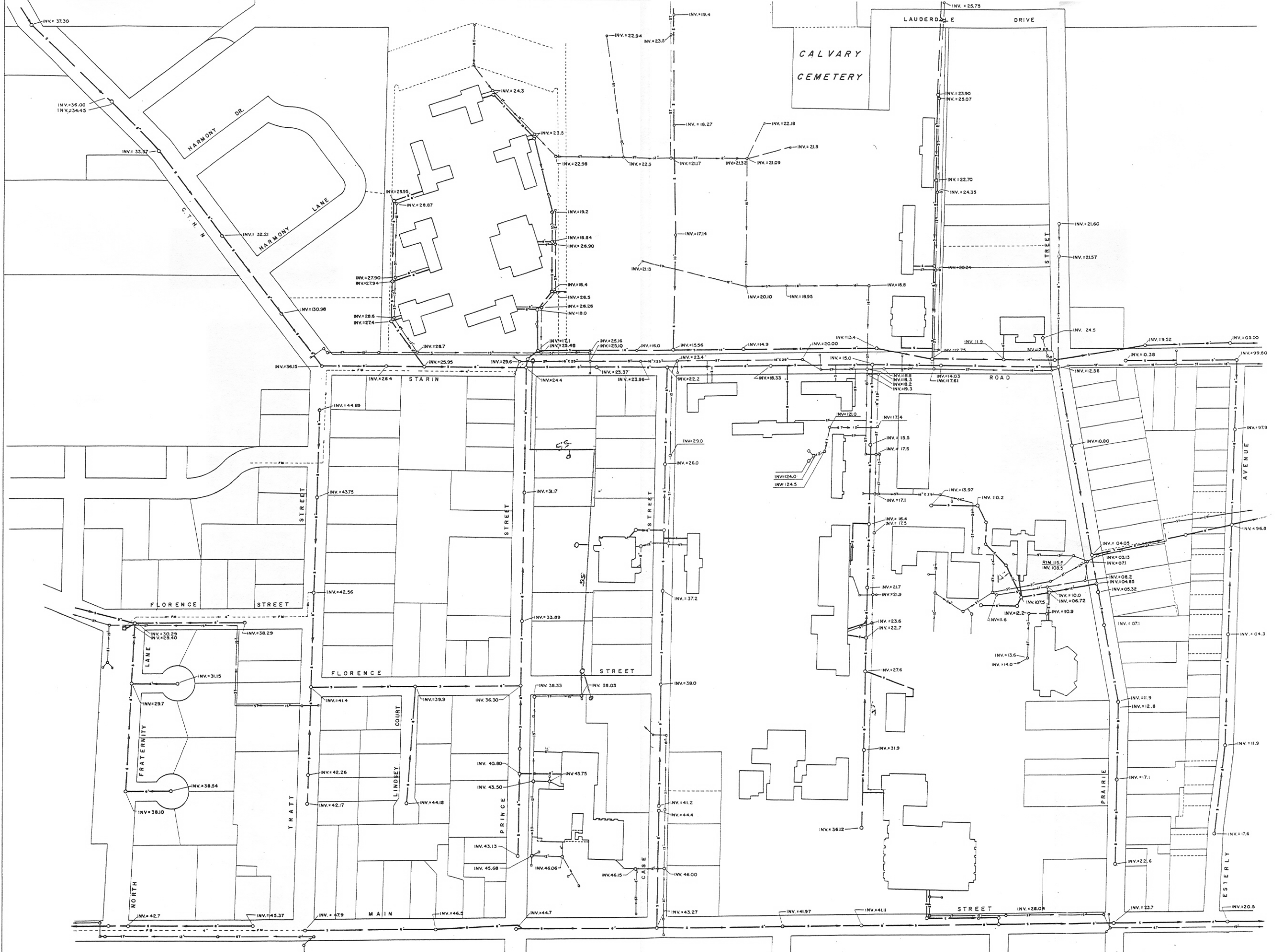
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**WISCONSIN STATE UNIVERSITY WHITEWATER**

LEGEND	
	STORM SEWER
	SANITARY SEWER
	FORCED MAIN
	INLET
	MANHOLE
	LIFT STATION

**SANITARY & STORM SEWER**





GREEN ENGINEERING COMPANY INC.  
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Middleton, Wisconsin



BOARD  
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WHITEWATER  
SANITARY & STORM SEWER

CITY OF WHITEWATER  
STORM SEWER  
&  
DRAINAGE  
SYSTEM MAP



1" = 400'

W.L.L. DECEMBER 2005

FRYERS

WOODS

UNIVERSITY OF WISCONSIN

STADIUM DR

FRONT ST

STADIUM DR.

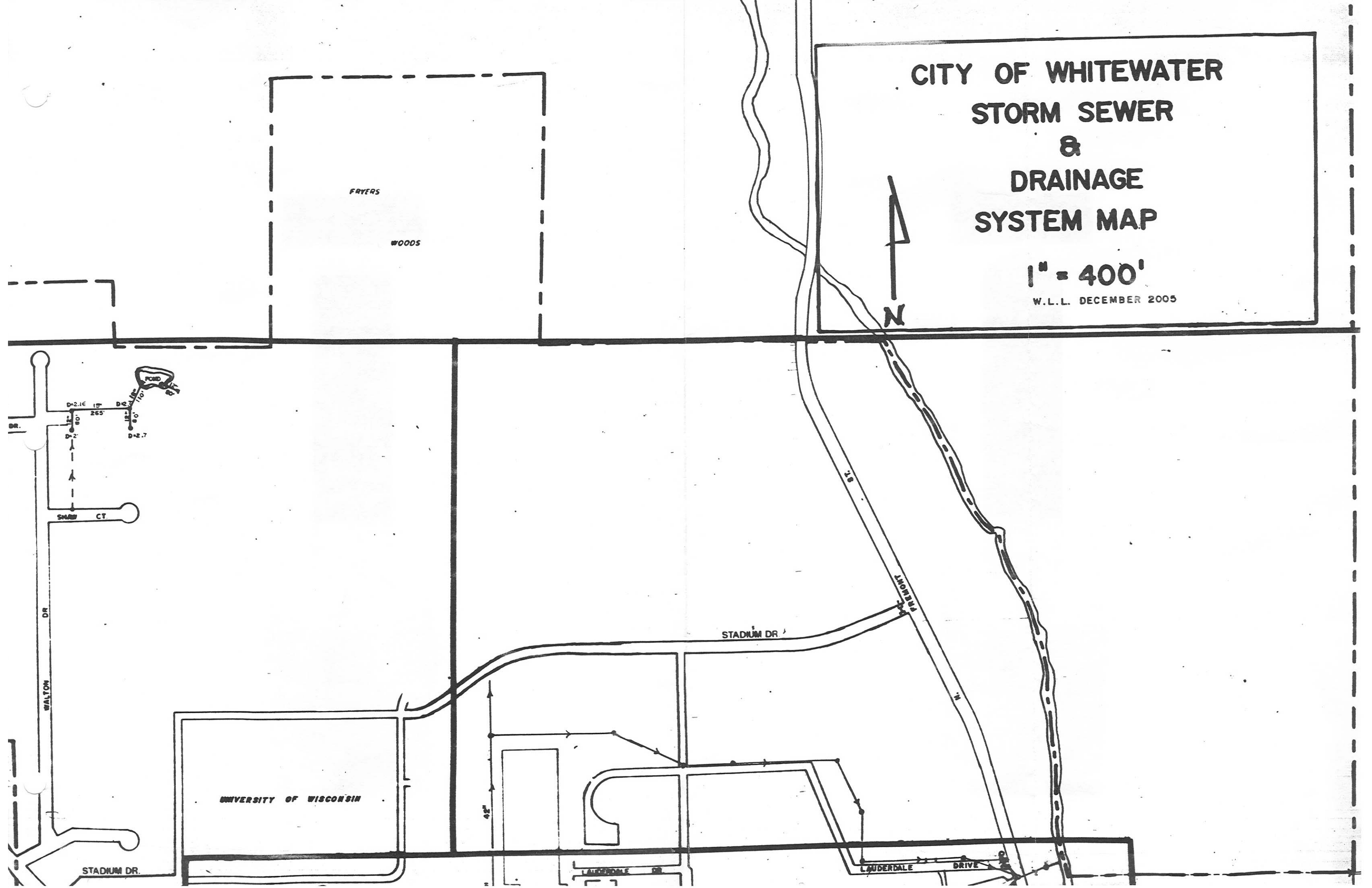
LAUDERDALE DR

LAUDERDALE DRIVE

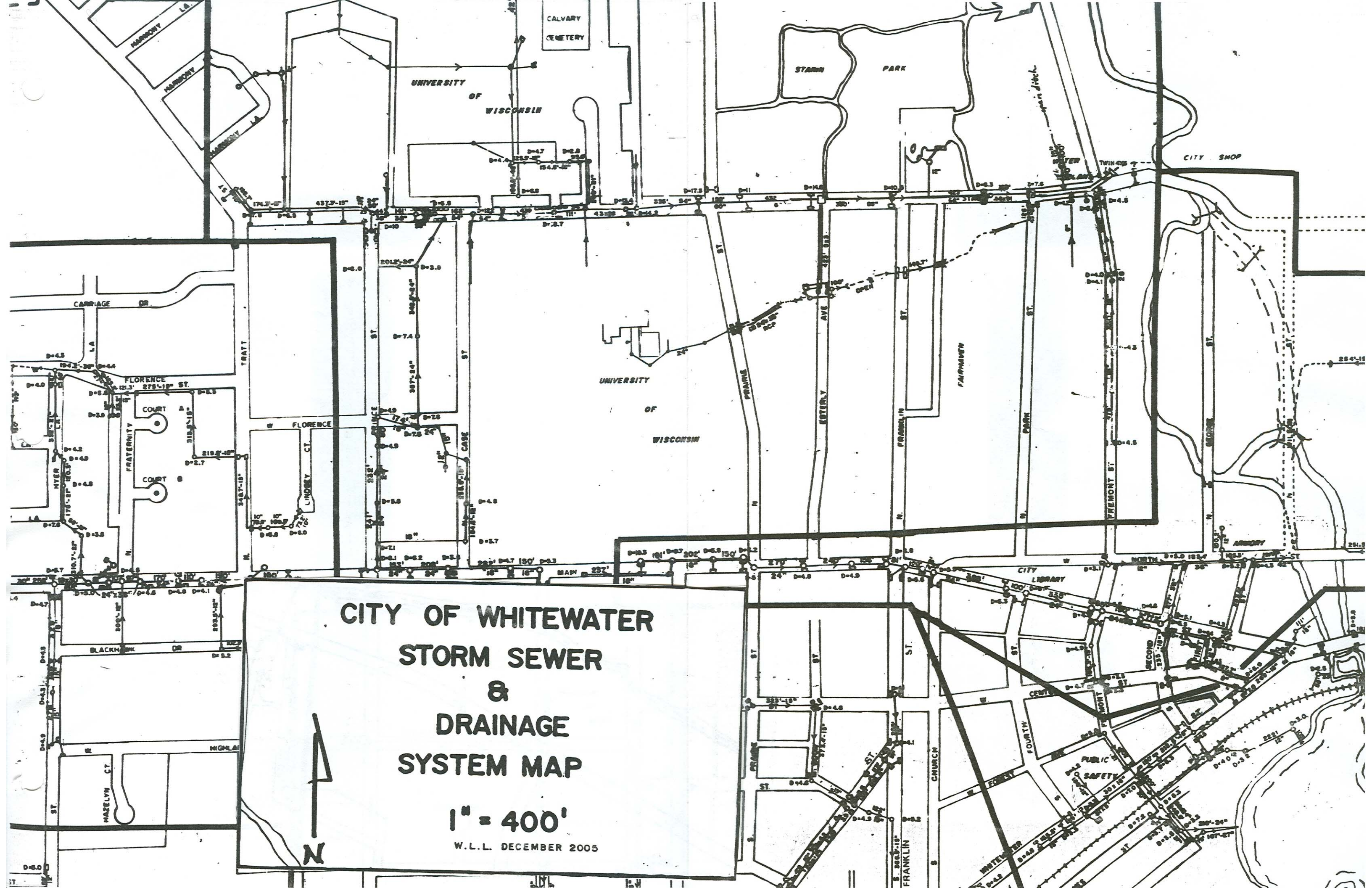
WALTON DR

D=2.16 15'  
D=2 265'  
D=2.7

SHAW CT







**CITY OF WHITEWATER  
STORM SEWER  
&  
DRAINAGE  
SYSTEM MAP**



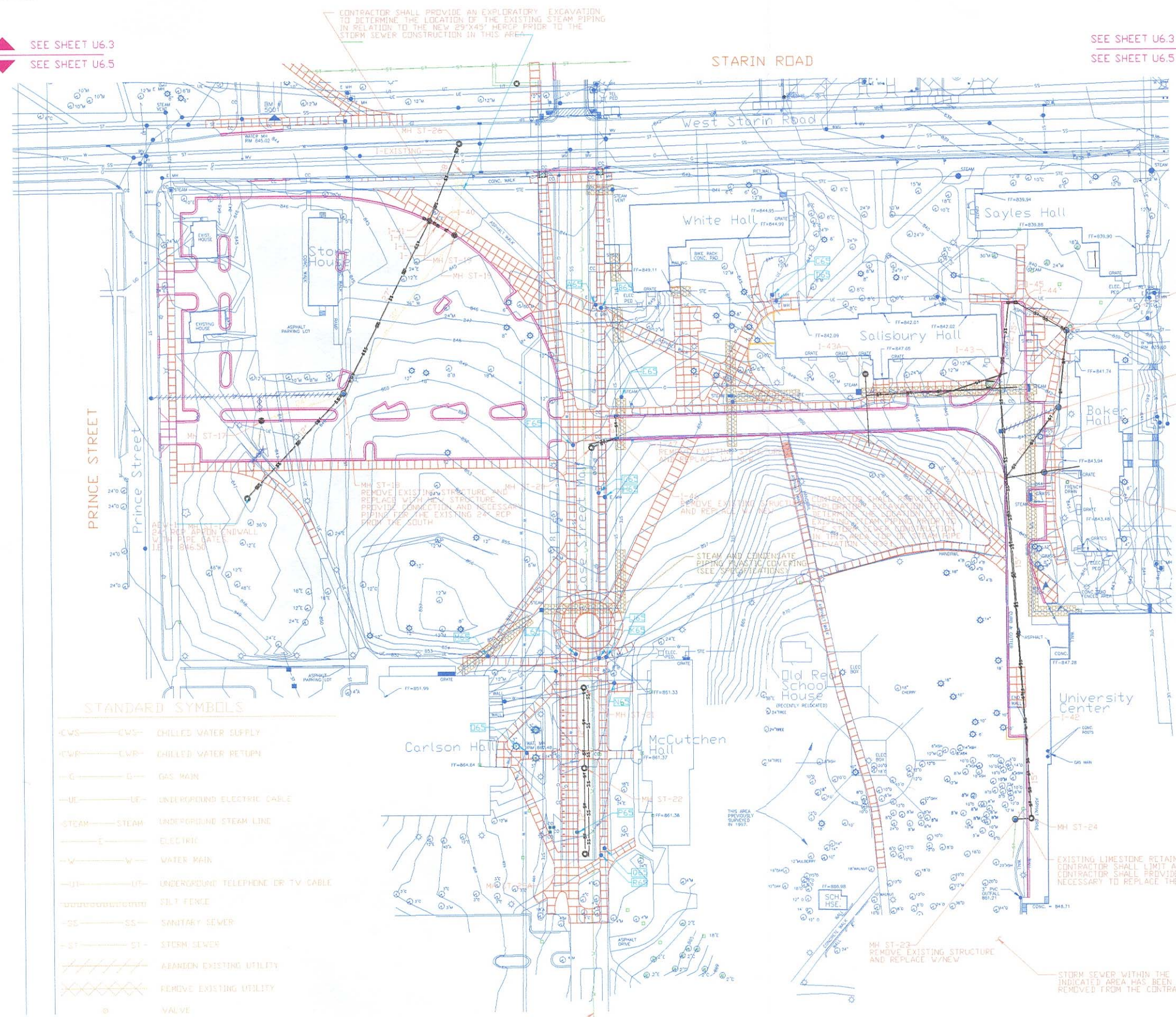
**1" = 400'**

W.L.L. DECEMBER 2005



SEE SHEET U6.3  
SEE SHEET U6.5

SEE SHEET U6.3  
SEE SHEET U6.5



**STANDARD SYMBOLS**

CWS	CWS	CHILLED WATER SUPPLY
CWR	CWR	CHILLED WATER RETURN
G	G	GAS MAIN
UE	UE	UNDERGROUND ELECTRIC CABLE
STEAM	STEAM	UNDERGROUND STEAM LINE
E	E	ELECTRIC
W	W	WATER MAIN
UT	UT	UNDERGROUND TELEPHONE OR TV CABLE
-----	-----	SILT FENCE
SS	SS	SANITARY SEWER
ST	ST	STORM SEWER
-----	-----	ABANDON EXISTING UTILITY
-----	-----	REMOVE EXISTING UTILITY
○		VALVE
●		MANHOLE
□		INLET
⊕		FIRE HYDRANT
-----	-----	PLASTIC COVERING

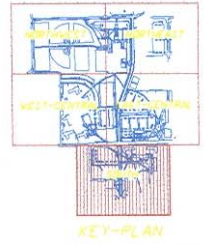
8" WATER MAIN TO BE CONSTRUCTED BY THE CITY OF WHITEWATER IN THE SPRING OF 2000

SEE SHEET NO. U6.6 FOR STORM SEWER TABLE AND STRUCTURE ADJUSTMENT TABLE

**KEN SAIKI DESIGN**  
303 S. PATERSON  
SUITE 1  
MADISON, WI 53703  
PHONE: 608 251-3600  
FAX: 608 251-2330

**Consultants:**  
  
**STRAND ASSOCIATES, INC. ENGINEERS**  
910 WEST WINGRA DRIVE  
MADISON, WISCONSIN 53715  
(608) 251-4843

**Notes:**  
WHERE ANY UTILITY WHICH SHOULD BE ABANDONED CONFLICTS WITH THE WORK, THE CONTRACTOR SHALL REMOVE THE NECESSARY PORTION OF THE UTILITY.  
MANHOLES TO BE ABANDONED SHALL HAVE THE CASTINGS AND TOP SECTION REMOVED, AND THE LOWER PORTION OF THE MANHOLE PERFORATED AND BACKFILLED WITH APPROVED MATERIAL.



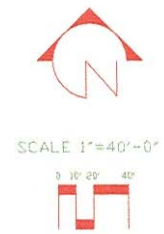
THE LOCATION OF EXISTING UTILITY INSTALLATIONS AS SHOWN ON THE PLAN ARE APPROXIMATE. THERE MAY BE OTHER UTILITY INSTALLATIONS WITHIN THE PROJECT AREA THAT ARE NOT SHOWN.  
  
CALL DIGGERS HOTLINE  
1-800-842-8511  
TOLL FREE  
FAX A LOCATE 1-800-336-3840  
TDD (FOR HEARING IMPAIRED) 1-800-542-2899  
RES. SERVICE 800-842-8511  
NOTICE BEFORE YOU EXCAVATE

Date	Issuance/Revisions	Symbol
05/2002	RECORD DRAWING	
05/04/01	ISSUED FOR BID CB 1015	
01/20/00	ISSUED FOR BID	
11/29/99	ISSUED FOR 100% BFD SUBMITTAL	
09/01/99	ISSUED FOR 35% BFD SUBMITTAL	

**WEST CAMPUS DEVELOPMENT  
UNIVERSITY OF WISCONSIN  
WHITEWATER**  
WHITEWATER, WISCONSIN

DFD NO. 9812N  
**STATE OF WISCONSIN**  
DEPARTMENT OF ADMINISTRATION  
DIVISION OF FACILITIES DEVELOPMENT

Drawing Title:  
**SITE UTILITIES (SOUTH)**  
SHEET NO. U6.5







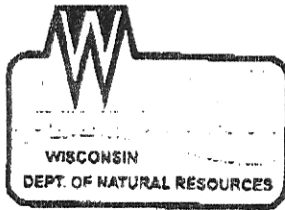
1. THIS MAP WAS PROVIDED THROUGH PERSONAL COMMUNICATION TO NORRIS & ASSOCIATES, INC. BY KEN SAIKI DESIGN, INC. WITH THE PERMISSION OF UW-WHITEWATER.

2. THIS MAP WAS USED IN THIS STUDY AS A POINT OF REFERENCE AND MAY NOT BE SUITABLE FOR DESIGN PURPOSES AND OTHER APPLICATIONS NOT AUTHORIZED BY UW-WHITEWATER STAFF.

***APPENDIX D***

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**PAST WPDES PERMITS**

**State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES**

**Tommy G. Thompson, Governor**  
**George E. Meyer, Secretary**  
**Gloria L. McCutcheon, Regional Director**

**Sturtevant Service Center**  
**9531 Rayne Road**  
**Sturtevant, WI 53177-1833**  
**Telephone (262) 884-2300**  
**FAX (262) 884-2307**  
**TDD (262) 884-2304**

August 23, 2000

IN REPLY REFER TO SITE NUMBER : 16147

Martin Romero  
Wisconsin Department of Administration  
PO Box 7866  
Madison, WI 53707

**SUBJECT:** Coverage Under WPDES General Permit No. 0067831: Storm Water Discharges Associated with Construction Activities Disturbing Five or More Acres

Permittee Name : Wisconsin Department of Administration  
Site Name : UW Whitewater West Campus Site Development

Dear Permittee:

The Department of Natural Resources received your Notice of Intent (NOI), Form 3400-161, on August 16 2000, for the UW Whitewater West Campus Site Development site and has evaluated the information provided regarding storm water discharges from your construction site. We have determined that your construction site activities will be regulated under Chapter 283, Wis. Stats., Chapter NR 216, Wis. Adm. Code, and in accordance with Wisconsin Pollutant Discharge Elimination System (WPDES) General Permit No. WI-0067831-I, Storm Water Discharges Associated with Construction Activities Disturbing Five or More Acres. All erosion control and storm water management activities undertaken at the site must be done in accordance with the terms and conditions of the enclosed general permit.

To ensure compliance with the general permit, please read it carefully and be sure you understand its contents. We emphasize that you be sure to take the following actions (This is not a complete list of the terms and conditions of the general permit):

- 1) The Construction Site Erosion Control Plan and Storm Water Management Plan that you completed prior to submitting your NOI must be implemented and maintained throughout construction. Failure to do so may result in enforcement action by the Department.
- 2) The general permit requires that erosion and sediment controls be routinely inspected at least every 7 days, and within 24 hours after a precipitation event of 0.5 inches or greater. Weekly written reports of all inspections must be maintained. The reports must contain the following information:
  - a) Date, time, and exact place of inspection;
  - b) Name(s) of individual(s) performing inspection;
  - c) An assessment of the condition of erosion and sediment controls;
  - d) A description of any erosion and sediment control implementation and maintenance performed;
  - e) A description of the site's present phase of construction.

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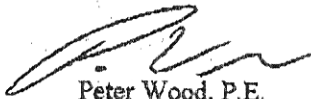
- 3) When construction activities have ceased and the site has undergone final stabilization, a Notice of Termination (NOT) of coverage under the general permit must be submitted to the Department. A copy of the NOT form is enclosed for your use.

Chapter 283.35, Wis. Stats., authorizes the Department to issue a general permit for discharge from specified categories or classes of point sources. It is important that you read and understand the terms and conditions of the general permit because they are enforceable. The general permit can also be withdrawn if you do not remain in compliance with the terms and conditions of the general permit. The Department may also withdraw a storm water discharge from coverage under the general permit and require an individual WPDES permit on the Department's own motion, upon the filing of a written petition by any person, or upon your request.

You may request judicial or administrative review of this decision to cover your construction site under the general permit. Either request must be submitted no later than 30 days after the date of this letter. To request judicial review of this decision pursuant to ss. 227.52 and 227.53, Wis. Stats., a petition naming the Department of Natural Resources as respondent must be filed with the appropriate circuit court and served on the Department. To request a contested case hearing on this decision pursuant to s. 227.42, Wis. Stats., a petition for hearing must be served on the Secretary of the Department of Natural Resources. This notice is provided pursuant to s. 227.48 (2), Wis. Stats.

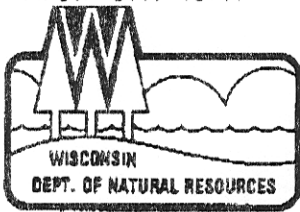
Thank you for your cooperation with the Construction Site Storm Water Discharge Permit Program. If you have any questions concerning the contents of this letter or the general permit, please contact me at (262) 884-2360.

Sincerely,



Peter Wood, P.E.  
Southeast Region  
Water Resources Engineer

Enclosures: WPDES General Permit No. WI-0067831  
Briefing Memo  
DNR Form 3400-162: Notice of Termination  
Sample Inspection Report

**State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES**

Scott McCallum, Governor  
Darrell Bazzell, Secretary  
Gloria L. McCutcheon, Regional Direct

9531 Rayne Road  
Sturtevant WI 53177-1833  
Telephone (262)884-2300  
FAX (262)884-2307  
TDD (262)884-2304

December 13, 2001

IN REPLY REFER TO SITE NUMBER : 16147

Glen Clickner  
Wisconsin Department of Administration  
PO Box 7866  
Madison WI 53707

Subject: Termination of Coverage Under WPDES General Permit No. WI-0067831-1: Storm Water Discharges Associated with Construction Activities Disturbing Five or More Acres

Permittee Name : Wisconsin Department of Administration  
Site Name : UW Whitewater West Campus Site Development

Dear Permittee :

According to the Notice of Termination (Form 3400-162) the Department of Natural Resources received from you on 12/13/2001, all land disturbing construction activities have been completed at the UW Whitewater West Campus Site Development site and the site has undergone final stabilization. "Final stabilization" means that all soil disturbing activities at the site have been completed and that a uniform perennial vegetative cover has been established with a density of 70% of the cover for the unpaved areas and areas not covered by permanent structures or that employ equivalent permanent stabilization measures.

This letter is to inform you that, pursuant to s. NR 216.55, Wis. Adm. Code, coverage under Wisconsin Pollutant Discharge Elimination System General Permit No. WI-0067831-1 for storm water discharges associated with the construction activity for the UW Whitewater West Campus Site Development site is terminated as of 12/13/2001. Storm water discharges into waters of the state from land disturbing construction activity associated with the site are no longer authorized.

Thank you for your cooperation with the Construction Site Storm Water Discharge Permit Program. If you have any questions or comments, please contact Peter Wood at (262)884-2360.

Sincerely,

Peter Wood P.E.  
Water Resources Engineer  
Southeast Region

---

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## *APPENDIX E*

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**WISCONSIN DNR  
NR 151 CODE, NR 120 CODE, NR 216 CODE, AND STATE  
STATUTE CHAPTER 283**

The following website links can be used to access NR 151, NR 120, NR 216, and SS 283.

NR 151: <http://www.legis.state.wi.us/rsb/code/nr/nr151.pdf>

NR 120: <http://www.legis.state.wi.us/rsb/code/nr/nr120.pdf>

NR 216: <http://www.legis.state.wi.us/rsb/code/nr/nr216.pdf>

SS 283: <http://www.legis.state.wi.us/statutes/stat0283.pdf>

*APPENDIX F*

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**MS4 GENERAL PERMIT – WPDES PERMIT NO.  
WI-S050075-1**



***STATE OF WISCONSIN  
DEPARTMENT OF NATURAL RESOURCES***

**GENERAL PERMIT TO DISCHARGE UNDER THE  
WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM  
WPDES PERMIT NO. WI-S050075-1**


In compliance with the provisions of ch. 283, Wis. Stats., and chs. NR 151 and 216, Wis. Adm. Code, owners and operators of municipal separate storm sewer systems are permitted to discharge storm water from all portions of the

**MUNICIPAL SEPARATE STORM SEWER SYSTEM**

owned or operated by the municipality to waters of the state in accordance with the conditions set forth in this permit.

The **Start Date** of coverage under this permit shall be included in the Department letter sent to the municipality authorizing coverage under this general permit. The Department is required to charge an annual permit fee to owners and operators authorized to discharge under this permit in accordance with s. NR 216.08, Wis. Adm. Code.

State of Wisconsin Department of Natural Resources  
For the Secretary

By   
Russell A. Rasmussen, Director  
Bureau of Watershed Management  
Division of Water

  
Date Permit Signed/Issued

**PERMIT EFFECTIVE DATE: Jan. 19, 2006**

**EXPIRATION DATE: Dec. 31, 2010**

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## **1. APPLICABILITY CRITERIA**

### **1.1 Permitted Area**

This permit covers all areas under the ownership, control or jurisdiction of the permittee that contribute to discharges from a “municipal separate storm sewer system” or “MS4” that receives runoff from any of the following:

**1.1.1** An "urbanized area", adjacent developing areas and areas whose runoff will connect to a municipal separate storm sewer regulated under subch. I of NR 216; or

**1.1.2** An area associated with a municipal population of 10,000 or more and a population density of 1,000 or more per square mile, adjacent developing areas and areas whose runoff will connect to a MS4 regulated under subch. I of NR 216; or

**1.1.3** An area that drains to a MS4 that is designated for permit coverage pursuant to s. NR 216.02(2) or 216.025, Wis. Adm. Code.

Note: “MS4” and "urbanized area" are defined in section 5 of this permit.

### **1.2 Authorized Discharges**

This permit authorizes storm water point source discharges from the MS4 to waters of the state in the permitted area. This permit also authorizes the discharge of storm water co-mingled with flows contributed by process wastewater, non-process wastewater, and storm water associated with industrial activity, provided the discharges are regulated by other WPDES permits or are discharges which are not considered illicit discharges.

### **1.3 Water Quality Standards**

**1.3.1** This permit specifies the conditions under which storm water may be discharged to waters of the state for the purpose of achieving water quality standards contained in chs. NR 102 through 105 and NR 140, Wis. Adm. Code. For the term of this permit, compliance with water quality standards will be addressed by adherence to general narrative-type storm water discharge limitations and implementation of storm water management programs and practices.

**1.3.2** This permit does not authorize water discharges that the Department, prior to authorization of coverage under this permit, determines will cause or have reasonable potential to cause or contribute to an excursion above any applicable water quality standards. Where such determinations have been made prior to authorization, the Department may notify the municipality that an individual permit application is necessary. However, the Department may authorize coverage under this permit where the storm water management programs required under this permit will include appropriate controls and implementation procedures designed to bring the storm water discharge into compliance with water quality standards.

### **1.4 Outstanding and Exceptional Resource Waters**

**1.4.1** The permittee shall determine whether any part of its MS4 discharges to an outstanding resource water (ORW) or exceptional resource water (ERW). ORWs and ERWs are listed in ss. NR 102.10 and 102.11, Wis. Adm. Code. An unofficial list of ORWs and ERWs may be found on the Department's Internet site at: <http://dnr.wi.gov/org/water/wm/wqs/>.



**1.4.2** The permittee may not establish a new MS4 discharge of pollutants to an outstanding resource water (ORW) or an exceptional resource water (ERW) unless the storm water management programs required under this permit are designed to ensure that any new MS4 discharge of pollutants to an ORW or ERW will not exceed background levels within the ORW or ERW.

**1.4.2.1** “New MS4 discharge of pollutants” means an MS4 discharge that would first occur after the permittee’s start date of coverage under this permit to a surface water to which the MS4 did not previously discharge storm water, and does not include an increase in an MS4’s discharge to a surface water to which the MS4 discharged on or before coverage under this permit.

**1.4.3** If the permittee has an existing MS4 discharge to an ERW, it may increase the discharge of pollutants if the increased discharge would not result in a violation of water quality standards.

**1.4.4** If the permittee has an existing MS4 discharge to an ORW, it may increase the discharge of pollutants provided all of the following are met:

**1.4.4.1** The pollutant concentration within the receiving water and under the influence of the existing discharge would not increase as compared to the level that existed prior to coverage under this permit.

**1.4.4.2** The increased discharge would not result in a violation of water quality standards.

## **1.5 Impaired Water Bodies and Total Maximum Daily Load Requirements**

**1.5.1** The permittee shall determine whether any part of its MS4 discharges to an impaired water body listed in accordance with section 303(d)(1) of the federal Clean Water Act, 33 USC §1313(d)(1)(C), and the implementing regulation of the US Environmental Protection Agency, 40 CFR §130.7(c)(1). Impaired waters are those that are not meeting applicable water quality standards. A list of Wisconsin impaired water bodies may be found on the Department’s Internet site at: <http://dnr.wi.gov/org/water/wm/wqs/303d/303d.html>.

**1.5.2** If the permittee’s MS4 discharges to an impaired water body, the permittee shall include a written section in its storm water management program that discusses the management practices and control measures it will implement as part of its program to reduce, with the goal of eliminating, the discharge of pollutant(s) of concern that contribute to the impairment of the water body. This section of the permittee’s program shall specifically identify control measures and practices that will collectively be used to try to eliminate the MS4’s discharge of pollutant(s) of concern that contribute to the impairment of the water body and explain why these control measures and practices were chosen as opposed to other alternatives. Pollutant(s) of concern means a pollutant that is causing impairment of a water body.

**1.5.3** After the permittee’s start date of coverage under this permit, the permittee may not establish a new MS4 discharge of a pollutant of concern to an impaired water body or increase the discharge of a pollutant of concern to an impaired water body unless the new or increased discharge causes the receiving water to meet applicable water quality standards, or the Department has approved a total maximum daily load (TMDL) for the impaired water body.

**1.5.4** The permittee shall determine whether its MS4 discharges to an impaired water body for which the Department has approved a TMDL. If so, the permittee shall assess whether the TMDL wasteload allocation for the MS4 is being met through the existing storm water management controls or whether additional control measures are necessary. The permittee's assessment of whether the TMDL wasteload allocation is being met shall focus on the adequacy of the permittee's storm water controls (implementation and maintenance). Approved TMDLs are listed on the Department Internet site at:

<http://dnr.wi.gov/org/water/wm/wqs/303d/index.html>.

**1.5.5** The storm water management program developed under section 2 of this permit shall be revised as necessary to achieve and maintain compliance with any Department approved-TMDL wasteload allocation for an impaired water to which the MS4 discharges. The redesigned storm water management programs shall be implemented as soon as possible.

## **1.6 Wetlands**

The permittee's MS4 discharge shall comply with the wetland water quality standards provisions in ch. NR 103, Wis. Adm. Code.

## **1.7 Endangered and Threatened Resources**

The permittee's MS4 discharge shall comply with the endangered and threatened resource protection requirements of s. 29.604, Wis. Stats., and ch. NR 27, Wis. Adm. Code.

## **1.8 Historic Property**

The permittee's MS4 discharge may not affect any historic property that is listed property, or on the inventory or on the list of locally designated historic places under s. 44.45, Wis. Stats., unless the Department determines that the MS4 discharge will not have an adverse effect on any historic property pursuant to s. 44.40 (3), Wis. Stats.

## **1.9 General Storm Water Discharge Limitations**

The permittee may not discharge the following substances from the MS4 in amounts that have an unreasonable effect on receiving water quality or aquatic life:

1. Solids that may settle to form putrescence or otherwise objectionable sludge deposits.
2. Oil, grease, and other floating material that form noticeable accumulations of debris, scum, foam, or sheen.
3. Color or odor that is unnatural and to such a degree as to create a nuisance.
4. Toxic substances in amounts harmful to aquatic life, wildlife, or humans.
5. Nutrients conducive to the excessive growth of aquatic plants and algae to the extent that such growth is detrimental to desirable forms of aquatic life, creates conditions that are unsightly, or is a nuisance.
6. Any other substances that may impair, or threaten to impair, beneficial uses of the receiving water.

## **1.10 Obtaining Permit Coverage**

**1.10.1** In order to obtain coverage under this permit, the owner or operator of an MS4 shall submit a complete Notice of Intent (NOI) to the Department. The Department will make an NOI form available on its Internet site or a copy may be obtained by contacting the storm water

program at (608) 267-7694. The NOI shall be mailed to Wisconsin DNR, Storm Water Program – WT/2, PO Box 7921, Madison, WI 53707-7921 or as otherwise directed by the Department.

**1.10.2** Coverage under this permit does not become effective until the Department sends the owner or operator a letter expressly authorizing coverage under this permit.

**1.11 Public Access to Information including Notices of Intent**

The Department will list on its storm water Internet site, for a period of at least 30 days, the NOIs that are received by the Department requesting coverage under this permit. This list will be accessible via: <http://dnr.wi.gov/org/water/wm/nps/stormwater/muni.htm>. Official Department records for individual municipalities are typically maintained in the office of the Department's regional storm water contact. To gain access to facility records, you should contact the appropriate regional contact, who is listed at: <http://dnr.wi.gov/org/water/wm/nps/stormwater/contact>. Or you may contact the Department's storm water program coordinator for assistance at (608) 267-7694.

**1.12 Public Comment and Request for Public Hearing on Notices of Intent**

All written comments received by the Department within 30 days of the NOI being initially listed on the Internet site will be considered along with the NOI and any other information on file to determine if coverage under this permit is appropriate. A public informational hearing may also be held if significant public interest is expressed. Requests for a public informational hearing must be filed within 30 days of the NOI being initially listed on the Department's Internet site, and must indicate the interest of the party filing the request and the reasons why a hearing is warranted. Comments and requests for public hearing must be mailed to: Wisconsin DNR, Storm Water Program – WT/2, P.O. Box 7921, Madison, WI 53707. The Department will evaluate comments and requests for public hearing to determine if there is sufficient interest to hold a public hearing prior to authorizing coverage under this permit.

**1.13 Transfers**

Coverage under this permit is not transferable to another municipality without the express written approval of the Department. If the permittee's MS4 is annexed into another municipality, the permittee shall immediately notify the Department by letter of such change. If the permittee ceases to own or operate any MS4 regulated under this permit, the Department may terminate its coverage under this permit.

**1.14 Exclusions**

The following are excluded from coverage (i.e. are not authorized) under this permit:

**1.14.1 Combined Sewer and Sanitary Sewer Systems**

Discharges of water from a sanitary sewer or a combined sewer system conveying both sanitary and storm water. These discharges are regulated under s. 283.31, Wis. Stats, and require an individual permit.

**1.14.2 Agricultural Facilities and Practices**

Discharges from "agricultural facilities" and "agricultural practices". "Agricultural facility" means a structure associated with an agricultural practice. "Agricultural practice" means beekeeping; commercial feedlots; dairying; egg production; floriculture; fish or fur farming; grazing; livestock raising; orchards; poultry raising; raising of grain, grass, mint and seed crops; raising of fruits, nuts and berries; sod farming; placing land in federal programs in return for payments in kind; owning land, at least 35 acres of which is enrolled in the conservation reserve

program under 16 USC 3831 to 3836; and vegetable raising.

#### **1.14.3 Other Excluded Discharges**

Storm water discharges from industrial operations or land disturbing construction activities that require separate coverage under a WPDES permit pursuant to subchs. II or III of ch. NR 216, Wis. Adm. Code. For example, while storm water from industrial or construction activity may discharge from an MS4, this permit does not satisfy the need to obtain any other permits for those discharges. This exclusion does not apply to the permittee's responsibility to regulate construction sites within its jurisdiction in accordance with sections 2.4 and 2.5 of this permit.

#### **1.14.4 Indian Country**

Storm water discharges within Indian Country. The federal Clean Water Act requires that owners and operators of storm water discharges within Indian Country in Wisconsin to obtain permit coverage directly from the United States Environmental Protection Agency.

#### **1.14.5 Non-MS4 Discharge**

Storm water discharges that do not enter an MS4.

## **2. PERMIT CONDITIONS**

The permittee shall establish written, measurable goals for achieving compliance with the programs developed under sections 2.1 through 2.6 in accordance with the compliance schedule contained in section 3 of this permit. The following permit conditions apply to the permittee, unless the Department issues a written determination that a condition is not appropriate under the circumstances. For example, where the permittee owns all of the land that drains to its MS4, it may be unnecessary to develop erosion control and storm water management ordinances since they are used to enforce against other landowners of construction and post-construction sites.

### **2.1 Public Education and Outreach**

The permittee shall implement a public education and outreach program to increase the awareness of storm water pollution impacts on waters of the state to encourage changes in public behavior to reduce such impacts. The program shall establish measurable goals and, at a minimum, include the following elements:

- 2.1.1** Promote detection and elimination of illicit discharges and water quality impacts associated with such discharges from municipal separate storm sewer systems.
- 2.1.2** Inform and educate the public about the proper management of materials that may cause storm water pollution from sources including automobiles, pet waste, household hazardous waste and household practices.
- 2.1.3** Promote beneficial onsite reuse of leaves and grass clippings and proper use of lawn and garden fertilizers and pesticides.
- 2.1.4** Promote the management of streambanks and shorelines by riparian landowners to minimize erosion and restore and enhance the ecological value of waterways.
- 2.1.5** Promote infiltration of residential storm water runoff from rooftop downspouts, driveways and sidewalks.

**2.1.6** Inform and where appropriate educate those responsible for the design, installation, and maintenance of construction site erosion control practices and storm water management facilities on how to design, install and maintain the practices.

**2.1.7** Identify businesses and activities that may pose a storm water contamination concern, and where appropriate, educate specific audiences on methods of storm water pollution prevention.

**2.1.8** Promote environmentally sensitive land development designs by developers and designers.

## **2.2 Public Involvement and Participation**

The permittee shall implement a program to notify the public of activities required by this permit and to encourage input and participation from the public regarding these activities. This program shall include measurable goals for public involvement and participation and comply with applicable state and local public notice requirements.

## **2.3 Illicit Discharge Detection and Elimination**

The permittee shall develop, implement and enforce a program to detect and remove illicit connections and discharges to the MS4. The program shall include measurable goals and include all of the following:

**2.3.1** An ordinance or other regulatory mechanism to prevent and eliminate illicit discharges and connections to the MS4. At a minimum, the ordinance or other regulatory mechanism shall:

**2.3.1.1** Prohibit the discharge, spilling or dumping of non-storm water substances or materials into waters of the state or the MS4.

**2.3.1.2** Identify non-storm water discharges or flows that are not considered illicit discharges. Non-storm water discharges that are not considered illicit discharges include water line flushing, landscape irrigation, diverted stream flows, uncontaminated groundwater infiltration, uncontaminated pumped groundwater, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, fire fighting and discharges authorized under a WPDES permit unless identified by the permittee as significant source of pollutants to waters of the state.

**2.3.1.3** Establish inspection and enforcement authority.

**Note:** Chapter NR 815, Wis. Adm. Code, regulates injection wells including storm water injection wells. [Construction or use of a well to dispose of storm water directly into groundwater is prohibited under s. NR 815.11\(5\), Wis. Adm. Code.](#)

**2.3.2** Initial field screening at all major outfalls during dry weather periods. At a minimum, field screening shall be documented and include:

**2.3.2.1** Visual Observation - A narrative description of visual observations including color, odor, turbidity, oil sheen or surface scum, flow rate and any other relevant observations

regarding the potential presence of non-storm water discharges or illicit dumping.

**2.3.2.2** Field Analysis - If flow is observed, a field analysis shall be conducted to determine the presence of illicit non-storm water discharges or illicit dumping. The field analysis shall include sampling for pH, total chlorine, total copper, total phenol and detergents, unless the permittee elects instead to use detergent, ammonia, potassium and fluoride as the indicator parameters. Other alternative indicator parameters may be authorized by the Department in writing.

Note: Detergent, ammonia, potassium and fluoride indicator parameters provide a better screening tool to identify whether the flow is contaminated with sanitary or wastewater, and also whether the source is a tap water or a natural source of water. The Center for Watershed Protection (CWP) has illicit discharge identification and elimination guidance available at [http://www.cwp.org/idde\\_verify.htm](http://www.cwp.org/idde_verify.htm). The CWP guidance includes illicit discharge field sampling guidance developed by Robert Pitt from the University of Alabama on how best to detect illicit discharges including recommended indicator parameters and associated levels of detection.

**2.3.2.2.1** Field screening points shall, where possible, be located downstream of any source of suspected illicit activity.

**2.3.2.2.2** Field screening points shall be located where practicable at the farthest manhole or other accessible location downstream in the system. Safety of personnel and accessibility of the location shall be considered in making this determination.

**2.3.3** On-going dry weather field screening of outfalls during the term of the permit. Outfalls that will be evaluated on an on-going basis and the field screening frequency shall be identified. Consideration shall be given to hydrological conditions, total drainage area of the site, population density of the site, traffic density, age of the structures or buildings in the area, history of the area and land use types. A description of this on-going field screening program shall be submitted to the Department in accordance with section 3.3.4.

**2.3.4** Procedures for responding to known or suspected illicit discharges. At a minimum, procedures shall be established for:

**2.3.4.1** As soon as possible, investigating portions of the MS4 that, based on the results of field screening or other information, indicate a reasonable potential for containing illicit discharges or other sources of non-storm water discharges.

**2.3.4.2** Responding to spills that discharge into and/or from the MS4 including tracking and locating the source of the spill if unknown.

**2.3.4.3** Preventing and containing spills that may discharge into or are already within the MS4.

**2.3.4.4** Notifying the Department immediately in accordance with ch. NR 706, Wis. Adm. Code, in the event that the permittee identifies a spill or release of a hazardous substance, which has resulted or may result in the discharge of pollutants into waters of the state. The Department shall be notified via the 24-hour toll free spill hotline at 1-800-943-0003. The

permittee shall cooperate with the Department in efforts to investigate and prevent such discharges from polluting waters of the state.

**2.3.4.5** To the maximum extent practicable, eliminating leakage from sanitary conveyance systems into the MS4.

**2.3.4.6** Providing the Department with advance notice of the time and location of dye testing within a MS4. (Because the dye may get reported to the Department as an illicit discharge or spill, the Department requires prior notification of dye testing.)

**2.3.5** The permittee shall take appropriate action to remove illicit discharges from its MS4 system as soon as possible. If it will take more than 30 days to remove an illicit connection, the Department shall be contacted to discuss an appropriate action and/or timeframe for removal.

**2.3.6** In the case of an illicit discharge that originates from the permittee's permitted area and that discharges directly to a municipal separate storm sewer or property under the jurisdiction of another municipality, the permittee shall notify the affected municipality within one working day.

**2.3.7** The name, title and phone number of the individual(s) responsible for responding to reports of illicit discharges and spills shall be included in the illicit discharge response procedure and submitted to the Department in accordance with section 3.3.2.

## **2.4 Construction Site Pollutant Control**

Each permittee shall develop, implement and enforce a program to reduce the discharge of sediment and construction materials from construction sites. The program shall establish measurable goals and include:

**2.4.1** An ordinance or other regulatory mechanism to require erosion and sediment control at construction sites and establish sanctions to ensure compliance. Note that Appendix A of ch. NR 152, Wis. Adm. Code, contains a construction site model ordinance. At a minimum, the ordinance or other regulatory mechanism shall establish or include:

### **2.4.1.1** Applicability and jurisdiction.

**2.4.1.1.1** It shall apply to all construction sites with one acre or more of land disturbance, and to sites of less than one acre if they are part of a larger common plan of development or sale under the jurisdiction of the permittee.

**2.4.1.1.2** It does not have to apply to construction sites that are listed under s. NR 216.42(2) to (11), Wis. Adm. Code, except that it shall apply to construction sites listed under s. NR 216.42 (4) and (9) where erosion control authority has been delegated to the permittee by the Wisconsin Department of Commerce.

**2.4.1.1.3** If the permittee is a city, village, county or town and does not have authority from the Wisconsin Department of Commerce (Commerce) to regulate erosion control at public buildings and places of employment, the permittee shall request such authority from Commerce pursuant to s. 101.1205(4), Wis. Stats., **within 18 months after the start date**. If Commerce delegates to the permittee the authority to regulate erosion control at public buildings and places of employment, the permittee shall exercise such

authority as soon as possible.

**2.4.1.2** Erosion and sediment control criteria, standards and specifications equivalent to those approved by the Department. Department erosion and sediment control standards are available through the Department's storm water Internet site at:  
<http://dnr.wi.gov/org/water/wm/nps/stormwater.htm>.

**2.4.1.3** Construction site performance standards equivalent to or more restrictive than those in ss. NR 151.11 and 151.23, Wis. Adm. Code.

**2.4.1.4** Erosion and sediment control plan requirements for landowners of construction sites equivalent to those contained in s. NR 216.46, Wis. Adm. Code.

**2.4.1.5** Inspection and enforcement authority.

**2.4.1.6** Requirements for construction site operators to manage waste such as discarded building materials, concrete truck washout, chemicals, litter and sanitary waste at the construction site so as to reduce adverse impacts to waters of the state.

**2.4.2** Procedures for construction site inspection and enforcement of erosion and sediment control measures. At a minimum, the procedures shall establish:

**2.4.2.1** Municipal departments or staff responsible for construction site inspections and enforcement.

**2.4.2.2** Construction site inspection frequency.

**2.4.2.3** Construction site inspection documentation.

**2.4.2.4** Enforcement mechanisms that will be used to obtain compliance.

**2.4.3** Procedures for receipt and consideration of information submitted by the public.

Note: A town may demonstrate to the Department that an adequate county ordinance that meets the requirements of this permit is administered and enforced within its town and then the town could be excused from having to adopt its own ordinance.

## **2.5 Post-Construction Storm Water Management**

The permittee shall develop, implement and enforce a program to require control of the quality of discharges from areas of new development and redevelopment, after construction is completed. The program shall establish measurable goals and include:

**2.5.1** An ordinance or other regulatory mechanism to regulate post-construction storm water discharges from new development and redevelopment. Note that Appendix B of ch. NR 152, Wis. Adm. Code, contains a post-construction site model ordinance. At a minimum, the ordinance or other regulatory mechanism shall establish or include:

**2.5.1.1** Applicability and jurisdiction that shall apply to construction sites with one acre or more of land disturbance, and sites of less than one acre if they are part of a larger common



plan of development or sale under the jurisdiction of the permittee.

**2.5.1.2** Design criteria, standards and specifications equivalent to technical standards or the Wisconsin Storm Water Manual approved by the Department. The Department-approved technical standards shall take precedence over the Wisconsin Storm Water Manual. The Department-approved technical standards and the Wisconsin Storm Water Manual are available at <http://dnr.wi.gov/org/water/wm/nps/stormwater/techstds.htm>.

**2.5.1.3** Post-construction performance standards equivalent to or more restrictive than those in ss. NR 151.12 and 151.24, Wis. Adm. Code.

**2.5.1.4** Storm water plan requirements for landowners of construction sites equivalent to those contained in s. NR 216.47, Wis. Adm. Code.

**2.5.1.5** Long-term maintenance requirements for landowners and other persons responsible for long-term maintenance of post-construction storm water control measures.

**2.5.1.6** Inspection and enforcement authority.

**2.5.2** Procedures that will be used by the permittee to ensure the long-term maintenance of storm water management facilities.

Note: A town may demonstrate to the Department that an adequate county ordinance that meets the requirements of this permit is administered and enforced within its town and then the town could be excused from having to adopt its own ordinance.

## **2.6 Pollution Prevention**

Each permittee shall develop and implement a pollution prevention program that establishes measurable goals for pollution prevention. The program shall include:

**2.6.1** Routine inspection and maintenance of municipally owned or operated structural storm water management facilities to maintain their pollutant removal operating efficiency.

**2.6.2** Routine street sweeping and cleaning of catch basins with sumps where appropriate.

**2.6.3** Proper disposal of street sweeping and catch basin cleaning waste.

**2.6.4** If road salt or other deicers are applied by the permittee, no more shall be applied than necessary to maintain public safety.

Note: The DOT "Highway Maintenance Manual", chapter 35, contains guidance on application of road salt and other deicers that can be used to determine whether not application is necessary and what application rate is appropriate for deicing and ice prevention. This information is held on a secured server and users must first register with the state of Wisconsin to obtain an ID and password. You can learn more about getting connected to this secured server at:

<http://www.dot.wisconsin.gov/business/extranet/>. The Wisconsin Department of Transportation (DOT) highway salt storage requirements are contained in ch. Trans 277, Wis. Adm. Code.

**2.6.5** Proper management of leaves and grass clippings, which may include on-site beneficial

reuse as opposed to collection.

**2.6.6** Storm water pollution prevention planning for municipal garages, storage areas and other sources of storm water pollution from municipal facilities.

**2.6.7** Application of lawn and garden fertilizers on municipally controlled properties, with pervious surfaces over 5 acres each, in accordance with a site-specific nutrient application schedule based on appropriate soil tests.

**2.6.8** Education of appropriate municipal and other personnel involved in implementing this program.

**2.6.9** Measures to reduce municipal sources of storm water contamination within source water protection areas. Wisconsin's source water assessment program information is available at: <http://www.dnr.state.wi.us/org/water/dwg/swap/index.htm>.

## **2.7 Storm Water Quality Management**

The permittee shall develop and implement a municipal storm water management program. This program shall achieve compliance with the developed urban area performance standards of s. NR 151.13(2), Wis. Adm. Code, for those areas of the municipality that were not subject to the post-construction performance standards of s. NR 151.12 or 151.24. The program shall include:

**2.7.1** To the maximum extent practicable, implementation of storm water management practices necessary to achieve a 20% reduction in the annual average mass of total suspended solids discharging from the MS4 to surface waters of the state as compared to implementing no storm water management controls, by March 10, 2008. The permittee may elect to meet the 20% total suspended solids standard on a watershed or regional basis by working with other permittee(s) to provide regional treatment that collectively meets the standard.

Note: Pursuant to s. NR 151.13(2), Wis. Adm. Code, the total suspended solids reduction requirement increases to 40% by March 10, 2013. The 20% and 40% total suspended solids reduction requirements are applied to runoff from areas of urban land use and are not applicable to agricultural or rural land uses and associated roads. Additional MS4 modeling guidance for modeling the total suspended solids control is given on the Department's Internet site at: <http://dnr.wi.gov/org/water/wm/nps/stormwater/techstds.htm>.

**2.7.2** Evaluation of all municipal owned or operated structural flood control facilities to determine the feasibility of retrofitting to increase total suspended solids removal from runoff.

**2.7.3** Assessment of compliance with s. NR 151.13(2), Wis. Adm. Code, by conducting a pollutant-loading analysis using a model such as SLAMM, P8 or equivalent methodology approved by the Department. At a minimum, the average annual total suspended solids and phosphorus loads to the MS4 shall be determined for the cumulative discharge from all outfalls for the controls and no controls conditions. For purposes of evaluating the modeling, pollutant loads from grouped drainage areas as modeled shall be reported. The modeling shall calculate the theoretical annual average mass of total suspended solids generated for the entire area served by a MS4 within the permittee's jurisdiction with no controls or BMPs applied. Modeling to reflect the current state of controls and BMPs shall be judged against the no controls condition to determine the percent of reduction. A storm water infiltration system is considered to be a

control or BMP. Controls and BMPs that exist at the time of permit issuance may be used to achieve this reduction. This pollutant level reduction applies to total suspended solids only.

Note: It is recommended that the pollutant-loading analysis be conducted as soon as possible. This analysis is needed to provide the permittee with information on which BMPs are needed to meet the implementation date of March 10, 2008.

## **2.8 Storm Sewer System Map**

The permittee shall develop and maintain a MS4 map. The municipal storm sewer system map shall include:

**2.8.1** Identification of waters of the state, name and classification of receiving water(s), identification of whether the receiving water is an ORW, ERW or listed as an impaired water under s. 303(d) of the Clean Water Act, storm water drainage basin boundaries for each MS4 outfall and municipal separate storm sewer conveyance systems.

**2.8.2** Identification of any known threatened or endangered resources, historical property and wetlands, as defined in sections 1.6 through 1.8 of this permit, which might be affected.

**2.8.3** Identification of all known MS4 outfalls discharging to waters of the state and other MS4s. Major outfalls shall be uniquely identified.

**2.8.4** Location of any known discharge to the MS4 that has been issued WPDES permit coverage by the Department. A list of WPDES permit holders in the permittee's area may be obtained from the Department.

**2.8.5** Location of municipally owned or operated structural storm water management facilities including detention basins, infiltration basins, and manufactured treatment devices. If the permittee will be taking credit for pollutant removal from privately-owned facilities, they must be identified.

**2.8.6** Identification of publicly owned parks, recreational areas and other open lands.

**2.8.7** Location of municipal garages, storage areas and other public works facilities.

**2.8.8** Identification of streets.

## **2.9 Annual Report**

The permittee shall submit an annual report to the Department in accordance with section 3.10 of this permit. The permittee shall invite the municipal governing body, interest groups and the general public to review and comment on the annual report. The annual report shall include:

**2.9.1** The status of implementing the permit requirements, status of meeting measurable program goals and compliance with permit schedules.

**2.9.2** A fiscal analysis which includes the annual expenditures and budget for the reporting year, and the budget for the next year.

**2.9.3** A summary of the number and nature of inspections and enforcement actions conducted

to ensure compliance with the required ordinances.

**2.9.4** Identification of any known water quality improvements or degradation in the receiving water to which the permittee's MS4 discharges. Where degradation is identified, identify why and what actions are being taken to improve the water quality of the receiving water.

**2.9.5** A duly authorized representative of the permittee shall sign and certify the annual report and include a statement or resolution that the permittee's governing body or delegated representatives have reviewed or been apprised of the content of the annual report. A signed copy of the annual report and other required reports shall be submitted to the appropriate Department regional storm water contact or to the Wisconsin DNR, Storm Water Program – WT/2, PO Box 7921, Madison, WI 53707-7921. Section 3.10 of this permit contains the date by which annual reports shall be submitted to the Department.

### **2.10 Cooperation**

The permittee may, by written agreement, implement this permit with another municipality or contract with another entity to perform one or more of the conditions of this permit. For example, if a county is implementing and enforcing an adequate storm water ordinance(s) within a town, the town would then not have to adopt its own ordinance. However, the permittee is ultimately responsible for compliance with the conditions of this permit.

## **3. COMPLIANCE SCHEDULE**

The permittee's programs under section 2 shall be submitted to the Department for review. The Department intends to review the program within the 6-month period prior to implementation to verify compliance with the requirements of this permit. The permittee shall comply with the specific permit conditions contained in section 2 according to following schedule:

### **3.1 Public Outreach and Education**

The permittee shall submit the proposed public education and outreach program to the Department within **18 months of the start date** of permit coverage. The permittee shall implement the public education and outreach program **within 24 months of the start date**.

### **3.2 Public Involvement and Participation**

The permittee shall submit the proposed public involvement and participation program to the Department within **18 months of the start date** of permit coverage. The permittee shall implement the public involvement and participation program **within 24 months of the start date**.

### **3.3 Illicit Discharge Detection and Elimination**

**3.3.1** The permittee shall submit the proposed illicit discharge and elimination ordinance to the Department **within 24 months of the start date** of permit coverage. The permittee shall adopt the illicit discharge and elimination ordinance **within 30 months of the start date**.

**3.3.2** The permittee shall submit the proposed illicit discharge response procedures to the Department **within 24 months of the start date** of permit coverage. The permittee shall implement the illicit discharge response procedures **within 30 months of the start date**.

**3.3.3** The permittee shall complete initial field screening **within 36 months of the start date**

of permit coverage.

**3.3.4** The permittee shall submit the proposed on-going field screening program to the Department **within 36 months of the start date** of permit coverage. The permittee shall implement the on-going field screening program **within 48 months of the start date**.

### **3.4 Construction Site Pollutant Control**

**3.4.1** The permittee shall submit the proposed construction site pollutant control ordinance to the Department **within 18 months of the start date** of permit coverage. The permittee shall adopt the construction site pollutant control ordinance **within 24 months of the start date**. If revision to any existing construction site pollutant control ordinance is necessary, the existing ordinances shall continue to be enforced until the revised ordinance becomes effective.

**3.4.2** The permittee shall submit the proposed construction site inspection and enforcement procedures to the Department **within 18 months of the start date** of permit coverage. The permittee shall implement the construction site inspection and enforcement procedures **within 24 months of the start date**.

### **3.5 Post-Construction Storm Water Management**

**3.5.1** The permittee shall submit the proposed post-construction storm water management ordinance to the Department **within 18 months of the start date** of permit coverage. The permittee shall adopt the post-construction storm water management ordinance **within 24 months of the start date**. If revision to any existing post-construction storm water management ordinance is necessary, the existing ordinances shall continue to be enforced until the revised ordinance becomes effective.

**3.5.2** The permittee shall submit the proposed long-term maintenance procedures to the Department **within 18 months of the start date** of permit coverage. The permittee shall implement the long-term maintenance procedures **within 24 months of the start date**.

### **3.6 Pollution Prevention**

The permittee shall submit the proposed pollution prevention program to the Department **within 24 months of the start date** of permit coverage. The pollution prevention program shall be implemented **within 30 months of the start date**.

### **3.7 Storm Water Quality Management**

The permittee shall complete the evaluation of flood control structures and assessment of compliance and submit the results to the Department **by March 10, 2008 or within 24 months of the start date** of permit coverage.

### **3.8 Storm Sewer System Map**

The permittee shall submit the MS4 map to the Department **within 24 months of the start date** of permit coverage.

### **3.9 Amendments**

The permittee shall amend a program required under this permit as soon as possible if the permittee becomes aware that it does not meet a requirement of this permit. The permittee shall amend its

program if notified by the Department that a program or procedure is insufficient or ineffective in meeting a requirement of this permit. The Department notice to the permittee may include a deadline for amending and implementing the amendment.

**3.10 Annual Report**

The permittee shall submit an annual report for each calendar year by **March 31<sup>st</sup> of the following year**. However, an annual report does not have to be submitted after the initial calendar year of permit coverage. The first annual report sent to the Department shall report on the previous 2 calendar years of permit coverage.

**3.11 Reapplication for Permit Coverage**

To retain authorization to discharge after the expiration date of this permit, the permittee shall apply for reissuance of this permit in accordance with the requirements of s. NR 216.09, Wis. Adm. Code, at least 180 days prior to this permit's expiration date.

**COMPLIANCE SCHEDULE SUMMARY**

PERMIT CONDITION	ACTIVITY	DUE TO DNR	IMPLEMENT
Public Education and Outreach – Section 3.1	Submit public education and outreach program	Within 18 months of the start date	Within 24 months of the start date
Public Involvement and Participation – Section 3.2	Submit public involvement and participation program	Within 18 months of the start date	Within 24 months of the start date
Illicit Discharge Detection and Elimination – Section 3.3	1. Submit illicit discharge ordinance	Within 24 months of the start date	Within 30 months of the start date
	2. Submit illicit discharge response procedures	Within 24 months of the state date	Within 30 months of the state date
	3. Complete initial field screening		Within 36 months of the start date
	4. Submit on-going field screening	Within 36 months of the start date	Within 48 months of the start date
Construction Site Pollutant Control – Section 3.4	1. Submit construction site pollutant control ordinance	Within 18 months of the start date	Within 24 months of the start date
	2. Submit construction site inspection and enforcement procedures	Within 18 months of the start date	Within 24 months of the start date
Post-Construction Storm Water Management – Section 3.5	1. Submit post-construction storm water management ordinance	Within 18 months of the start date	Within 24 months of the start date
	2. Submit long-term maintenance procedures	Within 18 months of the start date	Within 24 months of the start date
Pollution Prevention – Section 3.6	Submit pollution prevention program	Within 24 months of the start date	Within 30 months of the start date
Storm Water Quality Management – Section 3.7	1. Submit evaluation of flood control structures	By March 10, 2008 or within 24 months after start date	
	2. Submit assessment of compliance	By March 10, 2008 or within 24 months after start date	
MS4 Map – Section 3.8	Submit MS4 map	Within 24 months of the state date	
Annual Report – Section 3.10	Submit annual report	By March 31 of each year*	
Reapplication for Permit Coverage – Section 3.11	Submit reapplication	By March 31, 2009	

**\*Note:** An annual report does not have to be submitted after the initial calendar year of permit coverage. The first annual report sent to the Department shall report on the previous 2 calendar years of permit coverage.

#### **4. STANDARD CONDITIONS**

The conditions in s. NR 205.07(1) and (3), Wis. Adm. Code, are incorporated by reference in this permit. The permittee shall be responsible for meeting these requirements, except for s. NR 205.07(1)(n), which does not apply to facilities covered under general permits. Some of these requirements are outlined below in sections 4.1 through 4.18. Requirements not specifically outlined below can be found in s. NR 205.07(1) and (3), Wis. Adm. Code.

**4.1 Duty to Comply:** The permittee shall comply with all conditions of the permit. Any act of noncompliance with this permit is a violation of this permit and is grounds for enforcement action or withdrawal of permit coverage under this permit and issuance of an individual permit. If the permittee files a request for an individual WPDES permit or a notification of planned changes or anticipated noncompliance, this action by itself does not relieve the permittee of any permit condition.

**4.2 Enforcement Action:** The Department is authorized under s. 283.89 and 283.91, Wis. Stats., to utilize citations or referrals to the Department of Justice to enforce the conditions of this permit. Violation of a condition of this permit is subject to a fine of up to \$10,000 per day of the violation.

**4.3 Compliance Schedules:** Reports of compliance or noncompliance with interim and final requirements contained in any compliance schedule of the permit shall be submitted in writing within 14 days after the scheduled due date, except that progress reports shall be submitted in writing on or before each schedule date for each report. Any report of noncompliance shall include the cause of noncompliance, a description of remedial actions taken, and an estimate of the effect of the noncompliance on the permittee's ability to meet the remaining scheduled due dates.

#### **4.4 Noncompliance**

**4.4.1** Upon becoming aware of any permit noncompliance that may endanger public health or the environment, the permittee shall report this information by a telephone call to the Department regional storm water specialist within 24 hours. A written report describing the noncompliance shall be submitted to the Department regional storm water specialist within 5 days after the permittee became aware of the noncompliance. The Department may waive the written report on a case-by-case basis based on the oral report received within 24 hours. The written report shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times; the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance; and if the noncompliance has not been corrected, the length of time it is expected to continue.

**4.4.2** Reports of any other noncompliance not covered under STANDARD CONDITIONS sections 4.3, 4.4.1, or 4.6. shall be submitted with the annual report. The reports shall contain all the information listed in STANDARD CONDITIONS section 4.4.1.

**4.5 Duty to Mitigate:** The permittee shall take all reasonable steps to minimize or prevent any adverse impact on the waters of the state resulting from noncompliance with the permit.

**4.6 Spill Reporting:** The permittee shall immediately notify the Department, in accordance with ch. NR 706, Wis. Adm. Code, in the event of a spill or accidental release of hazardous substances which has resulted or may result in a discharge of pollutants into waters of the state. The Department shall be notified via the 24-hour spill hotline (1-800-943-0003).



**4.7 Proper Operation and Maintenance:** The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control which are installed or used by the municipality to achieve compliance with the conditions of the permit and the storm water management plan. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with conditions of this permit.

**4.8 Bypass:** The permittee may temporarily bypass storm water treatment facilities if necessary for maintenance, or due to runoff from a storm event which exceeds the design capacity of the treatment facility, or during an emergency.

**4.9 Duty to Halt or Reduce Activity:** Upon failure or impairment of storm water management practices identified in the storm water management program, the permittee shall, to the extent practicable and necessary to maintain permit compliance, modify or curtail operations until the storm water management practices are restored or an alternative method of storm water pollution control is provided.

**4.10 Removed Substances:** Solids, sludges, filter backwash or other pollutants removed from or resulting from treatment or control of storm water shall be stored and disposed of in a manner to prevent any pollutant from the materials from entering the waters of the state, and to comply with all applicable federal, state, and local regulations.

**4.11 Additional Monitoring:** If a permittee monitors any pollutant more frequently than required by the permit, the results of that monitoring shall be reported to the Department in the annual report.

**4.12 Inspection and Entry:** The permittee shall allow authorized representatives of the Department, upon the presentation of credentials, to:

**4.12.1** Enter upon the municipal premises where a regulated facility or activity is located or conducted, or where records are required to be maintained under the conditions of the permit;

**4.12.2** Have access to and copy, at reasonable times, any records that are required under the conditions of the permit;

**4.12.3** Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices or operations regulated or required under the permit; and

**4.12.4** Sample or monitor at reasonable times, for the purposes of assuring permit compliance, any substances or parameters at any location.

**4.13 Duty to Provide Information:** The permittee shall furnish the Department, within a reasonable time, any information which the Department may request to determine whether cause exists for modifying, revoking or reissuing the permit or to determine compliance with the permit. The permittee shall also furnish the Department, upon request, copies of records required to be kept by the permittee.

**4.14 Property Rights:** The permit does not convey any property rights of any sort, or any

exclusive privilege. The permit does not authorize any injury or damage to private property or an invasion of personal rights, or any infringement of federal, state or local laws or regulations.

**4.15 Other Information:** Where the permittee becomes aware that it failed to submit any relevant facts in applying for permit coverage or submitted incorrect information in any plan or report sent to the Department, it shall promptly submit such facts or correct information to the Department.

**4.16 Records Retention:** The permittee shall retain records of all monitoring information, copies of all reports required by the permit, and records of all data used to complete the notice of intent for a period of at least 5 years from the date of the sample, measurement, report or application.

**4.17 Permit Actions:** Under s. 283.35, Wis. Stats., the Department may withdraw a permittee from coverage under this general permit and issue an individual permit for the municipality if: (a) The municipality is a significant contributor of pollution; (b) The municipality is not in compliance with the terms and conditions of the general permit; (c) A change occurs in the availability of demonstrated technology or practices for the control or abatement of pollutants from the municipality; (d) Effluent limitations or standards are promulgated for a point source covered by the general permit after the issuance of that permit; or (e) A water quality management plan containing requirements applicable to the municipality is approved. In addition, as provided in s. 283.53, Wis. Stats., after notice and opportunity for a hearing this permit may be suspended, modified or revoked, in whole or in part, for cause.

**4.18 Signatory Requirements:** All applications, reports or information submitted to the Department shall be signed by a ranking elected official, or other person authorized by those responsible for the overall operation of the MS4 and storm water management program activities regulated by the permit. The representative shall certify that the information was gathered and prepared under his or her supervision and, based on report from the people directly under supervision that, to the best of his or her knowledge, the information is true, accurate, and complete.

**4.19 Attainment of Water Quality Standards after Authorization:** At any time after authorization, the Department may determine that the discharge of storm water from a permittee's MS4 may cause, have the reasonable potential to cause, or contribute to an excursion of any applicable water quality standard. If such determination is made, the Department may require the permittee to do one of the following:

**4.19.1** Develop and implement an action plan to address the identified water quality concern to the satisfaction of the Department.

**4.19.2** Submit valid and verifiable data and information that are representative of ambient conditions to demonstrate to the Department that the receiving water or groundwater is attaining the water quality standard.

**4.19.3** Submit an application to the Department for an individual storm water discharge permit.

## 5. DEFINITIONS

Definitions for some of the terms found in this permit are as follows:

**5.1 Controls Condition** means a surface-water pollutant-loading analysis that includes pollutant reductions from storm water management practices.

**5.2 Department** means the Wisconsin Department of Natural Resources.

**5.3 Erosion** means the process by which the land's surface is worn away by the action of wind, water, ice or gravity.

**5.4 Hazardous substance** means any substance which may pose a substantial present or potential hazard to human health or the environment because of its quantity, concentration or physical, chemical or infectious characteristics.

**5.5 Illicit Connection** means any man-made conveyance connecting an illicit discharge to a MS4.

**5.6 Illicit Discharge** means any discharge to a MS4 that is not composed entirely of storm water except discharges authorized by a WPDES permit or other discharge not requiring a WPDES permit such as landscape irrigation, individual residential car washing, fire fighting and similar discharges.

**5.7 Infiltration** means the entry and movement of precipitation or runoff into or through soil.

**5.8 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.

**5.9 Jurisdiction** means the area where the permittee has authority to enforce its ordinance(s) or otherwise has authority to exercise control over a particular activity of concern.

**5.10 Land Disturbing Construction Activity** 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 storm water runoff and lead to increased soil erosion and movement of sediment into waters of the state. Land disturbing construction activity includes, but is not limited to, clearing and grubbing, demolition, excavating, pit trench dewatering, filling and grading activities.

**5.11 Maximum Extent Practicable or MEP** means a level of implementing management practices in order to achieve a performance standard or other goal which takes into account the best available technology, cost effectiveness and other competing issues such as human safety and welfare, endangered and threatened resources, historic properties and geographic features.

**5.12 Major Outfall** means a municipal separate storm sewer outfall that meets one of the following criteria:

**5.12.1** A single pipe with an inside diameter of 36 inches or more or equivalent conveyance (cross sectional area of 1,018 square inches) which is associated with a drainage area of more than 50 acres.

**5.12.2** A single pipe with an inside diameter of 12 inches or more or equivalent conveyance (cross sectional area of 113 square inches) which receives storm water runoff from land zoned for industrial activity with 2 or more acres of industrial activity, but not land zoned for industrial activity that does not have any industrial activity present.

**5.13 Municipality** means any city, town, village, county, county utility district, town sanitary district, town utility district, school district or metropolitan sewage district or any other public entity created pursuant to law and having authority to collect, treat or dispose of sewage, industrial wastes, storm water or other wastes.

**5.14 Municipal Separate Storm Sewer System or MS4** means a conveyance or system of conveyances including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, constructed channels or storm drains, which meets all of the following criteria:

**5.14.1** Owned or operated by a municipality.

**5.14.2** Designed or used for collecting or conveying storm water.

**5.14.3** Which is not a combined sewer conveying both sanitary and storm water.

**5.15 No Controls Condition** means a surface water pollutant-loading analysis that does not include pollutant reductions from existing storm water management practices including, but not limited to, infiltration systems.

**5.16 Outfall** means the point at which storm water is discharged to waters of the state or leaves one municipality and enters another.

**5.17 Permittee** means the owner or operator of a MS4 authorized to discharge storm water into waters of the state.

**5.18 Permitted Area** refers to the areas of land under the jurisdiction of the permittee that drains into a MS4, which is regulated under a permit issued pursuant to subch. I of NR 216, Wis. Adm. Code.

**5.19 Redevelopment** means areas where development is replacing older development.

**5.20 Riparian Landowners** are the owners of lands bordering lakes and rivers.

**5.21 Sediment** means settleable solid material that is transported by runoff, suspended within runoff or deposited by runoff away from its original location.

**5.22 Start Date** is the initial date of permit coverage, which is specified in the Department letter authorizing coverage under this permit.

**5.23 Storm Water Management Practice** 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.

**5.24 Storm Water Pollution Prevention Planning** refers to the development of a site-specific

plan that describes the measures and controls that will be used to prevent and/or minimize pollution of storm water.

**5.25 Structural Storm Water Management Facilities** are engineered and constructed systems that are designed to provide storm water quality control such as wet detention ponds, constructed wetlands, infiltration basins and grassed swales.

**5.26 Urbanized Area** means a place and the adjacent densely settled surrounding territory that together have a minimum population of 50,000 people, as determined by the U.S. bureau of the census based on the latest decennial federal census.

**5.27 Waters of the State** include surface waters, groundwater and wetlands.

**5.28 WPDES Permit** means a Wisconsin Pollutant Discharge Elimination System permit issued pursuant to ch. 283, Wis. Stats.

***APPENDIX G***

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**STORM WATER GRANT FUNDING  
INFORMATION**

### ***Availability of Grants or Other Federal/Private Funding***

Both federal and state funding may be available to the University of Wisconsin campuses to help them promote and implement storm water best management practices. At the federal level, the EPA, Bureau of Reclamation (within the Department of the Interior), and USDA offer subsidies for research, studies, water quality protection projects, environmental technology demonstrations, and conservation efforts, among others. Following is a list of funding programs offered through several federal agencies. Further information regarding funding opportunities can be obtained by going directly to each agency's website.

#### ***EPA***

##### ***Water Quality Cooperative Agreement***

Under this program, the EPA will fund projects relating to water quality, including research, investigations, experiments, training, demonstrations, surveys, and studies relating to the cause, effects, extent, prevention, reduction, and elimination of pollution. It is important to note that Water Quality Cooperative Agreement funds are intended to initiate innovative programs and studies, not to sustain ongoing programs.

##### ***Clean Water State Revolving Fund***

The Clean Water State Revolving Fund provides funding to municipalities, communities of all sizes, farmers, homeowners, small businesses, and nonprofit organizations for water quality protection projects for wastewater treatment, non-point source pollution control, and watershed and estuary management.

#### ***Bureau of Reclamation***

##### ***Water Conservation Field Service Program***

The Water Conservation Field Service Program was designed to encourage water conservation, assist water agencies to develop and implement effective water management and conservation plans, coordinate with state and other local conservation plan efforts, and to foster improved water management on a regional, statewide, and

watershed basis. Funding through this program will be targeted at water management planning, water conservation education, demonstration of innovative technologies, and implementation of conservation measures.

***State and Local Sources***

The WDNR offers storm water grants to organizations that seek to control polluted runoff from both urban and rural sites. Two programs that focus on storm water BMP projects that begin in the year 2006 are discussed below:

Targeted Runoff Management (TRM) Grant Program:

TRM grants are provided to control polluted runoff from both urban and agricultural sites. In some cases, TRM grants can also fund design of BMPs as a part of construction project. Projects funded by TRM grants are site-specific.

The Urban Non-point Source & Storm water (UNPS & SW) Grants Program:

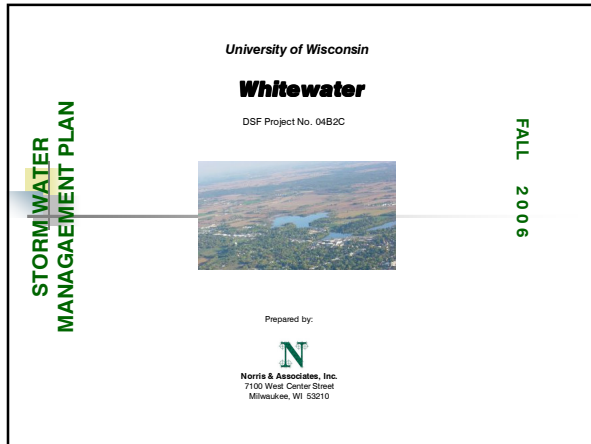
These grants are used to control polluted runoff in urban areas. Governmental units are eligible for a grant even if the governmental unit is covered by a WPDES permit under ch. NR 216.



*APPENDIX H*

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**PUBLIC MEETING SLIDES AND ATTENDEE  
LIST**

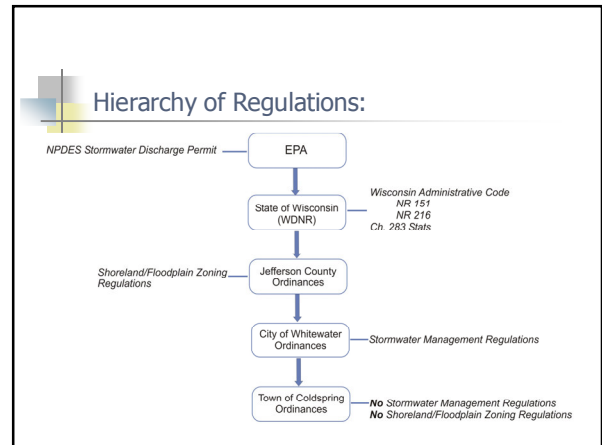


### Purpose of the UW-SWM

- To provide a stormwater management planning guide for the UW staff to use in their facilities planning process
- To investigate applicable state, regional, and local stormwater regulations
- To recommend Best Management Practices (BMPs) that will reduce the quantity and increase the quality of stormwater runoff on each campus.

### Purpose of the Public Meetings

To inform the public about the new stormwater management regulations in effect and how they will impact the UW campuses



### EPA Phase II Regulations

- Under the NPDES stormwater program, operators of large, medium and regulated small municipal separate storm sewer systems (MS4s) must obtain a NPDES discharge permit
- UW-Whitewater will be covered under their own permit

### Stormwater Discharge Permit

NR 216 Minimum control measures:

- Public education and outreach
- Public involvement and participation
- Illicit discharge detection and elimination
- Construction site pollutant control
- Post-construction site stormwater management
- Pollution prevention

## Existing Stormwater Management Efforts

### NR 216 Minimum control measures:

1. Public education and outreach
2. Public involvement and participation
3. Illicit discharge detection and elimination
4. Construction site pollutant control
5. Post-construction site stormwater management
6. Pollution prevention

### Existing efforts:

1. Nothing in effect, limited public awareness
2. Public meetings
3. Nothing in effect
4. Permit application for new construction
5. Design criteria
6. Street sweeping, fertilizer management, Spill Prevention, Control, and Countermeasure Plan (SPCCP)

## Anticipated Stormwater Management Efforts

### NR 216 Minimum control measures:

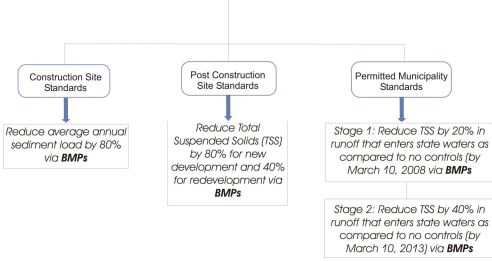
1. Public education and outreach
2. Public involvement and participation
3. Illicit discharge detection and elimination
4. Construction site pollutant control
5. Post-construction site stormwater management
6. Pollution prevention

### Future efforts:

1. Increase public awareness
2. Additional public meetings as needed
3. Inspect storm sewer system, procedures
4. Permit application, ordinances
5. Design criteria, ordinances, modeling
6. Increase existing efforts

## Performance Standards

### NR 151: Runoff Management



## Proposed Campus Development Timetable

Year	Location	Description
2005-2007	Business and Economics Building	Planning
	Upham Hall	Construction
	Multi-sport Athletic Complex	Construction
	University Center Addition	Planning & Construction
2007-2009	Roseman Building Renewal & Remodel	Planning
	Baker Hall Razing	Planning & Construction
	Sayles Hall Razing	Planning & Construction
	Salisbury Hall Razing	Planning & Construction
	Business and Economics Building	Construction
	Carlson Hall Renewal & Remodel	Planning
2009-2011	New Residence Hall	Planning & Construction
	White Hall Razing	Planning & Construction
	Moraine Hall Renewal & Remodel	Planning & Construction
	Roseman Hall Renewal & Remodel	Planning & Construction
2011-2013	Carlson Hall Renewal & Remodel	Construction
	Heide Hall Renewal & Remodel	Planning
	Heide Hall Renewal & Remodel	Construction

## Proceeding Forward

### Required steps:

- Submit NOI to operate MS4
- Develop NR 216 minimum control measures
- Perform water quality modeling
- Incorporate BMPs as dictated by modeling efforts for:
  - Existing campus conditions
  - Proposed campus developments

## Best Management Practices (BMPs):



### Silt Fence

A silt fence serves to prevent the runoff of sediment from construction sites. Silt fences are commonly seen surrounding active construction sites.

## Best Management Practices (BMPs):



### Inlet Filter

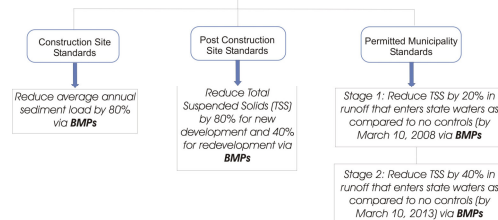
Inlet filters are filtration devices that are installed at storm sewer inlets and catch basins to remove sediment and debris in stormwater runoff.

Source: IPP Inlet Filters



## Performance Standards

### NR 151: Runoff Management



## Best Management Practices (BMPs):



### Parking Lot Changes

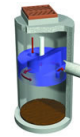
Incorporate rain gardens/green space into parking lots to store water and allow for infiltration.



Source: PA DEP



## Best Management Practices (BMPs):



Stormceptor®  
Source: Cretex Co.

### Modular Water Quality Treatment System (Parking Lots #20 & #24)

The Stormceptor® System is a storm water separator that removes sediment and hydrocarbons from urban runoff. The system treats 85-95% of annual runoff and captures significant amounts of Total Suspended Solids (TSS) and Total Petroleum Hydrocarbons (TPH).

## Best Management Practices (BMPs):



### Rain Gardens

Rain gardens are depressed landscaped areas next to parking lots or roof downspouts that are used to infiltrate storm water. These gardens utilize well-drained sandy soils and are planted with native vegetation.

Source: WNDR

## Best Management Practices (BMPs):



Great Lakes Water Institute Green Roof.  
Source: UW-Milwaukee

### Green Roofs

Green roofs are vegetated roofs that infiltrate and slowly release excess rainwater as well as conserve energy by insulating the building.

## Best Management Practices (BMPs):



### Porous Pavement

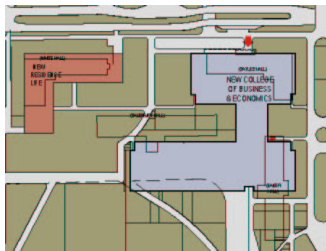
Porous pavement allows for the infiltration of rainwater through a non-sealing surface. It is most effective in low traffic areas such as parking lots, driveways, sidewalks, etc.

## Best Management Practices (BMPs):

### Non-Structural BMPs:

- Detect and eliminate illicit discharges (non-storm water releases into the storm sewer system)
- Develop a storm drainage system maintenance plan
- Develop lawn care and landscaping practices that encourage water infiltration and keep storm sewers free of leaves and grass clippings
- Restrict automobile washing areas within campus limits
- Develop a public outreach and education program

## Best Management Practices for Future Construction



## Student Involvement

- BMP Demonstration Projects on campus
- Departmental (especially architecture and engineering departments) involvement in green design initiatives (i.e, green roofs, stormwater management plans, etc.)

## Conclusions

- UW-Whitewater will need to submit an NOI to operate a MS4
- Water Quality modeling is necessary for the entire campus
- BMPs will need to be incorporated into future operations and building/campus improvements
- Future budgets must include BMP design, construction, and upkeep

## Questions/Comments?

UW Whitewater  
Storm Water Management Plan  
Public Meeting – 10/26/06

Attendance:

<u>Name</u>	<u>Representing</u>	<u>Contact Info:</u>
David Kaul	DOA/DSF	<a href="mailto:david.kaul@wisconsin.gov">david.kaul@wisconsin.gov</a>
Tom Bittner	UWSA	<a href="mailto:tbittner@uwsa.edu">tbittner@uwsa.edu</a>
David Dorgan	UWW	<a href="mailto:dorgand@uww.edu">dorgand@uww.edu</a>
Tim Reinbold	Norris & Associates, Inc.	<a href="mailto:treinbold@norris-assoc.com">treinbold@norris-assoc.com</a>
Tom Ganfield	Local citizen	<a href="mailto:tganfield@idonet.com">tganfield@idonet.com</a>

*APPENDIX I*

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**DNR MS4 MEMO TO UWSA (NOVEMBER 1,  
2006)**



**State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES**

**Jim Doyle, Governor**  
**Scott Hassett, Secretary**

101 S. Webster St.  
Box 7921  
Madison, Wisconsin 53707-7921  
Telephone 608-266-2621  
FAX 608-267-3579  
TTY Access via relay - 711

November 1, 2006

Mr. Thomas J. Bittner  
Planning & Systems Specialist  
University of Wisconsin System Administration  
P.O. Box 8010  
Madison, WI 53708-8010

**Subject:** University of Wisconsin System 4-Year Institutions  
Municipal Separate Storm Sewer System Permit Application Materials

Dear Mr. Bittner:

You have been sent this letter because the Department of Natural Resources believes that the 4-year University of Wisconsin institutions own or operate a "small" municipal separate storm sewer system (MS4) that require coverage under a Wisconsin Pollutant Discharge Elimination System (WPDES) permit. Under federal law (40 CFR § 122.32(a)(1) and (2)) and state law (section NR 216.02(2), (3) and (4), Wis. Adm. Code), MS4s within an "Urbanized Area" or serving a population of 10,000 or more with a population density of 1,000 or more per square mile are required to obtain WPDES storm water permit coverage.

The enclosed MS4 general permit is the means by which municipalities, including 4-year UW institutions, will be required to implement storm water management control measures (Please note that the general permit is being provided to you for informational purposes. Accordingly, the UW institutions listed in this letter are not covered under the general permit until notified by the Department after receipt and review of the application materials.). The Department has made a preliminary determination that your MS4s should be regulated under the enclosed MS4 general permit. The enclosed Notice of Intent (NOI) application form is used to apply for coverage under the MS4 general permit. **MS4 operators have 90 days after the receipt of this letter to complete the NOI application form and submit it to the Department.** An electronic fillable NOI form and information on Wisconsin's municipal storm water management program is available at the Department's storm water website at: <http://www.dnr.state.wi.us/org/water/wm/nps/stormwater/muni.htm>

If you have questions regarding the storm water program and filling out the NOI application for coverage under the MS4 general permit, feel free to contact me or the appropriate DNR storm water program contact listed below.

<b>UW Campus (4-year)</b>	<b>DNR Contact</b>
Eau Claire	*Steve Thon
Green Bay	Cheryl Bougie (920-662-5441)
La Crosse	Kurt Rasmussen (608-785-9910)
Madison	*Eric Rortvedt
Milwaukee	Susan Eichelkraut (414-263-8682)
Oshkosh	Jennifer Huffman (920-832-1803)
Parkside (T. of Somers)	Pete Wood (262-884-2360)



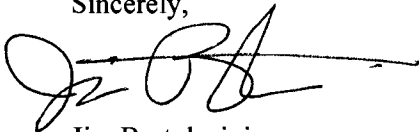
Platteville	**Eric Rortvedt
River Falls	Jim Devlin (715-684-2914 ext.123)
Stevens Point	Brad Johnson (715-359-2872)
Stout (Menomonie)	Steve Thon (715-839-3776)
Superior	Vacant (temporary contact: Jim Bertolacini, 608-264-8971)
Whitewater	Pete Wood (262-884-2360)

\* This letter does not apply to the UW - Eau Claire and the UW - Madison because they already have MS4 discharge permit coverage.

\*\* Since the 2000 Decennial Census of the City of Platteville was below 10,000, the City and UW - Platteville are not required to submit an NOI application for MS4 discharge permit coverage at this time. It is expected that the City and UW - Platteville would be subject to MS4 permit coverage if/when the Decennial Census for the City is 10,000 or greater.

Thank you for your future cooperation with the Department's municipal storm water program. If you have any questions, please contact the appropriate DNR storm water contact listed above or myself at 608-264-8971.

Sincerely,



Jim Bertolacini  
Storm Water Management Specialist  
Bureau of Watershed Management

Enclosures: WPDES General Permit No. WI-S050075-1  
Notice of Intent application for coverage under WPDES General Permit No. WI-S050075

cc: DNR Regional Contacts:  
Cheryl Bougie, NER/Green Bay  
Jim Devlin, WCR/Baldwin  
Susan Eichelkraut, SER/Milwaukee  
Jennifer Huffman, NER/Appleton  
Brad Johnson, WCR/Wausau  
Kurt Rasmussen, WCR/LaCrosse  
Eric Rortvedt, SCR/Fitchburg  
Steve Thon, WCR/Eau Claire  
Pete Wood, SER/Sturtevant

Municipal Storm Water Contacts:

Edward Wiesner, City of Green Bay	Reid Wronski, City of River Falls
Anthony Hutchens, City of La Crosse	F. Joseph Euclide, City of Stevens Point
Nader Jaber, City of Milwaukee	Randy Eide, City of Menomonie
Steven Gohde, City of Oshkosh	Diane Thompson, City of Superior
William Morris, Town of Somers	Dean Fischer, City of Whitewater

*APPENDIX J*

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**UW ANNUAL REPORT TEMPLATE (PHASE 2)**

**University of Wisconsin - [INSERT YOUR INSTITUTION  
HERE]**

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[INSERT CAMPUS  
LOGO HERE]

[INSERT YOUR INSTITUTION'S CITY/TOWN/VILLAGE HERE], WI

**Storm Water Management Program**  
[INSERT REPORTING YEAR HERE] Annual Report  
WPDES Permit No. WI-S050075-1

[INSERT REPORTING DATE HERE]

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Background and Purpose.....##  
Status Report .....##  
    Public Education and Outreach.....##  
    Public Involvement and Participation .....##  
    Illicit Discharge Detection and Elimination .....##  
    Construction Site Pollutant Control .....##  
    Post Construction Site Storm Water Management.....##  
    Pollution Prevention .....##  
Assessment and Summary .....##  
Appendices .....##

## BACKGROUND AND PURPOSE

Revisions to State of Wisconsin Department of Natural Resources administrative rules (NR 120, NR 151, and NR 216) to control polluted runoff from urban and rural lands went into effect on 10/1/2002. The laws require changes to non-point source water pollution abatement and to soil and water resources management. A summary of the laws applicable to UW System are included below for reference:

NR 120 (Priority Watershed and Lake Program): The rule under which the DNR administers the Non-point Source Water Pollution Abatement Program, includes a mandatory component for addressing critical non-point source pollution sites and the procedures to administer grants for cost sharing Best Management Practices (BMPs). Changes in cost-sharing administration include an increase in the duration of priority watershed projects and cost-share rates for several BMPs. Changes in critical site administration include increased flexibility in notification schedule and an explicit requirement that grantees cover all critical site needs when adequate cost-sharing is made available by the DNR. All Priority Watershed and Lake Program projects must be completed by 2009.

NR 151 (Runoff Management - Performance Standards and Prohibitions): The rule establishes polluted runoff performance standards for non-agricultural practices, including transportation, as well as performance standards and prohibitions for agricultural facilities and practices. This rule sets minimum performance standards to achieve water quality standards. Compliance with non-agricultural and transportation performance standards is required regardless of whether cost-sharing is available. For selected state areas, where performance standards do not achieve desired water quality, more site specific and targeted performance standards may be established. NR 151 also establishes implementation and enforcement provisions for the performance standards and prohibitions. Subchapter II of NR 151 (agricultural performance standards and prohibitions) is intended to protect water quality by minimizing soil erosion, nutrients from manure and croplands, and other non-point source pollutants entering waterways. Water quality management areas are located 300 feet from a stream, 1,000 feet from a lake, or are susceptible to groundwater contamination.

NR 216 (Storm Water Discharge Permits): The rule establishes criteria and procedures to issue storm water discharge permits (Wisconsin Pollution Discharge Elimination System - WPDES) for certain construction sites, industrial facilities, and municipalities to limit pollutant discharge carried by storm water runoff into waterways and bodies of water. This rule was primarily revised to incorporate NR 151's non-agricultural performance standards. Components of construction and municipal storm water discharge permits (i.e. storm water management programs and plans, storm water pollution prevention plans, erosion control plans) must meet the non-agricultural performance standards. Recent development of additional impervious surfaces at various campuses has increased pressure on storm water systems reaching or surpassing their designed capacities. Planned future developments will place even more pressure on these storm water systems.

The UW System has a responsibility to appropriately and comprehensively manage its storm water and limit erosion control and runoff pollutants entering bodies of water and waterways. To avoid problems of past practices which addressed storm water issues uniquely within each project boundary, in January 2004, the UW System began developing a comprehensive storm water management plan at each 4-year institution to identify problem areas, determine solutions, and develop an implementation plan. Since the storm water management plan was completed/updated in [INSERT STORM WATER MANAGEMENT PLAN COMPLETION MONTH AND YEAR HERE], all future campus development can now be planned and designed with the overall campus storm water management plans completed and incorporated as necessary, specific to each project.

On November 1, 2006, the Wisconsin Department of Natural Resources (WDNR) notified UW System Administration each 4-year institution was considered the owner and operator of a "small" municipal separate storm sewer system (MS4) and required coverage under a Wisconsin Pollutant Discharge Elimination System (WPDES) permit. Federal law [CFR 40 § 122.32(a)(1) and (2)] and state law [section NR 216.02(2), (3), and (4), Wis. Adm. Code] require MS4s within an "urbanized area" or serving a population of 10,000 or more with a population density of 1,000 or more per square mile to obtain WPDES storm water permit coverage.

On [INSERT DATE OF NOI SUBMITTAL TO WDNR HERE], UW-[INSERT YOUR INSTITUTION HERE] submitted the required Notice of Intent (NOI) application packet to the WDNR for coverage under the WPDES Permit No. WI-S050075-1. On [INSERT DATE OF WDNR ACCEPTANCE OF NOI SUBMITTAL HERE], the WDNR accepted the NOI submittal and granted UW-[INSERT YOUR INSTITUTION HERE] coverage under WPDES Permit No. WI-S050075-1. This report responds to conditions and required content detailed in sections 2.9 and 3.10 of the permit.

## **STATUS REPORT**

The university developed a comprehensive storm water management program to meet the requirements for owner/operators of municipal separate storm sewer systems (MS4s). This program will be implemented in phases starting in 2007. Each activity identifies measurable goals, implementation schedule, and pertinent contacts. Appendix A of this report includes a summary table quantifying the activities and measurable goals. Appendix B of this report includes a summary table quantifying various materials management efforts, mass communication efforts, and best management practices as they relate to storm water management.

A brief description of the university's annual storm water management activities is provided below for each of the WPDES permit condition areas required. Most activities relate to multiple requirement areas, and are documented accordingly to reflect the diverse nature of these efforts.

### Public Education and Outreach

#### **UW-001: Partnership with City**

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

#### **UW-002: Storm Water Management Plan**

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

#### **UW-003: Storm Water Management Mass Communication Program**

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

#### **UW-013: Campus Storm Water Logo Contest**

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

### Public Involvement and Participation

#### UW-001: Partnership with City

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

#### UW-002: Storm Water Management Plan

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

#### UW-003: Storm Water Management Mass Communication Program

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

#### UW-013: Campus Storm Water Logo Contest

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

### Illicit Discharge Detection and Elimination

#### UW-001: Partnership with City

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

#### UW-002: Storm Water Management Plan

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

#### UW-003: Storm Water Management Mass Communication Program

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

#### UW-012: Storm Sewer System Inspection

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

### Construction Site Pollution Control

**UW-001: Partnership with City**

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

**UW-002: Storm Water Management Plan**

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

**UW-008: Erosion Control**

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

**UW-009: Site Development Guideline**

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

**Post Construction Site Storm Water Management**

**UW-001: Partnership with City**

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

**UW-002: Storm Water Management Plan**

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

**UW-010: SLAMM Modeling**

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

**UW-011: Storm Water Operation & Maintenance Plans**

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

**UW-012: Storm Sewer System Inspection**

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

**Pollution Prevention**



**UW-001: Partnership with City**

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

**UW-002: Storm Water Management Plan**

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

**UW-003: Storm Water Management Mass Communication Program**

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

**UW-011: Storm Water Operation & Maintenance Plans**

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

**UW-012: Storm Sewer System Inspection**

[ENTER BRIEF NARRATIVE HERE RELATIVE TO THIS STORM WATER PROGRAM ACTIVITY]

**ASSESSMENT AND SUMMARY**

[ENTER BRIEF NARRATIVE SUMMARIZING AND ASSESSING YOUR INSTITUTION'S PERFORMANCE RELATIVE TO THE STORM WATER ACTIVITIES AND MEASURABLE GOALS]

**APPENDICES**

Appendix A: Storm Water Program Activity Detail Summary .....##  
Appendix B: Storm Water Program Activity Detail Worksheet.....##





**University of Wisconsin System**  
**Storm Water Program Activity Detail Summary for Annual Report**

UW - [ENTER YOUR INSTITUTION HERE]

DATE: [MM/DD/YYYY]

		[ENTER CALENDAR YEAR HERE]												
		TOTAL	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
<b>UW-001</b>	<b>PARTNERSHIP WITH CITY</b>													
A.	COLLABORATIVE EVENTS	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>UW-002</b>	<b>STORM WATER MANAGEMENT PLAN</b>													
A.	WEB SITE POSTING	0	0	0	0	0	0	0	0	0	0	0	0	0
B.	PUBLIC MEETING(S)	0	0	0	0	0	0	0	0	0	0	0	0	0
C.	ATTENDEES LIST	MM/DD/YYYY												
<b>UW-003</b>	<b>STORM WATER MANAGEMENT MASS COMMUNICATION</b>													
A.	BROCHURES (DISTRIBUTED)	0	0	0	0	0	0	0	0	0	0	0	0	0
B.	WEB SITE POSTING(S)	0	0	0	0	0	0	0	0	0	0	0	0	0
C.	EMAIL	0	0	0	0	0	0	0	0	0	0	0	0	0
D.	PUBLIC SERVICE ANNOUNCEMENTS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PODCAST(S)	0	0	0	0	0	0	0	0	0	0	0	0	0
	VIDEOCAST(S)	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>UW-004</b>	<b>EARTH DAY EVENTS</b>													
A.	ACTIVITIES	0	0	0	0	0	0	0	0	0	0	0	0	0
B.	NEWSPAPER ADS	0	0	0	0	0	0	0	0	0	0	0	0	0
C.	EMAIL	0	0	0	0	0	0	0	0	0	0	0	0	0
D.	DEBRIS REMOVED (LBS.)	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>UW-005</b>	<b>STORM WATER MANAGEMENT SIGNAGE</b>													
A.	RAIN GARDENS	0	0	0	0	0	0	0	0	0	0	0	0	0
B.	INLET STENCILS	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>UW-006</b>	<b>ENVIRONMENTALLY SENSITIVE PLANNING &amp; DESIGN</b>													
A.	SITE DEVELOPMENT IMPLEMENTED	0	0	0	0	0	0	0	0	0	0	0	0	0
B.	SITE DEVELOPMENT PLANNED	0	0	0	0	0	0	0	0	0	0	0	0	0
C.	BMPs IMPLEMENTED	0	0	0	0	0	0	0	0	0	0	0	0	0
D.	BMPs PLANNED	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>UW-007</b>	<b>ENVIRONMENTAL GROUPS &amp; BUSINESS ACTIVITIES</b>													
A.	ENVIRONMENTAL DEPARTMENTS	0	0	0	0	0	0	0	0	0	0	0	0	0
B.	ENVIRONMENTAL STUDENT GROUPS	0	0	0	0	0	0	0	0	0	0	0	0	0
C.	BROCHURES	0	0	0	0	0	0	0	0	0	0	0	0	0
D.	TRAINING	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>UW-008</b>	<b>EROSION CONTROL</b>													
A.	PROJECTS IMPLEMENTED	0	0	0	0	0	0	0	0	0	0	0	0	0
B.	INCIDENTS	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>UW-009</b>	<b>SITE DEVELOPMENT GUIDELINES</b>													
A.	PROJECTS IMPLEMENTED	0	0	0	0	0	0	0	0	0	0	0	0	0

**University of Wisconsin System**  
**Storm Water Program Activity Detail Summary for Annual Report**

UW - [ENTER YOUR INSTITUTION HERE]

DATE: [MM/DD/YYYY]

		[ENTER CALENDAR YEAR HERE]												
		TOTAL	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
<b>UW-010</b>	<b>SLAMM MODELING</b>													
A.	SLAMM MODEL COMPLETE	MM/DD/YYYY												
B.	20% TSS REDUCTION	03/10/2008												
C.	40% TSS REDUCTION	03/10/2013												
D.	80% TSS REDUCTION	NEW CONST												
<b>UW-011</b>	<b>STORM WATER OPERATION &amp; MAINTENANCE PLANS</b>													
A.	O&M PLANS DEVELOPED	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>UW-012</b>	<b>STORM SEWER SYSTEM INSPECTION</b>													
A.	INSPECTIONS (ISSUED)	0	0	0	0	0	0	0	0	0	0	0	0	0
B.	INSPECTIONS (COMPLETED)	0	0	0	0	0	0	0	0	0	0	0	0	0
C.	WORK ORDERS (ISSUED)	0	0	0	0	0	0	0	0	0	0	0	0	0
D.	WORK ORDERS (COMPLETED)	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>UW-013</b>	<b>CAMPUS STORM WATER LOGO CONTEST</b>													
A.	DESIGN ENTRIES	0	0	0	0	0	0	0	0	0	0	0	0	0
B.	CAMPUS LOGO SELECTED	MM/DD/YYYY												

**University of Wisconsin System  
Storm Water Program Activity Detail Worksheet**

UW - [ENTER YOUR INSTITUTION HERE]  
[ENTER DATE HERE]

		[ENTER CALENDAR YEAR HERE]													
		TOTAL	UNIT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
<b>A-00. BATCH DISCHARGES</b>															
A-01.	CHILLED WATER LOOP	0	GAL	0	0	0	0	0	0	0	0	0	0	0	0
A-02.	COOLING TOWER	0	GAL	0	0	0	0	0	0	0	0	0	0	0	0
A-03.	ICE RINK	0	LBS	0	0	0	0	0	0	0	0	0	0	0	0
A-04.	SWIMMING POOL	0	GAL	0	0	0	0	0	0	0	0	0	0	0	0
A-05.	WHIRLPOOL	0	GAL	0	0	0	0	0	0	0	0	0	0	0	0
<b>B-00. MATERIALS MANAGEMENT</b>															
B-01.	ANTIFREEZE/GLYCOL	0	LBS	0	0	0	0	0	0	0	0	0	0	0	0
B-02.	DEBRIS/LEAF	0	LBS	0	0	0	0	0	0	0	0	0	0	0	0
B-03.	FERTILIZER	0	LBS	0	0	0	0	0	0	0	0	0	0	0	0
B-04.	HAZ MATS	0	LBS	0	0	0	0	0	0	0	0	0	0	0	0
B-05.	HERBICIDE	0	LBS	0	0	0	0	0	0	0	0	0	0	0	0
B-06.	OIL	0	LBS	0	0	0	0	0	0	0	0	0	0	0	0
B-07.	PESTICIDE	0	LBS	0	0	0	0	0	0	0	0	0	0	0	0
B-08.	SALT/SAND	0	LBS	0	0	0	0	0	0	0	0	0	0	0	0
B-09.	STREET SWEEPING	0	LBS	0	0	0	0	0	0	0	0	0	0	0	0
<b>C-00. MASS COMMUNICATION</b>															
C-01.	BROCHURES (DISTRIBUTED)	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
C-02.	EMAIL	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
C-03.	EVENTS	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
C-04.	FLYERS (DISTRIBUTED)	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
C-05.	INLETS STENCILED	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
C-06.	NEWSPAPER	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
C-07.	PODCAST	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
C-08.	PUBLIC MEETINGS	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
C-09.	PUBLIC SERVICE ANNOUNCEMENT	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
C-10.	RADIO SPOT	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
C-11.	SIGNS	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
C-12.	TELEVISION SPOT	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
C-13.	VIDEOCAST	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
C-14.	WEB SITE POSTS	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
C-15.	WEB SITE VISITS	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
<b>D-00. OPERATIONS &amp; MAINTENANCE</b>															
D-01.	DEPT. REVIEW	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
D-02.	INCIDENT (EROSION)	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
D-03.	INCIDENT (ILLCIT DISCHARGE)	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
D-04.	INSPECTIONS	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
D-05.	O&M PLANS	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
D-06.	SPCC PLAN	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
D-07.	SWPP PLAN	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
D-08.	TRAINING	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
D-09.	WORK ORDERS	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0

**University of Wisconsin System  
Storm Water Program Activity Detail Worksheet**

UW - [ENTER YOUR INSTITUTION HERE]  
[ENTER DATE HERE]

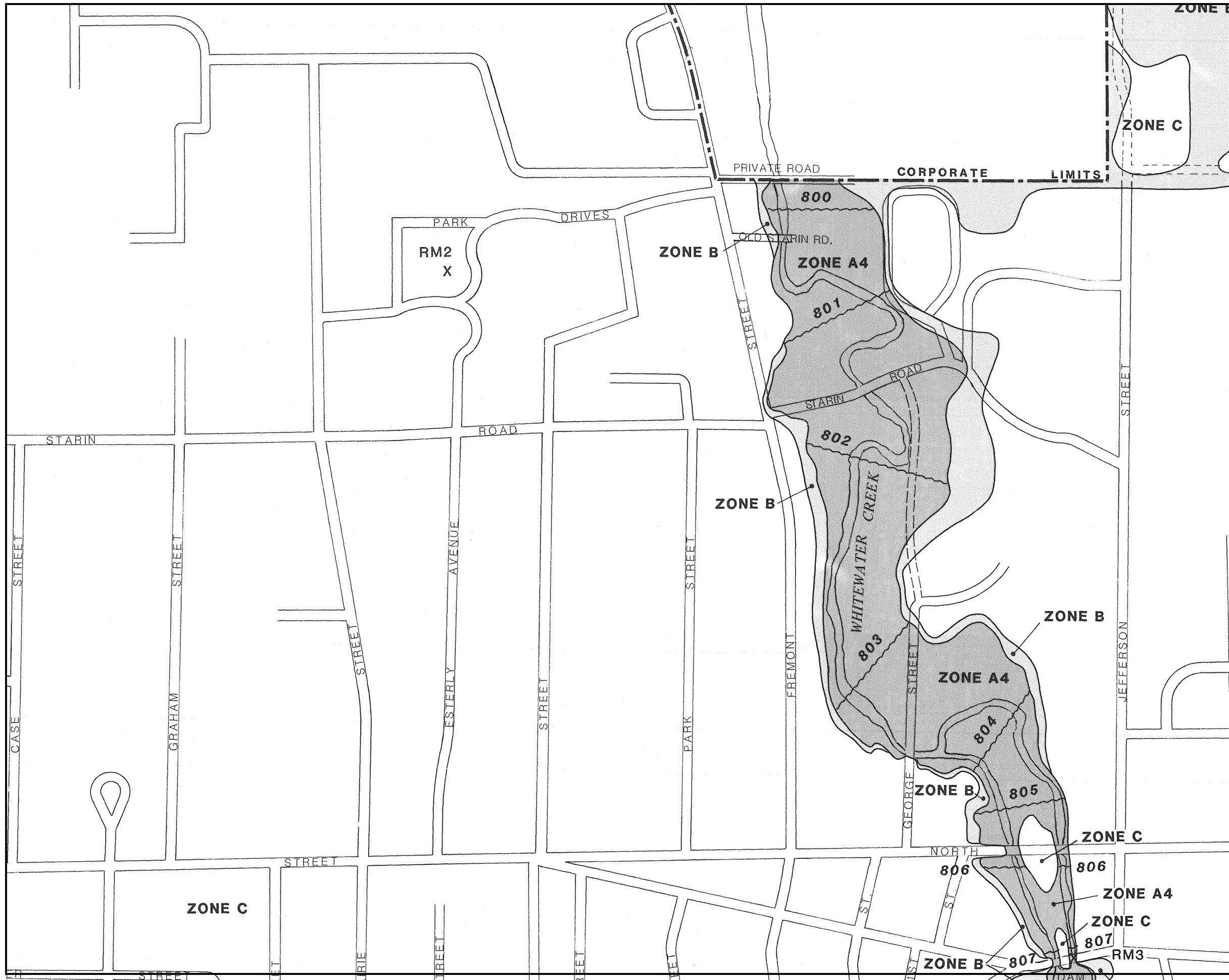
		[ENTER CALENDAR YEAR HERE]													
		TOTAL	UNIT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
<b>E-00.</b>	<b>BEST MANAGEMENT PRACTICES</b>														
E-01.	BIOFILTRATION/RAIN GARDEN	0	SF	0	0	0	0	0	0	0	0	0	0	0	0
E-02.	DETENTION POND (DRY)	0	SF	0	0	0	0	0	0	0	0	0	0	0	0
E-03.	DETENTION POND (WET)	0	SF	0	0	0	0	0	0	0	0	0	0	0	0
E-04.	DETENTION (UNDERGROUND)	0	GAL	0	0	0	0	0	0	0	0	0	0	0	0
E-05.	GREEN ROOFS	0	SF	0	0	0	0	0	0	0	0	0	0	0	0
E-06.	INLINE DEVICE	0	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
E-07.	POROUS PAVEMENT	0	SF	0	0	0	0	0	0	0	0	0	0	0	0
E-08.	ROOF DRAINS DISCONNECTED	0	LF	0	0	0	0	0	0	0	0	0	0	0	0



***APPENDIX K***

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**FEMA FIRMette (Flood Insurance Rate Map)**



APPROXIMATE SCALE  
 400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM


**FIRM**  
 FLOOD INSURANCE RATE MAP

CITY OF  
 WHITEWATER,  
 WISCONSIN  
 WALWORTH COUNTY

PANEL 4 OF 4  
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER  
 550200 0004 B

EFFECTIVE DATE:  
 JUNE 1, 1982



federal emergency management agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)