ENVIRONMENTAL IMPACTS WHEN BUILDING AN
ELECTRICAL SUBSTATION
IN
WISCONSIN POWER AND LIGHT TERRITORY

By

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ABSTRACT

This research states the importance of electrical substations to meet the increasing electrical demands in rural areas taking as an example Wisconsin Power & Light (WP&L) territory. Given the fact that WP&L is a regulated company; the substation is design, construct and operate to meet their customer’s needs at the lowest possible cost without jeopardizing safety or reliability. Therefore, the general design considerations are identified and described in this report. Some of the general considerations includes: site location, environmental, interfacing with other utilities (i.e. telecommunications), reliability, operating, safety and maintenance.

In addition, many engineers with varying backgrounds are engaged in the analysis, design, and construction of electrical substation; however, it seems that the most difficult part of constructing one is getting the necessary permits for erosion and sediment control or stormwater management. For this reason, this research will serve as a guide to engineers to understand what the documents are required to get permits.

With this in mind, this research focuses on the permitting and environmental issues that are encountered in the construction of an electrical substation. It describes the necessary permits, zoning and ordinances restrictions, long-term impacts and impacts during construction such as runoff and stream pollution. A compilation of requirements was gathered throughout WP&L territory and analyzed. Recommendations are provided to meet them by either using an erosion control and/or storm water plan using the best management practices.
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I. INTRODUCTION

A. Introduction

Wisconsin Power and Light (WP&L) is an electrical provider for central and southern Wisconsin. The subsidiary of Alliant Energy distributes electricity to more than 455,750 customers and natural gas to almost 178,000 customers in the state. WP&L has some 1,900 MW of generating capacity from interests in fossil-fueled, nuclear, wind and hydroelectric power plants; it sells some of its power to wholesale customers and the company owns a 16% stake in American Transmission Company (ATC), which operates the company’s former transmission assets, and it provides energy facility management services. The focus of this paper is on the environmental impacts of electrical substation construction.

B. Problem Statement

During the last few decades the design and construction of electrical substations have improved due to the available technologies. Many electrical utilities have invested time and effort in developing standards to improve productivity during design and construction. And, this is true for the physical layout and wiring of the electrical equipment inside the substation. On the other hand, the site’s geotechnical characteristics vary from project to project, making it difficult for utility engineers to conduct foundation and drainage design.

In addition, the federal regulations for stormwater management have also become more stringent by giving the state authority to enforce them. In the same manner, the state has given the local government authority to enforce regulations in smaller scale. This means that now it affects smaller construction sites including electrical substations sites. A good example is in Wisconsin where any new development over 1 acre, a stormwater plan is required. With this in mind, utilities engineers face challenges when choosing the best design and construction practices to meet these requirements.

C. Purpose of Study

This study’s purpose is to determine a guideline for WP&L utilities’ engineers to identify when a permit is require for either or both erosion & sediment control and stormwater management for a given site. It will also provide common best management practices (BMPs) that can be useful for their specific projects. Lastly, it identifies industries challenges.
D. Scope of Study

This study takes the existing regulations in place by the Wisconsin Department of Natural Resources (WDNR) on erosion & sediment control and stormwater management for construction sites; and analyzes the requirements into meeting them. This includes understanding NR 216 and NR 151 for the state program. It also identifies the 31 different counties enclosing WP&L’s service territory for any local requirements that may trigger any permits. A good example is the understanding of the local shoreline ordinance.

In addition, it provides recommendations to meet them by using the proper best management practices (BMPs) for a common substation construction sites. This includes the usage of technical standards provided by the WDNR. Lastly, it discusses challenges face in today’s industry.

E. Methodology

The first step of the study is to develop a database for organizing the data collected from different counties and WDNR websites to be analyzed. The second step is to set up metrics to compare the findings and this can include: area of disturbance and shoreline ordinances. The third step is to create a tool for WPL’s engineers to use to identify when a permit is require for a project knowing the size of the project and its location. Lastly, a recommendation is given in how to proceed for permitting approval.
II. ELECTRICAL SUBSTATIONS

A. Definitions

An electrical substation is part of an electrical system combining the generation, transmission and distribution systems where its main purpose is to transform the voltage from high to low, or the reverse, and it provides many other important functions. Most substations are designed to operate unattended and the usage of remote indication, control, metering, and methods of communication are often provided so that the systems and portions of systems can be monitored from a central point. In addition, a power system is designed so that the effects of an outage will result in minimal interruption and affect the fewest customers possible.

Transmission and distribution electrical substations are the two substations where in Wisconsin the transmission is handled by the American Transmission Company (ATC) and a distribution provider is WP&L.

Transmission Substation:

The function of transmission substation is to connect two or more transmission lines and it usually contains high-voltage switches that allow lines to be connected or isolated for fault clearances or maintenance. This type of substation can be simple or complex and it can cover a large area (several acres) with multiple voltage levels, many circuit breakers and a large of amount of protection and control equipment such as the usage of relays and SCADA systems. See Figure 1.

Distribution Substation:

Distribution substation transfers power from the transmission system to the distribution system to an area. In Wisconsin the input voltage is either 138 kV or 69 kV and the output is a number of feeders using 24.9 kV or 12.4 kV and this would be dependent on the size of the area served and the best utility practices. Distribution substations also isolate faults in either transmission or distribution systems. This type of substation typically can cover a range from a small to a large area (less than 1 acre and rarely over 1 acre) having a switch, one transformer, and minimal facilities on the low-voltage side. See Figure 2.
Figure 1 – Transmission Switching Station. Vienna Substation
Figure 2 - Distribution Substation using Switchgear.
B. **Design Considerations:**

The design considerations when building an electrical substation should include short and long term plans in developing their systems. For example, the long term plans would indicate the requirements of the substation for future use of it; and it will consider the physical and financial integrity of the electrical system because it’s essential for supplying adequate service for their customers. A good example of a long term plan is accounting for outage requirements for future expansion because the utility’s ability to serve the load during any outage shouldn’t change. The following considerations are divided in two groups: Site and Environmental consideration.

a. **Site Consideration:**

The location and siting of a substation are very critical factors of the design, and failure to carefully consider them can result in excessive site investment in the number of substations and associated transmission and distribution facilities. Performing initial site investigation prior the procurement of the property is important to minimize any cost associated with trying to make a property a substation a site. This includes the previous uses of the site as dumping ground where buried material or toxic waste has to be removed prior to any grading or installation of foundations.

The following factors are suggested to be evaluated when selecting a substation site:

- Location of present and future load center
- Location of existing and future sources of power
- Availability of suitable right-way and access to site by overhead or underground transmission and distribution circuits
- Alternative land use considerations
- Location of existing distribution lines
- Nearness to all-weather highway and railroad siding, accessibility to heavy equipment under all weather conditions, and access roads into the site.
- Possible objections regarding appearance, noise, or electrical effects
- Site maintenance requirements including equipment repair, watering, mowing, landscaping, storage, and painting.
- Possible objections regarding present and future impact on other private or public facilities.
- Soil resistivity
• Drainage and soil conditions
• Cost of earth removal, earth addition, and earthmoving
• Atmospheric conditions: salt and industrial contamination
• Cost of cleanup for contaminated soils or buried materials
• Space for future as well as present use
• Land title limitations, zoning, and ordinance restrictions
• General topographical features of site and immediately contiguous; avoidance of earthquake fault lines, floodplains, wetlands, and prime or unique farmlands where possible
• Public safety
• Public concern; avoidance of schools, daycare centers, and playgrounds
• Security from theft, vandalism, damage, sabotage, and vagaries of weather
• Total cost including transmission and distribution lines with due to consideration of environmental factors
• Threatened and endangered species and their critical habitat
• Cultural resources
• Possible adverse effects on neighboring communication facilities

b. **Environmental Considerations:**
   i. **General Considerations:**

   There are many different environmental concerns when planning to build an electrical substation especially when its site covers a large area. Under the Rural Utilities Service (RUS) environmental policies and procedures a substation disturbing more than 5 acres requires an Environmental Assessment (EA), while those below require an Environmental Report (ER). In many situations transmission and distribution substation share the same site location and it usually covers a large area and need to comply with zoning regulations. The following are environmental considerations for designing electrical substations.

   • **Appearance** – This has become important to the public where zoning regulations often suggest screening. The general approach is to locate substations in a certain way that they aren’t remarkably visible to the public. Some methods of improving the appearance is...
choosing underground rather than overhead circuits, build a façade around or landscaping around the perimeter of the substation.

- **Public Safety** – This is a priority for people who may occasionally be near a substation. For this reason, the primary method is to build a suitable barrier such as a metal fence following the minimum requirements of National Electrical Safety Code and IEEE STD 119, “IEEE Guide for Fence Safety Clearances.” The usage of appropriate warning signs should be posted on the substation’s peripheral barrier fence.

- **Audible Noise** – Electrical equipment such as power transformer, voltage regulators and circuit breakers just to name a few that are noise generators. The power transformers have the greatest potential in producing unacceptable noise. This research won’t be discussing how to meet this requirement; however, the design engineer should follow audible noise reference documents and regulations.

- **Effluent** – This is a requirement that is provided by the Code of Federal Regulations to eliminate the pollutions of navigable waterways. This is applicable in the substation since there is equipment that is filled with a pollutant such as oil. For example, the power transformers, regulators and circuit breaker all contain oil. The existing regulations are very flexible since the absolute prevention and containment of oil spills is not required; however, a Spill Prevention Control and Countermeasures (SPCC) plan of action for disposing of effluent when spills or leaks occur is required.

  ii. **Weather:**

  The substation should be in service in all weather conditions, so the design would change depending on its location. With this in mind, the engineer should consider the following factors that cause extreme weather conditions.

  - **Temperature:** It needs to be design to operate for extreme temperatures expected for its location. For example, this affects the electrical equipment such as: circuit breakers and relay protection. A good practice is to heat/cool the control enclosure where relay panels are located.

  - **Wind:** This affects structures / electrical equipment for open air substations. The design requirement is to resist the wind velocities suggested for their location. There are different methods in calculating wind loads and good place to start is referring to the

- **Ice:** It should operate regardless of ice accumulation and this is very important in line supporting structures where NESC loading guidelines are followed. This loading condition combines ice and wind conditions. On the other hand, the electrical equipment’s manufactures follow standards to meet electrical and mechanical withstands.

- **Rain:** It should have sufficient drainage under conditions of heavy rainfall. This would be discussed further under Section C “Site Design.”

- **Snow:** This is a concern hazard in the substation due to uncertainties of drifting and accumulation. The design should be impervious to snow damage, and consideration needs for snow accumulation and the maintenance of clearances.

- **Electrical Storms:** Lightning protection is used such as: surge arresters and shielding. Surge arresters are applicable to protect equipment but not sufficient to take on a direct stroke. For this reason, shielding is provided by overhead wires or mast can be used as extension of structures. A combination of both surge arresters and shielding would reduce damage from lightning.

- **Humidity:** Condensation could be a problem in outdoor cabinets and installation of thermostat-controlled heating is recommended, for example, the circuit breaker control cabinet.

  iii. **Altitude:**

  This consideration is important for equipment that depends on air because it would have a higher temperature rise and lower dielectric strength when operated at higher altitudes. Some of the equipment in the substation use air for insulating and cooling medium such as air switches and surge arresters.

  iv. **Earthquakes:**

  Seismic design practices should be use at locations where earthquakes are likely to occur. Seismic loads are environmental loads that are governed by the region of the country in which they occur. The electrical equipment most likely is design to be shock resistant; however, the foundations, structures and equipment anchors may not be. For most design purposes the “ASCE Substation Design Guideline” is a good source for simplified design methods.
In addition, the considerations mentioned above shall be done when designing an electrical substation.

C. Site Design

a. General:
The purpose of the site is to provide an accessible, dry maintenance free area for the installation and operation of substation equipment and structures. A subsurface soil investigation is a must for the civil design and includes:

— Site Grading:
There are three types of grades that are commonly used in the substation:

- Flat: The basic design and the most desirable for the layout and operational function of a substation. It allows uniformity in foundation elevations and structure heights.
- Slopped: This design would be desirable in situations where property restrictions or economic considerations would surpass the benefits of a flat design. However, when sloping is advantageous, it tends to be very small.
- Stepped: This design is usually occurs in extreme property restrictions, adverse mountainous terrain, or underlying rock formations making excavation not economical.

A site topography drawing should be developed, showing initial and final elevations, property boundaries, and general equipment layout. This would help reaching the optimum site design where sloped and stepped sites would require extra design considerations because there may be more structures required and variable foundations elevations.

b. Site Considerations:
In order to get an optimum site design, the considerations below should be followed to avoid any surprises.

i. Area Maps

ii. Topography drawing of substation property showing:

- Ground Elevations on a grid system.
- Location and elevation of existing road, railroad, ditch culverts, ditch inverts, and culverts.
- Location of pertinent overhead / underground utilities, especially the exact location and depth of any pipelines.
- Property Plan - Legal description of property
- Location of the Area’s drainage exits.
- High water elevation in area, if any
- Flood Zone designation with base flood elevation, if any

iii. Soil borings in immediate site area.

c. Drainage Considerations:

Drainage problems occur at all types of properties, new and old and this is a result of builders neglecting drainage considerations where the details of which may be implemented by non-qualified individuals in the final grading process. The following considerations should be taken into account during the design and construction.

i. Stormwater Management: This is usually under state and local government regulations where they have adopted storm drainage criteria. Many of them do require stormwater detention or retention basins and few of them require zero discharge from the site.

ii. Surface Drainage System: The system consists of sloping – 0.5% to 0.75% - ground surface so that water can drain to the edge of the substation or to shallow ditches within the substation. The ditch alternative may discharge into culverts or shallow open channels removing the runoff from the substation.

a. Closed Drainage System:

This is a type system that uses a network of catch basins and storm sewer pipe that provides the means of draining the substation. This may be required depending on the state and local regulations.

iii. Planning: The drainage system has to be coordinated along with the location of the cable trench, underground conduits and roads within the substation. Also, planning the drainage system to adjust for the potential future expansion of the substation should be required and this is a very important point, but that
in many times is neglected. The rule of thumb is not to discharge any more water into an existing drainage area outlet than what originally occurred. The placements of interceptor ditches are usually done to prevent erosion of slopes or embankments.

d. Erosion Protection

Erosion protection is the practice of preventing water erosion in land development and construction. The proper methods applied would prevent water pollution and soil loss. In many situations, the erosion controls are part of stormwater runoff management programs required by local governments. And, the controls often involve using of physical barriers such as vegetation or rock to absorb some of the energy of the water that is causing erosion. For example, on construction sites is very common to implement sediment controls such as sediment basins and silt fences.

With this in mind, a checklist has been created to help identify these preliminary requirements for the substation site design. See Appendix A.
III. REGULATIONS

A. Wisconsin Department of Natural Resources

    a. Background

    Stormwater has emerged as one of the most significant threats facing the country’s waterways, which is the reason the federal government has decided to implement and enforce regulations addressing this widespread environmental issue. Stormwater often contains large doses of contaminants, everything from petroleum products to lawn chemicals and fertilizers. According to the U.S. Environmental Protection Agency’s (EPA) survey that was conducted in 2002, they found that 47% of the nation’s assessed lakes and 45% of assessed streams and rivers did not meet water quality standards, with stormwater identified as one of the main causes of the impairment. It also showed a worst situation in the Great Lakes, where 91% of assessed shoreline areas and 99% of assessed open water areas failed to meet water quality standards. Then, as of 2006 pesticides were detected in 97% of urban stream water samples across the U.S., due to stormwater.

    After recognizing the significance of needing to improve stormwater control measures, U.S. Congress approved amendments to the Clean Water Act in 1987 that required the EPA to regulate stormwater discharges. In 1991 the EPA adopted stormwater rules for cities with more than 100,000 people, as well as regulations for industrial facilities and construction sites covering 5 or more acres. These requirements were expanded in 1999 to cover smaller municipalities and construction sites of between 1 and 5 acres in size.

    To meet requirements of the federal Clean Water Act, the Wisconsin DNR developed the Wisconsin Pollutant Discharge Elimination System (WPEDS) Storm Water Discharge Permit Program which is regulated under the authority of ch. NR 216, Wis. Adm. Code. As of the EPA NPDES, the WPDES Storm Water Program regulates discharge of storm water in Wisconsin from construction sites, industrial facilities, and selected municipalities. In addition, counties and municipalities above a certain population are required to adopt erosion control and stormwater standards at least as stringent.
B. **NR 151 – Runoff Management**

NR 151 addresses and establishes runoff pollution standards for non-agricultural facilities and transportation facilities and prohibitions for agricultural facilities and practices designed to achieve water quality standards. The development of electrical substations falls into subchapter III – “Non-Agricultural Performance Standards” and its applicability is for construction sites that consist of land disturbances of less than one acre (NR 151.105) and one acre or more (NR 151.11).

NR 151.12 – covers “Post-Construction performance standard for new development and redevelopment” and applies to any construction site under NR 151.11. This section is requiring for a written stormwater management plan to be developed and implemented for each – post construction site under NR 151.121. In addition, this section also lays out requirements for total suspended solids performance, peak discharge performance, and infiltration performance for post- construction under NR 151.122, 123, 124 respectively. NR 151.125 covers the protective areas performance standards where protective area means an area of land that commences at the top of the channel of lakes, streams and rivers at the delineated of wetlands.

For full detail please refer to NR 151 Subchapter III provided in the Appendix B section.

C. **NR 216 – Storm Water Discharge Permits**

NR 216 is part of 8 DNR rules that address runoff pollution or also known as non point source pollution, the major cause of polluted waters in Wisconsin and the U.S. It outlines the requirements for construction sites, industrial facilities, and various units of government, such as cities, villages, town and counties. Its latest revisions incorporate the non-agricultural performance standards of NR 151 into storm water discharges.

The development of electrical substations falls into NR 216 Subchapter III – “Construction Site Storm Water Discharge Permits”. The process of getting permitting approval is mentioned below:

a. **WPDES Permitting in Construction**

Wisconsin requires a permit when clearing, grading and excavating that result in disturbances of 1 or more acres. When applying for permits, the following should be done:
— Submit a Noticed of Intent (NOI)

i. WPDES Form #3500-053: This is the construction site storm water runoff general permit. This form is applicable when:
   o Work is in public waters administered by the DNR under ch. 3, Wis. Stats.
   o Work in Waters of the U.S. administered by the Army Corps of Engineers (COE).
   o A permit for wetland fills through DNR and COE.
   o The NOI (formerly form 3400-161) for state coverage under the WPDES construction general permit (#S067831) for land disturbing construction activity or the renewal of a construction site project where coverage under the permit has expired (after 3 years) and the applicant must reapply for coverage.
   o Dam projects through DNR and COE

— Submit a Construction Erosion and Sediment Control

i. The Department under the NR 151.31 has approved the technical standards listed below.

— Submit a Post-Construction Storm Water Management

   o This is not required for work in waterway or wetland.

For full detail please refer to NR 216 Subchapter III provided in the Appendix C section.
IV. DATA COLLECTION IN WP&L SERVICE TERRITORY

A. General

Wisconsin Power and Light (WP&L) is a subsidiary of Alliant Energy and it services in 31 different counties throughout Wisconsin. WP&L have divided its territory into three sections: South, North Central and Northeast to better service its customers and the counties are as follow:

<table>
<thead>
<tr>
<th>SOUTH</th>
<th>NORTH CENTRAL</th>
<th>NORTH EAST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crawford</td>
<td>Adams</td>
<td>Calumet</td>
</tr>
<tr>
<td>Grant</td>
<td>Columbia</td>
<td>Fond Du Lac</td>
</tr>
<tr>
<td>Green</td>
<td>Dane</td>
<td>Green Lake</td>
</tr>
<tr>
<td>Iowa</td>
<td>Dodge</td>
<td>Menominee</td>
</tr>
<tr>
<td>Jefferson</td>
<td>Juneau</td>
<td>Shawano</td>
</tr>
<tr>
<td>Kenosha</td>
<td>Marquette</td>
<td>Sheboygan</td>
</tr>
<tr>
<td>Lafayette</td>
<td>Portage</td>
<td>Washington</td>
</tr>
<tr>
<td>Monroe</td>
<td>Sauk</td>
<td>Waupaca</td>
</tr>
<tr>
<td>Richland</td>
<td>Wood</td>
<td>Waushera</td>
</tr>
<tr>
<td>Rock</td>
<td></td>
<td>Winnebago</td>
</tr>
<tr>
<td>Vernon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walworth</td>
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</tbody>
</table>

With this in mind, this study gathered the necessary information of each county and townships and analyzed the requirements in regard erosion and sediment control and stormwater management plan permitting information. See figure 3 for a geographical view of Alliant Energy service territory.
Construction Activity Flowchart as of Jan 01, 2011 in Wisconsin

Type of Construction

New Electrical Substation / Expansion of Existing Substation

1 Acre or greater of land disturbance

NR 216 STANDARDS
- 80% Sediment Reduction
- Inlet Protection
- Tracking Pad
- De-watering
- Material Handling

1 Acre or greater of land disturbance

All Projects in or near navigable waterways or wetlands

Check Local Ordinances

YES / NO

Erosion Control and Sediment Plan

YES

Stormwater Management Plan

YES / NO

YES

YES / NO
<table>
<thead>
<tr>
<th>ITEM</th>
<th>COUNTY</th>
<th>PERMIT NOT REQUIRED / LESS THAN 1 ACRE OF DISTURBANCE</th>
<th>SHORELAND ORDINANCES</th>
<th>ANY LAND DISTURBANCES</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>ADAMS</td>
<td>x x x</td>
<td>X X X</td>
<td>&lt; 1 ACRE</td>
</tr>
<tr>
<td>2</td>
<td>CALUMET</td>
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<td></td>
<td>1,000 SQ FT / 400 CY OF EXCAVATING OR FILLING / 100 FT OR MORE FROM A PROTECTIVE AREA</td>
</tr>
<tr>
<td>3</td>
<td>COLUMBIA</td>
<td>x x x</td>
<td>X X X</td>
<td>300 FT OR MORE FROM UNDERGROUND UTILITIES</td>
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<tr>
<td>4</td>
<td>CRAWFORD</td>
<td>x x x</td>
<td>X X X</td>
<td>4,000 SQ FT OR MORE / 400 CY OF EXCAVATION OR FILLING / 100 FT OR MORE FROM PROTECTIVE AREA</td>
</tr>
<tr>
<td>5</td>
<td>DANE</td>
<td>x x x</td>
<td>X</td>
<td>4,000 SQ FT OR MORE / 100 CY OF EXCAVATION OR FILLING / 100 FT OR MORE FROM UNDERGROUND UTILITIES</td>
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<td>x</td>
<td>4,000 SQ FT OR MORE / 100 CY OF EXCAVATION OR FILLING / 100 FT OR MORE FROM UNDERGROUND UTILITIES</td>
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<tr>
<td>6</td>
<td>DOUGIE</td>
<td>x x x</td>
<td>x</td>
<td>4,000 SQ FT OR MORE / 100 CY OF EXCAVATION OR FILLING / 100 FT OR MORE FROM UNDERGROUND UTILITIES</td>
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<td>7</td>
<td>FOND DU LAC</td>
<td>x x x</td>
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<td>8</td>
<td>GRANT</td>
<td>x x x</td>
<td>x</td>
<td>4,000 SQ FT OR MORE / 100 CY OF EXCAVATION OR FILLING / 100 FT OR MORE FROM UNDERGROUND UTILITIES</td>
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<tr>
<td>9</td>
<td>GREEN</td>
<td>x x x</td>
<td></td>
<td>4,000 SQ FT OR MORE / 400 CY OF EXCAVATION OR FILLING / 100 FT OR MORE FROM PROTECTIVE AREA</td>
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<td>x x x</td>
<td>4,000 SQ FT OR MORE / 100 CY OF EXCAVATION OR FILLING / 100 FT OR MORE FROM PROTECTIVE AREA</td>
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<td>IOWA</td>
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<td>JEFFERSON</td>
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<tr>
<td>13</td>
<td>JUDEAU</td>
<td>x x x</td>
<td>x</td>
<td>4,000 SQ FT OR MORE / 100 CY OF EXCAVATION OR FILLING / 100 FT OR MORE FROM PROTECTIVE AREA</td>
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B. Erosion and Sediment Control

The study shows that 12 counties within WP&L service territory have adopted an erosion control program and at many times are more stringent than WDNR regulations. The fact that WDNR doesn’t regulate small construction sites, the local government has the motivation of enforcing them through their programs. On the other hand, the WDNR does regulate smaller project sites when they are in or near navigable waterways or wetlands.

The study also shows that counties that don’t have a program in place, they do require a permit for an erosion and sediment control plan under their “shoreland ordinances” and they are usually stringent than WDNR navigable waterway or wetland requirement criteria. In addition, a permit would be required when the construction site is disturbing more than one acre and meet the NR 216 and NR 151 standards.

a. Erosion Control Performance

The erosion control performance criteria during construction has an average throughout the counties for soil loss rate is that it cannot exceed 7.5 tons/acre/year for any portion of the site, and this should accomplish by implementing the best management practices. NR 151 requires removing 80% if the total suspended solids (TSS) compared to no controls regardless to large or small sites. However, counties that don’t require a permit also don’t require meeting the TSS objectives unless they triggered the one acre of disturbance criteria.

b. Calculate Soil Loss

The counties have developed their own Universal Soil Loss Equation (USLE) to estimate soil loss from sheet and rill erosion on construction sites, but it doesn’t predict soil loss resulting from gully erosion.

The Universal Soil Loss Equation for Construction Sites:

\[ A = (%R)*(R)*(K)*(LS)*(C)*(P) \]

Where:

- **A**: Computed Soil Loss rate (ton/acre)
- **%R**: The Percentage of the annual R factor that has passed to date
- **R**: Annual Rainfall factor (it varies from 85 – 175 in Wisconsin)
- **K**: Soil Erodibility Factor
- **LS**: Slope length / steepness factor (based on slope length and percent slope)
- **C**: Land Cover Factor (Based on conditions of soil cover)
• **P:** Traditionally applies to agricultural practices such as contouring, terracing, etc. However, for construction sites, this has been applied to perimeter controls as silt fence, vegetated buffers, or sediment traps.

The USLE Spreadsheet is developed per county (not all counties have this) is for calculating the soil loss. For more information and instruction how to use USLE spreadsheet please see appendix D

c. **Best Management Practices for Construction Site Erosion & Sediment Control**

On any construction site the objective in erosion control is to prevent off-site sedimentation damage. Four basic methods are used to control erosion on construction sites: planning, soil stabilization, runoff control and sediment control. The site analysis, planning, and scheduling can reduce the need to utilize stabilization and control practices, and thereby reduce the cost of implementing these measures.

i. **Identify Control Problem**

Controlling erosion is very effective for small disturbed areas that do not drain to a sediment trapping facility. Sediment trapping should only be used on large developments where mass grading is planned, where it’s impossible or impractical to control erosion, and where sediment particles are relatively large.

ii. **Identify Problem Areas**

Areas where erosion is to be controlled usually involve slopes, graded areas or drainage ways. Slopes include graded right-of way, stockpile areas, all cut or fill slopes. Graded areas include all stripped areas other than slopes.

iii. **Identify Required Strategy**

Strategies can utilize an individual practice or a combination of practices.

iv. **Select Specific Control Measures**

Select the control measures as needed for specific job site taking into account items i-iii. See Appendix E for suggested practices.
d. Maintenance Plan

Counties in WP&L service territory that do require a permit, inspections and maintenance are required to be performed on erosion control measures. The following inspection and maintenance practices should be completed on active construction sites:

- Maintain all road drainage systems, stormwater systems, stormwater drainage systems, BMPs and other facilities identified in the erosion control plan.
- Repair any siltation or erosion damage to adjoining surfaces and drainage ways resulting from land disturbing construction activities and document repairs in a site erosion control log.
- Inspect all erosion control BMOs once a week minimum and within 24 hours after each rainfall event exceeding 0.5 inches. Repairs should be made within 24 hours of the inspection.

Record of inspection and maintenance actions performed on the site should be available for review by county or WDNR staff.

Please see Appendix G for the proposed WP&L Erosion and Sedimentation Control Plan template.

C. Stormwater Management Plan

The study shows that 8 counties within WP&L service territory have adopted a Stormwater Management program and at times are more stringent than WDNR regulations. The WDNR does not regulate or enforce under NR 216 for land disturbances less than one acre and the counties that have a program are usually to regulate small construction sites. On the other hand, the WDNR does regulate smaller project sites when they are in or near navigable waterways or wetlands and may or may not require a permit.

The study also shows that counties that don’t have a program in place still follow the WDNR requirements. In addition, a permit would be required when the construction site is disturbing more than one acre and meet the NR 216 and NR 151 standards.

The county and the WDNR set management standards to reduce the adverse impacts of stormwater. Specifically, stormwater management practices must be installed and designed to meet the ordinance criteria.
a. Performance Standards

i. Sediment Control
   — For new development, remove 80% of TSS on an annual basis
   — For re-development, remove 40% of TSS on an annual basis.

ii. Runoff rate Control
   — Modeling:
     All runoff calculations should follow the methodology described in the
     Natural Resource Conservation Service’s (NRCS) Technical Release 55-
     “Urban Hydrology for Small Watershed” (TR-55). HydroCad and
     WinSLAMM are appropriate modeling software for this purpose.
   — Design Standards:
     o Maintain predevelopment peak runoff rates for the 2 year, 24 hr
       storm event (2.5 inches over 24 hour duration)
     o Maintain predevelopment peak runoff rates for the 10 year, 24 hr
       storm event (3.8 inches over 24 hour duration)
     o Maintain predevelopment peak runoff rates for the 100 year, 24 hr
       storm event (5.4 inches over 24 hour duration)

iii. Infiltration
   — Non Residential:
     Infiltrate sufficient volume such that the post development average
     annual infiltration volume is 60% if the predevelopment infiltration
     volume.
   — Rates
     Infiltration rates should be measured at the site and elevation proposed
     practices are proposed. For planning purposes, the infiltration rates can be
     obtained by the WDNR Technical Standard 1002

iv. Area Caps
   — Non-Residential:
     No more than 2% of the impervious area is required for infiltration
     practices.
b. **Best Management Practices for Construction Site Stormwater Management**

The identify BMPs are noted in Appendix F.

c. **Maintenance Plan**

Maintenance of erosion control and stormwater management practices must be included in the design of all practices. As a condition of the permit, a maintenance plan is required describing who is responsible (responsible party or entity) for maintenance, the type of maintenance required, and the frequency of the required maintenance. Examples of responsible parties include the owner (WP&L), or the governing Town (if agreed to by the Town). The plan should also include measures for accessibility to the site and the level of maintenance required. Long-term maintenance costs should be considered when selecting a practice. Some practices may be inexpensive to implement, but long-term maintenance activities of the practice may be costly. As part of an approved erosion control or stormwater permit, maintenance requirements are enforceable per the county or WDNR Erosion Control and Stormwater Management Ordinance. Each county and the WDNR reserves the right to periodically perform inspections to assure the maintenance requirements set forth in the approved plan are being met.
V. RECOMMENDATIONS AND CONCLUSIONS

In Wisconsin, the awareness of regulating Erosion & Sediment Control and Stormwater Management has been increasing for the last decade. And, many local governments have plans in developing programs dedicated to this in the coming years. With this mentality, utility engineers should start getting comfortable in meeting these requirements for their projects that may include the construction of a new substation or an expansion of an existing one. The understanding of the regulations is a must for any engineer involved in the design of the substation to properly implement it during the construction phase and this is has been a challenge in today’s utility industry.

The first step is to train these engineers to understand and implement the best management practices to meet erosion and sediment control. This is the only way that they can verify and inspect the work during the construction phase. On the other hand, utility engineers should leave the design of stormwater management to consultants since the design of it is more complicated and would require some modeling which most utilities don’t have such resources. Nevertheless, utility engineers should be train to review and understand the modeling report and able to question parts of the design.

In addition, the report identifies the requirements for having a good site design and it shows the different regulations that are in place as of April of 2011. These regulations include Erosion and Sediment control plans and Stormwater Management at the State, county, village, city levels. After analyzing the different requirements for needing an erosion and sediment control plan, it seems reasonable that WP&L should develop a plan where it can be used everywhere within its service territory by adjusting the BMPs to meet site specific needs. A proposed template is included as part of this report under Appendix G. Lastly, a template plan for Stormwater Management cannot be achieve since this is dependable on the location.
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<td>Erosion Protection</td>
<td></td>
<td></td>
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<tr>
<td>4.2a</td>
<td>Permit</td>
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<tr>
<td>4.2b</td>
<td>Design</td>
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</tbody>
</table>
Exemptions. This section does not apply to the following:

(a) The period of time required to make a ruling on a variance request does not extend the compliance periods allowed under ss. NR 151.09 and 151.095.

Note: The department may consider decisions made by a governmental unit, in accordance with local ordinance provisions, when making its determination whether to accept or deny the variance.

History: CR 00−027: cr. Register September 2002 No. 561, eff. 10−1−02.

Subchapter III — Non−Agricultural Performance Standards

NR 151.10 Purpose. This subchapter establishes performance standards, as authorized by s. 281.16 (2) (a), Stats., for non−agricultural facilities and practices that cause or may cause nonpoint runoff pollution. These performance standards are intended to limit nonpoint runoff pollution in order to achieve water quality standards. Design guidance and the process for developing technical standards to implement this section are set forth in subch. V.

History: CR 00−027: cr. Register September 2002 No. 561, eff. 10−1−02.

NR 151.105 Construction site performance standard for non−permitted sites. (1) APPLICABILITY. Except as provided under (b), this section applies to all of the following:

(a) A construction site that consists of land disturbing construction activity of less than one acre.

Note: Land disturbing construction sites of less than one acre are not regulated under subch. III of ch. NR 216 unless designated by the department under s. NR 216.15 (5) (3).

(b) Construction projects that are exempted by federal statutes or regulations from the requirement to have a national pollutant discharge elimination system permit issued under 40 CFR 122, for land disturbing construction activity.

(2) EXEMPTIONS. This section does not apply to the following:

(a) One− and two− family dwellings regulated by the department of commerce pursuant to s.101.653, Stats.

(b) Agricultural facilities and practices.

(c) Silviculture activities.

(3) RESPONSIBLE PARTY. The landowner of the construction site or other person contracted or obligated by other agreement with the landowner to implement and maintain construction site BMPs is the responsible party and shall comply with this section.

(4) REQUIREMENTS. Erosion and sediment control practices at each site where land disturbing construction activity is to occur shall be used to prevent or reduce all of the following:

(a) The deposition of soil from being tracked onto streets by vehicles.

(b) The discharge of sediment from disturbed areas into on−site storm water inlets.

(c) The discharge of sediment from disturbed areas into adjacent waters of the state.

(d) The discharge of sediment from drainage ways that flow off the site.

(e) The discharge of sediment by dewatering activities.

(f) The discharge of sediment eroding from soil stockpiles existing for more than 7 days.

(g) The transport by runoff into waters of the state of chemicals, cement and other building compounds and materials on the construction site during the construction period. However, projects that require the placement of these materials in waters of the state, such as constructing bridge footings or BMP installations, are not prohibited by this paragraph.

Note: In accordance with subch. V, the department has developed technical standards to help meet the construction site performance standards. These technical standards are available on the department web page at: http://dnr.wi.gov/runoff/stormwater/techstds.htm.

(5) LOCATION. BMPs shall be located so that treatment occurs before runoff enters waters of the state.

(6) IMPLEMENTATION. The BMPs used to comply with this section shall be implemented as follows:

(a) Erosion and sediment control practices shall be constructed or installed before land disturbing construction activities begin.

(b) Erosion and sediment control practices shall be maintained until final stabilization.

(c) Final stabilization activity shall commence when land disturbing activities cease and final grade has been reached on any portion of the site.

(d) Temporary stabilization activity shall commence when land disturbing activities cease and final grade has been reached on any portion of the site.

Note: The universal soil loss equation and its successors, revised universal soil loss equation and revised universal soil loss equation 2, utilize an R factor which has been developed to estimate soil erosion, averaged over extended time periods. The R factor can be modified to estimate monthly and single−storm erosion.

(2) APPLICABILITY. This section applies to any construction site that consists of one acre or more of land disturbing construction activity.

(a) Subsections (3), (4), (5), (6), and (7) apply to all of the following:

1. Construction sites for which the department received a notice of intent in accordance with subch. III of ch. NR 216 before January 1, 2011.

2. Construction sites for which the department of commerce received a notice of intent in accordance with ch. Comm 60 before January 1, 2011.

3. Construction sites for which a bid has been advertised or construction contract signed for which no bid was advertised, before January 1, 2011.

(b) Subsections (3) (a) to (d), (4), (5), (6m), (7), and (8) apply to all of the following:

1. Construction sites for which the department received a notice of intent in accordance with subch. III of ch. NR 216 on or after January 1, 2011.

2. Construction sites for which a bid has been advertised or construction contract signed for which no bid was advertised, on or after January 1, 2011.

(3) EXEMPTIONS. This section does not apply to the following:

(a) Construction projects that are exempted by federal statutes or regulations from the requirement to have a national pollutant discharge elimination system permit issued under 40 CFR 122, for land disturbing construction activity.

(b) Transportation facilities, except transportation facility construction projects that are part of a larger common plan of development such as local roads within a residential or industrial development.

Note: Transportation facility performance standards are given in subch. IV.

(c) Nonpoint discharges from agricultural facilities and practices.

Note: This exemption is for nonpoint discharges from agricultural facilities and practices, such as cropping and pasturing. Subchapter III of ch. NR 216 also exempts nonpoint discharges, but regulates point source discharges of storm water, such as the construction of barns, manure storage facilities, sand settling lanes, and barnyard runoff control systems. Under s. NR 216.42 (2), such construction sites are subject to the construction performance standards of this section.
(d) Nonpoint discharges from silviculture activities.
(e) Routine maintenance for project sites that have less than 5 acres of land disturbance if performed to maintain the original line and grade, hydraulic capacity or original purpose of the facility.

(4) RESPONSIBLE PARTY. The landowner or other person performing services to meet the performance standards of this subchapter, through a contract or other agreement with the landowner, is the responsible party and shall comply with this section.

(5) PLAN. The responsible party under sub. (4) shall develop and implement a written plan for each construction site. The plan shall incorporate the applicable requirements of this section.

Note: The written plan may be that specified within s. NR 216.46, the erosion control portion of a construction plan or other plan.

(6) PRE-JANUARY 1, 2011 REQUIREMENTS. The plan required under sub. (5) shall include the following:

(a) Best management practices that, by design, achieve, to the maximum extent practicable, a reduction of 80% of the sediment load carried in runoff, on an average annual basis, as compared with no sediment or erosion controls, until the construction site has undergone final stabilization. No person shall be required to exceed an 80% sediment reduction to meet the requirements of this paragraph. Erosion and sediment control BMPs may be used alone or in combination to meet the requirements of this paragraph. Credit toward meeting the sediment reduction shall be given for limiting the duration or area, or both, of land disturbing construction activity, or other appropriate mechanism.

(b) Notwithstanding par. (a), if BMPs cannot be designed and implemented to reduce the sediment load by 80%, on an average annual basis, the plan shall include a written and site-specific explanation why the 80% reduction goal is not attainable and the sediment load shall be reduced to the maximum extent practicable.

(c) Where appropriate, the plan shall include sediment controls to do all of the following to the maximum extent practicable:
1. Prevent tracking of sediment from the construction site onto roads and other paved surfaces.
2. Prevent the discharge of sediment as part of site de-watering.
3. Protect separate storm drain inlet structures from receiving sediment.

(d) The use, storage and disposal of chemicals, cement and other compounds and materials used on the construction site shall be managed during the construction period to prevent their transport by runoff into waters of the state. However, projects that require the placement of these materials in waters of the state, such as constructing bridge footings or BMP installations, are not prohibited by this paragraph.

(6m) POST-JANUARY 1, 2011 REQUIREMENTS. The plan required under sub. (5) shall meet all of the following:

(a) Erosion and sediment control practices. Erosion and sediment control practices at each site where land disturbing construction activity is to occur shall be used to prevent or reduce all of the following:
1. The deposition of soil from being tracked onto streets by vehicles.
2. The discharge of sediment from disturbed areas into on-site storm water inlets.
3. The discharge of sediment from disturbed areas into adjacent waters of the state.
4. The discharge of sediment from drainage ways that flow off the site.
5. The discharge of sediment by dewatering activities.
6. The discharge of sediment eroding from soil stockpiles existing for more than 7 days.
7. The discharge of sediment from erosive flows at outlets and in downstream channels.
8. The transport by runoff into waters of the state of chemicals, cement, and other building compounds and materials on the construction site during the construction period. However, projects that require the placement of these materials in waters of the state, such as constructing bridge footings or BMP installations, are not prohibited by this subdivision.
9. The transport by runoff into waters of the state of untreated wash water from vehicle and wheel washing.

Note: Wastewaters, such as from concrete truck washout, needs to be properly managed to limit the discharge of pollutants to waters of the state. A separate permit may be needed from the department where a wastewater discharge has the potential to adversely impact waters of the state. The appropriate department wastewater specialist should be contacted to determine if wastewater permit coverage is needed where wastewater will be discharged to waters of the state.

(b) Sediment performance standards. In addition to the erosion and sediment control practices under par. (a), the following erosion and sediment control practices shall be employed:
1. For construction sites for which the department received a notice of intent for the construction project in accordance with subch. III of ch. NR 216, within 2 years after January 1, 2011, BMPs that, by design, achieve a reduction of 80 percent, or to the maximum extent practicable, of the sediment load carried in runoff, on an average annual basis, as compared with no sediment or erosion controls, until the construction site has undergone final stabilization.
2. For construction sites for which the department received a notice of intent for the construction project in accordance with subch. III of ch. NR 216, 2 years or more after January 1, 2011, BMPs that, by design, discharge no more than 5 tons per acre per year, or to the maximum extent practicable, of the sediment load carried in runoff from initial grading to final stabilization.
3. The department may not require any person to employ more BMPs than are needed to meet a performance standard in order to comply with maximum extent practicable. Erosion and sediment control BMPs may be combined to meet the requirements of this paragraph. The department may give credit toward meeting the sediment performance standard of this paragraph for limiting the duration or area, or both, of land disturbing construction activity, or other appropriate mechanisms.

4. Notwithstanding subd. 1. or 2., if BMPs cannot be designed and implemented to meet the sediment performance standard, the plan shall include a written, site-specific explanation of why the sediment performance standard cannot be met and how the sediment load will be reduced to the maximum extent practicable.

Note: Soil loss prediction tools such as revised universal soil loss equation 2 that estimate the sediment load leaving the construction site under varying land and management conditions, or methodology identified in subch. V, may be used to calculate sediment reduction.

Note: In accordance with subch. V, the department has developed technical standards to help meet the construction site performance standards. These technical standards are available on the department web page at: http://dnr.wi.gov/ runoff/ stormwater/ techstds.htm.

(c) Preventive measures. The plan shall incorporate all of the following:
1. Maintenance of existing vegetation, especially adjacent to surface waters whenever possible.
2. Minimization of soil compaction and preservation of topsoil.
3. Minimization of land disturbing construction activity on slopes of 20% or more.
(8) IMPLEMENTATION. The BMPs used to comply with this section shall be implemented as follows:
(a) Erosion and sediment control practices shall be constructed or installed before land disturbing construction activities begin in accordance with the plan developed under sub. (5).
(b) Erosion and sediment control practices shall be maintained until final stabilization.
(c) Final stabilization activity shall commence when land disturbing activities cease and final grade has been reached on any portion of the site.
(d) Temporary stabilization activity shall commence when land disturbing activities cease and will not resume for a period exceeding 14 calendar days.
(e) BMPs that are no longer necessary for erosion and sediment control shall be removed by the responsible party.

(9)ceipt of a notice of intent for the construction project, in accordance with subch. III of ch. NR 216, on or after January 1, 2011.

(5) REQUIREMENTS. The plan required under sub. (4) shall include:
(a) Total suspended solids. Best management practices shall be designed, installed and maintained to control total suspended solids carried in runoff from the post-construction site as follows:
1. For new development, by design, reduce to the maximum extent practicable, the total suspended solids load by 80%, based on an average annual rainfall, as compared to no runoff management controls.
2. For redevelopment, by design, reduce to the maximum extent practicable, the total suspended solids load by 40%, based on an average annual rainfall, as compared to no runoff management controls.
3. For in-fill development under 5 acres that occurs within 10 years after October 1, 2002, by design, reduce to the maximum extent practicable, the total suspended solids load by 40%, based on an average annual rainfall, as compared to no runoff management controls.
4. For in-fill development that occurs 10 or more years after October 1, 2002, by design, reduce to the maximum extent practicable, the total suspended solids load by 80%, based on an average annual rainfall, as compared to no runoff management controls.
5. Notwithstanding subds. 1. to 4., if the design cannot achieve the applicable total suspended solids reduction specified, the storm water management plan shall include a written and site-specific explanation why that level of reduction is not attained and the total suspended solids load shall be reduced to the maximum extent practicable.

Note: Pollutant loading models such as SLAMM and P8 are available at http://www.dnr.state.wi.us/water/wm/npws/Slamm.htm or contact the storm water coordinator in the runoff management section of the bureau of watershed management at (608) 267-7694.

(b) Peak discharge. By design, BMPs shall be employed to maintain or reduce the peak runoff discharge rates, to the maximum extent practicable, as compared to pre-development conditions for the 2-year, 24-hour design storm applicable to the post-construction site. Pre-development conditions shall assume “good hydrologic conditions” for appropriate land covers as identified in TR-55 or an equivalent methodology. The meaning of “hydrologic soil group” and “runoff curve number” are as determined in TR-55. However, when pre-development land cover is cropland, rather than using TR-55 values for cropland, the runoff curve numbers in Table 2 shall be used.

Table 2 – Maximum Pre-Development Runoff Curve Numbers for Cropland Areas

<table>
<thead>
<tr>
<th>Hydrologic Soil Group</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Runoff Curve Number</td>
<td>56</td>
<td>70</td>
<td>79</td>
<td>83</td>
</tr>
</tbody>
</table>
Note: The curve numbers in Table 2 represent mid-range values for soils under a good hydrologic condition where conservation practices are used and are selected to be protective of the resource waters.

2. This paragraph does not apply to:
   a. A post-construction site where the change in hydrology due to development does not increase the existing surface water elevation at any point within the downstream receiving water by more than 0.01 of a foot for the 2-year, 24-hour storm event.
   Note: Hydraulic models such as HEC-RAS or another methodology may be used to determine the change in surface water elevations.
   b. A redevelopment post-construction site.
   c. An in-fill development area less than 5 acres.
   Note: The intent of par. (b) is to minimize streambank erosion under bank full conditions.

   (c) Infiltration. BMPs shall be designed, installed and maintained to infiltrate runoff to the maximum extent practicable in accordance with the following, except as provided in subds. 5. to 8.:

   1. For residential developments one of the following shall be met:
      a. Infiltrate sufficient runoff volume so that the post-developent infiltration volume shall be at least 90% of the pre-development infiltration volume, based on an average annual rainfall. However, when designing appropriate infiltration systems to meet this requirement, no more than 1% of the project site is required as an effective infiltration area.
      b. Infiltrate 25% of the post-development runoff volume from the 2-year, 24-hour design storm with a type II distribution. Separate curve numbers for pervious and impervious surfaces shall be used to calculate runoff volumes and not composite curve numbers as defined in TR-55. However, when designing appropriate infiltration systems to meet this requirement, no more than 1% of the project site is required as an effective infiltration area.
   2. For non-residential development, including commercial, industrial and institutional development, one of the following shall be met:
      a. For this subdivision only, the “project site” means the rooftop and parking lot areas.
      b. Infiltrate sufficient runoff volume so that the post-development infiltration volume shall be at least 60% of the pre-development infiltration volume, based on an average annual rainfall. However, when designing appropriate infiltration systems to meet this requirement, no more than 2% of the project site is required as an effective infiltration area.
      c. Infiltrate 10% of the post-development runoff volume from the 2-year, 24-hour design storm with a type II distribution. Separate curve numbers for pervious and impervious surfaces shall be used to calculate runoff volumes and not composite curve numbers as defined in TR-55. However, when designing appropriate infiltration systems to meet this requirement, no more than 2% of the project site is required as an effective infiltration area.
   3. Pre-development condition shall be the same as specified in par. (b).
   Note: A model that calculates runoff volume, such as SLAMM, P8 or an equivalent methodology may be used. Information on how to access SLAMM and P8 is available at: http://www.dnr.state.wi.us/org/water/wm/nps/slamm.htm or contact the storm water coordinator in the runoff management section of the bureau of watershed management at (608) 267-7604.

   4. Before infiltrating runoff, pretreatment shall be required for parking lot runoff and for runoff from new road construction in commercial, industrial and institutional areas that will enter an infiltration system. The pretreatment shall be designed to protect the infiltration system from clogging prior to scheduled maintenance and to protect groundwater quality in accordance with subd. 8.
   Note: To achieve the infiltration requirement for the parking lots or roads, maximum extent practicable should not be interpreted to require significant topography changes that create an excessive financial burden. To minimize potential groundwater impacts it is desirable to infiltrate the cleanest runoff. To achieve this, a design may propose greater infiltration of runoff from low pollutant sources such as roofs, and less from higher pollutant source areas such as parking lots.

   5. Exclusions. The runoff from the following areas are prohibited from meeting the requirements of this paragraph:
      a. Areas associated with tier 1 industrial facilities identified in s. NR 216.21 (2) (a), including storage, loading, rooftop and parking.
      b. Storage and loading areas of tier 2 industrial facilities identified in s. NR 216.21 (2) (b).
      Note: Runoff from tier 2 parking and rooftop areas may be infiltrated but may require pretreatment.
      c. Fueling and vehicle maintenance areas.
      d. Areas within 1000 feet upgradient or within 100 feet downgradient of karst features.
      e. Areas with less than 3 feet separation distance from the bottom of the infiltration system to the elevation of seasonal high groundwater or the top of bedrock, except this subd. 5. e. does not prohibit infiltration of roof runoff.
      f. Areas with runoff from industrial, commercial and institutional parking lots and roads and residential arterial roads with less than 5 feet separation distance from the bottom of the infiltration system to the elevation of seasonal high groundwater or the top of bedrock.
      g. Areas within 400 feet of a community water system well as specified in s. NR 811.16 (4) or within 100 feet of a private well as specified in s. NR 812.08 (4) for runoff infiltrated from commercial, industrial and institutional land uses or regional devices for residential development.
      h. Areas where contaminants of concern, as defined in s. NR 720.03 (2), are present in the soil through which infiltration will occur.
      i. Any area where the soil does not exhibit one of the following characteristics between the bottom of the infiltration system and the seasonal high groundwater and top of bedrock: at least a 3-foot soil layer with 20% fines or greater; or at least a 5-foot soil layer with 10% fines or greater. This subd. 5. i. does not apply where the soil medium within the infiltration system provides an equivalent level of protection. Subdivision 5. i. does not prohibit infiltration of roof runoff.
      Note: The areas listed in subd. 5. are prohibited from infiltrating runoff due to the potential for groundwater contamination.

   6. Exemptions. The following are not required to meet the requirements of this paragraph:
      a. Areas where the infiltration rate of the soil is less than 0.6 inches/hour measured at the bottom of the infiltration system.
      b. Parking areas and access roads less than 5,000 square feet for commercial and industrial development.
      c. Redevelopment post-construction sites.
      d. In-fill development areas less than 5 acres.
      e. Infiltration areas during periods when the soil on the site is frozen.
      f. Roads in commercial, industrial and institutional land uses, and arterial residential roads.

   7. Where alternate uses of runoff are employed, such as for toilet flushing, laundry or irrigation, such alternate use shall be given equal credit toward the infiltration volume required by this paragraph.

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

b. Notwithstanding subd. 8. a., the discharge from BMPs shall remain below the enforcement standard at the point of standards application.

d. (d) Protective areas. 1. In this paragraph, “protective area” means an area of land that commences at the top of the channel of lakes, streams and rivers, or at the delineated boundary of wetlands, and that is the greatest of the following widths, as measured horizontally from the top of the channel or delineated wetland boundary to the closest impervious surface. However, in this paragraph, “protective area” does not include any area of land adjacent to any stream enclosed within a pipe or culvert, such that runoff cannot enter the enclosure at this location.

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

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

c. For lakes, 50 feet.

d. For highly susceptible wetlands, 50 feet. Highly susceptible wetlands include the following types: fens, sedge meadows, bogs, low prairies, conifer swamps, shrub swamps, other forested wetlands, fresh wet meadows, shallow marshes, deep marshes and seasonally flooded basins. Wetland boundary delineation shall be made in accordance with s. NR 103.08 (1m). This paragraph does not apply to wetlands that have been completely filled in accordance with all applicable state and federal regulations. The protective area for wetlands that have been partially filled in accordance with all applicable state and federal regulations shall be measured from the wetland boundary delineation after fill has been placed.

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

f. In subd. 1. a., d. and e., determinations of the extent of the protective area adjacent to wetlands shall be made on the basis of the sensitivity and runoff susceptibility of the wetland in accordance with the standards and criteria in s. NR 103.03.

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

2. This paragraph applies to post-construction sites located within a protective area, except those areas exempted pursuant to subd. 4.

3. The following requirements shall be met:

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

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

Note: It is recommended that seeding of non-aggressive vegetative cover be used in the protective areas. Vegetation that is flood and drought tolerant and can provide long-term bank stability because of an extensive root system is preferable. Vegetative cover may be measured using the line transect method described in the university of Wisconsin extension publication number A3533, titled “Estimating Residue Using the Line Transect Method”.

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

Note: Other regulations, such as ch. 30, Stats., and chs. NR 103, 115, 116 and 117 and their associated review and approval process may apply in the protective area.

d. Exemptions. This paragraph does not apply to:

a. Redevelopment post-construction sites.

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

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

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

e. Post-construction sites from which runoff does not enter the surface water, except to the extent that vegetative ground cover is necessary to maintain bank stability.

Note: A vegetated protective area to filter runoff pollutants from post-construction sites described in subd. 4. c. is not necessary since runoff is not entering the surface water at that location. Other practices necessary to meet the requirements of this section, such as a swale or basin, will need to be designed and implemented to reduce runoff pollutants prior to runoff entering a surface water of the state.

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

Note: A combination of the following BMPs may be used: oil and grease separators, canopies, petroleum spill cleanup materials, or any other structural or non-structural method of preventing or treating petroleum in runoff.

f. Location. To comply with the standards required under this subsection, BMPs may be located on-site or off-site as part of a regional storm water device, practice or system, but shall be installed in accordance with s. NR 151.003.

g. Timing. The BMPs that are required under this subsection shall be installed before the construction site has undergone final stabilization.

History: cr. 408−7 12: cr. (2) (bm) Register December 2010 No. 660, eff. 1−1−11.

NR 151.121 Post-construction performance standards. (1) GENERAL. In ss. NR 151.121 to 151.128, “post-construction site” means a construction site subject to regulation under this subchapter, after construction is completed and final stabilization has occurred.

(2) APPLICABILITY. Sections NR 151.121 to 151.128 apply to a post-construction site that is or was subject to the construction performance standards of s. NR 151.11, except any of the following:

a. A post-construction site with less than 10 percent connected imperviousness, based on the area of land disturbance, provided the cumulative area of all impervious surfaces is less than one acre. However, the exemption of this paragraph does not include exemption from the protective area standard of s. NR 151.125.

b. Agricultural facilities and practices.

Note: This exemption includes both point and nonpoint discharges from agricultural facilities and practices. Therefore, post-construction structures such as barns, manure storage facilities, sand settling lanes, and barnyard runoff control systems are subject to subch. If and are not subject, under s. NR 216.47 (1), to the post-construction performance standards of this subchapter.

c. Underground utility construction, but not including the construction of any above ground structures associated with utility construction.

(3) RESPONSIBLE PARTY. The landowner of the post-construction site or other person contracted or obligated by other agreement with the landowner to implement and maintain post-construction storm water BMPs is the responsible party and shall comply with ss. NR 151.121 to 151.128.

(4) STORM WATER MANAGEMENT PLAN. A written storm water management plan shall be developed and implemented for each
post-construction site and shall incorporate the requirements of ss. NR 151.122 to 151.128.

Note: Examples of storm water management plans that may be used to comply with ss. NR 151.122 to 151.128 may include those specified in s. NR 216.47 or the municipal storm water management program specified in s. NR 216.07 (5).

(5) MAINTENANCE OF EFFORT. For redevelopment sites where the redevelopment will be replacing older development that was subject to post-construction performance standards of this chapter in effect on or after October 1, 2004, the responsible party shall meet the total suspended solids reduction, peak flow control, infiltration, and protective areas standards applicable to the older development or meet the redevelopment standards of ss. NR 151.122 to 151.125, whichever are more stringent.

History: CR 09–112; cr. Register December 2010 No. 660, eff. 1–1–11.

NR 151.122 Total suspended solids performance standard. (1) REQUIREMENT. BMPs shall be designed, installed and maintained to control total suspended solids carried in runoff from the post-construction site. BMPs shall be designed in accordance with Table 1., or to the maximum extent practicable as provided in sub. (3). The design shall be based on an average annual rainfall, as compared to no runoff management controls.

(2) REDEVELOPMENT. Except as provided in s. NR 151.121 (5), the redevelopment total suspended solids reduction standard of Table 1., applies to redevelopment.

(3) MAXIMUM EXTENT PRACTICABLE. If the design cannot meet a total suspended solids reduction performance standard of sub. (1), Table 1., the storm water management plan shall include a written, site-specific explanation of why the total suspended solids reduction performance standard cannot be met and why the total suspended solids load will be reduced only to the maximum extent practicable. The department may not require any person to exceed the applicable total suspended solids reduction performance standard to meet the requirements of maximum extent practicable.

Note: Pollutant loading models such as DETPOND, SLAMM, P8, or equivalent methodology may be used to evaluate the efficiency of the design in reducing total suspended solids. Information on how to access these models is available at: http://dnr.wi.gov/runoff/models/index.htm or by contacting the department’s storm water management program at (608) 267−7694. Use the most recent version of the model and the rainfall files and other parameter files identified for Wisconsin users unless directed otherwise by the regulatory authority.

(4) OFF-SITE DRAINAGE. When designing BMPs, runoff draining to the BMP from off-site shall be taken into account in determining the treatment efficiency of the practice. Any impact on the efficiency shall be compensated for by increasing the size of the BMP accordingly.

History: CR 09–112; cr. Register December 2010 No. 660, eff. 1–1–11.

NR 151.123 Peak discharge performance standard. (1) REQUIREMENT. By design, BMPs shall be employed to maintain or reduce the 1−year, 24−hour and the 2−year, 24−hour post−construction peak runoff discharge rates to the 1−year, 24−hour and the 2−year, 24−hour pre−development peak runoff discharge rates respectively, or to the maximum extent practicable. The runoff curve numbers in Table 2. shall be used to represent the actual pre−development condition.

### Table 1. TSS Reduction Standards

<table>
<thead>
<tr>
<th>Development Type</th>
<th>TSS Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Development</td>
<td>80 percent</td>
</tr>
<tr>
<td>In−fill ≥ 5 acres</td>
<td>80 percent</td>
</tr>
<tr>
<td>In−fill &lt; 5 acres on or after October 1, 2012</td>
<td>80 percent</td>
</tr>
<tr>
<td>Redevelopment</td>
<td>40 percent of load from parking areas and roads</td>
</tr>
<tr>
<td>In−fill &lt; 5 acres and before October 1, 2012</td>
<td>40 percent</td>
</tr>
</tbody>
</table>

(2) EXCEPTIONS. This section does not apply to the following:

(a) A post−construction site where the discharge is directly into a lake over 5,000 acres or a stream or river segment draining more than 500 square miles.

(b) Except as provided under s. NR 151.121 (5), a redevelopment post−construction site.

(c) An in−fill development area of less than 5 acres.

Note: The intent of s. NR 151.121 is to minimize streambank and shoreline erosion under bank−full conditions.

History: CR 90−112; cr. Register December 2010 No. 660, eff. 1−1−11.

NR 151.124 Infiltration performance standard. (1) REQUIREMENT. BMPs shall be designed, installed, and maintained to infiltrate runoff in accordance with the following or to the maximum extent practicable:

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

(b) Moderate imperviousness. For development with more than 40 percent and up to 80 percent connected imperviousness, such as commercial strip malls, shopping centers, and commercial downtowns, infiltrate sufficient runoff volume so that the post−development infiltration volume shall be at least 75 percent of the pre−development infiltration volume, based on an average annual rainfall. However, when designing appropriate infiltration systems to meet this requirement, no more than 2 percent of the post−construction site is required as an effective infiltration area.

(c) High imperviousness. For development with more than 80 percent connected imperviousness, such as retail centers and industrial and institutional development, infiltrate sufficient runoff volume so that the post−development infiltration volume shall be at least 60 percent of the pre−development infiltration volume, based on an average annual rainfall. However, when designing appropriate infiltration systems to meet this requirement, no more than 2 percent of the post−construction site is required as an effective infiltration area.

### Table 2. Maximum Pre-Development Runoff Curve Numbers

<table>
<thead>
<tr>
<th>Runoff Curve Number</th>
<th>Hydrologic Soil Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Woodland</td>
<td>30</td>
</tr>
<tr>
<td>Grassland</td>
<td>39</td>
</tr>
<tr>
<td>Cropland</td>
<td>55</td>
</tr>
</tbody>
</table>

Note: Where the pre−development condition is a combination of woodland, grassland, or cropland, the runoff curve number should be pre−rated by area.

Notes: A histogram showing the relationship between connected imperviousness and land use is available at http://dnr.wi.gov/runoff/stormwater/muni.htm.

(2) PRE-DEVELOPMENT. Pre−development condition shall be the same as specified in s. NR 151.123 (1), Table 2.

Note: A model that calculates runoff volume, such as SLAMM, P8, or an equivalent methodology may be used. For performance standards based on an average annual rainfall, specific rainfall files for five geographic locations around the state may be used. Information on how to access SLAMM and P8 and the rainfall files is available at: http://dnr.wi.gov/runoff/models/index.htm or by contacting the department’s storm water management program at (608) 267−7694. Use the most recent version of the model and the parameter files for Wisconsin users unless directed otherwise by the regulatory authority.

(3) SOURCE AREAS. (a) Prohibitions. Runoff from the following areas may not be infiltrated and may not qualify as contributing to meeting the requirements of this section unless demonstrated to meet the conditions of sub. (6):

1. Areas associated with a tier 1 industrial facility identified in s. NR 216.21 (2) (a), including storage, loading, and parking.
Rooftops may be infiltrated with the concurrence of the regulatory authority.

2. Storage and loading areas of a tier 2 industrial facility identified in s. NR 216.21 (2) (b).
   
   Note: Runoff from the employee and guest parking and rooftop areas of a tier 2 facility may be infiltrated but runoff from the parking area may require pretreatment.

3. Fueling and vehicle maintenance areas. Rooftops of fueling and vehicle maintenance areas may be infiltrated with the concurrence of the regulatory authority.

(b) Exemptions. Runoff from the following areas may be credited toward meeting the requirement when infiltrated, but the decision to infiltrate runoff from these source areas is optional:

1. Parking areas and access roads less than 5,000 square feet for commercial development.
2. Parking areas and access roads less than 5,000 square feet for industrial development not subject to the prohibitions under par. (a).
3. Except as provided under s. NR 151.121 (5), redevelopment post-construction sites.
4. In–fill development areas less than 5 acres.
5. Roads in commercial, industrial, and institutional land uses, and arterial residential roads.

(4) LOCATION OF PRACTICES. (a) Prohibitions. Infiltration practices may not be located in the following areas:

1. Areas within 1,000 feet upgradient or within 100 feet downgradient of direct conduits to groundwater.
2. Areas within 400 feet of a community water system well as specified in s. NR 811.16 (4) or within the separation distances listed in s. NR 812.08 for any private well or non–community well for runoff infiltrated from commercial, including multi–family residential, industrial, and institutional land uses or regional devices for one– and two–family residential development.
3. Areas where contaminants of concern, as defined in s. NR 720.03 (2), are present in the soil through which infiltration will occur.

(b) Separation distances. 1. Infiltration practices shall be located so that the characteristics of the soil and the separation distance between the bottom of the infiltration system and the elevation of seasonal high groundwater or the top of bedrock are in accordance with Table 3:

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

2. Notwithstanding par. (b), applicable requirements for injection wells classified under ch. NR 815 shall be followed.

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

1. Where the infiltration rate of the soil measured at the proposed bottom of the infiltration system is less than 0.6 inches per hour using a scientifically credible field test method.
2. Where the least permeable soil horizon to 5 feet below the proposed bottom of the infiltration system using the U.S. department of agriculture method of soils analysis is one of the following: sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, or clay.

(5) ALTERNATE USE. Where alternate uses of runoff are employed, such as for toilet flushing, laundry or irrigation or storage on green roofs where an equivalent portion of the runoff is captured permanently by rooftop vegetation, such alternate use shall be given equal credit toward the infiltration volume required by this section.

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

(b) Notwithstanding par. (a), the discharge from BMPs shall remain below the enforcement standard at the point of standards application.

(7) PRETREATMENT. Before infiltrating runoff, pretreatment shall be required for parking lot runoff and for runoff from new road construction in commercial, industrial, and institutional areas that will enter an infiltration system. The pretreatment shall be designed to protect the infiltration system from clogging prior to scheduled maintenance and to protect groundwater quality in accordance with sub. (6). Pretreatment options may include, but are not limited to, oil and grease separation, sedimentation, biofiltration, filtration, swales, or filter strips.

(8) MAXIMUM EXTENT PRACTICABLE. Where the conditions of subs. (3) and (4) limit or restrict the use of infiltration practices, the performance standard of s. NR 151.124 shall be met to the maximum extent practicable.

History: CR 99-112: cr. Register December 2010 No. 660, eff. 1–1–11.

NR 151.125 Protective areas performance standard. (1) DEFINITION. In this section, “protective area” means an area of land that commences at the top of the channel of lakes, streams and rivers, or at the delineated boundary of wetlands, and that is the greatest of the following widths, as measured horizontally from the top of the channel or delineated wetland boundary to the closest impervious surface. However, in this section, “protective area” does not include any area of land adjacent to any stream enclosed within a pipe or culvert, so that runoff cannot enter the enclosure at this location.

(a) For outstanding resource waters and exceptional resource waters, 75 feet.

(b) For perennial and intermittent streams identified on a U.S. geological survey 7.5–minute series topographic map, or a county soil survey map, whichever is more current, 50 feet.

(c) For lakes, 50 feet.

(d) For wetlands not subject to par. (e) or (f), 50 feet.

(e) For highly susceptible wetlands, 75 feet. Highly susceptible wetlands include the following types: calcareous fens, sedge meadows, open and coniferous bogs, low prairies, coniferous swamps, lowland hardwood swamps, and ephemeral ponds.

(f) For less susceptible wetlands, 10 percent of the average wetland width, but no less than 10 feet nor more than 30 feet. Less susceptible wetlands include: degraded wetlands dominated by
invasive species such as reed canary grass; cultivated hydric soils; and any gravel pits, or dredged material or fill material disposal sites that take on the attributes of a wetland.

(g) In pars. (d) to (f), determinations of the extent of the protective area adjacent to wetlands shall be made on the basis of the sensitivity and runoff susceptibility of the wetland in accordance with the standards and criteria in s. NR 103.03.

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

(i) For concentrated flow channels with drainage areas greater than 130 acres, 10 feet.

(j) Notwithstanding pars. (a) to (i), the greatest protective area width shall apply where rivers, streams, lakes, and wetlands are contiguous.

Note: A stream or lake is not eligible for a lower protective area width even if contiguous to a less susceptible wetland.

(2) APPLICABILITY. This section applies to post-construction sites located within a protective area, except those areas exempted pursuant to sub. (4).

(3) REQUIREMENTS. The following requirements shall be met:

(a) Impervious surfaces shall be kept out of the protective area entirely or to the maximum extent practicable. If there is no practical alternative to locating an impervious surface in the protective area, the storm water management plan shall contain a written, site-specific explanation.

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

Note: It is recommended that seeding of non-invasive vegetative cover be used in the protective areas. Some invasive plants are listed in ch. NR 40.

Vegetation that is flood and drought tolerant and can provide long-term bank stability because of an extensive root system is preferable. Vegetative cover may be measured using the line transect method described in the University of Wisconsin extension publication number A3533, titled “Estimating Residue Using the Line Transect Method”.

(c) Best management practices such as filter strips, swales, or wet detention ponds, that are designed to control pollutants from non-point sources, may be located in the protective area.

Note: Other laws, such as ch. 30, Stats., and chs. NR 103, 115, 116, and 117 and their associated review and approval processes may apply in the protective area.

(4) EXEMPTIONS. This section does not apply to any of the following:

(a) Except as provided under s. NR 151.121 (5), redevelopment post-construction sites.

(b) In-fill development areas less than 5 acres.

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

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

(e) Areas of post-construction sites from which the runoff does not enter the surface water, including wetlands, without first being treated by a BMP to meet the requirements of ss. NR 151.122 to 151.123, except to the extent that vegetative ground cover is necessary to maintain bank stability.

Note: A vegetated protective area to filter runoff pollutants from post-construction sites described in par. (a) is not necessary since the runoff at that location is treated prior to entering the surface water. Other practices necessary to meet the requirements of this section, such as a swale or pond, will need to be designed and implemented to reduce runoff pollutants prior to runoff entering a surface water of the state. The requirements of ch. NR 103 still apply and should be considered before runoff is diverted to or from a wetland.

History: CR 09−112: cr. Register December 2010 No. 660, eff. 1−1−11.

NR 151.126 Fueling and vehicle maintenance areas performance standard. Fueling and vehicle maintenance areas shall have BMPs designed, installed, and maintained to reduce petroleum within runoff, so that the runoff that enters waters of the state contains no visible petroleum sheen, or to the maximum extent practicable.

A combination of the following BMPs may be used: oil and grease separators, canopys, petroleum spill cleanup materials, or any other structural or non-structural method of preventing or treating petroleum in runoff.

History: CR 09−112: cr. Register December 2010 No. 660, eff. 1−1−11.

NR 151.127 Location. To comply with the standards required under ss. NR 151.122 to 151.124, BMPs may be located on-site or off-site as part of a regional storm water device, practice, or system, but shall be installed in accordance with s. NR 151.003.

History: CR 09−112: cr. Register December 2010 No. 660, eff. 1−1−11.

NR 151.128 Timing. The BMPs that are required under ss. NR 151.122 to 151.126 shall be installed before the construction site has undergone final stabilization.

Note: In accordance with subch. V, the department has developed technical standards to help meet the post-construction performance standards. These technical standards are available on the department web page at: http://dnr.wi.gov/runoff/stormwater/techstds.htm.

History: CR 09−112: cr. Register December 2010 No. 660, eff. 1−1−11.

NR 151.13 Developed urban area performance standard for municipalities. (1) INCORPORATED MUNICIPALITIES.

(a) Applicability. This subsection applies to any incorporated municipality with an average density of 1,000 people per square mile or greater, based on the latest decennial census made by the U.S. census, as well as any commercial and industrial areas contiguous to these areas.

Note: The municipality has primary responsibility for complying with this subsection. However, the public is expected to follow municipal ordinance requirements and requests to carry out activities such as: proper curbside placement of leaves for collection, relocating vehicles for street sweeping, and utilizing proper disposal methods for oils and other chemicals.

(b) Requirements. For areas identified under par. (a), all of the following shall be implemented:

1. A public information and education program, utilizing materials identified by the department, promoting beneficial on-site reuse of leaves and grass clippings and proper use of turf and garden fertilizers and pesticides, proper management of pet wastes, and prevention of dumping oil and other chemicals in storm sewers.

2. A municipal program, as appropriate, for the management of leaf and grass clippings, including public education about this program.

3. The application of turf and garden fertilizers on five acres or more of municipally controlled property shall be done in accordance with a site specific nutrient application schedule based on appropriate soil tests. The nutrient application schedule shall be designed to maintain the optimal health of the turf or garden vegetation.

Note: In accordance with subch. V, the department has developed a technical standard to help meet the nutrient management performance standard. The technical standard is available on the department web page at: http://dnr.wi.gov/runoff/stormwater/techstds.htm.

4. Detection and elimination of illicit discharges to storm sewers.

(2) PERMITTED MUNICIPALITIES. (a) Applicability. This subsection applies to municipalities that are subject to the municipal storm water permit requirements of subch. I of ch. NR 216.

(b) Program. A municipality shall develop and implement a storm water management program, including the adoption and administration of any necessary ordinance, to meet the following requirements:
1. ‘Stage 1 requirements.’ The municipalities identified under par. (a) shall implement all of the following within 2 years of receiving permit coverage under subch. I of ch. NR 216:
   a. All of the requirements contained in sub. (1) (b).
   b. A 20 percent reduction in total suspended solids, or to the maximum extent practicable, as compared to no controls, for runoff from existing development that enters waters of the state.

2. ‘Stage 2 requirements.’ The municipalities identified under par. (a) shall implement one of the following for runoff from existing development that enters waters of the state, as compared to no controls:
   a. A 40 percent reduction in total suspended solids, by March 31, 2013, if permit coverage was received under subch. I of ch. NR 216 on or before January 1, 2010.
   b. A 40 percent reduction in total suspended solids within 7 years of the date of receiving permit coverage for municipalities identified under par. (a), if permit coverage was received under subch. I of ch. NR 216 after January 1, 2010.
   c. If a municipality identified under par. (a) has determined that it will not achieve a 40 percent reduction in total suspended solids in runoff that enters waters of the state as compared to no controls, by the applicable date of subd. 2. a. or b., then 6 months before the applicable date the municipality shall submit a report to the department describing the control measures that it has implemented and shall submit a long term storm water management plan in accordance with subd. 3.

3. ‘Long term storm water management plan.’ Plans shall include all of the following elements:
   a. A baseline report showing the existing development boundary, drainage basins, and land uses; and applicable model results to justify the loading for total suspended solids for no controls and controls implemented by the applicable date in subd. 2. to meet the requirements in subd. 2. Modeling shall conform to that described in subd. 5.
   b. Any agreements with an adjacent municipality, or with municipalities within a 10 digit hydrologic unit code level, to implement the 40 percent total suspended solids reduction on a regional basis per s. NR 216.07 (6).
   c. Any long–term maintenance agreements with non–publicly owned control measures where credit for the total suspended solids reduction is included in the analysis.
   d. An implementation plan and its associated timetable for control measures identified in a cost–effectiveness analysis consistent with subd. 3. f., that would result in achieving a 40 percent total suspended solids reduction within a period not to exceed 10 years from the applicable compliance date in subd. 2. unless documentation in subd. 3. e. is provided. The plan shall include modeling data consistent with subd. 5.
   e. If a municipality has determined that it cannot achieve 40 percent total suspended solids reduction within 10 years from the applicable compliance date in subd. 2. including the use of agreements with other municipalities and long term maintenance agreements for non–public control measures, the plan shall demonstrate why 40 percent reduction cannot be achieved. A long term storm water management plan under this subdivision shall describe the control measures identified in a cost–effectiveness analysis consistent with subd. 3. f. that the municipality will implement within 10 years and document the amount of reduction that will be achieved. The plan shall also include an implementation plan and associated timetable for control measures identified in a cost–effectiveness analysis consistent with subd. 3. f. that would result in achieving a 40 percent total suspended solids reduction. The plan shall include modeling data consistent with subd. 5.
   f. A cost–effectiveness analysis shall include a systematic comparison of alternatives to meet the 40 percent total suspended solids reduction based on the cost per pound of pollutant removed.

This analysis shall take into account anticipated redevelopment or reconstruction projects and the cost to retrofit the site versus the cost to install practices during redevelopment or reconstruction. The analysis shall consider the cost to ensure long term maintenance of non–publicly owned control practices for which the municipality is taking credit as well as publicly owned control practices, the source of funding for installation and maintenance of control measures, and competing interests for that funding source. The municipality may include an analysis of affordability in the cost–effectiveness analysis. The analysis shall consider the feasibility and commensurate increase in cost of installing a control measure where there are competing issues such as human safety and welfare, endangered and threatened resources, historic properties, and geographic features.

4. ‘Long term plan review.’ a. The department shall review the plan required under subd. 3. and provide comments within 6 months of receipt. The municipality shall modify the plan to correct any deficiencies identified by the department.
   b. The department shall accept documentation that demonstrates to the department’s satisfaction that the 40 percent reduction will be met by the applicable compliance date of subd. 2.
   c. The department shall review plans where the 40 percent reduction can be made within the schedule proposed by the municipality under subd. 3. d. However, the department upon review of the plan may request a modification of the schedule or control measures if the department determines that control measures can achieve the 40 percent reduction within a shorter timeframe. The department shall include in the acceptance of the plan the provision in subd. 4. e.
   d. The department shall review a plan with an extended timetable beyond 10 years from the applicable compliance date in subd. 2. where the municipality has demonstrated to the department’s satisfaction that the 40 percent reduction cannot be made within 10 years from the applicable compliance date in subd. 2. However, upon review of the plan the department may request a modification of the schedule or control measures if the department determines that control measures can achieve the 40 percent reduction within a shorter timeframe than proposed by the municipality. The department shall include in the acceptance of the plan the provision in subd. 4. e.
   e. The municipality shall submit a report on an initial schedule set by the department and every 5 years thereafter documenting progress and reviewing whether changes in land use, local regulations, control technology or other factors have affected the use or timing of control measures meeting the performance standard of subd. 2. The report shall include a modeling analysis documenting progress and recommending any changes in control measures or timetables for achieving a 40 percent reduction.

5. ‘Model requirements.’ Evidence of meeting the performance standard of subd. 2. shall be based on the use of a model or an equivalent methodology approved by the department. Acceptable models and model versions include SLAMM version 9.2 and P8 version 3.4 or subsequent versions of those models. Earlier versions of SLAMM are acceptable when the municipality is not taking any credit for street cleaning.

Note: Information on how to access SLAMM and P8 and the relevant parameter files are available at: http://dnr.wi.gov/runoff/models/index.htm or by contacting the department’s storm water management program at (608) 267–7694.

Note: It is expected that a municipality will be able to achieve the 40 percent reduction with a combination of practices including the use of high efficiency street cleaning, structural BMP retrofit practices, structural BMP redevelopment or reconstruction practices, and entering into maintenance agreements for BMPs on privately owned lands, such as shopping centers, to receive credit.

(c) Location. To comply with the standards required under this subsection, BMPs may be located on–site or off–site as part of a regional storm water device, practice or system, but shall be installed in accordance with s. NR 151.003.

(d) Exemption. The requirements of par. (b) 1. and 2. do not apply to areas subject to a permit issued under subch. II of ch. NR 216.
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Unofficial Text (See Printed Volume).  Current through date and Register shown on Title Page.

(e) Calculation of reduction.  The department shall recognize total suspended solids reduction not otherwise accounted for in computer models for the implementation of programs, ordinances and other institutional controls that result in scientifically supported reductions of total suspended solids and are developed as a technical standard under s. NR 151.31.

History:  CR 00−027: cr. Register September 2002 No. 561, eff. 10−1−02; CR 09−112: r. and recr. Register December 2010 No. 660, eff. 1−1−11.

NR 151.14  Turf and garden nutrient management performance standard.  (1) APPLICABILITY.  This section applies when all of the following conditions are met:

(a) The property is not subject to s. NR 151.13 (1) (b) 3.
(b) Nutrients are applied to over 5 acres of turf or garden.
(c) The property discharges runoff to waters of the state.
(d) The property is not an agricultural facility or practice.
(e) The property does not conduct silviculture activity.

(2) RESPONSIBLE PARTY.  The landowner is the responsible party and shall comply with this section.

(3) REQUIREMENTS.  The application of turf and garden fertilizers on these properties shall be done in accordance with site−specific nutrient application schedules based on appropriate soil tests.  The nutrient application schedule shall be designed to maintain the optimal health of the turf or garden vegetation.

Note:  In accordance with subch. V, the department has developed a technical standard to help meet the nutrient management performance standard.  The technical standard is available on the department web page at: http://dnr.wi.gov/runoff/models/index.htm or by contacting the storm water/techstds.htm.

History:  CR 00−027: cr. Register September 2002 No. 561, eff. 10−1−02; CR 09−112: r. and recr. Register December 2010 No. 660, eff. 1−1−11.

NR 151.15  Implementation and enforcement.

(1) IMPLEMENTATION.  This subchapter shall be implemented as follows:

(a) Construction sites and post−construction sites.  The provisions of ss. NR 151.11, 151.12, and 151.121 to 151.128 shall be implemented through subch. III of ch. NR 216.

Note:  The department may develop and revise available model ordinances to reflect the applicability and performance standards in ss. NR 151.11, 151.12, and 151.121 to 151.128.  These model ordinances are in chs. NR 152. Municipalities are encouraged to adopt the requirements of ss. NR 151.11, 151.12, and 151.121 to 151.128 into local ordinances.  Incentives are included in the grant programs identified in chs. NR 153 and 155, for municipalities that adopt the performance standards into their ordinances, provide an information and education program, and track and report their enforcement activity.

(b) Developed urban areas.  The provisions of s. NR 151.13 (2) shall be implemented through subch. I of ch. NR 216.

(2) ENFORCEMENT.  The department shall enforce this subchapter under s. 281.98, Stats., except for those requirements that are implemented through ch. NR 216, which shall be enforced under ss. 283.89 and 283.91, Stats.

History:  CR 00−027: cr. Register September 2002 No. 561, eff. 10−1−02; CR 09−112: am. (1), (2) Register December 2010 No. 660, eff. 1−1−11; correction to numbering of (2) made under s. 13.92 (4) (b) 1., Stats., Register December 2010 No. 660.

Subchapter IV — Transportation Facility Performance Standards

NR 151.20  Purpose and applicability.  (1) This subchapter establishes performance standards, as authorized by s. 281.16 (2) (a), Stats., for transportation facilities that cause or may cause runoff pollution.  These performance standards are intended to limit runoff pollution in order to achieve water quality standards.  Design guidance and the process for developing technical standards to implement this subchapter are set forth in subch. V.

(2) Transportation facilities that are directed and supervised by the department of transportation and that are regulated by an administrative rule administered by the department of transportation, where the department determines in writing that the rule meets or exceeds the performance standards of this subchapter and is implemented in accordance with the administrative rule provisions, shall be deemed to meet the requirements of the portions of this subchapter determined by the department.

(3) In s. NR 151.23, soil loss is calculated using the appropriate rainfall or runoff factor, also referred to as the R factor, or an equivalent design storm using a type II distribution, with consideration given to the geographic location of the site and the period of disturbance.

Note:  The universal soil loss equation and its successors, revised universal soil loss equation and revised universal soil loss equation 2, utilize an R factor which has been developed to estimate soil erosion, averaged over extended time periods.  The R factor can be modified to estimate monthly and single−storm erosion.

History:  CR 00−027: cr. Register September 2002 No. 561, eff. 10−1−02; CR 09−112: am. Register December 2010 No. 660, eff. 1−1−11.

NR 151.21  Definitions.  In this subchapter:

(1m) “Average annual rainfall” means a typical calendar year of precipitation as determined by the department for users of models such as SLAMM, P8, or equivalent methodology.  The average annual rainfall is chosen from a department publication for the location closest to the municipality.

Note:  Information on how to access SLAMM and P8 and the average annual rainfall values for five locations in the state, as published periodically by the department, is available at: http://dnr.wi.gov/runoff/models/index.htm or by contacting the storm water management program at (608) 267−7694.

(2) “Borrow site” means an area outside of a project site from which stone, soil, sand or gravel is excavated for use at the project site, except the term does not include commercial pits.

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

(4) “Material disposal site” means an area outside of a project site, which is used, for the lawful disposal of surplus materials or materials unsuitable for use within the project site that is under the direct control of the contractor.  A municipally owned landfill or private landfill that is not managed by the contractor is excluded from this definition.

(5) “Minor reconstruction” means either of the following:

(a) For transportation facility construction sites where, before January 1, 2011, a bid was advertised, a construction contract was signed and no bid was advertised, or a notice of intent was received by the department in accordance with subch. III of ch. NR 216, reconstruction that is limited to 1.5 miles in continuous or aggregate total length of realignment and that does not exceed 100 feet in width of roadbed widening.

(b) For transportation facility construction sites where, on or after January 1, 2011, a bid is advertised, a construction contract signed where no bid is advertised or a notice of intent was received by the department in accordance with subch. III of ch. NR 216, reconstruction that is limited to 1.5 miles in continuous or aggregate total length of realignment and that does not exceed 100 feet in width of roadbed widening, and that does not include replacement of a vegetated drainage system with a non−vegetated drainage system except where necessary to convey runoff under a highway or private road or driveway.

(6) “Prime contractor” means a person authorized or awarded a contract to perform, directly or using subcontractors, all the work of a project directed and supervised by the transportation facility authority.

(7) “Private road or driveway” has the meaning given in s. 340.01 (46), Stats.

(8) “Public−use airport” has the meaning given it in 49 USC 47102(21).

(9) “Public mass transit facility” means any area of land or water which is used, or intended for use, by bus or light rail, and any appurtenant areas which are used, or intended for use, by bus or light rail, including buildings or other facilities or rights−of−way, either publicly or privately owned, that provide the public with general or special service on a regular and continuing basis.

(10) “Public trail” means a “state ice age trail area” designated under s. 23.17 (2), Stats., a state trail under s. 23.175 (2) (a), Stats., an “all−terrain vehicle trail” under s. 23.33 (1) (d), Stats., an “off−the−road motorcycle trail” under s. 23.33 (9) (b) 4., Stats., a “rec−
APPENDIX C
The date of coverage under the permit and the second inspection report within 30 months of the effective date of permit coverage. The report shall be written on department forms, and shall contain information from the inspection, quarterly visual inspection, and the annual chemical monitoring. Facilities covered under the tier 2 permit shall keep the results of their annual facility site compliance inspection and quarterly visual inspections on site for department inspection. Facilities covered under a tier 1 permit are not required to submit inspection reports after submittal of the second inspection report, unless so directed by the department. However, these inspections and quarterly visual inspections shall still be conducted; and results shall be kept on site for department inspection.

(3) Inspection dates. The first quarterly visual inspection of storm water discharge quality shall be conducted within 3 months of the effective date of coverage under the permit.

(4) Chemical sampling dates. Owners and operators of facilities covered under a tier 1 permit shall submit annual chemical monitoring results with the compliance inspection report required under s. NR 216.28 (2) for the first 2 years following SWPPP implementation. The monitoring results shall include all of the information specified in s. NR 216.28 (4) (g).

(5) BMP Implementation. Unless an alternate implementation schedule is identified in the permit, the BMPs identified in the SWPPP shall be implemented beginning at the start of industrial operations.

(6) SWPPP Amendments. The permittee shall correct deficiencies in the original SWPPP. The permittee shall amend the SWPPP and notify the department in the event of any facility operational changes that could result in additional significant storm water contamination.

(7) Record Retention. Records required under this subchapter shall be retained for 5 years beyond the date that the record was made and shall be made available to the department upon request.

(8) Signature. Reports required under this subchapter shall be signed in accordance with s. NR 216.22 (7).

History: CR 03–028: cr. Register July 2004 No. 583, eff. 8–1–04.

NR 216.30 Permit fees. (1) A storm water discharge permit fee shall be paid annually by each industrial facility covered by or holding a permit under this subchapter or a wastewater discharge permit that incorporates storm water management requirements under this chapter. Permit fees are due June 30 of each year. The fee shall be either:

(a) $260 for coverage under a tier 1 general industrial storm water discharge permit under s. NR 216.21 (2) (a), an industry-specific general industrial storm water discharge permit under s. NR 216.24 with tier 1 requirements, or an individual WPDES permit under s. 283.31, Stats., with tier 1 requirements.

(b) $130 for coverage under a tier 2 general industrial storm water discharge permit under s. NR 216.21 (2) (b), an industry-specific general industrial storm water discharge permit under s. NR 216.24 or an individual WPDES permit under s. 283.31, Stats., with tier 2 requirements, or

(c) $500 for coverage under an individual WPDES storm water permit issued under s. 283.33 (1), Stats.

(2) Notwithstanding sub. (1), no fee may be charged under this section for facilities that are regulated under a WPDES permit developed specifically to address discharges from non–metallic mining operations and that the department concurs are internally drained and no pollutants are exposed that could contaminate groundwater. A non–metallic mining operation is internally drained if all storm water that contacts disturbed areas or excavated material is directed to onsite seepage areas that are entirely confined and retained within the property boundaries of the site.

History: CR 03–028: cr. Register July 2004 No. 583, eff. 8–1–04.

NR 216.31 Permit coverage transfers. A permittee who will no longer control the permitted industrial facility may request that permit coverage be transferred to the person who will control the industrial facility. The transfer request shall be signed by both the permittee and the new owner or operator and sent via certified or registered mail to the department. The department may require additional information including a notice of intent to be filed prior to transferring permit coverage. Coverage is not transferred until the department sends notification of transfer approval to the new owner or operator.

History: CR 03–028: cr. Register July 2004 No. 583, eff. 8–1–04.

NR 216.32 Permit termination. (1) If the owner or operator of a facility no longer claims coverage under any general or individual permit for the discharge of storm water from industrial activity under this subchapter, the permittee shall submit a signed notice of termination to the department.

(2) A notice of termination shall be submitted on forms available from the department. Data submitted in the notice of termination forms shall be used as a basis for terminating coverage under this subchapter.

(3) The notice of termination form shall be signed in accordance with the signature requirements in s. NR 216.22 (7).

(4) Termination of coverage under this subchapter shall be effective upon receipt of written confirmation from the department by the permittee.

Note: Notice of termination forms may be obtained from the department website at http://www.dnr.state.wi.us/org/water/wm/tnrstormwaterpublications.htm, any regional office of the department, by writing to the Department of Natural Resources, Storm Water Program — WT/2, PO Box 7921, Madison, WI 53707–7921 or by calling the storm water program at (608) 267–7694.

(5) Notice of termination forms shall be filed with the appropriate department regional office or with the Department of Natural Resources, Storm Water Program — WT/2, PO Box 7921, Madison, WI 53707–7921.

History: CR 03–028: cr. Register July 2004 No. 583, eff. 8–1–04.

Subchapter III — Construction Site Storm Water Discharge Permits

NR 216.41 Purpose. The purpose of this subchapter is to establish criteria defining those construction site activities that constitute discharges needing a WPDES storm water permit for landowners of construction sites that require coverage under a WPDES permit for storm water discharges; and the requirements for filing a WPDES permit application for a construction site, as required by s. 283.35, Stats.; to prescribe the form of the WPDES storm water permit application pursuant to s. 283.37, Stats.; to specify the number of working days within which the department will indicate its intended action on a WPDES permit application or request for modification, pursuant to s. 227.116 (1), Stats.; and to specify the erosion control and storm water management that is required at construction sites regulated under this subchapter.

History: CR 03–028: cr. Register July 2004 No. 583, eff. 8–1–04.

NR 216.415 Authorized local program. (1) Purpose. The purpose of this section is to promote efficient, integrated administration of state and municipal construction site erosion control and storm water management programs. A municipality with an authorized local program will be the primary entity fulfilling the technical and administrative responsibilities to assure compliance with both local and state construction site erosion control and storm water management requirements. Authorized local programs simplify the permitting process for landowners and operators responsible for complying with state and local laws and facilitate the integration of erosion control and storm water requirements with other local planning and zoning functions. The department retains its authority to take enforcement against individual landowners and operators for violations of this chapter.
(2) Voluntary Participation. Any municipality may apply to the department for authorization of its local program under this section.

(3) Application and Approval Process. (a) A municipality seeking approval from the department for an authorized local program shall submit an application on forms available from the department. Applications shall be submitted by October 1 of the year prior to anticipated operation of an authorized local program.

(b) The department shall review the application and any other relevant information and determine whether to authorize the local program. The department shall base its decision on the applicant’s ability to meet the requirements in subs. (5) and (6). The department shall notify the applicant in writing of its decision. If the application is denied, the department shall identify the reasons for denial.

(c) Department authorization of a local program shall remain effective until termination or discontinuation under sub. (10).

(4) State Coverage. Any landowner of a construction site that is regulated by an authorized local program under this section is deemed to be covered under a department construction site storm water discharge permit issued pursuant to this subchapter and shall comply with the requirements of the department’s permit. The department may enforce against the landowner of a construction site for violation of the permit.

(5) Program Requirements. (a) The municipality shall have the legal authority and resources to implement and enforce the requirements of this subchapter.

(b) The municipality shall adopt, implement and enforce an ordinance with erosion control and storm water management requirements that comply with the requirements of subs. III and IV of ch. NR 151.

Note: Municipalities may wish to use the model ordinances within ch. NR 152 to guide them in developing their erosion control and storm water management ordnances. This section does not give the municipality authority to regulate certain agricultural, commercial and transportation projects that are exempt pursuant to s. NR 216.42 (2) to (11) from the requirement to obtain a permit under this subchapter.

(c) The municipality shall implement a program to inform the public that it has an authorized local program under which landowners are to apply for erosion control and storm water management approval under this subchapter via the municipality.

(d) The program requirements in this subsection and subs. (6) to (8) may be provided through municipal staff, intergovernmental agreements or use of professional service contracts.

(6) Application. For construction sites regulated under this subchapter, all of the following apply:

(a) A municipality operating an authorized local program shall clearly identify in writing to applicants seeking municipal erosion control and storm water management approval, that applicants will also be granted coverage under the department’s general construction site storm water discharge permit pursuant to sub. (4).

(b) A municipality operating an authorized local program shall require that landowners submit a copy of the department’s notice of intent or an equivalent application form to request municipal erosion control and storm water management approval. An equivalent application form shall comply with the signature requirements under s. NR 216.43 (3). The submittal of a complete application to a municipality operating an authorized local program by a landowner constitutes submittal to the department of a notice of intent under s. NR 216.43. The application that is required under this paragraph shall be sent to the department if the department requests a copy.

(c) 1. The 14–working day timeline for permit coverage authorization granted under s. NR 216.44 does not apply to construction sites regulated by an authorized local program under this section.

2. Under this section, the notice of intent or equivalent application shall be submitted by the landowner to the municipality operating the authorized local program at least 30 calendar days prior to the anticipated commencement of any land disturbing construction activities. Unless notified to the contrary by the municipality or the department, a landowner who has submitted a notice of intent or equivalent application in accordance with this section is authorized to discharge storm water from a construction site under the terms and conditions of the department’s general construction site storm water discharge permit 30 calendar days after the date that the municipality operating the authorized local program receives the notice of intent or equivalent application. The municipality may grant coverage to a landowner in a period of less than 30 days.

(7) Site Review. A municipality operating an authorized local program shall perform the following for applications for construction site approval under this section:

(a) Using information made available by the department, screen applications to identify projects that may be affected by any of the following:

1. Wetland water quality standards provisions in ch. NR 103.

2. Endangered and threatened resource protection requirements of s. 29.604, Stats., and ch. NR 27.

3. Rules pertaining to any historic property that is a listed property, on the inventory or on the list of locally designated historic places under s. 44.45, Stats.

Note: Historic properties include archaeological sites, burial sites and historic structures. The municipality screens projects to help landowners identify conflicts with the requirements listed under par. (a), but it is the landowner’s responsibility to meet the requirements listed under par. (a) regardless of whether or not the authorized local program identifies concerns.

(b) Where the municipality identifies that a proposed construction site may be affected by requirements listed under par. (a), direct the landowner to the appropriate state agency to resolve concerns or obtain proper authorization as appropriate.

Note: A construction site storm water discharge permit issued pursuant to this subchapter expressly requires that the construction project be conducted in accordance with the requirements listed under par. (a).

(c) Review proposed projects for compliance with the municipality’s erosion control and storm water management ordinance.

Note: For cultural, commercial and transportation projects that are exempt pursuant to s. NR 216.415 (c), department authorization of a local program shall remain effective until termination or discontinuation under sub. (10).

(8) Records, Annual Report and Fees. (a) The municipality shall maintain applications, inspection records and other relevant information necessary to administer an authorized local program.

(b) A municipality shall submit a written annual report to the department by March 31, based on the activities undertaken during the previous calendar year of authorized local program operation. The annual report shall include the following:

1. Name, address and phone number of person responsible for administering the municipality’s authorized local program.

2. Construction project name and legal address of projects that have been granted initial coverage under this section in the previous calendar year and the acreage of land disturbance at each of those sites.

3. An estimate of the number of construction site inspections performed and citations issued.

(c) The application fee payable by the landowner to the department under s. NR 216.43 (2) is waived for each landowner who applies to an authorized local program, and in lieu of these individual payments, the municipality shall submit an annual fee to the department. This fee shall be paid by March 31 based on the previous calendar year of operation as an authorized local program. The annual fee is $75.00 for each construction project.

(9) Department Audit. (a) The municipality shall provide the department with relevant information requested by the department to evaluate the municipality’s effectiveness in administering its authorized local program.
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(b) The municipality shall cooperate with the department in performing site inspections.

(10) PROGRAM TERMINATION. (a) To discontinue operation of an authorized local program, a municipality shall do all of the following:

1. Notify the department by letter of program termination at least 30 days prior to discontinuation of an authorized local program and include reasons for termination.

2. Inform landowners of construction sites and the public at least 30 days prior to discontinuation of an authorized local program that the department will be taking over as the primary enforcing agency under this subchapter.

3. Send the department a copy of all construction site applications and other relevant information where approval under this section was granted and coverage has not been terminated.

4. Provide the department with the annual report as required under sub. (8) (b).

5. Provide the department with its shared application revenue for projects that the municipality granted coverage to over the past calendar year in accordance with sub. (8) (c).

(b) The department shall notify a municipality of any deficiencies in complying with the authorized local program requirements of this section. The municipality shall be given a reasonable opportunity to correct deficiencies in complying with this section. If the municipality is unable to correct deficiencies or the department determines that the municipality has had continued occurrences of noncompliance with the requirements of this section, the department may terminate the authorization of a municipality’s local program. The department shall notify the municipality by letter at least 30 days prior to termination.

History: CR 03−028: cr. Register July 2004 No. 583, eff. 8−1−04;

NR 216.42 Applicability. (1) CONSTRUCTION SITES OF ONE ACRE OR MORE OF LAND DISTURBANCE. Except as provided in subs. (2) to (11), a notice of intent shall be filed with the department pursuant to s. NR 216.43 or to an authorized local program pursuant to s. NR 216.415 by any landowner who intends to create a point source discharge of storm water from a construction site to waters of the state. The landowner of the construction site regulated by this subchapter shall comply with all applicable provisions of this subchapter and the appropriate WPDES permit issued pursuant to this subchapter.

(2) AGRICULTURE. Storm water discharges from planting, growing, cultivating and harvesting of crops for human or livestock consumption and pasturing or yarding of livestock, including sod farms and tree nurseries are not regulated by this subchapter. This exemption does not include the construction of structures such as barns, manure storage facilities or barnyard runoff control systems.

(3) SILVICULTURE. Storm water discharges from silviculture activities, including tree nursery operations, tree harvesting operations, reforestation, tree thinning, prescribed burning, and pest and fire control are not regulated by this subchapter. Clearing and grubbing of an area of a construction site is not a silviculture activity.

Note: Certain lumber, wood and paper product manufacturers may require coverage under a general industrial WPDES permit for storm water discharges pursuant to subch. II. A silviculture activity may require approval pursuant to ch. 30 or 31, Stats., or an U.S. army corps of engineers section 404 permit under 33 USC 1344.

(4) COMMERCIAL BUILDINGS. Storm water discharges from construction sites for public buildings and buildings that are places of employment regulated by the department pursuant to s. 281.33, Stats., in a manner which is equivalent to this subchapter shall be deemed to hold a WPDES permit issued pursuant to this subchapter.

Note: Beginning January 1, 2010, the regulation of erosion resulting from the construction of public buildings and buildings that are places of employment is transferred to 2009 Wisconsin Act 28 from the Department of Commerce to the Department of Natural Resources. Consequently, the Department of Commerce no longer regulates public buildings and buildings that are places of employment in a manner that is equivalent to subchapter III of ch. NR 216, Wis. Adm. Code.

(5) DEPARTMENT OF TRANSPORTATION PROJECTS. Storm water discharges from projects directed and supervised by the department of transportation, regulated by ch. Trans 401, and subject to the department of transportation and department of natural resources liaison cooperative agreement, if in compliance with ch. Trans 401 and the liaison cooperative agreement shall be deemed to be in compliance with s. 283.33, Stats., and the requirements of this subchapter. The department of transportation shall notify the department of projects under this subsection which shall constitute the notice of intent for these projects.

(6) OTHER ENVIRONMENTAL PROGRAMS. If a storm water discharge is in compliance with a department permit or approval which includes storm water control requirements that are at least as stringent as requirements under this subchapter, the department may determine that a facility is in compliance with permit coverage required under s. 283.33, Stats., and will not be required to hold a separate permit under s. 283.33, Stats.

(7) MILL AND CRUSH OPERATION. If construction activity does not result in land disturbing construction activity including a mill and crush operation that does not have soil disturbance, filling or road shoulder grading, the activity is not regulated under this subchapter.

(8) ROUTINE MAINTENANCE. Routine maintenance for project sites that involve under 5 acres of land disturbance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the facility is not regulated under this subchapter.

(9) ONE− AND TWO−FAMILY DWELLINGS. Storm water discharges from construction sites of one− and two−family dwellings regulated by the department of commerce pursuant to s. 101.653, Stats., in a manner which is equivalent to the requirements of this subchapter as determined by the department in writing, shall be deemed to hold a WPDES permit issued pursuant to this subchapter.

Note: The Department of Natural Resources concurs that the Department of Commerce’s erosion control and storm water management requirements for one− and two−family dwellings are equivalent to this subchapter. Consequently, landowners of construction sites of one− and two−family dwellings where there is one acre or more of land disturbance and who comply with the Department of Commerce’s requirements do not need to apply separately to the Department of Natural Resources for construction site storm water discharge permit coverage.

(10) OIL AND GAS INDUSTRY. Storm water discharges from construction sites that disturb from one to 5 acres of land and that are associated with construction activity at oil and gas exploration, production, processing or treatment operations or transmission facilities are exempt from this subchapter until March 10, 2005.

(11) QUARTER MILE SEPARATION. Where discrete construction projects within a larger common plan of development or sale are located at least 1/4 mile apart and the area between the projects is not being disturbed, each individual project may be treated as a separate plan of development or sale provided any interconnecting road, pipeline or utility project that is part of the same “common plan” is not concurrently being disturbed.

History: CR 03−028: cr. Register July 2004 No. 583, eff. 8−1−04; corrections in (4) made under s. 13.92 (4) (b) 6. and 7., Stats.

NR 216.43 Notice of intent requirements. (1) FORMS. The landowner shall submit a notice of intent to the department on forms available from the department. Data submitted in the notice of intent forms shall be used as a basis for conferring coverage under a WPDES storm water permit.

Note: Notice of intent forms may be obtained from the department website at http://www.dnr.state.wi.us/org/water/wm/npa/stormwater/publications.htm, any regional office of the department, by writing to the Department of Natural Resources,
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Storm Water Program — WT/2, PO Box 7921, Madison, WI 53707–7921 or by calling the storm water program at (608) 267–7694.

(2) APPLICATION FEE. A storm water construction site application fee defined by Table 5 shall be submitted to the department with the notice of intent.

Table 5

<table>
<thead>
<tr>
<th>Acres of Land Disturbance</th>
<th>Application Fee</th>
</tr>
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<tbody>
<tr>
<td>Less than 5</td>
<td>$140</td>
</tr>
<tr>
<td>5 or more and less than 25</td>
<td>$235</td>
</tr>
<tr>
<td>25 or greater</td>
<td>$350</td>
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</tbody>
</table>

(3) SIGNATURE REQUIREMENTS. The notice of intent form shall be signed by the landowner as follows:

(a) In the case of a corporation, by a principal executive officer of at least the level of vice president or by the officer’s authorized representative having overall responsibility for the operation of the site for which a permit is sought.

(b) In the case of a limited liability company, by a member or manager.

(c) In the case of a partnership, by a general partner.

(d) In the case of a sole proprietorship, by the proprietor.

(e) For a unit of government, by a principal executive officer, ranking elected official or other duly authorized representative.

History: CR 03–028: cr. Register July 2004 No. 583, eff. 8–1–04.

NR 216.44 Notice of intent deadline. (1) Except as provided under sub. (3), a landowner required to obtain WPDES permit coverage for storm water discharges from a construction site shall submit a completed notice of intent, via certified or registered mail, in accordance with the requirements of this subchapter. The notice of intent shall be submitted so that it is received by the department at least 14 working days prior to the commencement of any land disturbing construction activities. Unless notified by the department to the contrary, a landowner who has submitted a notice of intent in accordance with the provisions of this subchapter is authorized to discharge storm water from a construction site under the terms and conditions of the general construction site storm water discharge permit 14 working days after the date that the department receives the notice of intent or upon receipt of notice from the department that the construction site is covered under the general construction site storm water discharge permit. The landowner becomes the permittee once the construction site is authorized permit coverage.

(2) A site–specific erosion control and storm water management plan pursuant to ss. NR 216.46 and 216.47 shall be completed by the landowner prior to submitting the notice of intent to the department under sub. (1) and shall be updated as appropriate pursuant to s. NR 216.50. The erosion control and storm water management plans shall be submitted to the department upon request so that it may evaluate whether the plans comply with ss. NR 216.46 and 216.47. The department may withhold permit coverage as necessary until it verifies that the plans comply with ss. NR 216.46 and 216.47.

Note: The department encourages landowners and their representatives to consult with the department’s regional storm water staff prior to local plan approval on the conceptual plans for erosion control and storm water management. Department regional storm water staff can be identified through the department website at http://www.dnr.state.wi.us/org/water/wm/wps/stormwater.htm or by calling the storm water program at (608) 267–7694.

(3) If the construction site is located in an area regulated by an authorized local program pursuant to s. NR 216.45, the landowner shall apply for storm water discharge approval to the authorized local program.

History: CR 03–028: cr. Register July 2004 No. 583, eff. 8–1–04.

NR 216.45 Incomplete notice of intent and time limit for department decision. (1) Within 14 working days after the date the department receives the notice of intent, the department may require the applicant to submit data that the department has identified as being necessary to complete any deficient notice of intent or may require the applicant to submit a complete new notice of intent when the deficiencies are extensive or the appropriate form has not been used.

(2) The department shall refuse to the applicant the stormwater construction site storm water discharge permit application fee paid under s. NR 216.43 (2) if the department does not make a determination on the permit application within 45 business days of receipt of the information required under sub. (1). In this subsection, “business day” means any day except Saturday, Sunday, and state holidays as designated in s. 230.35 (4) (a), Stats. This subsection does not apply to permit applications related to mining, as defined in s. 293.01 (9), Stats., prospecting, as defined in s. 293.01 (18), Stats., or nonmetallic mining, as defined in s. 295.11 (3), Stats.

History: CR 03–028: cr. Register July 2004 No. 583, eff. 8–1–04.

NR 216.455 Proof of permit coverage. (1) A copy of the notice of intent or other documentation that storm water discharges from the site are covered under a construction site storm water discharge permit shall be kept with building plans on the construction site and with the landowner.

(2) The permittee shall post a permit certificate in a conspicuous place on the construction site. The department shall make a permit certificate available. An authorized local program under s. NR 216.415 may make its own permit certificate or equivalent notice for posting.

History: CR 03–028: cr. Register July 2004 No. 583, eff. 8–1–04.

NR 216.456 Responsible parties. (1) The permittee or landowner required to submit a notice of intent under this subchapter is responsible for complying with this subchapter.

(2) An operator shall comply with this subchapter where the operator has a contract or other agreement with the landowner to meet the requirement.

Note: General contractors, landscape architects, project designers and inspectors are responsible for the particular services that they provide to a landowner to comply with the requirements of this subchapter.

History: CR 03–028: cr. Register July 2004 No. 583, eff. 8–1–04.

NR 216.46 Erosion control plan requirements. (1) SITE–SPECIFIC PLAN. The permittee or landowner required to submit a notice of intent under this subchapter shall develop a site–specific erosion control plan for each construction site regulated by this subchapter. The permittee or landowner required to submit a notice of intent under this subchapter, or their representative, shall implement and maintain as appropriate all best management practices specified in the erosion control plan from the start of land disturbing construction activities until final stabilization of the construction site.

(2) PERFORMANCE STANDARDS. The construction site erosion control plan shall meet the applicable performance standards in either s. NR 151.11 for construction sites that are not transportation facilities or s. NR 151.23 for transportation facility construction sites.

Note: Pursuant to s. NR 151.32(2), the department maintains a list of technical standards that it has determined adequate and effective for designing best management practices to control erosion and sediment runoff. Contact the department storm water program in the Bureau of Watershed Management at (608) 267–7694 to obtain a copy of this list. Transportation facilities regulated under ch. Trans 401 generally have a 2–step plan development process of an erosion control plan (ECP) that contains design requirements and then development of an erosion control implementation plan (ECIP) that includes implementation details. This subchapter requires an erosion control plan that is equivalent to the Trans 401 ECP and ECIP plans put together.

(3) PLAN COMPLETION. The erosion control plan shall be completed prior to the submittal of a notice of intent to the department and shall be updated as appropriate pursuant to s. NR 216.50.

(4) REQUIRED INFORMATION. The construction site erosion control plan shall include, at a minimum, the following items:

(a) Description of the construction site and the nature of the land disturbing construction activity, including representation of
NR 216.46

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the limits of land disturbance on a USGS 7.5−minute series topographical map.

(b) Description of the intended sequence of major land disturbing construction activities for major portions of the construction site, such as grubbing, excavation or grading.

(c) Estimates of the total area of the construction site and the total area of the construction site that is expected to be disturbed by land disturbing construction activities.

(d) Available data describing the surface soil as well as subsoils.

(e) Wherever permanent infiltration devices will be employed or otherwise evaluated, the depth to the nearest seasonal high groundwater elevation or top of bedrock shall be identified as outlined in s. NR 216.47 (3).

(f) Name of immediate named receiving water from the United States geological service 7.5−minute series topographic maps.

(5) SITE MAP REQUIREMENTS. Each construction site map shall include all of the following:

(a) Existing topography and drainage patterns, roads and surface waters.

(b) Boundaries of the construction site.

(c) Drainage patterns and approximate slopes anticipated after major grading activities.

(d) Areas of soil disturbance.

(e) Location of major structural and non−structural controls identified in the erosion control plan.

(f) Location of areas where stabilization practices will be employed.

(g) Areas that will be vegetated following land disturbing construction activities.

(h) Area and location of wetland acreage on the construction site and locations where storm water is discharged to a surface water or wetland within one−quarter mile downstream of the construction site.

(i) Areas used for infiltration of post−construction storm water runoff.

(j) An alphanumeric or equivalent grid overlying the entire construction site.

(6) EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES. The erosion control plan shall include a description of appropriate erosion and sediment control best management practices that will be installed and maintained at the construction site to prevent pollutants from reaching waters of the state. The erosion control plan shall clearly describe the appropriate erosion and sediment control best management practices for each major land disturbing construction activity and the timing during the period of land disturbing construction activity that the erosion and sediment control best management practices will be implemented. The description of erosion and sediment control best management practices shall include the following requirements:

(a) Description of any interim and permanent stabilization practices, including a schedule for implementing the practices. The erosion control plan shall ensure that existing vegetation is preserved where attainable and that disturbed portions of the construction site are stabilized.

(b) Description of any structural practices to divert flow away from exposed soils, store flows or otherwise limit runoff and the discharge of pollutants from the construction site. Unless otherwise specifically approved in writing, structural measures shall be installed on upland soils.

(c) Management of overland flow at all areas of the construction site, unless otherwise controlled by outfall controls.

(d) Trapping of sediment in channelized flow.

(e) Staging land disturbing construction activities to limit exposed soil areas subject to erosion.

(f) Protection of downslope drainage inlets where they occur.

(g) Minimization of tracking at all vehicle and equipment entry and exit locations of the construction site.

(h) Clean up of off−site sediment deposits.

(i) Proper disposal of building and waste material.

(j) Stabilization of drainage ways.

(k) Installation of permanent stabilization practices as soon as possible after final grading.

(L) Minimization of dust to the maximum extent practicable.

(7) MATERIAL. No solid materials, including building materials, may be discharged in violation of ch. 30 or 31, Stats., or 33 USC 1344 or an U.S. army corps of engineers section 404 permit issued under 33 USC 1344.

(8) NON−EROSIVE FLOW. Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel as necessary to provide a non−erosive flow from the structure to a watercourse so that the natural physical and biological characteristics and functions are maintained and protected.

(9) INSPECTIONS. The landowner, or the landowner’s representative, shall inspect erosion and sediment control practices weekly, and within 24 hours following a rainfall of 0.5 inches or greater. Written documentation of each inspection shall be maintained at the construction site and shall indicate the time, date and location of inspection, the phase of land disturbance at the construction site, person conducting the inspection, assessment of control practices, and a description of any erosion or sediment control measure installation or maintenance performed in response to the inspection.

History: CR 03−028: cr. Register July 2004 No. 583, eff. 8−1−04.

NR 216.47 Storm water management plan requirements. Pollution caused by storm water discharges from the construction site after construction is completed, including rooftops, parking lots, roadways and the maintenance of grassed areas, shall be addressed by a storm water management plan. A storm water management plan shall be developed prior to submitting a notice of intent to the department and shall comply with all of the following:

(1) PERFORMANCE STANDARDS. The storm water management plan shall meet the applicable performance standards in either s. NR 151.12 for construction sites that are not transportation facilities or s. NR 151.24 for transportation facility construction sites.

(2) PRACTICES DURING CONSTRUCTION. The plan shall include a description of the management practices that will be installed during the construction process to control total suspended solids and peak flow, enhance infiltration, maintain or restore protective areas and to reduce petroleum in runoff that will occur after construction operations have been completed. Storm water management practices shall be in accordance with applicable state and local regulations.

(3) GROUNDWATER LIMITATIONS. When permanent infiltration systems are used, appropriate on−site testing shall be conducted to determine if seasonal high groundwater elevation or top of bedrock is within 5 feet of the bottom of the proposed infiltration system.

(4) SEPARATION DISTANCES. Storm water management practices shall be adequately separated from wells to prevent contamination of drinking water, and the following minimum separation distances shall be met:

(a) Storm water infiltration systems and ponds shall be located at least 400 feet from a well serving a community water system unless the department concurs that a lesser separation distance would provide adequate protection of a well from contamination.

(b) Storm water management practices shall be located with a minimum separation distance from any well serving a non−community or private water system as listed within s. NR 812.08.

Note: Chapter NR 813, when promulgated, will regulate injection wells including storm water injection wells.

(5) LONG−TERM MAINTENANCE. For any permanent structures, provisions shall be made for long−term maintenance with the municipality or other responsible party. A copy of the long−term
NR 216.50 Amendments. (1) Landowner initiated. The permittee or landowner required to submit a notice of intent under this subchapter shall:

(a) Conduct the following construction site inspections:
1. Weekly inspections of implemented erosion and sediment control best management practices.
2. Inspections of erosion and sediment controls within 24 hours after a precipitation event of 0.5 inches or greater. A precipitation event may be considered to be the total amount of precipitation recorded in any continuous 24–hour period.
(b) Repair or replace erosion and sediment control best management practices as necessary within 24 hours of an inspection or department notification that repair or replacement is needed.
(c) Maintain, at the construction site or available via an Internet website, weekly written reports of all inspections conducted by or for the permittee or landowner required to submit a notice of intent under this subchapter. The landowner shall notify the department of all appropriate Internet addresses to access the weekly inspection records. Weekly inspection reports shall include all of the following:
1. The date, time and location of the construction site inspection.
2. The name of the individual who performed the inspection.
3. An assessment of the condition of erosion and sediment controls.
4. A description of any erosion and sediment control best management practice implementation and maintenance performed.
5. A description of the present phase of land disturbing construction activity at the construction site.

NR 216.49 Conformance with other applicable regulations. (1) Local compliance. The erosion control and storm water management plans shall document other applicable municipal regulatory provisions, compliance with which will also meet the requirements of the permit. If these municipal provisions are more stringent than those provisions appearing in a permit issued pursuant to this subchapter, the erosion control and storm water management plans shall include a description of how compliance with the municipal provisions will be achieved.

(2) Plumbing regulations. The erosion control and storm water plans shall be in compliance with applicable state plumbing regulations.

Note: Plumbing regulations are contained within chs. Comm 81 to 87.

History: CR 03–028: cr. Register July 2004 No. 583, eff. 8–1–04.

NR 216.50 Amendments. (2) Submittal requirements. For construction sites for which there has been earlier department review of the erosion control and storm water management plans, if the permittee or landowner required to submit a notice of intent under this subchapter identifies changes needed in either plan, the permittee or the landowner required to submit a notice of intent under this subchapter shall notify the department 5 working days prior to making the changes in the plan.
NR 216.50  WISCONSIN ADMINISTRATIVE CODE  148–6

Unofficial Text (See Printed Volume). Current through date and Register shown on Title Page.

(3) PERMIT MODIFICATION. The department may, upon request of a permittee or upon finding of just cause, modify the compliance and reporting schedules or any requirement of a storm water discharge permit.

History: CR 03–028: cr. Register July 2004 No. 583, eff. 8–1–04.

NR 216.51  Department actions. (1) INADEQUATE PLANS. The department may notify the permittee or landowner required to submit a notice of intent under this subchapter at any time that the erosion control or storm water management plans do not meet one or more of the requirements of this subchapter, or a permit issued pursuant to this subchapter, for reducing and preventing the discharge of pollutants. The notification shall identify those provisions that are not being met by the erosion control or storm water management plan, and identify which provisions of the plan require modifications in order to meet the requirements.

(2) REQUIRED PLAN REVISIONS. Within the time frame identified by the department in its notification, the permittee or landowner required to submit a notice of intent under this subchapter shall make the required changes to the erosion control and storm water management plans, perform all actions required by the revised plans, and submit to the department a written certification that the requested changes have been made and implemented, and submit other information the department requires. The department may revoke construction site storm water discharge permit coverage for failure to comply with this section or take action under s. 283.89, Stats. The landowner of a construction site where the department has revoked coverage under the general WPDES permit may not discharge storm water to waters of the state from the construction site unless an individual WPDES permit for storm water discharge is issued to the landowner.

(3) OTHER STORM WATER DISCHARGES. The department may require the landowner of any storm water discharge associated with land disturbing construction activity to apply for and obtain a storm water discharge permit if the storm water discharge is either:

(a) Contributing to the violation of a water quality standard, or

(b) Contributing significant pollution to waters of the state.

Note: This subsection allows the department to require permit coverage of construction sites with less than one acre of land disturbance.

(4) DENIAL OR REVOCA TION OF GENERAL PERMIT. The department may deny or revoke coverage under a general WPDES permit and require submittal of an application for an individual WPDES storm water permit based on a review of the completed notice of intent or other relevant information. The landowner of a construction site denied or revoked coverage under the general WPDES permit may not discharge storm water to waters of the state from the construction site until an individual WPDES permit for storm water discharge is issued to the landowner.

(5) INDIVIDUAL PERMIT. The department may require the landowner of any storm water discharge covered by a general WPDES permit issued pursuant to this subchapter to apply for and obtain an individual WPDES storm water permit if any of the following occur:

(a) The storm water discharge is determined to be a significant source of pollution and more appropriately regulated by an individual WPDES storm water permit.

(b) The storm water discharge is not in compliance with the terms and conditions of this subchapter, or of a general WPDES permit issued pursuant to this chapter.

(c) A change occurs in the availability of demonstrated technology or best management practices for the control or abatement of pollutants from the storm water discharge.

(d) Effluent limitations or standards are promulgated for a storm water discharge that is different than the conditions contained in this subchapter.

(6) PETITION. Any person may submit a written request to the department that it take action under sub. (5).

Note: The department will evaluate a request submitted pursuant to this subsection to determine if an individual permit is warranted.

History: CR 03–028: cr. Register July 2004 No. 583, eff. 8–1–04.

NR 216.52  Use of information. All information contained in the notice of intent other than that specified as confidential shall be available to the public for inspection and copying. All confidential information, so identified, shall be in separate documents. Effluent data is not confidential information. Confidential treatment will be considered only for that information identified as confidential in documents separate from non–confidential information and which meets the requirements of s. 283.55 (2) (c), Stats., and for which written application for confidentiality has been made pursuant to s. NR 2.19.

History: CR 03–028: cr. Register July 2004 No. 583, eff. 8–1–04.

NR 216.54  Transfers. A landowner who has submitted a completed notice of intent and does not intend to control the permitted activities on the construction site may transfer authorization of construction site storm water discharge permit coverage to the person who will control the permitted activities. The transfer shall occur upon written notification, signed by both the current permittee and the proposed permittee and sent via certified or registered mail to the department. Unless the department notifies the permittee to the contrary, the department will recognize this permit coverage transfer upon receipt of written notification. The department may require additional information to be filed prior to granting coverage under the general WPDES permit. The department may, if appropriate, require an application for an individual WPDES storm water permit.

History: CR 03–028: cr. Register July 2004 No. 583, eff. 8–1–04.

NR 216.55  Notice of termination. (1) WHEN TO FILE. When a construction site has undergone final stabilization, temporary erosion control best management practices have been removed and all storm water discharges associated with the construction site activities that were required to have WPDES permit coverage under this subchapter have ceased, the permittee shall submit a signed notice of termination to the department.

(2) FORMS. A notice of termination shall be submitted to the department on forms available from the department. Data submitted in the notice of termination forms shall be used as a basis for terminating coverage of a storm water discharge permit.

Note: Notice of termination forms may be obtained from the department website at http://www.dnr.state.wi.us/org/water/wm/nps/stormwater.htm, any regional office of the department, by writing to the Department of Natural Resources, Storm Water Program — WT/2, PO Box 7921, Madison, WI 53707−7921 or by calling the storm water program at (608) 267−7694.

(3) SIGNATURE REQUIREMENTS. The notice of termination form shall be signed as required under s. NR 216.43 (3).

(4) REQUIRED INFORMATION. The notice of termination shall include the following information:

(a) The mailing address and location of the construction site for which the notice of termination is submitted.

(b) The name, mailing address and telephone number of the current permittee, as well as any transferee.

(c) The name, mailing address and telephone number of the general contractor.

(d) The following signed certification:

“I certify under penalty of law that disturbed soils at the identified site have undergone final stabilization and temporary erosion and sediment control measures have been removed or that all storm water discharges associated with construction activity that are authorized by a general WPDES permit have otherwise been eliminated. I understand that by submitting this notice of termination, I am no longer authorized to discharge storm water associated with construction activity by the general WPDES permit, and that discharging pollutants in storm water associated with
construction activity to waters of Wisconsin is unlawful where the discharge is not authorized by a general WPDES permit.”

(5) **EFFECTIVE DATE.** Termination of coverage under the permit shall be effective upon written confirmation of permit termination by the department to the permittee.

**History:** CR 03–028: cr. Register July 2004 No. 583, eff. 8–1–04.
Appendix D
USLE Spreadsheet

An Excel Spreadsheet has been developed for certain counties to calculate the soil loss from construction sites. The USLE is used to evaluate whether the combination of proposed erosion control practices will limit soil loss from sheet and rill erosion to 7.5 tons/acre/year or less. The USLE, its variables, an example calculations are provided below. This tool does not predict soil loss resulting from high channel, velocities, gully erosion or streambank erosion.

The Universal Soil Loss Equation for Construction Sites:

$$A = \%R \times R \times K \times LS \times C \times P$$

Where:

- **A**: Computed Soil Loss rate (ton/acre)
- **\%R**: The Percentage of the annual R factor that has passed to date
- **R**: Annual Rainfall factor (it varies from 85 – 175 in Wisconsin)
- **K**: Soil Erodibility Factor
- **LS**: Slope length / steepness factor (based on slope length and percent slope)
- **C**: Land Cover Factor (Based on conditions of soil cover)
- **P**: Traditionally applies to agricultural practices such as contouring, terracing, etc.

The USLE spreadsheet calculates the soil loss from inputs entered by the user. The user only needs to enter the following information:

- Type of land disturbing activity in column 1
- Begin date in column 2
- Soil map unit in column 6
- Slope in column 7
- And slope length in column 8

The remainder of the USLE variables are automatically determined or calculated by the spreadsheet, based on the input data. See figure 1-D.
# Universal Soil Loss Equation

**Sheboygan County Land Conservation Department**

<table>
<thead>
<tr>
<th>Land Disturbing Activity</th>
<th>Begin Date</th>
<th>End Date</th>
<th>Period % R</th>
<th>Annual R Factor</th>
<th>Soil Map Unit</th>
<th>Soil Erodibility K Factor</th>
<th>Slope (%)</th>
<th>Slope Length (feet)</th>
<th>S Factor</th>
<th>Land Cover C Factor</th>
<th>Soil loss A=KRXxLSxC (tons/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bare Ground</td>
<td>5/30/2011</td>
<td>7/22/2011</td>
<td>39.6%</td>
<td>120</td>
<td>KnB</td>
<td>0.43</td>
<td>6.0%</td>
<td>30</td>
<td>0.37</td>
<td>1.00</td>
<td>7.6</td>
</tr>
<tr>
<td>Seed and Mulch</td>
<td>7/27/2011</td>
<td>10/27/2011</td>
<td>42.5%</td>
<td>120</td>
<td>KnB</td>
<td>0.43</td>
<td>6.0%</td>
<td>30</td>
<td>0.37</td>
<td>0.12</td>
<td>1.0</td>
</tr>
</tbody>
</table>

**Note:** Cells in bold, black font are manually entered by the user.

<table>
<thead>
<tr>
<th>REDUCTION REQUIRED</th>
<th>12%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silt fence</td>
<td>42%</td>
</tr>
<tr>
<td>Removal Efficiency for &quot;Other&quot;</td>
<td>N/A</td>
</tr>
<tr>
<td>NET SOIL LOSS</td>
<td>5.0</td>
</tr>
<tr>
<td>Performance Criterion</td>
<td>7.5</td>
</tr>
<tr>
<td>Criterion Met?</td>
<td>YES</td>
</tr>
</tbody>
</table>
Variable Descriptions:

*Land Disturbing Activity (pull-down menu)*

The land disturbing activity relates to the type of disturbance that is occurring on the ground. The land disturbing activity inputs must be selected from the pull-down menu.

Activity Inputs:

- **Bare Ground:**
  Usually the initial disturbance occurs when the ground is left bare due to stripping vegetation, grading, or other actions that leave the soil devoid of cover.

- **Seed and mulch:**
  The application of a minimum of 1.5 tons/acre straw or other comparable mulch. Enter this if the seeding and mulching are done at the same time. It is not necessary to also enter seeding if this input is used. Requires 60 days of cover establishment during the growing season. Mulching is recommended on all disturbed areas that are to be seeded to control erosion and establish cover.

- **Seeding**
  The application of permanent or temporary seeding without the use of mulch. Not to be used with mulch with seed. Requires 60 days of cover establishment during the growing season.

- **Sod**
  The installation of sod for cover establishment.

- **End**
  This entry is made at the end of cover establishment. It is required that a 60 day cover establishment period be used when seeding or seed and mulch is utilized. Refer to notes listed under Date. (Required Input)

*Begin Date (entered by user)*

The date the planned land disturbing activity begins, e.g. 5/30/2006. The activity is assumed to continue until the next activity is entered. A 60-day cover establishment period, during the growing season, is recommended for the establishment of seeding.

Notes:

1. Permanent seeding should be completed by September 1.
2. Temporary seeding should be completed by October 15. Selection of the temporary seeding type (oats, rye, wheat) should be made with consideration to the time of year that the seeding will take place.

3. When the seeding dates are later than the date guidelines, the end of the cover establishment period should be extended to May 1 of the following spring to allow for growth.

*End Date (automatically calculated)*

The date when the land disturbing activity ends and this cell is automatically calculated when the next Begin Date is entered.

*Period % R (automatically calculated)*

The percentage of the annual R factor calculated for the period from one land disturbing activity to the next. The %R is the percentage of the annual R factor that has passed to date. In the Midwest over half of the rainfall energy occurs during July, August, and September. Final raindrop energy is the primary cause for soil detachment. For these reasons, the R factor needs to be adapted to the construction schedule of the project, and this would be county dependent.

*Annual R factor (automatically calculated)*

The rainfall factor, R, is the number of erosion-index units in a normal year’s rain. The erosion index is a measure of the erosive force of a specific rainfall. The rainfall, or “R” factor represents the total amount of rainfall energy that occurs during an average year. The R factor for any county can obtained from the RUSLE2 Database.

*Soil Map Unit (entered by user)*

The soil-mapping unit symbol for the predominant soil type in the area of the land disturbing activity, e.g. KnB. This information is available in the published soil survey of the county provided by their Land Conservation department or may be accessed by clicking the “Soil Data” tab in the spreadsheet.

*Soil Erodibility K Factor (automatically calculated)*

The erosiveness of a specific layer and type of soil. The spreadsheet uses the highest K factor published for the soil type, typically a subsoil layer. The USLE’s soil erodibility or “K” factor represents a soil’s ability to resist breakdown and erosion. The factor is
determined by documenting erosion of a soil in a bare condition on a unit test plot. The higher the erosion rates, the higher the K factor will be. The K factor can be found in soil characterization tables. The soil properties that affect erodibility are: 1) soil structure, 2) soil particle size distribution, 3) permeability, 4) organic matter content, and 5) iron content-aluminum oxides (e.g. whether the subsoil has high clay content). These are listed for the county soil series in the “Soil Data” tab in the spreadsheet.

**Slope (entered by user)**
The percent slope for the representative portion of the disturbed area, regarding overland flow and not channel flow, e.g., .05 for a slope of 5 percent.

**Slope Length (entered by user)**
Slope length (in feet) is measured along the overland flow path from the top to the bottom of the slope of the representative disturbed area. Channel lengths are not included in the slope length.

**LS Factor (automatically calculated)**
The program calculates this ratio based on the relationship between the percent slope and the length of slope of the representative disturbed area. The slope length/steepness or “LS” factor in the USLE equation relates the length and steepness of the slope. The rate of erosion increases exponentially as the length of the slope becomes longer. Erosion rates rise even more drastically as the steepness of the slope increases. The function used to calculate LS is:

\[
\text{LS Factor} = (\frac{L}{72.6})^M \times (65.41 \times \sin^2 \theta + 4.56 \times \sin \theta + 0.065)
\]

Where:
- \( L \) = slope length in feet
- \( \theta \) = angle of slope (in degrees)
- \( M = 0.2 \) for slopes <1%
- \( M = 0.3 \) for slopes 1.0 to 3.0%
- \( M = 0.4 \) for slopes 3.0 to 4.5%
- \( M = 0.5 \) for slopes >4.5%
**Land Cover C Factor (automatically calculated)**

The cover and management factor is the ratio of soil loss from an area with a specified cover and management practice to that from a unit plot of bare land. The input from the Land Disturbing Activity corresponds to the C factor value. The “C”, or land cover factor, is the ratio of soil loss from an area with specified cover and management to the corresponding loss from a clean-tilled, continuously fallow condition. It is based on the type and condition of the cover on the soil surface. In construction site erosion control, the cover is extremely important. The vegetative cover provides the needed protection from rainfall impact and runoff water. If the condition of the cover is poor, the C factor will be higher. Conversely, when the vegetation is well established, the erosion and C factor will be reduced. C factors for construction sites can be found from tables in Predicting Rainfall Erosion Losses, published by the USDA. Commonly used C factors are:

<table>
<thead>
<tr>
<th>Land Disturbing Activities</th>
<th>Land Cover Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bare Ground</td>
<td>1.00</td>
</tr>
<tr>
<td>Seed and Mulch</td>
<td>0.12</td>
</tr>
<tr>
<td>Seeding</td>
<td>0.40</td>
</tr>
<tr>
<td>Sod</td>
<td>0.01</td>
</tr>
</tbody>
</table>

**Soil Loss (automatically calculated)**

The predicted value of soil loss (tons per acre), A, that corresponds to the time period of each land disturbing activity. This value is calculated using the equation:

\[ A = (%R) \times (R) \times (K) \times (LS) \times (C) \]

**Reduction Required (automatically calculated)**

The percentage value in the “Reduction Required” row corresponds to the reduction in soil loss necessary to comply with Sheboygan County’s Erosion Control and Stormwater Management Ordinance.
**Perimeter Controls (entered by user)**

Two typical perimeter controls can be utilized within the spreadsheet to meet the performance standard.

1. Silt fence – Percent reduction is approximately 42 percent if installed per WDNR’s technical guidance 1056.
2. Vegetated buffer (minimum 25-feet width) – Percent reduction is approximately 70 percent

If two BMP’s are placed in series, the total sediment reduction that can be credited is the removal efficiency for the BMP that has the higher removal efficiency. In other words, perimeter control BMP removal efficiencies are not additive. For example, if a silt fence were placed upslope of a vegetated buffer, then the removal efficiency would be 70 percent.

Compliance with the ordinance standards can be achieved by:

1. Adjusting the management of the disturbed area, i.e., tightening schedule or installing erosion control measures.
2. Installing perimeter controls such as silt fence or maintaining vegetated buffers.
3. Installing a sediment basin or other sediment control measures below the disturbed area.
4. Obtaining cooperative efforts of adjoining landowners.
Appendix E
<table>
<thead>
<tr>
<th>Non-Structural Practices</th>
<th>Applicable Standards</th>
<th>Applicability to Sites</th>
<th>Maintenance Requirement</th>
<th>Environmental Concerns</th>
<th>Special Considerations</th>
<th>WDNR Technical Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Scheduling</td>
<td>7.5 tons/acre/year</td>
<td>Widely Applicable</td>
<td>Low</td>
<td>None</td>
<td>Can greatly reduce erosion from a site</td>
<td>NA</td>
</tr>
<tr>
<td>Deep Tilling</td>
<td>7.5 tons/acre/year</td>
<td>Widely Applicable</td>
<td>Very Low</td>
<td>None</td>
<td>Should be timed after grading has occurred; Buried Utilities</td>
<td></td>
</tr>
<tr>
<td>Mulching</td>
<td>7.5 tons/acre/year</td>
<td>Widely Applicable on low to moderate slopes</td>
<td>Moderate</td>
<td>Limited effectiveness on steep slopes</td>
<td>Must be reapplied / replaced frequently and crimped</td>
<td>1058</td>
</tr>
<tr>
<td>Polymer Application</td>
<td>7.5 tons/acre/year</td>
<td>Applicable on sites that are not actively being graded</td>
<td>Moderate</td>
<td>Risk of adverse impacts if over applied</td>
<td>Must be re-applied if site is disturbed after initial application</td>
<td>1051</td>
</tr>
<tr>
<td>Seeding Permanent</td>
<td>7.5 tons/acre/year</td>
<td>Widely Applicable</td>
<td>Moderate; Low once established</td>
<td>Possible erosion during establishment; fertilizer runoff</td>
<td>Must be match seed mix with the time of year and site conditions; requires 6” of topsoil</td>
<td>1059</td>
</tr>
<tr>
<td>Seeding Temporary</td>
<td>7.5 tons/acre/year</td>
<td>Widely Applicable</td>
<td>Moderate; Low once established</td>
<td>Possible erosion during establishment; fertilizer runoff</td>
<td>Effective for a maximum of 1 year, requires 6” of topsoil</td>
<td>1059</td>
</tr>
<tr>
<td>Sod</td>
<td>7.5 tons/acre/year</td>
<td>Widely Applicable</td>
<td>Low after established</td>
<td>Fertilizer runoff, over watering</td>
<td>May need to be staked on steep slopes &amp; Channels; Proper selection of species; Requires 6” of prepared topsoil</td>
<td></td>
</tr>
<tr>
<td>Surface Roughening</td>
<td>7.5 tons/acre/year</td>
<td>Widely Applicable</td>
<td>Low</td>
<td>Erosion may increase if not done on the contour of the slope</td>
<td>Need a specially selected tracked or wheeled vehicle</td>
<td></td>
</tr>
</tbody>
</table>

Table E-1 – Non- Structural Erosion Control Practices
<table>
<thead>
<tr>
<th>Structural Practices</th>
<th>Applicable Standards</th>
<th>Applicability to Sites</th>
<th>Maintenance Requirement</th>
<th>Environmental Concerns</th>
<th>Special Considerations</th>
<th>WDNR Technical Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Buffer and Filter Strip</strong></td>
<td>7.5 tons/acre/year</td>
<td>Widely Applicable</td>
<td>Low</td>
<td>None</td>
<td>Sufficient / suitable land area; Must be used in conjunction with other practices</td>
<td>1054</td>
</tr>
<tr>
<td><strong>Diversion, Permanent</strong></td>
<td>7.5 tons/acre/year</td>
<td>Widely Applicable</td>
<td>Moderate</td>
<td>Possible erosion of diversion structure if runoff diverted carries large sediment load</td>
<td>Must be carefully designed to prevent property damage</td>
<td>1066</td>
</tr>
<tr>
<td><strong>Diversion, Temporary</strong></td>
<td>7.5 tons/acre/year</td>
<td>Widely Applicable</td>
<td>Moderate</td>
<td>Possible erosion of diversion structure if runoff diverted carries large sediment load</td>
<td>Must be repaired/replaced frequently; channel must be stabilized on slopes with a grade of &gt;2%</td>
<td>1066</td>
</tr>
<tr>
<td><strong>Erosion Matting</strong></td>
<td>7.5 tons/acre/year</td>
<td>Applicable on low to moderate slopes</td>
<td>Low</td>
<td>Limited effectiveness on steep slopes</td>
<td>Proper Installation</td>
<td>1052 / 1053</td>
</tr>
<tr>
<td><strong>Gabion</strong></td>
<td>7.5 tons/acre/year</td>
<td>Applicable to vegetated ditches and swales</td>
<td>Low</td>
<td>Should be utilized in conjunction with sediment traps or basins</td>
<td>Manual labor costs can be high</td>
<td>1059</td>
</tr>
<tr>
<td><strong>Hay Bales</strong></td>
<td>7.5 tons/acre/year</td>
<td>Widely Applicable</td>
<td>High</td>
<td>Sediment transport; high rates of failure if not properly installed and maintained; disposal</td>
<td>Longevity, proper installation</td>
<td>1055</td>
</tr>
<tr>
<td><strong>Sediment Basin</strong></td>
<td>7.5 tons/acre/year</td>
<td>Widely Applicable</td>
<td>Low</td>
<td>Maximum sediment removal capacity of 60-80%</td>
<td>Must be repaired/replaced frequently; Sufficient/suitable land area; Proper design and construction</td>
<td>1064</td>
</tr>
<tr>
<td>Practice</td>
<td>Sediment Load</td>
<td>Applicability</td>
<td>Effectiveness</td>
<td>Maintenance/Removal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>---------------</td>
<td>---------------</td>
<td>---------------</td>
<td>---------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sediment Trap</td>
<td>7.5 tons/acre/year</td>
<td>Applicable to sites with a drainage area of &lt;5 acres</td>
<td>Low</td>
<td>Maximum sediment removal capacity of 60-80%</td>
<td>Must be repaired/replaced frequently; Sufficient/suitable land area; Proper design and construction</td>
<td></td>
</tr>
<tr>
<td>Silt Fence</td>
<td>7.5 tons/acre/year</td>
<td>Widely Applicable</td>
<td>High</td>
<td>Sediment transport rates of 60-80%</td>
<td>Low to Moderate</td>
<td>Longevity, proper installation</td>
</tr>
<tr>
<td>Slope Drain, Temporary</td>
<td>7.5 tons/acre/year; Prevents Gully Erosion</td>
<td>Applicable on sites that are vulnerable to convey runoff downslope</td>
<td>Moderate</td>
<td>Possible erosion around inlet &amp; outlet</td>
<td>Pipe size</td>
<td></td>
</tr>
<tr>
<td>Stone Check Dam / Weeper</td>
<td>7.5 tons/acre/year; Prevents Gully Erosion</td>
<td>Applicable to vegetated ditches and swales, Drainage area &lt;2 acres</td>
<td>Low to Moderate</td>
<td>Should be utilized in conjunction with sediment traps or basins</td>
<td>Difficult to remove after vegetation establishment</td>
<td></td>
</tr>
<tr>
<td>Stone tracking Pad</td>
<td>7.5 tons/acre/year</td>
<td>Widely Applicable</td>
<td>Low to High</td>
<td>None</td>
<td>Cost-effective; must use 3” clear stone</td>
<td></td>
</tr>
<tr>
<td>Stormwater Inlet Protection</td>
<td>7.5 tons/acre/year</td>
<td>Widely Applicable</td>
<td>Moderate</td>
<td>Ineffective for large storm events; Limited effectiveness with large sediment loads</td>
<td>Must be replaced / repaired frequently</td>
<td></td>
</tr>
</tbody>
</table>

Table E-2 – Structural Erosion Control Practices (cont.)
Appendix F
<table>
<thead>
<tr>
<th>Non-Structural Practices</th>
<th>Applicable Standards</th>
<th>Applicability to Sites</th>
<th>Maintenance Requirement</th>
<th>Environmental Concerns</th>
<th>Special Considerations</th>
<th>WDNR Technical Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impervious Area, Minimizing</td>
<td>Rate Control, Infiltration</td>
<td>Limited application to retrofit sites</td>
<td>Low</td>
<td>None</td>
<td>May reduce improvement costs</td>
<td>NA</td>
</tr>
<tr>
<td>Native Plants</td>
<td>Rate Control, Infiltration</td>
<td>Widely Applicable</td>
<td>Low</td>
<td>None</td>
<td>Careful Selection of Native species, Requires a cover crop during establishment</td>
<td></td>
</tr>
<tr>
<td>Street / Parking Lot Sweeping</td>
<td>20% TSS Goal</td>
<td>Widely Applicable</td>
<td>Moderate</td>
<td>Sediment and debris collected may be contaminated with heavy metals</td>
<td>Hi-Vac trucks are more efficient</td>
<td></td>
</tr>
<tr>
<td>Tree Planting</td>
<td>Infiltration</td>
<td>Widely applicable</td>
<td>Low</td>
<td>None</td>
<td>Long establishment time</td>
<td></td>
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Table F-1 – Non-Structural Stormwater Practices
<table>
<thead>
<tr>
<th>Structural Practices</th>
<th>Applicable Standards</th>
<th>Applicability to Sites</th>
<th>Maintenance Requirement</th>
<th>Environmental Concerns</th>
<th>Special Considerations</th>
<th>WDNR Technical Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Basin</td>
<td>80% TSS; 40% TSS; Rate Control</td>
<td>Widely applicable, Larger drainage areas needed</td>
<td>Low to Moderate</td>
<td>Provides less water quality improvement than Wet Basins</td>
<td>Sufficient/Suitable land area; Design considerations; Sediment forebay</td>
<td>1003</td>
</tr>
<tr>
<td>Wet Basin</td>
<td>80% TSS; 40% TSS; Rate Control</td>
<td>Widely Applicable</td>
<td>Low</td>
<td>None</td>
<td>Sufficient/Suitable land area; Design considerations; Sediment forebay</td>
<td>1003</td>
</tr>
<tr>
<td>Buffer, Vegetated</td>
<td>80% TSS; Rate Reduction</td>
<td>Widely Applicable</td>
<td>Low</td>
<td>None</td>
<td>Sufficient/suitable land area; Careful selection of species; Must be used in conjunction with other BMP’s</td>
<td>1054</td>
</tr>
<tr>
<td>Constructed Wetland</td>
<td>80% TSS</td>
<td>Applicable on sites with medium-fine textured soils; requires a large drainage area</td>
<td>High</td>
<td>Possible downstream warning releases nutrients in the fall</td>
<td>Sufficient/suitable land area; Cost; Careful design; Biomass harvesting</td>
<td></td>
</tr>
<tr>
<td>Diversion, Permanent</td>
<td>Stable Outlet</td>
<td>Applicable to vegetated ditches and swales</td>
<td>Moderate</td>
<td>Possible erosion of diversion structure if runoff diverted carriers large sediment load</td>
<td>Must be careful designed to prevent property damage</td>
<td>1066</td>
</tr>
<tr>
<td>Gabion</td>
<td>80% TSS; 40% TSS; Stable Outlet</td>
<td>Widely Applicable</td>
<td>Low to Moderate</td>
<td>Should be utilized in conjunction with wet basins</td>
<td>Carefully size Stones; Long Term maintenance key</td>
<td>1059</td>
</tr>
<tr>
<td>Infiltration Basin</td>
<td>Rate Control; Infiltration</td>
<td>Highly restricted to sites with small drainage areas and proper soils; Depth to water table and bedrock; Slopes</td>
<td>Moderate to High</td>
<td>Potential for groundwater contamination; Restricted use for areas with high pollution potential</td>
<td>Recommended with careful soils evaluation &amp; pretreatment</td>
<td>1003</td>
</tr>
<tr>
<td>Infiltration Trench</td>
<td>Rate Control; Infiltration</td>
<td>Same as above</td>
<td>Moderate to High</td>
<td>Same as above</td>
<td>Same as above</td>
<td>1003</td>
</tr>
<tr>
<td>Pervious Pavement</td>
<td>Infiltration; Rate Control</td>
<td>Applicable on Areas with very low traffic volumes</td>
<td>Moderate</td>
<td>Potential for groundwater contamination</td>
<td>Limited use in cold climates, Durability, Potential to clog</td>
<td></td>
</tr>
</tbody>
</table>

Table F-2 – Structural Stormwater Practices
<table>
<thead>
<tr>
<th>Rip-Rap Protection, Outlets</th>
<th>Stable Outlet</th>
<th>Widely applicable</th>
<th>Low</th>
<th>Limited effectiveness with large storm events</th>
<th>Sufficient/suitable land area; Carefully size stone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rip-Rap Protection, Swales</td>
<td>Conveyance</td>
<td>Widely applicable</td>
<td>Low to Moderate</td>
<td>Provides limited sediment and pollutant removal</td>
<td>Sufficient/suitable land area; Water velocities 1005</td>
</tr>
<tr>
<td>Stone Check Dam / Weeper</td>
<td>80% TSS; 40% TSS; Rate Control; Stable outlet</td>
<td>Applicable to vegetated ditches and swales</td>
<td>Low to Moderate</td>
<td>Should be utilized in conjunction with wet basins</td>
<td>Use clear or washed stone; long term maintenance is key</td>
</tr>
<tr>
<td>Subsurface drain</td>
<td>Rate Control</td>
<td>Widely applicable</td>
<td>Low</td>
<td>Provides limited sediment and pollutant removal</td>
<td>Must have stable outlet</td>
</tr>
<tr>
<td>Swale, vegetated</td>
<td>80% TSS; 40% TSS; Stable Outlet</td>
<td>Widely applicable</td>
<td>Low to Moderate</td>
<td>Restricted use for areas with high pollution potential</td>
<td>Pretreatment; Check dams; Careful design 1005</td>
</tr>
</tbody>
</table>

Table F-2 – Structural Stormwater Practices (cont.)
Appendix G
EROSION CONTROL PLAN

FOR THE

LOGANVILLE SUBSTATION PROJECT
VILLAGE OF LOGANVILLE, SAUK COUNTY, WISCONSIN

APRIL 2011

PREPARED BY:

ALLIANT ENERGY/WISCONSIN POWER & LIGHT
4902 NORTH BILTMORE LANE
MADISON, WI 53718
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Appendix B  Forms
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Project Contact Summary

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1

1.1 BACKGROUND AND PURPOSE

Alliant Energy/Wisconsin Power & Light (WPL) is planning to refurbish its Loganville substation by replacing a distribution bay and installing associated underground feeder circuits. WP&L is also planning to extend the substation fence by 10 ft north and 25 ft east of existing fence.

This substation has been identified for this project for the age and condition of the equipment inside the substation. The expansion of the substation is to adjust future load increase of the area.

The substation is located off Spring Valley Rd North of STH 5781 in the Village of Loganville, Sauk County, Wisconsin. The project site is approximately 100 feet east of the Spring Valley Creek.

This erosion control plan submittal outlines the detailed construction-time erosion control approach for the project.

1.2 APPLICABLE PERMIT AND PERFORMANCE CRITERIA

1.2.1 Permit Applicability

Construction of new underground feeder circuits and associated substation grading will result in approximately 570 square feet of disturbance, based on probable estimates of disturbance associated with the proposed construction activities. While neither Sauk County nor the Village of Loganville regulate construction time erosion control on commercial sites, the majority of the proposed work area lies within the Shoreland Area and is subject to the requirements of Chapter 8 of Sauk County Ordinances. Chapter 8 outlines the protection provisions for a variety of activities within the Shoreland Area, including grading and other land disturbing construction activities.

The Shoreline Protection ordinance requires a County Land Use Permit for any filling or grading within the Shoreland Area, defined as within 300 feet landward of the ordinary high water mark of a river or stream, or landward side of the floodplain. Additionally, the ordinance requires a Special Exemption Permit for projects with grading in excess of 4,000 square feet on slopes less than 12%. Approximately 3,066 SF of disturbance will occur within the Shoreland Area. This project will require only one permit.

Substation expansion for the distribution bay will create approximately 3,946 square feet of additional impervious area. However this area does not approach the threshold for State of Wisconsin post-construction storm water management requirements.
1.3 DATA SOURCES

The following information was used in assembling the erosion control plan:

- Drawings and project information provided by Alliant Energy
- Soils data obtained online from the Natural Resource Conservation Service’s (NRCS) Web Soil Survey (http://websoilsurvey.nrcs.usda.gov);
- 24K hydrography, USGS 7.5’ Topographic Digital Raster Graphic and Digital Wisconsin Wetland Inventory maps obtained from Wisconsin Department of Natural Resources (WDNR); and
- Floodplain information from FEMA Flood Insurance Rate Map obtained online from the FEMA Map Viewer (https://hazards.fema.gov/femaportal/wps/portal).
2

2.1 LOCATION
The Loganville Substation is located S5781 Spring Valley Rd, Loganville, WI.

2.2 SITE SOILS
The soil types located within the construction limits are classified as Ettrick silt loam.

2.3 EXISTING SITE CONDITIONS
All construction activities will take place on the WPL substation property. The terrain in this area is grassy turf vegetation, with some mature trees located to the north of the substation gravel drives and a flat gravel pad inside the fenced substation.

Alliant Energy also reviewed WWI maps and Wisconsin DNR 24 Hydrography to evaluate regulated water resources within the construction area. No waterways or wetlands were identified within the project limits. However, Spring Valley Creek is located approximately 100 to 200 feet to the west of the work area, putting the project within the Shoreland Area.

The substation property is located on flat surface east of the Spring Valley Creek with the highest elevations located at the Substation. Drainage from the substation is generally radial, with regional drainage typically discharging Easterly to Spring Valley Creek.

Alliant Energy also reviewed FEMA Flood Insurance Rate Maps to determine the floodplain status of the project site. The entire proposed work area is located outside of any designated floodplain.
3

3.1 SUMMARY OF CONSTRUCTION ACTIVITIES

As discussed in Section 1.1, the project consists of adding a new distribution bay and associated feeder circuits. This addition consists of a new riser termination structure (3 existing), power trench. The Extension of the fence will allow accommodating future equipment as the Trachte Control Enclosure, and additional distribution, 90 feet of the fence along the northwest corner of the existing substation will be moved approximately 10 feet north of its present location. In addition, 120 feet of the fence along the north east corner of the existing substation will be moved approximately 25 feet east of its present location (Appendix A - Figure 1).

Six Concrete foundations will be installed to accommodate the distribution bay. To install the foundation a hole will be drill approximately 31 in diameter by 9 feet deep, within the substation fencing.

Three concrete foundations will be installed to accommodate the riser termination structure. The installation of the foundation would require to drill a hole approximately 30 inches diameter by 7 feet deep.

Four concrete foundations will be installed to accommodate reclosers. The installation of the foundation would require digging a hole approximately 4.5 feet wide by 5.5 feet long by 1 foot deep.

A concrete foundation will be installed to accommodate regulator. The installation of the foundation would require digging a hole approximately 10.5 feet wide by 5 feet by 1.5 feet deep.

All foundation walls will be back filled when set. Excess soil will be removed to an off-site location for disposal.

The new underground feeder circuits will be installed in two trenches to the north and one trench to the south of the substation. The trenches will be advanced to a depth of 4 feet and with a combined length of approximately 200 feet. Consistent with prior projects, we have assumed that the width of disturbance will be the width of the trench, the spoil pile and the width of the tractor for a total width of approximately 8 feet. Using this assumption, the project has the potential to create a soil disturbance of approximately 570 square feet, outside the limits of the substation gravel surface.
3.2 **ANTICIPATED CONSTRUCTION SCHEDULE**

Pending approval from Sauk County, the anticipated construction schedule is as follows:

- Construction Start: September 2010
- Complete Grading and Restoration: October 2010
- Vegetation Establishment: November 2010
- Construction End: December 2010

3.3 **CONSTRUCTION-TIME EROSION CONTROL**

Best Management Practices and erosion control methods will vary depending upon site grade, slope direction, installation procedure, and site conditions at the time of installation. The existing and proposed conditions, erosion control measures, regulated natural resource features, and other relevant information are shown on Appendix A – Figure 1. Specific construction methods and associated practices are summarized in Sections 3.3.1 – 3.3.6. Erosion control details are shown on Appendix A - Figure 1.

3.3.1 **Material Staging Areas**

Construction materials will be staged at the Loganville substation. Additional erosion control measures will not be required for the staging area.

3.3.2 **Direct Bury - Trenching**

*Construction Description*

Open-cut trenching is the primary method for the feeder circuit installation. The trench will be constructed with an excavator or backhoe and advanced to a minimum depth of 48 inches. The trench width will be between 2 and 8 feet depending on the nature and stability of the underlying soils. Dewatering will be performed as needed. The contractor will only advance the trench as far as they can install conduit in the same day. The trench will be backfilled at the end of each working day.

Topsoil will be removed and placed on one side of the excavation. Subgrade suitable for re-use will be placed on the other side of the excavation. Ripped rock, cobbles, and subsoil not suitable for use as backfill will be removed and hauled away as necessary. A 6” PVC conduit will be installed to contain the feeder circuit and provide access for future maintenance or replacement. Additional backfill will be imported as necessary to make up for removed materials. The trench will be backfilled and compacted and the topsoil re-spread using tracked dozers. The disturbed areas will be graded to restore the pre-construction hydrologic conditions.
Erosion Control Measures
In general, the trenching work will be completed relatively fast, allowing for prompt restoration with seed and mulch or erosion matting. At a minimum, restoration activities will occur within 7 days of initial land disturbance. Revegetation and stabilization activities are described in Section 3.3.6

3.3.3 Dewatering
Another potential source of erosion potential and off-site sediment migration is dewatering operations. The dewatering approach will be as follows:

- Locate the discharge of dewatering a minimum of 100 feet from wetlands and waterways and on upland slopes less than 5 percent.
- Discharge the dewatering water at the downslope edge of the corridor to limit the potential for flow to enter the disturbed site / trench.
- Coordinate with the landowner(s) where it is expected the discharge will flow overland.
- Treat the dewatering water using the following approach:
  - Prior to beginning dewatering operations, excavate a sediment trap of sufficient size to adequately settle particles from the dewatering water. The outlet from the sediment trap shall be a stone weeper with earthen berms to constrict the flow to pass through the outlet structure.
  - Add polymer or equivalent flocculent to the discharge, at a rate recommended by the flocculent supplier. Install a containment area downslope of the discharge using straw wattles, rock filter bags, sediment logs to allow the water to pond behind the containment so sediment can settle out.
  - Pump dewatering discharge to a geotextile filter bag.
- Monitor the discharge during dewatering operations, as follows:
  - Qualitatively compare the turbidity of the inflow and outflow to determine if adequate treatment is being provided. If adequate treatment is not being provided, modify the treatment approach as needed.
  - Note the extent to which the dewatering water is flowing onto off-site lands of if the flow is re-entering the disturbed corridor.
  - Note if a concentrated flow channel is being eroded at the outlet of the sediment trap. If this is occurring, cease operations and modify the dewatering approach as needed.
  - Document volume of water pumped, discharge location etc. for project records.

3.3.4 Grading Operations
Grading activities will occur on the western side of the substation to transition the from expanded gravel pad to the adjacent ground surface. The new slope will be graded at a 3:1 slope or flatter. Fill material will be placed with a tracked dozer in 6 inch lifts and compacted by passing over the area with the dozer. A minimum of 4 inches of topsoil will be placed to bring the ground surface to finish grade.
Erosion Control Measures
Prior to grading operations, perimeter sediment control measures, such as silt fencing will be installed downslope from the limits of grading disturbance as shown in Appendix A – Figure 1. Following the completion of grading activities, disturbed areas will be restored using seed and mulch/erosion matting. Revegetation and stabilization activities are described in Section 3.3.6.

3.3.5 Off-site Deposits
Little vehicle traffic is expected in and out of the disturbed work area. Should sediment be deposited on public roadways as a result of construction activities, it shall be removed by the end of each working day.

3.3.6 Restoration and Revegetation
Seeding
In areas maintained with turf grass, restoration procedures will consist of preparing the seedbed, seeding and installing mulch crimped in place. The seedbed tilled as needed to break up any compaction and dragged to loosen the topsoil surface. Any rocks or debris that may interfere with seeding or mulching operations should be removed prior to sowing the seed. Seeding will be with WisDOT seed mix number 40 or approved equivalent at a rate of 2 lbs per 1,000 square feet. The seed shall be applied using a broadcast spreader, seed drill, or other calibrated method to ensure uniform seed distribution at the specified rate. Mulch will be applied at a rate of at least 2 tons per acre in accordance with WisDOT Standard Specifications for Highway and Structure Construction Section 627 by Method C, crimping. Crimping shall be completed using a notched coulter to punch the mulch into the ground to a minimum depth of approximately 1 ½ inches.
A representative for Alliant Energy will inspect erosion and sediment control practices a minimum of once per week and within 24 hours following a rainfall of 0.5 inches or more. Written documentation of the inspection will be maintained at the construction site and will describe any corrective measures taken, if applicable. All corrective action will be taken within 24 hours of inspection. WDNR form 3400-187, Construction Site Inspection Report, shall be used to document the inspections. A copy of this form is included in Appendix B. Written documentation will include information as specified in NR 216.48(4), which includes:

1. Date, time, and location of the construction site inspection;
2. Name of the individual performing the inspection;
3. Assessment of the condition of erosion and sediment controls;
4. Description of any corrective erosion and sediment control implementation or maintenance performed; and
5. Description of the current location and phase of the land disturbing activity.

These inspections will occur until the site has undergone final stabilization (when there is greater than 70% vegetative density).
APPENDIX A
FIGURES
APPENDIX B

FORM
Notice: Use of this specific form is voluntary, but the information contained on this form must be collected and kept by the permittee under s. NR 216.48(4), Wis. Adm. Code, for a construction site covered under the General WPDES Construction Site Storm Water Discharge Permit, Permit No. WI-0067831-2. This form is provided for the convenience of the permittee to meet the requirements of s. NR 216.48(4), Wis. Adm. Code. Multiple copies of this form may be made to compile the inspection report.

Inspections of implemented erosion and sediment control best management practices must be performed weekly and within 24 hours after a precipitation event 0.5 inches or greater which results in runoff.

Weekly written reports of all inspections conducted by or for the permittee must be maintained throughout the period of general permit coverage.

The information maintained in accordance with s. NR 216.48 (4) must be submitted to the Department upon request.

Name of Permittee:

<table>
<thead>
<tr>
<th>Construction Site Name (Project):</th>
<th>Construction Site ID No.:</th>
</tr>
</thead>
</table>

Location: County:

Contractor: Field Office Phone:

Note: Weekly inspection reports, along with erosion control and stormwater management plans, are required to be maintained on site and made available upon request.

Date of inspection (mm/dd/yy):

<table>
<thead>
<tr>
<th>Type of inspection:</th>
<th>Weekly</th>
<th>Precipitation Event</th>
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</thead>
<tbody>
<tr>
<td>Other (specify)</td>
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</tr>
</tbody>
</table>

Time of inspection: Start: _______ a.m./p.m.

End: _______ a.m./p.m.

Name(s) of individual(s) performing inspection:

Weather:

Description of present phase of construction:

<table>
<thead>
<tr>
<th>Modifications Required</th>
<th>Yes</th>
<th>No</th>
<th>Not Applicable</th>
<th>Comments/Recommendations</th>
<th>Note</th>
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</thead>
<tbody>
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<td>Ditch Checks</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Erosion Control Plan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erosion Mat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grading Practices</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Inlet Protection</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Mulch</td>
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<td>Exact place of erosion/sediment control inspected</td>
<td>Type of erosion/sediment control and its observed condition</td>
<td>Description of any necessary maintenance or repair to erosion/sediment control, including anticipated date of completion</td>
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