Elk River Stormwater Program Guide

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Forward

The City of Elk River (City) completed a Surface Water Management Plan (SWMP) in December 2013, which contained a stormwater management implementation plan to address MS4-related activities (SWMP Table 6-1). Many of these activities are addressed in the present document. The document begins with a template for a MOU between the City and Sherburne County (SWMP Table 6-1 Item 0-A), followed by updates to enforcement response procedures for issuing SWPP violation citations (Item 0-B). The six minimum control measures required by the MS4 program are then addressed in the remainder of the document as noted by the bulleted items below:

1. **Public Education and Outreach**
   - Education Activity Implementation Plan (Item 1-A)

2. **Public Participation and Involvement**
   - Applicable Public Notice Requirement and Annual Meeting (Items 2-A, 2-B)

3. **Illicit Discharge Detection and Elimination (IDDE)**
   - Updated Storm Sewer Map (Item 3-A)
   - IDDE and Enforcement Ordinance Review (Item 3-B)
   - IDDE Program Development and Implementation Plan (Item 3-C)

4. **Construction Site Runoff Control**
   - Updated Construction Site Stormwater Runoff Ordinance (Item 4-A)
   - Construction Site Plan Review Written Procedures (Item 4-B)
   - Erosion Control Inspection Procedures (Item 4-C)
   - Permit Application System Procedures (Item 4-D)

5. **Post-Construction Runoff Control**
   - Post-Construction Stormwater Management Review Program Written Procedures (Item 5-A)
   - Updated Land Development Ordinance (Item 5-A)

6. **Pollution Prevention/Good Housekeeping**
   - City Employee Training Programs (Item 6-A)
   - Structural Stormwater BMP Maintenance Program (Item 6-E)
   - Spill Prevention & Control Plans for Municipal Facilities (Item 6-F)
   - Maintenance Yard Inspection Procedures (Item 6-G)
   - Facility Inventory (Item 6-H)
   - Pond Assessment Procedures & Schedule (Item 6-I)
   - Asset Management System (Item 6-J)
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Part I: Introduction and Preliminary Documentation

The purpose of Part I is to provide background information on the MS4 program as it pertains to the City of Elk River, and to address activities necessary prior to addressing the MS4 minimum control measures that are presented in Part II. After the background information, Part II presents a template for a MOU between the City and Sherburne County, followed by updates to enforcement response procedures for issuing SWPPP violation citations.

The City of Elk River is located in Sherburne County, Minnesota (Appendix A, Figure 1). It has a population of approximately 23,000 and is about 34 miles northwest of Minneapolis. In general, stormwater runoff in the city drains to the Elk River which is tributary to the Mississippi or Rum River, depending on location. Elk River has a humid continental climate and receives an average of 28 inches of precipitation and 45 inches of snow annually.

The Federal Clean Water Act established the National Pollutant Discharge Elimination System in 1987 in order to help control illicit discharges. The Minnesota Pollution Control Agency (MPCA) has been granted the authority to administer NPDES permits regulating stormwater discharge within the state of Minnesota. The City of Elk River has been regulated by the Phase II Municipal Stormwater Permit since 2003, when it was designated by the MPCA as a Mandatory Small Municipal Storm Sewer System (MS4). As a small MS4, the City must fulfill six minimum requirements:

1. Public Education and Outreach
2. Public Participation and Involvement
3. Illicit Discharge Detection and Elimination
4. Construction Site Runoff Control
5. Post – Construction Runoff Control
6. Pollution Prevention and Good Housekeeping

Minimum requirement three has additional requirements which must be met per the State of Minnesota MS4 General Permit Part III.D.3.c-h. The City must do the following:

- Create storm sewer maps showing all pipes 12 inches in diameter or greater, their outfalls, their receiving water bodies, and all structural stormwater Best Management Practices (BMPs) associated with the City’s small MS4. Unique identification tags must be appended to each outfall, and flow direction arrows must be shown on all pipes.
- Establish authority to prohibit illicit, non-stormwater discharges into the small MS4.
- Implement practices to detect and eliminate illicit discharges and their sources.
- Train all field staff in methods of illicit discharge identification and reporting
- Perform an analysis which identifies areas with a higher probability of illicit discharges, and conduct additional inspections in these suspect areas.
- Create procedures for:
  - Responding to reports of illicit discharges, eliminating them in keeping with Part III.B of the MS4 General permit, and preventing future occurrences
  - Emergency response to spills inside the City’s MS4. This procedure will involve contacting the Minnesota Department of Public Safety Duty Officer. See the Response Procedures section of this document for emergency response contact information.
• Document the following:
  o All IDDE inspections in keeping with Part III.D.3.c and f
  o Reports of illicit discharges including the date received and actions taken
  o Dates of discovery of illicit discharges
  o Locations of discovered illicit discharges, including outfall identifications where relevant
  o Illicit discharge sources
  o Actions taken by the City to prevent future illicit discharges at detected locations
1.0 Stormwater Partnerships

The goal of this stormwater partnership is to formalize the coordination between the City of Elk River and Sherburne County with regards to design, construction, and maintenance of each other’s respective MS4. Benefits of this partnership include reducing costs, sharing knowledge and resources, minimizing duplication of effort, and reducing the amount of pollutants to receiving waters.

This Memorandum of Understanding (MOU) does not create any legal obligations, but expresses the intent of the parties involved to work in a cooperative relationship in order to promote stormwater pollution prevention. This agreement is not intended, nor shall it in any way alter, impede, or interfere with the authorities and procedures of the parties involved.
Agreement Template

Memorandum of Understanding

This Memorandum of Understanding (the Memorandum) is made on this_______, by and between the City of Elk River, MN and Sherburne County.

PURPOSE

The purpose of this Memorandum is to provide the City and the County an agreement that states that each entity shall review projects on a case by case basis that affects one another's MS4 and the waste load allocation as described in Part III.E of the MS4 NPDES Permit.

AREAS OF AGREEMENT

The signatories agree to promote collaboration and to pursue mutual interests with regards to each other's MS4s. In particular the parties will work towards:

1. Finding opportunities to work together on stormwater pollution prevention projects of mutual interest.
2. Sharing and exchanging stormwater pollution prevention technologies and techniques
3. Work towards eliminating or reducing stormwater pollution and encouraging the use of prevention techniques.

AUTHORIZATION AND EXECUTION

The signing of the Memorandum of Understanding does not constitute a formal undertaking, and as such it simply intends that the signatories shall strive to reach, to the best of their abilities, the goals stated in this MOU.

This Agreement shall be signed by the City of Elk River, MN and Sherburne County and shall be effective as the date first written above.

PARTY 1

Dated: _______________ By______________________________

City of Elk River, MN

PARTY 2

Dated: _______________ By______________________________

Sherburne County
2.0 Enforcement Response Plan

This Enforcement Response Plan (ERP) is intended to be used as a guide by the City of Elk River for enforcement procedures of violations of construction stormwater runoff control as stated in the National Pollutant Discharge Elimination System (NPDES) Permit Program. Under 40 CFR Part 122.34(b)(4)(ii), the City is required to develop and implement written enforcement actions to help achieve compliance of construction activities within the Municipal Separate Storm Sewer System (MS4). The Enforcement Response Plan communicates the types of responses that are available and when they are appropriate to use in order to ensure compliance. In any conflict between the ordinance and this guide, the ordinance shall govern.

ENFORCEMENT RESPONSE PLAN GUIDE

1. Criteria to Decide Type of Violation
   A. Magnitude
   B. Duration
   C. Effect on the Environment
   D. Compliance History of the Operator
   E. Good Faith of the Operator

2. Types of Responses
   A. Informal
   B. Formal
   C. Judicial

3. Violations and Range of Actions
4. Time Frames for Enforcement Actions

1.0 Criteria to Decide Type of Violation

The enforcement process begins when the violation is identified. Depending on if the violation is minor or major there is other criterion that needs to be looked at when taking action. Every violation and response needs to be documented properly in order for the correct process to take place and to have historical information for future use. To determine if the violation is minor or major the following criteria must be taken into account:

A. Magnitude
   Generally, a minor isolated violation can be met through informal enforcement. As the severity of the violation increases and there is potential to harm the environment, the formal and judicial responses may need to be taken.

B. Duration
   Regardless of the severity of the violations which continue over an extended amount of time shall be subjected to escalated enforcement actions. The response laid out in this document should prevent extended periods of non-compliance.

C. Effect of the Environment
   One of the main objectives of the NPDES permit is to prevent pollutants from entering into receiving waters. Any violation that results or has the potential to result in environmental harm will receive an escalated enforcement response. Environmental harm will be assumed when a construction site directly discharges pollutants into adjacent receiving waters or fails to prevent sediments and pollutants from entering the City’s
MS4. If there is the potential for a toxic effect on the waters and violates the MS4 NPDES permit, a minimum of a formal response will be taken.

D. Compliance History of the Operator
The construction site operator’s compliance history will be a factor when determining the appropriate enforcement response. The City has the ability to issue informal responses for minor violations if the construction site operator has a history of compliance. If there is a pattern of recurring violations in the construction site operator’s recent history then it would be appropriate to escalate the response as necessary.

E. Good Faith of the Operator
The construction operator’s good faith efforts to correct violations may help determine the correct enforcement action to take. Good faith is defined as the operator’s honest intention to fix its non-compliance, coupled with actions that support this intention. Good faith does not necessarily eliminate the requirement of an enforcement action depending on the violation.

2.0 Types of Responses
There are three types of enforcement responses that can be taken if a violation occurs. The response chosen must be appropriate for the violation. The three types of responses are Informal, Formal, and Judicial.

A. Informal Responses
An informal response is taken by the City when the violations show that education is needed, the violations do not pose a significant threat to the environment, or the actions below can be taken. An informal response will still involve documenting each violation thoroughly because a formal action may need to be made in the future which may require proof of past violations.

1. Personal Contact
   For minor violations, the inspector shall notify the construction operator and work to remedy the violation. The telephone call, email, site visit, or informal meeting will be recorded and placed in the construction project file.

2. Refusal of Municipal Inspections
   The city inspector may refuse required inspections of approved activities (i.e. building permits, etc.) if the construction site does not have a Notice of Intent posted, the perimeter controls are not installed or failing, or there is evidence of sediment or other pollutants outside the area of construction.

3. Notice of Violation
   A notice of violation is a written notice stating the date the violation occurred, identifies the violations, and the corrective actions that need to be implemented by the construction operator. A response from the construction site operator will need to be received within three calendar days which includes an explanation of why the violation occurred and what steps they intend to do or have taken if the City’s actions are not suitable. A fine per violation as described by the agreement with the City will be issued with administrative fees.

4. Stop Work Order
   The Stop Work Order is a notice that is posted by the City on the construction site that informs the construction site operator that a violation is ongoing and no work is allowed to commence until the issue is resolved. This is the most stringent device the City has before a formal action needs to be enforced.
The Stop Work Order is implemented when the Notice of Violation is not responded to, the violation was never fixed, or there is a moderate to major violation that requires immediate action.

**B. Formal Responses**

A formal response addresses the non-compliance by the construction site operator or the serious/immediate threat to the environment and the steps that the construction site operator needs to take in order to resolve the violations.

1. **Administrative Order**
   An Administrative Order is a written order to the construction site operator that specifies a required action or to cease certain activities on site. This order will contain corrective measures, a deadline to complete the corrective actions, and potentially a compliance schedule.

2. **Administrative Fines**
   A fine is a financial penalty that the City assesses to the construction site operator for a violation of the City Code or standards. The fine is considered punitive damages and the amount may be determined by the City on an individual basis. The amount may not be related to any specific cost that is incurred by the City and should be proportional to the damage caused by the violation.

3. **Suspension of Permit/Termination**
   The City may suspend or revoke the approved construction plan and any other City approved permits if the owners fail to comply with previous administrative orders, if the City can prevent discharges that pose an immediate or serious threat to the environment, or if the owners fail to stop discharges that pose an immediate or serious threat.

**C. Judicial Responses**

A judicial response is a formal response that involves the courts and the actions may include civil litigation and/or criminal prosecution.

1. **Civil Litigation**
   The three types of civil litigation consent decrees, injunctions, and civil suits. Consent decrees are legally binding agreements, signed by a judge, between the City and the construction site operator that were reached after the lawsuit has been filed. and a judge needs to sign it to legally bind it. Injunctions are court orders that direct parties to do something perform court ordered actions or refrain from doing something inactions. A civil suit is used to recover the costs borne by the City in responding to the construction site operator non-compliance.

   Civil litigation is an appropriate level of enforcement if any of the following situations:

   - Injunctive relief is necessary to halt or prevent activities or non-stormwater discharges that threaten human health, the environment or the MS4.
   - Efforts to restore compliance using informal and formal actions have failed.
   - The construction site operator does not pay the assessed fines.
   - The City needs to recover funds lost due to the violation of the construction operator.

2. **Criminal Prosecution**
   Criminal prosecution is the process of charging the involved parties with violations that are punishable, upon conviction, with fines and/or imprisonment. This is the appropriate response when willful non-
compliance took place and when criminal negligence or intent can be proven. Examples of this can include falsifying reports, tampering with sample, unauthorized discharges, and violations of previous formal responses.

The process for criminal enforcement commences when the City has reason to believe that crimes will be or have been committed. The inspection reports, monitoring samples, or other forms of reporting from employees or the public should be gathered for evidence. When informal and formal responses have failed and a crime is either suspected or known, the Director of Public Works shall be informed. Subsequently the City Attorney will be notified by the Director in order to properly collect the evidence for the case.

3.0 Violations and Range of Actions
Table 1 lays out common violations, potential circumstances, and the appropriate response procedures. This is a guide and the appropriate level of response may differ from the table below.

Level 1 – Administrative issues with relatively low environmental risk and an infrequent record of violation by the construction site operator should cause the following enforcement sequence:

- Personal Contact
- Notice of Violation
- Refusal of Municipal Inspections
- Stop Work Order
- Administrative Order
- Suspension of Permit/Termination
- Judicial Action
Level 2 – Record keeping and site conditions that pose a moderate/major environmental risk to discharge pollutants into the MS4 or adjacent receiving waterbody should cause the following enforcement sequence:

Refusal of Municipal Inspections

Personal Contact

Notice of Violation

Stop Work Order

Administrative Order

Suspension of Permit/Termination

Judicial Action with Administrative Fees

Level 3 – Any immediate threat to human health and environment or demonstrated willful noncompliance by a construction site operator should cause the following enforcement sequence:

Personal Contact

Notice of Violation

Suspension of Permit/Termination

Stop Work Order

Administrative Order with Administrative Fees

Judicial Action with Administrative Fees
### Table 1. Common Violations and Enforcement Responses

<table>
<thead>
<tr>
<th>Violation</th>
<th>Circumstances of Violation</th>
<th>Recommended Enforcement Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failure to Prepare or Maintain a Stormwater Pollution Prevention Plan or Required Records</td>
<td>Operator is unaware of requirements to prepare and maintain a SWPPP</td>
<td>Level 1</td>
</tr>
<tr>
<td></td>
<td>Operator is aware, but does not follow requirements to prepare and maintain a SWPPP</td>
<td>Level 2</td>
</tr>
<tr>
<td>Failure to Install, Maintain, or Properly Select BMPs per Approved Plan</td>
<td>Operator demonstrates good faith effort to select, install, and maintain BMPs</td>
<td>Level 1</td>
</tr>
<tr>
<td></td>
<td>Operator disregards responsibilities to select, install, and maintain BMPs</td>
<td>Level 2</td>
</tr>
<tr>
<td>Conducting Covered Activity without Approval of Erosion and Sediment Control Plan</td>
<td>Operator is unaware of requirements to obtain approval for land disturbance activities</td>
<td>Level 2</td>
</tr>
<tr>
<td></td>
<td>Operator is aware of requirements to obtain approval for land disturbance activities, but has not or has refused to gain approval</td>
<td>Level 3</td>
</tr>
<tr>
<td>Failure to Perform Inspections or Submit Required-Requested Reports and/or Documents</td>
<td>Infrequent occurrences</td>
<td>Level 1</td>
</tr>
<tr>
<td></td>
<td>Frequent or routine occurrences</td>
<td>Level 2</td>
</tr>
<tr>
<td>Discharge Sediment or Pollutant to MS4 or Receiving Waters</td>
<td>A significant amount of sediment or pollutants has accumulated in the MS4 or receiving water bodies due to improper management</td>
<td>Level 2</td>
</tr>
<tr>
<td></td>
<td>There is a significant accumulation of sediment or pollutants in the MS4 or receiving water bodies due to improper management</td>
<td>Level 3</td>
</tr>
<tr>
<td>Documented Pattern of Systematic Violations of Stormwater Regulations and/or Permit Requirements</td>
<td>The City will consider violations on a project and operator basis when determining awareness and good faith effort</td>
<td>Level 3</td>
</tr>
</tbody>
</table>

### 4.0 Time Frames and Responsibilities for Enforcement Actions

Violations must be looked at on a case by case basis to ensure that the appropriate enforcement response is taken. Table 2 lays out the types of enforcement responses, the maximum time frame for enforcement to take place, and which party is typically responsible for the enforcement.

### Table 2. Responses and Responsibilities

<table>
<thead>
<tr>
<th>Response</th>
<th>Time Frame</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Contact</td>
<td>Within 24 hours of inspection/initial contact</td>
<td>Stormwater Manager</td>
</tr>
<tr>
<td>Refusal of Municipal Inspections</td>
<td>Immediate</td>
<td>Development Inspector Manager, Stormwater Manager</td>
</tr>
<tr>
<td>Response</td>
<td>Time Frame</td>
<td>Responsibility</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----------------------------------</td>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td>Notice of Violation</td>
<td>Within 3 calendar days of inspection/notice</td>
<td>Stormwater Manager</td>
</tr>
<tr>
<td>Stop Work Order</td>
<td>After notice of violation and prior to formal response</td>
<td>Stormwater Manager, Director of Public Works</td>
</tr>
<tr>
<td>Administrative Order</td>
<td>Within 60 calendar days of inspection/notice</td>
<td>Stormwater Manager, Director of Public Works, City Attorney, City Manager</td>
</tr>
<tr>
<td>Administrative Fine</td>
<td>Within 60 calendar days of inspection/notice</td>
<td>Stormwater Manager, Director of Public Works, City Attorney, City Manager</td>
</tr>
<tr>
<td>Suspension of Permit/Termination</td>
<td>Within 30 calendar days of inspection/notice</td>
<td>Stormwater Manager, Director of Public Works, City Attorney, City Manager</td>
</tr>
<tr>
<td>Judicial</td>
<td>Case by case</td>
<td>Stormwater Manager</td>
</tr>
</tbody>
</table>
Glossary

Administrative Fine - A punitive monetary charge unrelated to actual treatment costs assessed by the City rather than a court.

Administrative Order - A document which orders the violator to perform a specific act or refrain from an act. For example, the order may require operators to attend a show cause meeting, cease and desist discharging, or undertake activities pursuant to a compliance schedule.

Best management practices (BMP's) means erosion and sediment control and water quality management practices that are the most effective and practicable means of controlling, preventing, and minimizing the degradation of surface water, including construction-phasing, minimizing the length of time soil areas are exposed, prohibitions, and other management practices published by state or designated area-wide planning agencies.

Civil Litigation - A lawsuit filed in a civil court. If the court rules that the defendant construction site operator violated the law the court may impose civil penalties, injunctions or other equitable remedies and/or cost recovery.

Criminal Prosecution - A criminal charge brought by the City against an accused violator. The alleged criminal action may be a misdemeanor or a felony and is defined as willful, negligent, knowing, and/or intentional violations. Upon conviction, punishment may include a monetary penalty, imprisonment, or both.

Fine - A punitive monetary charge for a violation of the law. Often used synonymously with "penalty", although the term "fine" generally implies the use of administrative rather than civil (judicial) procedures.

Good Faith Effort or Progress - Prompt and vigorous pollution control measures undertaken by the discharger which shows that extraordinary efforts (not a "business-as-usual" approach) have been made to achieve compliance.

Injunctive Relief - A court order which restrains or compels action by the construction site operator.

Judicial Action - An enforcement action that involves a court. (The action may either be civil or criminal in nature).

Legal Authority - The source of the City's jurisdiction and regulatory powers.

Notice of Violation - A City document notifying a construction site operator that it has violated stormwater standards and requirements. Generally used when the violation is relatively minor and the City expects the violation to be corrected within a short period of time.

Penalty - A monetary or other punitive measure usually associated with a court action. For purposes of this Enforcement Policy, the term is used synonymously with fine.

Plea Bargain - An agreement between the prosecuting attorney and a criminal defendant whereby the defendant pleads guilty to a lesser charge and/or a reduction of sentence in exchange for cooperation in investigating or prosecuting the crime (e.g., waiving a trial).
Stop Work Order - A notification posted by the City on the construction site of non-compliance warning the noncompliant operator that work is not allowed to continue until the terms of the Notice of Violation have been fulfilled. The Stop Work Order precedes formal enforcement action by the City.

Suspension of Permit - A temporary stoppage of the non-compliant operator’s services necessary to proceed with the project until specific conditions are met.
Part II: Minimum Control Measures

There are six minimum control measures that must be addressed by the City to meet MS4 requirements:

1. Public Education and Outreach
2. Public Participation and Involvement
3. Illicit Discharge Detection and Elimination (IDDE)
4. Construction Site Runoff Control
5. Post-Construction Runoff Control, and
6. Pollution Prevention/Good Housekeeping

Each of these requirements will be discussed in Part II. Forms and checklists are placed in the Appendices to facilitate readability in the main body of the document.
1.0 Public Education and Outreach

This part of the MS4 requirements is addressed by an education activity implementation plan. The City of Elk River currently distributes educational content to the public in the following forms:

- Handouts
- Notices in the City newsletter and website
- Resident surveys
- Flyers
- Developer trainings

In the 2013 City of Elk River Surface Water Management Plan (SWMP) (City of Elk River, 2013) the City acknowledges the public education requirement of the MS4 permit and states that it will continue to provide educational content through the above listed methods. The City of Elk River collaborates with The Lake Orono Lake Association and other agencies in order to further educate and solicit feedback about City programs and water resource issues in the area. This feedback could result in an increased understanding of illicit discharge issues and hotspots inside the City.

**EDUCATION ACTIVITY IMPLEMENTATION PLAN**

This Education Activity Implementation Plan will include descriptions of how to implement education activities for various audiences to educate and inform people of the Storm Water Management Plan (Management Plan) program.

**Goals and Objectives**

- Educate audiences on methods and best management practices (BMPs)
- Use branded communication tools and templates to create clear messaging to audiences
- Analyze activity implementation to review the reach, adoption, and tool effectiveness

**Outreach Activities**

1.0 Meetings and Workshops

Meetings and workshops for the Management Plan with stakeholders will be integral in teaching methods and describing the BMPs. It should foster an environment in which the participants can engage and collaborate with project professionals and the opportunity to ask any questions.

In order to adequately plan and prepare to host an effective meeting or workshop, the following planning schedule will be executed.

**Eight Weeks Prior**

- Meeting plan - draft with venue information, contacts, materials, and schedule
- Logistics - secure venue and identify if refreshments are needed
- Email - send out Save the Date (collect RSVPs, if applicable)
- Factsheet - review and edit content
- Paid advertisement - draft and review content
- Social media - draft and review post
- Presentation - draft outline
- Participants – Identify participants and draft mailings list (letter, email, media outlets, etc.)
- Mailed letter – draft, review, and approve content
**Three Weeks Prior:**
- Meeting plan - draft with venue information, contacts, materials, and schedule
- Logistics – confirm venue and refreshments for meeting
- Factsheet - review and edit content
- Paid advertisement – review and approve content
- Social media – post invitation
- Presentation - draft and review content
- Participants – finalize mailing lists (letter, email, media outlets, etc.)
- Mailed letter – review and send to printer

**Two Weeks Prior:**
- Email - send out reminder (collect RSVPs, if applicable)
- Factsheet - review and edit content
- Paid advertisement – send to publication
- Social media – post invitation
- Presentation - draft and review content
- Mailed letter – review and send to printer

**One Week Prior:**
- Logistics – gather group activity supplies (for working sessions)
- Email - send out reminder (collect RSVPs, if applicable)
- Factsheet - review and edit content
- Paid advertisement – send to publication
- Social media – post reminder invitation
- Presentation - review content
- Mailed letter – collect RSVPs if applicable

**Week of Event:**
- Logistics – gather all materials and supplies, set up venue
- Factsheet and survey – print and compile, enter into database after event
- Presentation – print and upload to electronics (laptop and flash drive)

Materials for each meeting or workshop will vary depending on the audience. Common materials could include:

**Local Businesses, Contractors, and Vendors**
- Factsheet
- Presentation
- Brochure
- Meeting plan
- Email (or modified electronic newsletter template)
- Worksheet (for working session)
- Survey (optional)
- Sign in / sign up for mailing list

**Education Professionals**
- Factsheet
• Presentation
• Meeting plan
• Email (or modified electronic newsletter template)
• Learning activity packet or educational program (optional)
• Survey (optional)

City Council and City Staff Presentations
• Factsheet template
• Presentation template
• Brochure
• Email (or modified electronic newsletter template)

2.0 Newsletter
The newsletter will be sent to active participants of the Management Plan, which would include stakeholders, meeting attendees, and those that have expressed interest via website, email, letter, etc.

The newsletter content will be generated in collaboration with the City of Elk River and will feature city updates regarding the Management Plan, profiles of active participants, describe BMP techniques, and upcoming events or workshops.

Four Weeks Prior:
• Develop a newsletter outline for included topics and content

Three Weeks Prior:
• Identify content leads
• Draft content
• Determine recipient list

Two Weeks Prior:
• Review content
• Draft electronic version of newsletter
• Compile recipient data for mailing list

One Week Prior:
• Review and finalize content
• Review and finalize recipient list
• Review electronic version

Week of Sending:
• Send file to printer
• Upload recipient list into Publicaster
• Send electronic version after print version has been mailed
• Collect responses

3.0 Cable Access Channel
The presentation viewed on a cable access channel can include information on the upcoming event and will be developed on the presentation or display board template. Graphics can be taken from the City’s archive or
through images collected while performing previous activities including demos or workshops. Applications for this activity could include:

- Advertising a workshop or meeting
- Re-capping an activity or community involvement event
- Reminder of BMPs and management plan tips and methods
- Inform viewers of resources available in the city

4.0 Classroom Connections

Educating students about the BMPs and involving teachers can occur by having a City representative present to classrooms or groups, or conducting a teacher forum where teachers learn more about the BMPs in order to create lessons from the information. A school-wide activity or research project can also be an intensive way to get students involved. Learning events can be held on or off-campus and include a hands-on activity. Events to schedule could include:

- Annual workshop with teachers
- Presenting to a classroom should occur once per school year per school
- Off-campus events should occur once per school year.

Note: for a hands-on research project, frequency will increase depending on length of lesson or amount of data to be collected. For example, a two week long lesson on BMPs for students may involve an in-classroom presentation, a work and data collection day, a site visit in the city, and a capstone presentation.

Classroom Toolkit Materials could include:

- Teacher presentation (water model, video, etc.)
- Student worksheet
- Teacher survey
- Factsheet
- Research activity (optional)
5.0 Social Media – Facebook
Using the City of Elk River’s Facebook page, posts should be used to engage the public in using BMPs, participating in public or stakeholder workshops, and to inform the audience on new developments or city updates regarding the SWMP.

Geographic paid advertisements through users news feed are cost-effective approach to distributing education materials. A price limit and timeframe can be set through Facebook.

6.0 Trainings
Training and educating staff is important to ensure knowledge and proficiency in the newest and most effective approaches to BMPs.

Municipal field staff, inspectors, and other staff whose normal job responsibilities include practice of or oversight of activities related to stormwater management (i.e. illicit discharge, spills, polluting activities).

The five training presentations available in the powerpoint format can be updated in response to the type of audience, new information, or length of time available. Training information can be conveyed using the factsheet and tri-fold brochure template, as well.

Trainings for new employees should occur within their first year of employment. Trainings for existing staff should occur annually to reinforce and refresh BMPs and procedures. Evaluating the training’s effectiveness using the analytics tools should occur within 30 days of conducting training. Maintaining records of the training provided and the staff trained must also be retained during this time.

Partnerships

1.0 Blue Thumb Program and Sherburne Soil and Water Conservation District
Elk River is a paying partner of BlueThumb™ as is the SWCD. Blue Thumb - Planting for Clean Water™ is a collaborative program originally developed by Rice Creek Watershed District. Blue Thumb partners are a group of professionals from local governmental units (watershed and conservation districts, cities, counties); non-profit and community organizations; and nursery and landscape professionals. The Blue Thumb program aims to encourage homeowners to use native plant gardening, raingardens, and shoreline stabilization to reduce runoff from their home landscape in an effort improve water quality.

Partners may use Blue Thumb logo on print pieces, purchase promotional materials co-developed by field professionals, and more effectively collaborate with agencies and organizations with shared education goals. A partnership like Blue Thumb minimizes duplication and increases the strength of our reach to watershed residents. Retailers benefit from the increased exposure that results from association with Blue Thumb, and will also receive technical support and opportunities for professional development through trainings and workshops.

2.0 ISD#728 – Elk River Area School District
The school district can provide a network of teachers and areas in which the BMPs can be most applicable to. Creating a lesson plan around BMPs and engaging a group of educators for long-term partnership is a key goal in connecting water management work to the classroom. The officials and teachers involved in developing lesson plans, presentations, and activities are to be considered active participants and should receive updates on BMPs and on workshops in the community.
3.0 Sherburne County
Sherburne County is also an MS4 entity with similar interests and needs related to stormwater runoff collection, conveyance, treatment, and discharge to waters of the State. In as such, a partnership will be developed with the County to reduce redundancy between programs and infrastructure between the County and City.

Measurement Tools

1.0 Online Analytics

Email/Newsletter
Tracking participants’ interaction with emails and newsletters sent electronically can be done through Publicaster. Indicators of engagement will include open rates and click-through rates to the website or partner links. Users’ response to the emails by RSVP’ing to an event, asking questions, and providing comments can also be documented.

Website:
Visitors to the City’s website and to the links that contain BMP information, downloadable content, or a comment form can be tracked in views, clicks, and length of time spent via Google Analytics. Comment forms submitted electronically to an email will also be documented.

1.0 Survey

Electronic
Surveys developed on an online platform can collect responses and aggregate the data to better view patterns and to compare with previous results. They can be used to measure adoption rates of BMPs in active participants, how well information in presentations was retained, or whether there needs to be improvement in outreach activities.

Paper
Paper surveys can be copied from an electronic version to a printable format. Surveys collected at outreach events can be entered into the online version to combine the results of both electronic and printed versions.

Templates
1. PowerPoint Presentation
2. Fact Sheet
3. Brochure (Tri-fold and Bi-fold)
4. Display Board
5. Worksheet
6. Survey (Electronic and Paper)
7. Social Media Graphics/Banners
8. Media Paid Advertisement
9. Newsletter
10. Email
11. Meeting Notifications (Email and Letter)

Resources
CleanWater.Org ms4 Permit Toolkit
EPA Watershed Outreach Guide
2.0 Public Participation and Involvement

This part of the MS4 requirements is addressed by a public notice for an annual public meeting (combined with City Council Meeting or other public participation/involvement event) to solicit public input on the SWPPP. The meeting typically is provided as an agenda item for a Board meeting in late winter, prior to Annual Reporting (June 30th).
3.0 Illicit Discharge Detection and Elimination

This part of the MS4 requirements is addressed by updating the City storm sewer map, reviewing the Illicit Discharge Detection and Elimination (IDDE) and Enforcement ordinance, and developing an IDDE program and implementation plan. An illicit discharge is defined by the City’s MS4 general permit as any non-stormwater discharge to the storm sewer, except those allowed through the NPDES permit.

GIS MAPPING UPDATES

The purpose of this GIS exercise is to update the City’s storm sewer map, as well as to include any new ponds, wetlands, lakes, and other structural BMPs. Part III.C.1 of the MS4 Permit requires the following information to be contained in a storm sewer system map:

- All storm sewer pipes with a diameter of 12 inches or greater, including stormwater flow direction
- All outfalls, with a unique identification number appended to each
- All structural stormwater BMPs
- All receiving waters.

Storm sewer maps showing some of the information required by the MS4 can be found in Appendix A, Figures 2 through 6. Each outfall has been assigned a unique Apron Number, which is located in the attribute table of the map file. The City is working to update their GIS data so that it includes all of the information required for Part III.C.1 of the MS4.

ILlicit Discharge Detection and Elimination (IDDE) and Enforcement Ordinance

The new code provided below is intended to replace elements of Elk River City Code, Sec. 30-2174 (b). HDR proposes that this section of Code be moved out of Section 30 (Land Development Regulations) and into Section 78, Division 2, under Sewer Use and Discharge Requirements.

IDDE City Code

I. Background

The Municipal Separate Storm Sewer Systems (MS4) permit requires that the permittee review and update ordinances related to stormwater. As part of that review, language related to Illicit Discharge Detection and Elimination is scrutinized in the first year of the permit cycle for its ability to meet the regulatory needs of the City to meet its permit requirements.
II. Sec. 30-2174. Stormwater and urban runoff control

(a) Applicability
1. This ordinance shall apply to all water entering the storm drain system generated on any developed and undeveloped lands unless explicitly exempted by the City.

(b) Compatibility With Other Regulations
1. This ordinance is not intended to modify or repeal any other ordinance, rule, regulation, or other provision of law. The requirements of this ordinance are in addition to the requirements of any other ordinance, rule, regulation, or other provision of law, and where any provision of this ordinance imposes restrictions different from those imposed by any other ordinance, rule, regulation, or other provision of law, whichever provision is more restrictive or imposes higher protective standards for human health or the environment shall control.

(c) Severability
1. The provisions of this ordinance are hereby declared to be severable. If any provision, clause, sentence, or paragraph of this ordinance or the application thereof to any person, establishment, or circumstances shall be held invalid, such invalidity shall not affect the other provisions or application of this ordinance.

(d) Prohibition of Illegal Discharges
1. All discharges to the MS4 are prohibited except as described as follows:
   a. The following discharges are exempt from discharge prohibitions established by this ordinance: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration, uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, and street wash water.
   b. Discharges or flow from firefighting, and other discharges specified in writing by the city as being necessary to protect public health and safety.
   c. Discharges associated with dye testing, however this activity requires a verbal notification to the City prior to the time of the test.
   d. The prohibition shall not apply to any non-storm water discharge permitted under an NPDES permit, waiver, or waste discharge order issued to the discharger and administered under the authority of the United States Environmental Protection Agency (EPA), provided that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations, and provided that written approval has been granted for any discharge to the storm drain system.

(e) Prohibition of I illicit Connections
1. Sanitary sewer connections or other unauthorized connections to the MS4 system are prohibited.
2. This prohibition expressly includes, without limitation, such connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection.
3. A person is considered to be in violation of this ordinance if the person connects a line conveying sewage to the MS4, or allows such a connection to continue.
4. Improper connections in violation of this ordinance shall be disconnected and redirected, if necessary, to an approved onsite wastewater management system or the sanitary sewer system upon approval of the City. Any drain or conveyance that has not been documented in plans, maps or equivalent, and which may be connected to the storm sewer system, shall be located by the owner or occupant of that property upon receipt of written notice of violation from the City requiring that such locating be completed. Such notice will specify a reasonable time period within which the location of the drain or conveyance is to be determined, that the drain or conveyance be identified as storm sewer, sanitary sewer or other, and that the outfall location or point of connection to the storm sewer system, sanitary sewer system or other discharge point be identified. Results of these investigations are to be documented and provided to the City.

\(f\) Watercourse Protection

1. Every person owning property through which a watercourse passes, or such person's lessee, shall keep and maintain that part of the watercourse within the property free of trash, debris, excessive vegetation, and other obstacles that would pollute, contaminate, or significantly retard the flow of water through the watercourse. In addition, the owner or lessee shall maintain existing privately owned structures within or adjacent to a watercourse, so that such structures will not become a hazard to the use, function, or physical integrity of the watercourse.

\(g\) Right of Entry: Inspection and Sampling

1. The City shall be permitted to enter and inspect facilities subject to regulation under this ordinance as often as may be necessary to determine compliance with this ordinance.
   a. If a discharger has security measures in force which require proper identification and clearance before entry into its premises, the discharger shall make the necessary arrangements to allow access to representatives of the City.
   b. Facility operators shall allow the City ready access to all parts of the premises for the purposes of inspection, sampling, examination and copying of records that shall be kept under the conditions of an NPDES permit to discharge stormwater, and the performance of any additional duties as defined by state and federal law.
   c. The City shall have the right to set up on any permitted facility such devices as are necessary in the opinion of the City to conduct monitoring and/or sampling of the facility's storm water discharge.
   d. The City has the right to require the discharger to install monitoring equipment as necessary. The facility's sampling and monitoring equipment shall be maintained at all times in a safe and proper operating condition by the discharger at its own expense. All devices used to measure storm water flow and quality shall be calibrated to ensure their accuracy.
   e. Any temporary or permanent obstruction to safe and easy access to the facility to be inspected and/or sampled shall be promptly removed by the operator at the written or oral request of the City and shall not be replaced. The costs of clearing such access shall be borne by the operator.
   f. Unreasonable delays in allowing the City access to a permitted facility is a violation of a storm water discharge permit and of this ordinance. A person who is the operator of a facility with an NPDES permit to discharge storm water associated with industrial activity commits an offense if the person denies the City reasonable access to the permitted facility for the purpose of conducting any activity authorized or required by this ordinance.
(b) **Search Warrants**

1. If the City has been refused access to any part of the premises from which storm water is discharged, and he/she is able to demonstrate probable cause to believe that there may be a violation of this ordinance or the City’s MS4 permit/authorization, or that there is a need to inspect and/or sample as part of a routine inspection and sampling program designed to verify compliance with this ordinance or any order issued hereunder, or to protect the overall public health, safety, and welfare of the community, then the City may seek issuance of a search warrant from any court of appropriate jurisdiction.

(i) **Spill Notification**

1. Notwithstanding other requirements of law, as soon as any person responsible for a facility or operation, or responsible for emergency response for a facility or operation has information of any known or suspected unauthorized discharges under this ordinance or the City’s MS4 permit into stormwater, the storm drain system, or waters of the state, said person shall take all necessary steps to ensure the discovery, containment, and cleanup of such release. In the event of such a release of hazardous materials said person shall immediately notify emergency response agencies of the occurrence via emergency dispatch services. In the event of a release of non-hazardous materials, said person shall notify the City in person or by phone no later than the next business day. Notifications in person or by phone shall be confirmed by written or electronic notice, sent to the City within five (5) business days of the verbal notice. If the discharge of prohibited materials originates from a commercial or industrial establishment, the owner or operator of such establishment shall also retain an on-site written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least three (3) years.

Failure to provide notification of a release as provided above is a violation of this ordinance.

(j) **Violations, Warnings, and Notices**

1. It shall be unlawful for any person to violate any provision or fail to comply with any of the requirements of this ordinance. Any person who has violated or continues to violate the provisions of this ordinance, may be subject to the enforcement actions outlined in this section. In the event the violation constitutes an immediate danger to public health or public safety, the City is authorized to enter upon the subject private property without giving prior notice, to take any and all measures necessary to abate the violation and/or restore the property. The City is authorized to seek costs of the abatement as outlined in this ordinance.

2. When the City finds that any person has violated, or continues to violate, any provision of this ordinance, or any order issued hereunder, the City may serve upon that person a written or electronic Warning Notice, specifying the particular violation believed to have occurred and requesting the discharger to immediately investigate the matter and to seek a resolution whereby any offending discharge will cease. Investigation and/or resolution of the matter in response to the Warning Notice in no way relieves the alleged violator of liability for any violations occurring before or after receipt of the Warning Notice. Nothing in this section shall limit the authority of the City to take any action, including emergency action or any other enforcement action, without first issuing a Warning Notice.

3. Whenever the City finds that a person has violated a prohibition or failed to meet a requirement of this ordinance, the City may order compliance by written or electronic notice of violation to the responsible person. The Notice of Violation shall contain:
   a. The name and address of the alleged violator;
b. The address when available or a description of the building, structure or land upon which the violation is occurring, or has occurred;

c. A statement specifying the nature of the violation;

d. A description of the remedial measures necessary to restore compliance with this ordinance and a time schedule for the completion of remedial action;

e. A statement of the penalty or penalties that shall or may be assessed against the person to whom the notice of violation is directed;

f. A statement that the determination of violation may be appealed to the City by filing a written notice of appeal within ten (10) days of the issued date on the notice of violation; and

g. A statement specifying that, should the violator fail to restore compliance within the established time schedule, the work will be done by a designated governmental agency or a contractor and the expense thereof shall be charged to the violator.

4. A notice of violation may require without limitation:

a. The performance of monitoring, analyses, and reporting;

b. The elimination of illicit connections or discharges;

c. That violating discharges, practices, or operations shall cease and desist;

d. The abatement or remediation of storm water pollution or contamination hazards and the restoration of any affected property;

e. Payment of a fine to cover administrative and remediation costs; and

f. The implementation of source control or treatment BMPs.

(k) Enforcement and Penalties

1. In lieu of enforcement proceedings, penalties, and remedies authorized by this ordinance, the City may impose upon a violator appropriate alternative compensatory action designed to meet the overall purposes of this ordinance and the City’s MS4 permit/authorization, including without limitation storm drain stenciling, attendance at compliance workshops, or river cleanup.

2. When the City finds that any person has violated, or continues to violate, any provision of this ordinance, or any order issued hereunder, or that the person’s past violations are likely to recur, and that the person’s violation(s) has (have) caused or contributed to an actual or threatened discharge to the MS4 or waters of the United States which reasonably appears to present an imminent or substantial endangerment to the health or welfare of persons or to the environment, the City may issue an order to the violator directing it immediately to cease and desist all such violations and directing the violator to immediately comply with all ordinance requirements and to take appropriate preventive action as may be needed to properly address a continuing or threatened violation, including immediately halting operations and/or terminating the discharge. Any person notified of an emergency order directed to it under this Subsection shall immediately comply and stop or eliminate its endangering discharge. In the event of a discharger’s failure to immediately comply voluntarily with the emergency order, the City may take such steps as deemed necessary to prevent or minimize harm to the MS4 or waters of the United States, and/or endangerment to persons or to the environment, including immediate termination of a facility’s water supply, sewer connection, or other municipal utility services. The City may allow the person to recommence its discharge when it has demonstrated to the satisfaction of the City that the period of endangerment has passed, unless further termination proceedings are initiated against the discharger under this ordinance. A person that is responsible, in whole or in part, for any discharge presenting imminent endangerment shall
submit a detailed written statement, describing the causes of the harmful discharge and the measures
taken to prevent any future occurrence, to the City within ten (10) days of receipt of the emergency
order. Issuance of an emergency cease and desist order shall not be a bar against, or a prerequisite
for, taking any other action against the violator.
3. The City may, without prior notice, suspend MS4 discharge access to a person when such suspension
is necessary to stop an actual or threatened discharge which presents or may present imminent and
substantial danger to the environment, or to the health or welfare of persons, or to the MS4 or waters
of the United States. If the violator fails to comply with a suspension order issued in an emergency,
the City may take such steps as deemed necessary to prevent or minimize damage to the MS4 or
waters of the United States, or to minimize danger to persons.
4. Any person discharging to the MS4 in violation of this ordinance may have their MS4 access
terminated if such termination would abate or reduce an illicit discharge. The City will notify a
violator of the proposed termination of its MS4 access. The violator may petition the City for a
reconsideration and hearing. A person commits an offense if the person reinstates MS4 access to
premises terminated pursuant to this Section, without the prior approval of the City.
5. In the event the alleged violator fails to take the remedial measures set forth in the notice of violation
or otherwise fails to correct the violations described therein within ten (10) calendar days, or such
greater period as the City deems appropriate, after the City has taken one or more of the actions
described above, the City may impose a penalty not to exceed $1,000 (depending on the severity
of the violation) for each day the violation remains unremedied after receipt of the notice of violation.
6. Any person that has violated or continues to violate this ordinance shall be liable to criminal
prosecution to the fullest extent of the law, and shall be subject to a criminal penalty of $1,000 per
violation per day. Each act of violation shall constitute a separate offense.

(1) Appeal
1. Any person receiving a Notice of Violation may appeal the determination of the City. The notice of
appeal must be received within ten (10) calendar days from the date of the Notice of Violation.
Hearing on the appeal before the appropriate authority or his/her designee shall take place within 30
days from the date of receipt of the notice of appeal. The decision of the municipal authority or their
designee shall be final.

ILILICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) PROGRAM
The City of Elk River SWMP has identified water quality problem areas; these areas will be considered in the
high risk evaluation. A GIS analysis using City and EPA GIS data was done to determine other areas of
concern. The assessed criteria are as follows:

- Land-use type (City of Elk River, 2014)
  - Industrial, Mining, Landfill
- Pollutant source points (City of Elk River, 2014)

The majority of the industrial land use areas in the City drain to on-site stormwater ponds and not directly to
receiving waters. Illicit discharges from these industrial areas would likely be diluted upon reaching the outfall.
Physical identifiers of illicit discharges would likely not be present. Tests following the Industrial Benchmark
must be done in this case to determine if there is an illicit discharge. City stormwater GIS data does not show
any storm sewer pipe coming out of two industrial zones in the south east. These areas have been flagged as
high risk and are shown in Appendix A, Figure 9. They should be investigated in the field in order to
determine which outfalls discharge from these sites might affect. The industrial areas with GIS storm sewer information were delineated into drainage areas and pipesheds. In the case of a spill it will be easy to reference the map and identify where the spill will go. These drainage areas can be found in Appendix A, Figures 7 and 8. Drainage areas and pipesheds were also delineated in areas with high concentrations of pollutant sources per Figure 9 of the Elk River SWMP. Outfalls near areas with a high concentration of pollutant sources, industrial areas, and Jackson Avenue (flagged by the City) were given the highest priority for inspection.

**AREAS AT HIGH RISK OF ILICIT DISCHARGE**

Table 3 below details the areas determined to be at high risk of illicit discharge, the method of determination, impacted water bodies, and outfalls which should be monitored in the area. The outfall identification number used in the table is the Apron Number from the City stormwater GIS data.

**Table 3. High Risk Outfalls**

<table>
<thead>
<tr>
<th>Area</th>
<th>Method</th>
<th>Impacted Waterbodies</th>
<th>At Risk Outfalls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jackson Avenue</td>
<td>SWMP</td>
<td>Mississippi River</td>
<td>AP1786, AP1784, AP304, AP193, AP562</td>
</tr>
<tr>
<td>Great River Energy Dr. NW Industrial Sites</td>
<td>GIS Analysis</td>
<td>Mississippi River</td>
<td>AP518, AP137</td>
</tr>
<tr>
<td>North of intersection of Pasc. Dr. NW and 185th Ave. NW</td>
<td>GIS analysis</td>
<td>Elk River</td>
<td>AP562</td>
</tr>
<tr>
<td>East of intersection of Waco St. NW and 185th Ave. NW</td>
<td>GIS analysis</td>
<td>Elk River</td>
<td>AP483</td>
</tr>
<tr>
<td>Eastern end of 185th Ln. NW</td>
<td>GIS analysis</td>
<td>Orono Lake</td>
<td>AP400</td>
</tr>
<tr>
<td>South of the intersection of Island View Dr. NW and Concord St. NW</td>
<td>GIS analysis</td>
<td>Orono Lake</td>
<td>AP334</td>
</tr>
<tr>
<td>Industrial areas in south east of City, between Jarvis St NW and 165th Ave NW</td>
<td>GIS Analysis</td>
<td>Mississippi River</td>
<td>To be determined in the field</td>
</tr>
</tbody>
</table>

**SEARCH FOR ILLICIT DISCHARGE PROBLEMS IN THE FIELD**

Outfall Reconnaissance Inventory (ORI)

Before the first permit cycle expires, the City should perform a stream walk for every stream and open channel within the City limits. This method of performing the Outfall Reconnaissance Inventory is simple and comprehensive. The High Risk Areas contained in Table 1 above should be prioritized over other channels and streams. If possible, field work should not be performed in the early spring as the ground is saturated with snowmelt. Field work should be performed during a dry weather period with at least a 48-hour
buffer since the last precipitation event. This is because dry weather flows have been shown to contain more pollutants than wet weather flows (Center for Watershed Protection, 2004).

Prior to performing an ORI, City field staff should be educated in illicit discharge detection and field safety procedures. Field maps should be made using City GIS data to make it easy for field staff to identify outfalls and High Risk Areas. The public should be notified via the City Newsletter or website of field activities and their purpose before they begin.

In the field, there are additional procedures that should be followed. All outfalls should be marked with their City designated Apron Numbers and photographed. Displaying outfalls and their ID numbers on field maps makes this task easier. The flow charts (Figure 1 and Figure 2) and table (Table 4) shown below can be used to determine necessary actions.

**Figure 1. Flow Chart 1 from IDDE Guidance Manual (Environmental Protection Agency, 2014)**

Note: Caulk Dams, Optical Brightener Monitoring (OBM) traps, and visiting the site Off-Hours are methods for monitoring intermittent flows that may not be present during the initial field visit. With flowing water, Flow Chart 2 or the Industrial Benchmark can be used to further categorize discharge. If field staff are near an industrial area or suspect industrial discharge, the Industrial Benchmark should be used. If not, Flow Chart 2 is appropriate.
Figure 2. Flow Chart 2 from Wissahickon IDDE Workshop (Center for Watershed Protection, 2011)

Table 4. Industrial Benchmarks from Wissahickon IDDE Workshop (Center for Watershed Protection, 2011)

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Concentration</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia (mg/L)</td>
<td>≥ 50</td>
<td>Existing Flow Chart 2 Parameter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Concentrations higher than the benchmark can identify a few industrial discharges</td>
</tr>
<tr>
<td>Potassium (mg/L)</td>
<td>≥ 20</td>
<td>Existing Flow Chart 2 Parameter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Excellent indicator of a broad range of industrial discharges</td>
</tr>
<tr>
<td>Color (units)</td>
<td>≥ 500</td>
<td>Supplemental parameter that identifies a few specific industrial discharges</td>
</tr>
<tr>
<td>Conductivity (μS/cm)</td>
<td>≥ 2,000</td>
<td>Identifies a few industrial discharges</td>
</tr>
<tr>
<td>Hardness (mg/L as CaCO3)</td>
<td>≤ 10 or ≥ 2,000</td>
<td>May be useful to distinguish between industrial sources</td>
</tr>
<tr>
<td>pH (units)</td>
<td>≤ 5</td>
<td>Only captures a few industrial discharges</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High pH values may also indicate an industrial discharge but residential wash waters can have a high pH as well</td>
</tr>
<tr>
<td>Turbidity (NTU)</td>
<td>≥ 1,000</td>
<td>Supplemental parameter that identifies a few specific industrial discharges</td>
</tr>
</tbody>
</table>

Color, turbidity, pH, flow, temperature, and ammonia can easily be tested in the field. For parameters that cannot easily be tested in the field, water samples should be gathered and sent to a lab. The City may require more stringent testing procedures and additional testing parameters at their discretion. The Sample Monitoring Results Records in Appendix D can be used to record the results of field tests. Site inspection forms should also be completed when in the field, these can be found in Appendix B. The City has existing water quality monitoring stations already in place and the data from these stations can be used to establish benchmark pollutant levels. Results from field testing can be compared against these levels to determine if there is an illicit discharge.
Response Procedures
In the event that a field crew encounters an obvious illicit discharge, certain procedures should be followed. The ORI should be stopped, and the field crew should ensure that the public keeps a safe distance from the discharge. Emergency response personnel should be contacted immediately if it appears there is a significant spill or health hazard. The Minnesota Department of Public Safety Duty Officer should be contacted at 1.800.422.0798 for any spill presenting a health or environmental hazard. Once the proper authorities have been contacted, photographs and a sample of the effluent should be taken if the field crew is comfortable approaching the discharge. Detailed notes should be taken in the site inspection form found in Appendix B. Upon completing the above tasks, the field crew should begin to track down the source of the illicit discharge. Procedures for tracing sources can be found below.

**TRACING AND REMOVING DISCHARGES**

Implement Pollution Hotline
The City has already allocated budget towards updating their illicit discharge reporting system on the City website. Once the program has been updated, the public should be notified of the improved reporting system to increase its utilization. It is important that reports be responded to within 24 hours, that personnel are properly trained in responding to incidents, and that the response is documented so that the pollutant source can be traced.

Tracing Sources
Once an illicit discharge has been discovered, the source should be traced and removed as soon as possible. The pipe containing the illicit discharge can be traced upstream using City GIS maps showing storm sewer pipes. Utilizing several field staff makes this task much more efficient, as pipes will often branch out and all branches must be investigated. To further isolate which branch of the storm sewer contains the discharge, manhole investigations can be done. These involve lifting the manhole cover off of the storm sewer and doing a visual inspection to determine if there is an illicit discharge flowing in the pipe. A more thorough investigation can be done if the discharge has no physically identifiable characteristics by using Flow Chart 2 (Figure 2) or the Industrial Benchmark (Table 2). If the source cannot be identified at known entrances to the storm sewer, dye testing can be used to identify illegal connections. Non-toxic dye can be poured through suspected illegal connections such as garage floor drains or industrial sinks. The presence of dye in the downstream storm sewer indicates a possible illegal connection.

Removing Sources
Once an illicit discharge source has been isolated several factors must be considered. Where does the responsibility for the discharge lie, how is the discharge going to be stopped, how much time will that take, and how will the elimination of the source be documented? The City should supply guidance for removing the illicit discharge to the property owner. Property owners must comply with the regulations discussed in the Authority and Responsibility section of this document. When responding to an incident, City staff must document the following:

- Time, place and description of violation
- Name of violator
- Corrective action taken (if any)
- Time corrective action was taken
- Other regulatory organizations involved
• Date problem resolved

PROGRAM EVALUATION
It is important that the City periodically review the effectiveness of their IDDE program. Below are some examples questions that can be used to assess performance.

• Community participation in IDDE education programs
  o Do people attend classes?
  o Are newsletters and notifications well received?
• Effectiveness of illicit discharge reporting system
  o Does the community use the program?
  o Is the program effective in tracking down illicit discharges?
• Recordkeeping protocol and database
  o Is past data accessible and understandable?
  o Is it possible to easily compare past data to present data?
  o Have baseline pollutant levels for different areas been established?
• Preparedness of field staff –Do staff feel comfortable
  o Responding to reports of illicit discharges?
  o Tracing illicit discharges?
  o Removing illicit discharges?

Once the existing program has been assessed, it is important to update the goals and strategies of the program to improve IDDE.
4.0 Construction Site Stormwater Runoff Control
This part of the MS4 requirements is addressed by updating the City’s Construction Site Stormwater Runoff ordinance, developing written procedures for construction site plan review, developing erosion control inspection procedures, and developing permit application system procedures.

CONSTRUCTION SITE STORMWATER RUNOFF CONTROL ORDINANCE
The Municipal Separate Storm Sewer Systems (MS4) permit requires that the permittee review and update its ordinances related to stormwater. As part of that review, language related to Construction Site Stormwater is scrutinized in the first year of the permit cycle for its ability to meet the regulatory needs of the City to meet its permit requirements.

New ordinance language for this task is included in Section 30-2174 Stormwater and urban runoff control, (h) through (n) in the following pages. The original 2007 ordinance is included in Appendix E to indicate additions/deletions.

ARTICLE VII. - STORMWATER MANAGEMENT
Sec. 30-2172. - Generally.
a. The purpose of this article is to satisfy SWPPP obligations for a regulatory mechanism to control stormwater pollution and illegal discharges under the statewide general permit for small MS4s. This article sets forth minimum requirements for stormwater management to diminish threats to public health, safety, public and private property and natural resources of the community by establishing standards that will:
   1. Protect life and property from dangers associated with flooding;
   2. Protect public and private property from damage resulting from runoff or erosion;
   3. Ensure site design minimizes the generation of stormwater and maximizes pervious areas for stormwater treatment;
   4. Promote regional stormwater management by watershed;
   5. Protect, maintain and/or restore water quality from nutrients, pathogens, toxics and debris;
   6. Promote infiltration and groundwater recharge;
   7. Promote water quality treatment for new development, redevelopment, and linear construction projects.

b. No person shall develop any land for residential, commercial, industrial, or institutional uses without having provided the stormwater management measures set forth herein to control or manage runoff from such development. All water entering the storm drain system generated on any developed and undeveloped lands, unless explicitly exempted by the city, shall be protected from illegal disposal/discharge and illegal connections.

(Ord. No. 07-05, § 1, 6-18-2007)

Sec. 30-2173. - Definitions.
Unless specifically defined below, the words or phrases used in this article shall have the same meaning as they have in common usage. When not inconsistent with the context, words used in the present tense include the future tense, words in the plural number include the singular number, and words in the singular number include the plural number. The words "shall" and "must" are always mandatory and not merely directive.
Applicant means any person or entity that applies for a building permit, subdivision approval, or a permit to allow land-disturbing activities. Applicant also means that person’s agents, employees, and others acting under this person’s direction.

Best management practices (BMP’s) means erosion and sediment control and water quality management practices that are the most effective and practicable means of controlling, preventing, and minimizing the degradation of surface water, including construction-phasing, minimizing the length of time soil areas are exposed, prohibitions, and other management practices published by state or designated area-wide planning agencies. (Examples of BMP’s can be found in the current versions of the Minnesota Pollution Control Agency’s publications, "Protecting Water Quality in Urban Areas," and, "Storm-Water and Wetlands: Planning and Evaluation Guidelines for Addressing Potential Impacts of Urban Storm-Water and Snow-Melt Runoff on Wetlands," the United States Environmental Protection Agency’s, "Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices," (as a reference for BMP’s) and the Minnesota Department of Transportation’s, "Erosion Control Design Manual.")

Buffer means a protective vegetated zone located adjacent to a natural resource, such as a water of the state, that is subject to direct or indirect human alteration. Such a buffer strip is an integral part of protecting an aquatic ecosystem through filtering, pollutants and providing adjacent habitat. The width of a buffer strip is the width along each bank of a stream. Therefore, a 30-foot wide stream with 100-foot buffer strips has a total width of 230 feet. Acceptable buffer vegetation includes preserving existing predevelopment vegetation and/or planting locally distributed native Minnesota trees, shrubs and grassy vegetation. Alteration of buffers is strictly limited. Buffer areas are designated with permanent markers.

Drainage means any collection, conveyance, or movement of stormwater runoff on a site or between adjacent areas. Examples include, but are not limited to, the existing soil topography that may result in accelerated stormwater runoff and/or additional runoff volume, leading to soil erosion and movement of sediment into surface waters or drainage systems. Examples of construction activity may include clearing, grading, filling, and excavating. Construction activity includes the disturbance of land area that is a part of a larger common plan of development or sale if the larger common plan will ultimately disturb 10,000 square feet or more.

Developer means a person, firm, corporation, sole proprietorship, partnership, state agency, or political subdivision thereof engaged in a land disturbance activity.

Discharge means the release, conveyance, channeling, runoff, or drainage, of stormwater, including snowmelt, from a construction site.

Energy dissipation means the methods employed at pipe outlets to prevent erosion. Examples include, but are not limited to; aprons, riprap, splash pads, and gabions that are designed to prevent erosion.

Erosion means any process that wears away the surface of the land by the action of water, wind, ice, or gravity. Erosion can be accelerated by the activities of people and nature.

Erosion control Refers to methods employed to prevent erosion. Examples include soil stabilization practices, horizontal slope grading, temporary or permanent cover, and construction phasing.
Erosion and sediment practice specifications or practice means the management procedures, techniques, and methods to control soil erosion and sedimentation as officially adopted by either the state, county, city or local watershed group, whichever is more stringent.

Exposed soil areas means all areas of the construction site where the vegetation (trees, shrubs, brush, grasses, etc.) or impervious surface has been removed, thus rendering the soil more prone to erosion. This includes topsoil stockpile areas; borrow areas and disposal areas within the construction site. It does not include stockpiles or surcharge areas of gravel, concrete or bituminous. Once soil is exposed it is considered "exposed soil," until it meets the definition of "final stabilization."

Filter strips means a vegetated section of land designed to treat runoff as overland sheet flow. They may be designed in any natural vegetated form from a grassy meadow to a small forest. Their dense vegetated cover facilitates pollutant removal and infiltration.

Final stabilization means that all soil disturbing activities at the site have been completed, and that a uniform perennial vegetative cover with a density of 75 percent of the cover for unpaved areas and areas not covered by permanent structures has been established, or equivalent permanent stabilization measures have been employed. Simply sowing grass seed is not considered final stabilization. (Examples of vegetative cover practices can be found in the current version of the Minnesota Department of Transportation's publication, "Supplemental Specifications to the (year of the latest update) Standard Specifications for Construction."

Hazardous materials means any material, including any substance, waste, or combination thereof, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, a substantial present or potential hazard to human health, safety, property, or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Hydric soils means soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part.

Hydrophytic vegetation means Macrophytic (large enough to be observed by the naked eye) plant life growing in water, soil or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content.

Illegal discharge means any direct or indirect non-storm water discharge to the storm drain system, except as exempted in this ordinance.

Illicit connection means any drain or conveyance, whether on the surface or subsurface that allows an illegal discharge to enter the storm drain system including but not limited to any conveyances that allow any non-storm water discharge including sewage, process wastewater, and wash water to enter the storm drain system and any connections to the storm drain system from indoor drains and sinks, regardless of whether said drain or connection had been previously allowed, permitted, or approved by an authorized enforcement agency or, any drain or conveyance connected from a commercial or industrial land use to the storm drain system that has not been documented in plans, maps, or equivalent records and approved by the City.

Impervious surface means a constructed hard surface that either prevents or retards the entry of water into the soil, and causes water to run off the surface in greater quantities and at an increased rate of flow than existed prior to development. Examples include rooftops, sidewalks, patios, driveways, parking lots, storage areas, and concrete, asphalt, or gravel roads.
Industrial activity means any activity subject to NPDES Industrial Storm Water Permits as defined in 40 CFR, Section 122.26 (b)(14).

Municipal Separate Storm Sewer System (MS4) means the system of conveyances (including sidewalks, roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) owned and operated by the city and designed or used for collecting or conveying storm water, and that is not used for collecting or conveying sewage.

Native vegetation means the presettlement group of plant species native to the local region, that were not introduced as a result of European settlement or subsequent human introduction.

Non-stormwater discharge means any discharge to the storm drain system that is not composed entirely of stormwater.

Ordinary high water mark means the boundary elevation where the vegetation changes from predominately aquatic (Where "aquatic" broadly means that the vegetation can survive moist conditions) to terrestrial. This elevation delineates the highest water level, which has been maintained for a sufficient period of time to leave evidence upon the landscape, commonly the point where the natural vegetation changes from predominately aquatic to predominantly terrestrial. Water often reaches this elevation in spring. For rivers and streams the ordinary high water mark is usually the top of the bank. It is less well defined for lakes and wetlands. The definition in Minnesota Statute 103G.005, subdivision 14 says that the "... "Ordinary high water level" means the boundary of waterbasins, watercourses, public waters, and public waters wetlands, and:

1. The ordinary high water level is an elevation delineating the highest water level that has been maintained for a sufficient period of time to leave evidence upon the landscape, commonly the point where the natural vegetation changes from predominately aquatic to predominantly terrestrial;
2. For watercourses, the ordinary high water level is the elevation of the top of the bank of the channel; and
3. For reservoirs and flowages, the ordinary high water level is the operating elevation of the normal summer pool.

The term "ordinary high water mark" is further defined in Minnesota Rule 6120.2500, subpart 11. The Minnesota Department of Natural Resources' area hydrologist determines ordinary high water marks.

Owner means the person or party possessing the title of the land on which the construction activities will occur; or if the construction activity is for a lease, easement, or mineral rights license holder, the party or individual identified as the lease, easement or mineral rights license holder; or the contracting government agency responsible for the construction activity.

Paved surface means a constructed hard, smooth surface made of asphalt, concrete or other pavement material. Examples include, but are not limited to, roads, sidewalks, driveways and parking lots.

Permanent cover means "final stabilization." Examples include grass, gravel, asphalt, and concrete. See also the definition of "final stabilization."

Pollutant means anything which causes or contributes to pollution. Pollutants may include, but are not limited to: paints, varnishes, and solvents; oil and other automotive fluids; non-hazardous liquid and solid wastes and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects, ordinances, and
accumulations, so that same may cause or contribute to pollution; floatables; pesticides, herbicides, and fertilizers; hazardous substances and wastes; sewage, fecal coliform and pathogens; dissolved and particulate metals; animal wastes; wastes and residues that result from constructing a building or structure; and noxious or offensive matter of any kind.

*Public waters* means all water basins and watercourses that are described in Minn. Stat. 103G.005 subd. 15.

*Receiving waters* means creeks, streams, rivers, lakes, estuaries, groundwater formations, or other bodies of water into which surface water, treated waste, or untreated waste are discharged.

*Sanitary waste facility* means all property, real or personal, including negative and positive easements and water and air rights, which is or may be needed or useful for the processing or disposal of waste, except property for the collection of the waste and property used primarily for the manufacture of scrap metal or paper. Waste facility includes but is not limited to transfer stations, processing facilities, and disposal sites and facilities.

*Sediment* means the product of an erosion process; solid material both mineral and organic, that is in suspension, is being transported, or has been moved by water, wind, or ice, and has come to rest on the earth's surface either above or below water level.

*Sedimentation* means the process or action of depositing sediment.

*Sediment control* means the methods employed to prevent sediment from leaving the development site. Sediment control practices include silt fences, sediment traps, earth dikes, drainage swales, check dams, subsurface drains, pipe slope drains, storm drain inlet protection, and temporary or permanent sedimentation basins.

*Soil* means the unconsolidated mineral and organic material on the immediate surface of the earth. For the purposes of this document stockpile of gravel, aggregate, concrete or bituminous materials are not considered "soil" stockpiles.

*Stabilized* means the exposed ground surface after sod, erosion control blanket, riprap, or other material that prevents erosion has covered it. Simply sowing grass seed is not considered stabilization.

*Stormwater* under Minnesota Rule 7077.0105, subpart 41b storm water, "means precipitation runoff, storm water runoff, snow melt runoff, and any other surface runoff and drainage." (According to the Federal Code of Regulations under 40 CFR 122.26 [b][13], "Storm water means storm water runoff, snow melt runoff and surface and drainage."). Stormwater does not include construction site dewatering.

*Stormwater pollution prevention plan or SWPPP* means a joint storm water and erosion and sediment control plan that is a document containing the requirements of Section IV of the NPDES permit, that when implemented will decrease soil erosion on a parcel of land and off-site nonpoint pollution. It involves both temporary and permanent controls erosion prevention, sediment control, and pollution prevention practices. Structure means anything manufactured, constructed or erected, which is normally attached to or positioned on land, including portable structures, earthen structures, roads, parking lots, and paved storage areas.

*Structure* means anything manufactured, constructed, or erected, which is normally attached to or positioned on land, including portable structures, earthen structures, roads, parking lots, and paved storage areas.
Subdivision means any tract of land divided into building lots for private, public, commercial, industrial, etc. development. Minnesota Rule 6120.2500, subpart 17 defines subdivision as, "... land that is divided for the purpose of sale, rent, or lease, including planned unit development."

Temporary protection means short-term methods employed to prevent erosion. Examples of such protection include: straw, mulch, erosion control blankets, wood chips, and erosion netting.

Vegetated or grassy swales means a vegetated earthen channel that conveys stormwater, while treating the stormwater by biofiltration. Such swales remove pollutants by both filtration and infiltration.

Waters of the State as defined in Minnesota Statutes § 115.01, subdivision 22 the term "... "waters of the state" means all streams, lakes, ponds, marshes, watercourses, waterways, wells, springs, reservoirs, aquifers, irrigation systems, drainage systems and all other bodies or accumulations of water, surface or underground, natural or artificial, public or private, which are contained within, flow through, or border upon the state or any portion thereof."

Wet detention facility means a manmade structure, containing a permanent pool of water, used for the temporary storage of runoff.

Wetlands as defined in Minnesota Rules 7050.0130, subpart F, “... "wetlands" are those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Constructed wetlands designed for wastewater treatment are not waters of the state. Wetlands must have the following attributes:

1. A predominance of hydric soils;
2. Inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in a saturated soil condition; and
3. Under normal circumstances support a prevalence of such vegetation.

(Ord. No. 07-05, § 1, 6-18-2007)

Sec. 30-2174. - Stormwater and urban runoff control.

a. Illegal disposal/dumping.
   1. No person shall throw, deposit, place, leave, maintain, or keep any substance upon any street, alley, sidewalk, storm drain, inlet, catch basin conduit or drainage structure, business place, or upon any public or private plot of land, so that the substance might be or become a pollutant, except in containers, recycling bags, or other lawfully established waste disposal facility.

2. No person shall intentionally dispose of grass, leaves, dirt, or landscape material into a water resource, buffer, street, road, alley, catch basin, culvert, curb, gutter, inlet, ditch, natural watercourse, flood control channel, canal, storm drain or any fabricated natural conveyance.

c. Good housekeeping provisions. Any owner or occupant of property within the city shall comply with the following good housekeeping requirements:

1. No person shall leave, deposit, discharge, dump, or otherwise expose any chemical or septic waste in an area where discharge to streets or storm sewer system may occur. This section shall apply to both actual and potential discharges.
a) Septic systems must be maintained to prevent failure.

b) No part of any individual septic system requiring on-land or in ground disposal of waste shall be located closer than 150 feet from the ordinary high water level in the case of DNR protected waters, or 25 feet from the wetland boundary in the case of all other water bodies, unless it is proven by the applicant that no effluent will immediately or gradually reach the water bodies because of existing physical characteristics of the site or the system.

c) Recreational vehicle sewage shall be disposed of at a proper sanitary waste facility. Waste should not be discharged in an area where drainage to streets or storm sewer systems may occur.

d) For pools, water shall be allowed to sit seven days without the addition of chlorine to allow for chlorine to evaporate before discharge.

2. Runoff of water from residential property shall be minimized to the maximum extent practicable. Runoff of water from the washing down of paved areas in commercial or industrial property is prohibited unless necessary for health or safety purposes and not in violation of any other provisions in city codes.

3. Mobile washing companies (carpet cleaning, mobile vehicle washing, etc.) shall dispose of wastewater to the sanitary sewer. Wastewater shall not be discharged where drainage to streets or storm sewer systems may occur.

4. Storage of materials, machinery, and equipment
   a) Objects, such as motor vehicle parts, containing grease, oil or other hazardous substances, and unsealed receptacles containing hazardous materials, shall not be stored in areas susceptible to runoff.
   b) Any machinery or equipment that is to be repaired or maintained in areas susceptible to runoff shall be placed in a confined area to contain leaks, spills, or discharges.

5. Debris and residue shall be removed, as noted below:
   a) All motor vehicle parking lots and private streets shall be swept, at a minimum of once a year in the spring to remove debris. Such debris shall be collected and properly disposed.
   b) Fuel and chemical residue or other types of potentially harmful material, such as animal waste, garbage or batteries shall be removed as soon as possible and disposed of properly. Hazardous waste must be disposed of at an appropriate disposal site and shall not be placed in a trash container.

c. Industrial or construction activity discharges. Any person subject to an industrial or construction activity NPDES stormwater discharge permit shall comply with all provisions of such permit. Proof of compliance with said permit may be required in a form acceptable to the city prior to the allowing of discharges to the storm sewer system. All facilities that have stormwater discharges associated with industrial activity, including construction activity must adhere to the following guidelines:

1. The owner or operator of a commercial or industrial establishment shall provide, at their own expense, reasonable protection from accidental discharge of prohibited materials or other wastes into the storm sewer system or watercourses through the use of structural and non-structural BMPs.

2. Any person responsible for a property or premise, which is, the source of an illicit discharge, shall be required to implement, at said person's expense, additional structural and non-structural BMPs to prevent the further discharge of pollutants to the storm sewer system. These BMPs
shall be part of a storm water pollution prevention plan (SWPPP) as necessary for compliance with requirements of the NPDES permit.

d. *Notification of spills.* Not withstanding other requirements of law, as soon as any person responsible for a facility or operation, or responsible for emergency response for a facility or operation has information of any known or suspected release of materials which are resulting or may result in illegal discharges or pollutants discharging into the storm sewer system, or water of the state said person shall take all necessary steps to ensure the discovery, containment, and cleanup of such release. In the event of such a release of hazardous materials said person shall immediately notify emergency response agencies of the occurrence via emergency dispatch services. In the event of a release of non-hazardous materials, said person shall notify the city no later than the next business day.

e. *Access to buildings for inspection, monitoring and/or dye testing.*
   1. The city shall be permitted to enter and inspect all buildings under this article as often as may be necessary to determine compliance with this article.
   2. Facility operators shall allow the city ready access to all parts of the premises for the purposes of inspection, sampling, dye testing, examination and copying of records that relate to the discharge of stormwater.
   3. The city shall have the right to set up at any building such devices as are necessary to conduct monitoring, sampling and/or dye testing of the facility's stormwater discharge.
   4. The city has the right to require the discharger to install monitoring equipment as necessary.
   5. Unreasonable delays in allowing the city access to a facility is a violation of this article.
   6. If the city has been refused access to any part of the premises from which stormwater is discharged, and is able to demonstrate probable cause to believe that there may be a violation of this section, or that there is a need to inspect and/or sample as part of a routine inspection and sampling program designed to verify compliance with this article or any order issued hereunder, or to protect the overall public health, safety, and welfare of the community, then the city may seek issuance of a search warrant from any court of competent jurisdiction.

h. Suspension of storm sewer system access.
   1. Suspension due to illicit discharges in emergency situations. The city may, without prior notice, suspend storm sewer system discharge access to a person when such suspension is necessary to stop an actual or threatened discharge which presents or may present imminent and substantial danger to the environment, or to the health or welfare of persons, or to the storm sewer system or waters of the state. If the violator fails to comply with a suspension order issued in an emergency, the city may take such steps as deemed necessary to prevent or minimize damage to the storm sewer system or waters of the state, or to minimize danger to persons.
   2. Suspension due to the detection of illicit discharge. Any person discharging to the storm sewer system in violation of this article may have their storm sewer system access terminated if such termination would abate or reduce an illicit discharge. A person commits an offense if the person reinstates storm sewer system access to premises terminated pursuant to this section, without the prior approval of the city.

(A) *Applicability*

1. A City approved Stormwater Pollution Prevention Plan (SWPPP) and Permit shall be required prior to any construction or grading activity that meets any of the criteria immediately below, unless otherwise exempted in this ordinance.
a. Construction or grading activity involving between 10,000 square feet and one (1) acre of land disturbance.
b. Any construction or grading activity, regardless of size, that the City determines is likely to cause an adverse impact to an environmentally sensitive area or other property.

Construction or grading activity that exceeds one (1) acre of land disturbance and is subject to NPDES Construction Stormwater General Permit regulations is considered in compliance with this section with an approved NPDES coverage card. Proof of NPDES coverage and the approved SWPPP shall be provided to the City prior to construction. NPDES compliance shall be maintained through the duration of the project. In the event that the NPDES permit is closed or expired, City Permit regulations shall be followed until a final certificate of occupancy has been provided by the City, as applicable in accordance with the development’s zoning classification. Instances of non-compliance with NPDES regulations are subject to the City’s enforcement procedures described at the end of this section.

(B) Exemptions
1. The following activities shall be exempt from all of the requirements of this ordinance:
   a. Emergency work necessary to protect life, limb, or property.
   b. Routine agricultural activity such as tilling, planting, harvesting, and associated activities. Other agricultural activities are not exempt including activities such as construction of structures.

(C) Permit Review Process
1. Application review
   a. The applicant shall not commence any construction activity subject to this ordinance until a permit (herein referred to as “City Permit”) has been authorized by the city. A complete review of the City Permit application shall be done within ten (10) business days of the receipt of a complete City Permit application from the applicant. The city will work with the necessary state, county, and local agencies to complete the review as appropriate. The city shall review all information in the City Permit application including proposed stormwater practices, hydrologic models, and design methodologies for compliance with this ordinance.

2. City Permit authorization
   a. If the city determines that the application meets the requirements of this ordinance, the city may issue approval authorizing the project or activity. The approval shall be valid for one year. Approval will be in written or electronic format from the city to the applicant.

3. City Permit denial
   a. If the city determines the application does not meet the requirements of this ordinance the application will be denied. If the application is denied, the applicant will be notified of the denial in written or electronic format, including reasons for the denial. Once denied, a new application shall be resubmitted for approval before any activity may begin. All building permits shall be suspended until the applicant has an authorized City Permit.

4. Plan information requirements
   a. The minimum information shown in the applicant’s plan shall be consistent with the erosion and sediment control requirements in the most recent version of the NPDES Construction Stormwater General Permit and shall include a fully completed application.

5. Modification of permitted plans
a. The applicant must amend an approved plan to include additional requirements such as additional or modified stormwater best management practices (BMPs) designed to correct problems whenever:
   i. There is a change in design, construction, operation, maintenance, weather or seasonal conditions that has a significant effect on the discharge of pollutants to surface water or underground water.
   ii. Inspections or investigations by site operators, local, state or federal officials indicate the plans are not effective in eliminating or significantly minimizing the discharge of pollutants to surface water or underground water or that the discharges are causing water quality standard exceedances.
   iii. The plan is not achieving the general objectives of minimizing pollutants in stormwater discharges associated with the activity on the permitted site.

6. City Permit completion
a. Before work under the City Permit is deemed complete, the permittee must submit as-buils, a long term maintenance plan and information demonstrating that the stormwater facilities conform to design specifications.
b. All soil disturbing activities at the site have been completed and all soils are stabilized by a uniform perennial vegetative cover with a density of 70 percent of its expected final growth density over the entire pervious surface area, or other equivalent means necessary to prevent soil failure under erosive conditions.
c. A final certificate of occupancy has been provided by the City, as applicable according to the zoning classification of the development.

(D) Site Design Considerations
1. Design process
a. New and redevelopment projects shall be designed to incorporate erosion control and stormwater management features and to meet the minimum requirements outlined in the most recent version of the NPDES Construction Stormwater General Permit.
b. Whenever possible, new development projects shall be designed using the Better Site Design Techniques of the current version of the Minnesota Stormwater Manual. Better Site Design involves techniques applied early in the design process to preserve natural areas, reduce impervious cover, distribute runoff and use pervious areas to more effectively treat stormwater runoff. Site design should address open space protection, impervious cover minimization, and runoff distribution and minimization, and runoff utilization.

(E) Inspections and Maintenance
1. Applicant responsibilities
a. The applicant is responsible for inspections, maintenance, and record keeping during construction for all stormwater BMPs on the site.

2. Right of entry
a. The issuance of a City Permit or NPDES Construction Stormwater General Permit constitutes a right-of-entry for the city or its agent to enter upon the construction site. The applicant shall allow the city and their authorized representatives, upon presentation of credentials, to:
   i. Enter upon the permitted site for the purpose of obtaining information, examination of records, conducting investigations or surveys
ii. Bring such equipment upon the permitted development as is necessary to conduct such surveys and investigations
iii. Examine and copy any books, papers, records, or memoranda pertaining to activities or records required to be kept under the terms and conditions of the applicable permit(s)
iv. Inspect the stormwater pollution control measures
v. Sample and monitor any items or activities pertaining to stormwater pollution control measures

3. City inspections
   a. The city reserves the right to conduct inspections on a regular basis to ensure that both temporary and permanent stormwater management and erosion control measures are properly installed and maintained prior to construction, during construction, and at the completion of the project.

(F) Maintenance Schedule
1. Generally
   a. All nonfunctional BMPs must be repaired, replaced, or supplemented with functional BMPs by the end of the next business day after discovery, or as soon as field conditions allow access unless another time frame is specified below.
2. Perimeter control devices
   a. All perimeter control devices and inlet protection devices must be repaired, replaced, or supplemented when they become nonfunctional or the sediment reaches one-half (1/2) the height of the device. These repairs must be made by the end of the next business day after discovery, or thereafter as soon as field conditions allow access.
3. Sedimentation basins
   a. Temporary and permanent sedimentation basins must be drained and the sediment removed when the depth of the sediment collected in the basin reaches one-half (1/2) the storage volume. Drainage and removal must be completed within 72 hours of discovery, or as soon as field conditions allow access.
4. Surface waters
   a. The permittee must remove all deltas and sediment deposited in surface waters, including drainage ways, catch basins, and other drainage systems. Areas where sediment removal results in exposed soil must be re-stabilized. The removal and stabilization must take place within seven (7) days of discovery unless precluded by legal, regulatory, or physical access constraints. The permittee is responsible for contacting all local, regional, state, and federal authorities and receiving any applicable permits, prior to conducting any work in surface waters.
5. Sediment tracking
   a. All sediment that escapes the site or that is tracked onto paved surfaces must be removed within 24 hours of discovery, or if applicable, within a shorter time.

(G) Enforcement Actions
1. Notification of non-compliance
   a. The City shall notify the permittee if the construction or grading activity is not compliant with NPDES rules or City code, or is ineffective in achieving the goals of these regulations. Notification may be verbal, written, or electronic format.
2. Corrective work
   a. The permittee shall perform corrective work in the manner and time frame outlined above, and consistent with other regulatory requirements as applicable. The maintenance schedule and enforcement response schedule is based on the date that the City issues a notification of non-compliance, not to be contingent upon receipt or review by the permittee.
   b. The City reserves the right to perform corrective work in emergency situations at the City’s discretion, if the permittee is unable to do so in a time frame that the City finds satisfactory.
3. Failure to perform corrective work
   a. When an applicant fails to conform to any provision of this policy, through final completion and occupancy of the development as applicable, the City may take the following actions:
      i. Permit Revocation - Revoke any permit issued or authorized by the City to the applicant for the site in question or any other of the applicant’s sites within the City’s jurisdiction.
      ii. Correction by the City – The City reserves the right to perform mitigation measures to prevent public harm or nuisance, such as recovering sediment that has escaped the site onto a City street or into a stormwater conveyance or BMP. The applicant will be required to reimburse the City for all costs incurred in performing mitigation work.
      iii. In the event the alleged violator fails to take remedial measures set forth in the manner and time frame specified above, the City impose a penalty not to exceed $1,000 (depending on the severity of the violation) for each day the violation remains unremedied after notice of non-compliance.
      iv. Stop Work Order - The City reserves the right to issue a stop work order, withhold the scheduling of inspections, and/or the issuance of a Certificate of Occupancy in the event that other enforcement actions are not achieving the desired level of compliance.

Sec. 30-2175. - Post construction stormwater management.
The purpose of this section is to prevent or reduce water pollution within the city after construction has been completed. This section establishes standards for new development, redevelopment, and linear construction projects in order to minimize the stormwater pollution, soil erosion, and sedimentation.

   a. The applicant shall consider reducing the need for stormwater management performance standards by incorporating the use of natural topography and land cover. It shall also:
      1. Minimize impact to significant natural features.
      2. Review the site for wetlands, wooded areas of significance, rare and endangered species habitat, areas designated by the Country Biological Survey (1993), and/or Elk River Natural Resource Inventory (NRI) (December 2004). These areas should not be developed.
      3. Minimize impervious surface coverage to the maximum extent practicable.
      4. In designated shoreland areas the development shall meet the impervious surface requirements of the shoreland ordinance regardless of conveyance systems.
      6. Volume control. Designer shall be required to provide soil boring analysis to determine the infiltration rate prior to approval of plans. The design shall meet the following requirements depending on the type of project in accordance with the MS4 NPDES permit:
a. **New development.** For new, nonlinear developments that create more than one acre of new impervious surface on sites without restrictions, stormwater runoff volumes will be controlled and the post-construction runoff volume shall be retained on site for 1.1 inches of runoff from all impervious surfaces on the site.

b. **Redevelopment.** Nonlinear redevelopment projects on sites without restrictions that create one or more acres of new and/or fully reconstructed impervious surfaces shall capture and retain on site 1.1 inches of runoff from the new and/or reconstructed impervious surfaces.

c. **Linear development.** Linear projects on sites without restrictions that create one or more acres of new and/or fully reconstructed impervious surfaces shall capture and retain the larger of the following:
   
   i. 0.55 inches of runoff from new and/or reconstructed impervious areas on the site

   ii. 1.1 inches of runoff from the net increase in impervious areas on the site

7. **Water Quality**

   a. Total suspended solids. Treatment also must achieve an 80 percent removal of suspended solids.

   b. Phosphorus control. Stormwater shall be treated to remove 60 percent of the post-development phosphorus load on an annual basis before discharge to natural water bodies. The amount of total phosphorus removed should be modeled using the MIDS calculator or an equivalent water quality modeling program. Where water quality ponding is exclusively used to meet the phosphorus removal requirement, the ponds must be sized to store the site runoff from a two and one-half inch rainfall below the normal outlet elevation.

   c. Oil and grease control. For all storm water plans for commercial or industrial developments and all other uses where the potential for pollution by oil or grease, or both, exists, the first one-half inch of runoff will be treated using the best oil and grease removal technology available. This requirement may be waived by the city when the applicant can demonstrate that installation of such practices is not necessary.

8. **Rate Control.** For post-construction rate control modeling a minimum curve number of 84 shall be used on all disturbed/graded soil areas, due to soil compaction impacts, unless Soil Protection/Compaction Remediation specifications have been incorporated into the Proposal (Plan Set, Stormwater Management Plan, etc.) and are approved by the City Engineer. Atlas 14 shall be used in all rate-control estimates.

   a. **New construction.** Projects shall have no increase in runoff from the predevelopment peak runoff rates for the 2 year, 10 year, and 100 year, 24 hour storm events.

   b. **Redevelopment.** Projects shall have no increase in runoff from the pre-project peak runoff rates for the 2 year, 10 year, and 100 year, 24 hour storm events.
9. Treatment design sequencing for sites with restrictions (as found in the MIDS Design Sequence Flowchart).

Applicant shall fully attempt to comply with the appropriate performance goals described above. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site. If full compliance is not possible due to any of the factors listed below, the applicant must document the reason. If site constraints or restrictions limit the full treatment goal, the following treatment design sequence shall be followed:

Applicant shall document the treatment sequence starting with Alternative #1. If Alternative #1 cannot be met, then Alternative #2 shall be analyzed. Applicants must document the specific reasons why Alternative #1 cannot be met based on the factors listed below. If Alternative #2 cannot be met then Alternative #3 shall be met. Applicants must document the specific reasons why Alternative #2 cannot be met based on the factors listed below. When all of the conditions are fulfilled within an alternative, this sequence is completed.

Volume reduction techniques considered shall include infiltration, reuse & rainwater harvesting, and canopy interception & evapotranspiration and/or additional techniques included in the MIDS calculator and the Minnesota Stormwater Manual.

Higher priority shall be given to BMPs that include volume reduction. Secondary preference is to employ filtration techniques, followed by rate control BMPs.

Factors to be considered for each alternative will include:

i. Karst geology
ii. Shallow bedrock
iii. High groundwater
iv. Hotspots or contaminated soils
v. Drinking Water Source Management Areas or within 200 feet of drinking water well
vi. Zoning, setbacks or other land use requirements
vii. Excessive cost
viii. Poor soils (infiltration rates that are too low or too high, problematic urban soils)

Alternative #1:
Applicant Attempts to Comply with the Following Conditions:

i. Achieve at least 0.55” volume reduction from all impervious surfaces if the site is new development or from the new and/or fully reconstructed impervious surfaces for a redevelopment site.
ii. Remove 75% of the annual TP load from all impervious surfaces if the site is new development or from the new and/or fully reconstructed impervious surfaces for a redevelopment site.

iii. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site.

*Alternative #2:*

Applicant Attempts to Comply with the Following Conditions:

i. Achieve volume reduction to the maximum extent practicable.

ii. Remove 60% of the annual TP load from all impervious surfaces if the site is new development or from the new and/or fully reconstructed impervious surfaces for a redevelopment site.

iii. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site.

*Alternative #3:*

*Off-site Treatment.* Mitigation equivalent to the performance of 1.1 inches of volume reduction for new development or redevelopment as described above in this section, (including banking or cash) can be performed off-site to protect the receiving water body. Off-site treatment shall be achieved in areas selected in the following order of preference:

i. Locations that yield benefits to the same receiving water that receives runoff from the original construction activity.

ii. Locations within the same Department of Natural Resource (DNR) catchment area (Hydrologic Unit 08) as the original construction activity.

iii. Locations within the next adjacent DNR catchment area upstream.

iv. Locations anywhere within the community’s jurisdiction.

Impervious Surface Area Calculations shall include all disturbed/graded soil areas, due to soil compaction impacts, unless Soil Protection/Compaction Remediation specifications have been incorporated into the Proposal (Plan Set, Stormwater Management Plan, etc.) and are approved by the City Engineer.

Designers shall be required to provide estimates of BMP-site specific infiltration rates to the City Engineer for approval prior to site plan review. For information on estimation of infiltration rates, see the Minnesota Stormwater Manual (http://stormwater.epa.state.mn.us).

The MIDS Design Sequence Flowchart can be found in the Minnesota Stormwater Manual: http://stormwater.epa.state.mn.us/index.php/Flexible_treatment_options.

All volume control practices and site design specifications shall conform to the current version of the Minnesota Stormwater Manual.
b. **Storm sewer sizing.** At a minimum, the storm sewer system shall be designed for the 10 year storm event. Low areas must have an acceptable overland drainage route with the proper transfer capacity when the event is exceeded.

c. **Outlets.** Discharges from new construction sites must have a stable outlet capable of carrying designed flow at a non-erosive velocity. Outlet design must consider flow capacity and flow duration. This requirement applies to both the site outlet and the ultimate outlet to the storm sewer system or waterbody. Measures to trap floatables for energy dissipation must also be constructed.

d. **Better site design.** Whenever possible, projects shall be designed using better site design techniques early in the design process to preserve natural areas, reduce impervious cover, distribute runoff and us pervious area more effectively to treat stormwater runoff. The applicant shall attempt to limit the impervious surface of the developed site or subdivision by incorporating the following design considerations, consistent with zoning, subdivision, and PUD requirements:

1. Open space protection and restoration
   a. Maximizing open space while incorporating smaller lot sizes to conserve natural areas and reduce the amount of stormwater runoff generated at the site.
   b. Conservation of natural vegetation wherever practical.
   c. Reforestation
   d. Reestablishment of prairies and wetlands
   e. Increase buffers around streams, steep slopes, and wetlands to protect from flood damage and provide additional water quality treatment.

2. Reduction of impervious cover
   a. Reduce new impervious area through redevelopment of existing sites and use existing roadways, trails, etc.
   b. Minimize street widths, parking space size, driveway length, sidewalk width
   c. Reduce impervious structure footprint.
   d. Use shared parking facilities consistent with zoning requirements.
   e. Install semi-permeable/permeable or porous paving.

3. Distribution and minimization of runoff
   a. Utilize vegetated areas for stormwater treatment
   b. Look for vegetated areas that can filter sheet flow, removing sediment and other pollutants, and increasing the time of concentration.
   c. Disconnect impervious areas by allowing runoff from small impervious areas to be directed to pervious areas where it can be infiltrated or filtered
   d. All runoff from downspouts, driveways and other impervious areas shall be directed to pervious surfaces, where feasible, or unless the applicant can demonstrate that the practice is likely to result in groundwater contamination.
   e. Eliminate curb and gutter where practicable, and use vegetated swales or equivalent.
   f. Encourage infiltration and soil storage of runoff through grass channels, soil compost amendment, vegetated swales, rain gardens, etc.
g. Plant vegetation that does not require irrigation beyond natural rainfall and runoff from site.

f. Regional ponding. If the city determines the site is not suitable for on-site treatment, off-site stormwater management and associated fees may be established, provided that provisions are made to manage stormwater by an off-site facility, and provided that all of the following conditions for the off-site facility are met:
   1. The facility is in place or the city has knowledge of future regional ponding on site;
   2. The facility is designed and adequately sized to provide a level of stormwater control that at least meets the ordinance standards;
   3. The city is satisfied that the facility has a legally obligated entity responsible for its long-term operation and maintenance.

g. Accepted alternatives to stormwater pond treatments. Alternative treatments may be installed and shall be reviewed and approved by the city. Alternative treatments are included but are not limited to those stated in the Minnesota Stormwater Manual.

h. Maintenance of private stormwater facilities. All private stormwater facilities shall be maintained by the owner in proper condition consistent with the performance standards for which they were originally designed.
   1. All settled materials from sumps, grit chambers, and other devices, including settled solids, shall be removed and properly disposed of on an annual basis. One- to five-year waivers from this requirement may be granted by the city when the owner presents evidence that the facility has additional capacity to remove settled solids in accordance with the original design capacity.
   2. Ponds shall be inspected at least once every five years to determine if settled materials should be removed. Settled materials shall be removed and properly disposed of when the pond is no longer functioning at the original design capacity.
   3. When requested by the city, a maintenance plan must be provided that defines who will conduct the maintenance, the type of maintenance and the maintenance intervals of a private stormwater facility before the facility is approved.
   4. All stormwater facilities must be designed to minimize the need for maintenance, to provide easy vehicle and personnel access for maintenance purposes, and be structurally sound. It shall be the responsibility of the applicant to obtain any necessary easements or other property interests to allow access to the facilities for inspection or maintenance.
   5. The city shall have the right to request and review inspection and maintenance records and shall have the right to perform an inspection of stormwater facilities at any time if the city has probable cause to believe that the facilities are not being properly maintained or inspected. A charge based on current wages will be assessed to the owner for any inspections or maintenance that needs to be performed.

(Ord. No. 07-05, § 1, 6-18-2007)

Sec. 30-2176. - Enforcement.
a. **Notice of Violation**

1. Upon discovering that a person has violated a prohibition or failed to meet a requirement of this section, under the provisions of this article the city administrator or designee shall serve a notice upon the owner of the property upon which the nuisance exists. Such notice shall be given by certified mail at the last known address as shown on the property tax records of the county. Such notice shall advise that a nuisance exists and require the property owner to abate the nuisance within a reasonable time, as established by the city administrator or designee and stated in the notice. Such time shall not be less than 14 days. Such notice may require without limitation:
   a. The performance of monitoring, analyses, and reporting;
   b. The elimination of illicit connections or discharges;
   c. That violating discharges, practices, or operations shall cease and desist;
   d. The abatement or remediation of stormwater pollution or contamination hazards and the restoration of any affected property; and
   e. Payment of a fine to cover administrative and remediation costs; and
   f. The implementation of source control or treatment BMPs.

2. Such notice shall also advise the property owner of the right to request a hearing before the city administrator or designee to contest the contents of the notice.

3. If requested by the person upon whom the notice is served under subsection (a) of this section, a hearing before the city administrator or designee shall be held at which the person may contest the contents of the notice. The request for such a hearing must be made within five days after receipt of the notice provided for in subsection (a) of this section. After such hearing the city administrator or designee may affirm the notice, modify the notice or quash the notice.

4. If the property owner does not abate the nuisance as required by the notice provided for in subsection (a) of this section and has not requested a hearing before the city administrator or designee under subsection (2) of this section, authorized agents of the city shall abate the nuisance. The cost of such abatement shall be collected as a special assessment against the property upon which the nuisance was located.

5. If the property owner requests a hearing before the city administrator or designee under subsection (2) of this section, no abatement actions shall be taken until the hearing is held. If after the hearing the city administrator or designee affirms or modifies the notice and the nuisance is not abated as provided in the notice as affirmed or modified, authorized agents of the city shall abate the nuisance. The cost of such abatement shall be collected as a special assessment against the property upon which the nuisance was located.

6. Nothing in this section prevents abatement by the city of a public nuisance without notice and hearing in the case of an emergency in which there is an immediate and direct threat to the public health or safety. The expense of such an emergency abatement shall be collected as a special assessment against the property upon which the nuisance was located.

*(Ord. No. 07-05, § 1, 6-18-2007)*

**Sec. 30-2177. – Financial Securities.**

a. The city may require bonds in such form and amounts necessary to assure that the work is completed in accordance with the approved plans and specifications.
b. In lieu of a surety bond the applicant may file a cash bond or instrument of credit with the city in an amount equal to that which would be required in the surety bond.

c. If requested by the applicant, the amount of the financial security may be reduced by the city. Such reduction will be based upon the extent to which the grading and restoration have been completed and shall consider the continued need for erosion control.

**CONSTRUCTION SITE PLAN REVIEW**
The purpose of construction site plan review is to assure that construction sites will adequately address stormwater sediment runoff. A form is provided in Appendix F that contains 48 items to be addressed, as well as a signatory block.

**EROSION CONTROL INSPECTIONS**
The purpose of erosion control inspections is to assure that BMPs to control erosion are operational during construction. A form is provided in Appendix G that contains 15 items to be addressed, as well as a signatory block.

**PERMIT APPLICATION SYSTEM**
The purpose of the permit application system is to provide the Planning Commission and/or City Council the opportunity to review development proposals prior to a meeting. An electronic, editable PDF form is provided to applicants on the City of Elk River website.

**General Planning Narrative**
The narrative is your opportunity to describe, promote and sell your proposal to the Planning Commission and/or City Council before the meeting(s). A typewritten narrative explaining your request in detail should include, but not limited to, all the following applicable information:

1. Detailed description/scoped of project (max 500 characters)
2. How compatible is it with surrounding properties? (max 500 characters)
3. Hours of Operation (max 500 characters)
4. Days open
5. Total time on property (beginning and end dates)
6. Number of Employees (max 500 characters)
7. Number of parking stalls being utilized or removed (max 500 characters)
8. What impact does the parking use have on existing business or vehicular circulation?
9. Temporary Signage (max 500 characters)
10. Outdoor storage (What is stored, amount) (max 500 characters)
11. Other - if applicable (max 500 characters)

**Site Plan Review Narrative**
The narrative is your opportunity to describe, promote and sell your proposal to the Planning Commission and/or City Council before the meeting(s). Please type your responses in the form below.

1. Detailed description/scoped of project (max 500 characters)
2. How compatible is it with surrounding properties? (max 500 characters)
3. Hours of Operation (max 500 characters)
4. Number of Employees (max 500 characters)
5. Number of parking stalls, existing and additional (max 500 characters)
6. Is there proposed screening of the site? (max 500 characters)
7. Proposed building materials (max 500 characters)
8. Signage (how many, what type, locations, etc) (max 500 characters)
9. Outdoor storage (What is stored, amount, proposed screening) (max 500 characters)
10. Other - if applicable (max 500 characters)
5.0 Post Construction Stormwater Management

This part of the MS4 requirements is addressed by developing written procedures for the City’s post-construction stormwater management review program, and updating the City’s Land Development ordinance.

**Post-Construction Stormwater Management Review Program**

The purpose of post-construction review is to assure that BMPs are in place to control stormwater runoff after construction is completed. A form is provided in Appendix H that contains 37 items to be addressed, as well as a signatory block.

**Land Development Ordinance**

The implementation of the City’s SWPPP and Permit required updates to the Stormwater Management section of the City’s Land Development Regulations ordinance. The Permit for MS4s included updated definitions, modifications to construction runoff, and adding measureable values for the post construction stormwater runoff control. Section 4 of this report contains the modified version of this ordinance; refer to Appendix E for changes to the City ordinance.
6.0 Pollution Prevention and Good Housekeeping
This part of the MS4 requirements is addressed by developing a structural stormwater BMP maintenance program, developing spill prevention and control plans for municipal facilities, developing maintenance yard inspection procedures, conducting a facility inventory, developing pond assessment procedures and schedule, and developing an asset management system. City employee training programs are being addressed by the City.

**STRUCTURAL STORMWATER BMP MAINTENANCE PROGRAM**
Structural Stormwater Best Management Practices (BMPs) are used in order to treat stormwater runoff prior to conveyance to receiving waters. The NPDES permit regulates the stormwater discharges from municipal separate storm sewer systems (MS4s) and requires that they fully implement all stormwater runoff control practices identified by the permit. As part of the permit, MS4s need to adopt post-construction stormwater management practices along with pollution prevention and good housekeeping measures for municipal operations. There are many types of BMPs used to treat and limit pollutants and sediments in stormwater runoff. Six commonly used BMPs are discussed in this section: stormwater ponds, stormwater wetlands, infiltration basins, filtration devices, bioretention, and permeable pavement. Additional information on these and additional BMPs can be found within the Minnesota Stormwater Manual on the Minnesota Pollution Control Agency website ([http://www.pca.state.mn.us/](http://www.pca.state.mn.us/)).

In order to prolong the life of the BMPs and ensure that they are effective long-term, a regular maintenance schedule needs to be adopted. The following sections lay out a recommended maintenance schedule for the BMPs and states general maintenance activities that need to take place. The following maintenance schedule and activities are not mean to be all-inclusive and will need to be tailored to meet the City’s needs in the future.
Routine Maintenance Schedule

<table>
<thead>
<tr>
<th>Maintenance Frequency</th>
<th>Stormwater Ponds</th>
<th>Stormwater Wetlands</th>
<th>Infiltration Basin</th>
<th>Filtration</th>
<th>Bioretention</th>
<th>Permeable Pavement</th>
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<td>Every Fall</td>
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<td>Every Spring</td>
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<tr>
<td>After Major Storms</td>
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<td>Inspect</td>
<td>Inspect</td>
<td>Inspect</td>
<td>Inspect</td>
<td>Inspect</td>
</tr>
</tbody>
</table>

Stormwater Ponds
General maintenance activities and schedule are below (MPCA, 2005).

Monthly/Quarterly/After Major Storms (>1”) Maintenance
- Inspect low flow orifices and other pipes for clogging and remove debris as needed.
- Check the permanent pool/dry pond area for floating debris and unwanted vegetation.
- Ensure that the contributing areas and embankments are stabilized and repair as needed.
- Monitor wetland plant composition and health.
- Look for broken signs, locks, and other dangerous items.
- Remove debris and trash.
- Mow along the rights-of-way and the embankment at minimum in the Spring and Fall. The remaining buffer can be managed as a meadow (mowing every other year), prairie, or forest.

Semi-annual to Annual Maintenance
- Monitor wetland plant composition to understand the overall stormwater pond health.
- Identify and remove invasive plants.
- Make sure mechanical components are working properly and repair as necessary.
- Remove debris and trash.
- Annual inspections during the winter freeze periods will show signs of improper operation.
- Lowering the water level in the Fall will allow for additional retention storage for snowmelt runoff. Do not drain the permanent pool and leave enough water so the pool does not freeze completely through.
- Ponds should not be drained during the spring, as temperature stratification and high chloride concentrations at the bottom can occur, which could result in negative downstream effects.
- Care should be exercised while draining the pond to prevent rapid release and minimize the discharge of sediments or anoxic water. The approving jurisdiction should be notified before draining a pond.

One to Three Year Maintenance
- Inspect and repair all pipes, risers, mechanical components, and embankments for damage.
- Monitor sediment deposition in facility and forebay and remove sediment as every two to seven years or after 50 percent of total forebay or permanent pool capacity has been lost. In areas where road sand is used, an inspection of the forebay and permanent pool should be scheduled.
after the spring melt to determine if clean-out is necessary. Dispose of sediment in compliance with local, state and federal regulations.

**Five to Twenty-Five Year Maintenance**
- Remote television inspection of reverse slope pipes, underdrains, and other hard to access piping.
- Replace pipes as needed.
- Remove sediment from main pond area. Inform the proper permitting authorities prior to sediment removal and dispose of sediment in compliance with local, state and federal regulations.

**Stormwater Wetlands**
General maintenance activities and schedule are below (MPCA, 2005).

**After First Year**
- Ensure at least 50% of wetland species survive and replant if necessary.

**Monthly/Quarterly/After Major Storms (>1”) Maintenance**
- Inspect low flow orifices and other pipes for clogging and remove debris as needed.
- Check the permanent pool/dry pond area for floating debris and unwanted vegetation.
- Ensure that the contributing areas and embankments are stabilized and repair as needed.
- Monitor wetland plant composition and health.
- Look for broken signs, locks, and other dangerous items.
- Remove debris and trash.
- Mow along the rights-of-way and the embankment at minimum in the Spring and Fall. The remaining buffer can be managed as a meadow (mowing every other year), prairie, or forest.

**Semi-annual to Annual Maintenance**
- Monitor wetland plant composition and health. Replant and harvest wetland vegetation as needed.
- Identify and remove invasive plants.
- Make sure mechanical components are working properly and repair as necessary.
- Remove debris and trash.
- Annual inspections during the winter freeze periods will show signs of improper operation.

**One to Three Year Maintenance**
- Inspect and repair all pipes, risers, mechanical components, and embankments for damage.
- Monitor sediment deposition in facility and forebay and remove sediment as every two to seven years or after 50 percent of total forebay or permanent pool capacity has been lost. In areas where road sand is used, an inspection of the forebay and permanent pool should be scheduled after the spring melt to determine if clean-out is necessary. Dispose of sediment in compliance with local, state and federal regulations.

**Five to Twenty-Five Year Maintenance**
- Remote television inspection of reverse slope pipes, underdrains, and other hard to access piping.
- Replace pipes as needed.
• Remove sediment from main pond area. Inform the proper permitting authorities prior to sediment removal and dispose of sediment in compliance with local, state and federal regulations.

Infiltration Basins
Effective long-term operation of infiltration practices necessitates a dedicated and routine maintenance schedule with clear guidelines and schedules. Some important post-construction maintenance considerations are provided below.

• A legally binding and enforceable maintenance agreement should be executed between the practice owner and the local review authority.
• Adequate access must be provided for all infiltration practices for inspection, maintenance, and landscaping upkeep, including appropriate equipment and vehicles.

General infiltration basin maintenance activities and schedule are provided below (MPCA, 2005).

As Needed
• Replace topsoil and top surface filter fabric when clogged.

Monthly Maintenance
• Inspect inlet areas and clear debris as necessary.
• Ensure that the contributing areas and embankments are stabilized and repair as needed.
• Remove sediment and oil/grease from pre-treatment devices including overflow structures.
• Mow grass filter strips and remove grass clippings as needed.
• Repair eroded areas at inflow and outflow structures.

Semi-annual Maintenance
• Inspect pre-treatment devices and diversions structures for sediment build up and structural damage.
• Remove trees that start to grow in the basin with minimal disruption of vegetation and soils.

Annual Maintenance
• Disc or aerate bottom of basin.
• Dethatch bottom of basin.

Five Year Maintenance
• Scrape bottom of basin and remove sediment. Dispose of sediment in compliance with local, state and federal regulations. Restore basin to original cross section and compare infiltration rate with the design rate.
• Seed and restore ground cover in and around basin.

Upon Failure
• Perform total rehabilitation of basin to maintain design storage capacity. Expose the clean soils on the walls of the basin.
Filtration Devices
Effective long-term operation of filtration practices necessitates a dedicated and routine maintenance schedule with clear guidelines and schedules. Some important post-construction considerations are provided below (MPCA, 2005):

- A site specific operation and maintenance (O&M) plan that includes the following considerations should be prepared by the designer prior to putting the stormwater filtration practice into operation:
  - operating instructions for drawdown valves, gates and removable weirs (surface filters only);
  - vegetation maintenance, inspection, and routine maintenance checklists
- legally binding and enforceable maintenance agreement should be executed between the facility owner and the local review authority to ensure the following:
  - Sediment should be cleaned out of the sedimentation chamber when it accumulates to a depth equal to ½ the total depth to the outlet, or when greater than 1.5 feet, whichever is less. The sediment chamber outlet devices should be cleaned/repairs when drawdown times exceed 36 hours.
  - Silt/sediment should be removed from the filter bed when the accumulation exceeds one inch. When the filtering capacity of the filter diminishes substantially (i.e., when water ponds on the surface of the filter bed for more than 48 hours), the top few inches of discolored material should be removed and replaced with fresh material.
- Media filters that have a grass cover should be mowed as needed during the growing season to maintain maximum grass heights less than 12 inches.

As Needed
- If filter bed is clogged, manual manipulation of the surface layer of sand may be required.
  Remove the top few inches of media, roto-till or otherwise cultivate the surface, and replace media with like material meeting the design specifications.
- Replace any surface filter fabric when clogged.
- After 1” rain events, check drawdown of filtration area to make sure filter surface is not clogged.

Monthly Maintenance
- Inspect inlet areas and clear debris as necessary.
- Ensure that the contributing areas and embankments are stabilized and repair as needed.
- Remove trash and debris from treatment area.
- Ensure that activities in the drainage area minimize oil/grease and sediment entry into the system.
- Mow grass filter strips and remove grass clippings as needed.
- Check drawdown of filtration area to make sure filter surface is not clogged.
- If permanent water level is present in pre-treatment chamber, ensure the chamber does not leak and normal water level is retained.

Annual Maintenance
- Check to see that the filter bed is clean of sediment and that there is not more than 6 inches of sediment. Remove sediment as necessary.
• Inspect chamber to make sure there is no deterioration or cracking of concrete.
• Inspect inlets, outlets, and overflow spillways for evidence of erosion.
• Repair or replace any damaged structural parts.
• Stabilize contributing areas and embankments.
• Confirm that no flow is bypassing the filtration area.
• Check for any noticeable odors and remedy if there are odors.

**Three to Five Year Maintenance**

- Remove and replace the top 2-5 inches of media depending on the amount of sediment application and treatment areas with high oil/grease. Dispose of sediment in compliance with local, state and federal regulations.

**Bioretention**

Effective long-term operation of bioretention practices necessitates a dedicated and routine maintenance schedule with clear guidelines and schedules. Proper maintenance will not only increase the expected life span of the facility, but will also improve aesthetics and property value. Some important post-construction considerations are provided below along with recommended maintenance standards (MPCA, 2005).

- A site specific O&M plan that includes the following considerations should be prepared by the designer prior to putting the stormwater filtration practice into operation:
  - Operating instructions for outlet component
  - Vegetation maintenance schedule
  - Inspection checklists
  - Routine maintenance checklists
- A legally binding and enforceable maintenance agreement should be executed between the practice owner and the local review authority. It is recommended that the practice be bonded.
- Adequate access must be provided for all bioretention facilities for inspection, maintenance and landscaping upkeep, including appropriate equipment and vehicles.
- The surface of the ponding area may become clogged with fine sediment over time. Core aeration or cultivating of non-vegetated areas may be required to ensure adequate filtration.
- Bioretention areas should not be used as dedicated snow storage areas:
  - Areas designed for infiltration should be protected from excessive snow storage where sand and salt is applied.
  - Specific soil storage areas should be assigned that will provide some filtration before the stormwater reaches the infiltration areas.
  - When used for snow storage, or if used to treat parking lot runoff, the bioretention area should be planted with salt tolerant, and non-woody plant species.
- Bioretention areas should always be inspected for sand build-up on the surface following the spring melt event.

General maintenance activities and schedule are provided below.

**First year after planting**

- Adequate water is crucial to plant survival and temporary irrigation will be needed unless rainfall is adequate until plants mature
As Needed

- Prune and weed to maintain appearance
- Stabilize or replace mulch when erosion is evident
- Remove trash and debris
- Mow filter strip
- Renew mulch to replace that which has broken down into organic matter
- Replace vegetation whenever percent cover of acceptable vegetation falls below 90 percent or project specific performance requirements are not met. If vegetation suffers for no apparent reason, consult with horticulturist and/or test soil as needed.

Semi-annually

- Inspect inflow points for clogging (off-line systems) and remove any sediment
- Inspect filter strip/grass channel for erosion or gullying and sod as necessary
- Herbaceous vegetation, trees and shrubs should be inspected to evaluate their health and replanted as appropriate to meet project goals
- Remove any dead or severely diseased vegetation

Annually in Fall

- Inspect and remove any sediment and debris build-up in pre-treatment areas.
- Inspect inflow points and bioretention surface for build up of road sand associated with spring melt period, remove as necessary and replant areas that have been impacted by sand/salt build up.
- Cut back and remove previous year’s plant material and remove accumulated leaves if needed (or controlled burn where appropriate).

Maintenance of vegetation after establishment is similar to adjacent gardens (except for application of fertilizer). Weeding is especially important during the plant establishment period, when vegetation cover is not 100 percent yet, but some weeding will likely always be needed. It is also important to budget for some plant replacement (at least 5 to 10 percent of the original plantings) during the first few years after planting, in case some of the plants that were originally planted die. Rubbish and trash removal will likely need to be more frequently than in the adjacent landscape, since the hydraulic loading ratio is high. Trash removal is important for prevention of mosquitoes. Mulch renewal will be needed two or three times after establishment (first five years). After that, the plants are typically dense enough to make it difficult to mulch, and the breakdown of plant material will provide enough organic matter to the infiltration/filtration device. It is recommended that bioretention performance evaluations follow the four level assessment system in Stormwater Treatment: Assessment and Maintenance (Gulliver et al., 2010). More detailed information about maintenance procedures, a maintenance schedule, and estimated maintenance costs are also available in Gulliver et al. (2010).

Permeable Pavement

The primary goal of maintenance is to prevent fine sediments from clogging the pavement subsurface.

The most frequently cited maintenance problem is surface clogging caused by organic matter and sediment, which can be reduced by the following measures (MPCA, 2005):

- Periodic Vacuuming – The pavement surface is the first line of defense in trapping and eliminating sediment that may otherwise enter the stone base and soil subgrade. The rate of sediment deposition should be monitored and vacuuming done at least two times per year. A typical
vacuum cleaning schedule may include the end of winter (April) and after autumn leaf-fall
(November). Maintenance records should be maintained by the owner. The vacuuming
frequency should be adjusted according to the intensity of use and deposition rate on the
permeable pavement surface. At least one pass should occur at the end of winter. Regenerative
air vacuum sweepers are the suggested means for regular surface cleaning. For neglected
surfaces, i.e., those with no surface cleaning over several years, true vacuum sweepers have the
most efficient removal of debris and fine particulates when compared with regenerative air or
mechanical sweepers. However, areas on steep slopes or near curbs may limit vacuum sweeper
performance. If a true vacuum sweeper is used on PICP the removed aggregate in the joints
should be replaced with the same material.

* Ongoing – Minimizing salt use or sand for de-icing and traction in the winter, keeping the
  landscaping areas well maintained and preventing soil from being washed onto the pavement
  helps increase its life. Less salt will be needed. However, such water should not be directed to
  irrigation uses.

* Maintenance Agreements - Maintenance agreements should note which conventional parking lot
  maintenance tasks must be avoided (e.g., sanding, re-sealing, re-surfacing, power-washing). Signs
  should be posted on parking lots to indicate their stormwater function and special maintenance
  requirements. When permeable pavements are installed on private residential or commercial
  property, owners must understand routine maintenance requirements. These requirements can be
  enforced via a deed restriction, drainage easement, maintenance agreement, performance bond,
  letter of credit or other mechanism enforceable by the local authority to help ensure that the
  permeable pavement is maintained and continues functioning. The local authority should use this
  MIDS guideline to establish measurable performance criteria for enforcing maintenance
  procedures. The mechanism should, if possible, grant authority for local agencies to enter the
  property for inspection or corrective action.

**SPILL PREVENTION AND CONTROL PLANS FOR MUNICIPAL FACILITIES**
The purpose of spill prevention and control plans is to provide protocols to prevent spills and protocols for
responses should a spill occur.

**General Facilities**
The Municipal Separate Storm Sewer Systems (MS4) permit requires that the permittee develop spill
prevention plans for municipal facilities. To support the construction of current and future facility plans, this
protocol outlines key considerations for their development. Much of the material provided herein was
synthesized from various MPCA sources (salvage yard guidance, the Pollution Prevention and the MS4
Program document, among others).

**Facility Types**
The following types of municipal facilities are considered hotspots that could produce higher levels of
stormwater pollutants as well as potentially be at higher risk for their spills, leaks or illicit discharges.

* Composting facilities
* Equipment storage and maintenance yards
* Hazardous waste disposal facilities
* Hazardous waste handling and transfer facilities
* Incinerators
- Landfills
- Materials storage yards
- Public buildings (e.g. schools, libraries, police and fire departments)
- Public golf courses
- Public swimming pools
- Public works yards
- Solid waste handling and transfer facilities
- Vehicle storage and maintenance yards
- Water and wastewater treatment facilities

Elk River Maintenance Facility
The Elk River Maintenance Yard is located off of Proctor Avenue NW and Proctor Road NW at 19000 Proctor Avenue. The building houses the necessary equipment for the Elk River Public Works which includes fleet storage and maintenance, a fueling station, aggregate storage, salt storage, and has a composting area.

The figure below identifies the maintenance yard layout, including the location and contents of each area that have potential to pollute surrounding waters.

![Map of Elk River Maintenance Facility](image)

Facility Inventory
General sites without outdoor storage or exposure:

- City Hall Campus, 13065 Orono Parkway
- Library, 13020 Orono Parkway
- Westbound Liquor Store, 13484 185th Avenue
- Pinewood Golf Course, 18150 Waco Street
- Senior Center, 413 Proctor Road
- Chamber of Commerce Building, 509 Highway 10
- Fire Station 1, 415 Jackson Avenue
- Lions Park Center, 1104 Lions Park Drive
- Trout Brook Barn, 18294 Trout Brook Parkway
- Ice Arena, 1000 School Street
- Northbound Liquor Store, 19348 Evans Street
- Waste Water Treatment Facility, 248 Railroad Drive

The Public Works Facility (19000 Proctor Road) is a more complex site. The site includes fleet storage, fleet maintenance, fueling station, aggregate storage, salt storage, and a compost site.

Pollution Prevention Practices

Hazardous Waste
1. Avoid loading/unloading materials in the rain and/or provide cover for the activity.
2. Track transfers and routes to identify potential spill locations
3. Time delivery and handling of materials during favorable weather conditions.
4. Inspect container structural integrity prior to loading/unloading
5. Use dry cleanup methods (e.g. squeegee and dust pan, sweeping, and absorbents as a last step) in case of spillage rather than hosing down surfaces.
6. Provide cover and provide grading or berming at loading docks to prevent run-on of stormwater.

Material (Aggregate) Storage
The aggregate storage area is located on the northwest side of the facility. Measures should be installed to prevent distribution of sediment from the stockpiles. These measures include but are not limited to: covering the stock piles, installing appropriate erosion control measures, maintaining a buffer strip before discharging into a water body, and sweeping area to prevent tracking.

1. Confine material storage indoors, to the greatest extent feasible, and disable connection of the storage location to floor drains.
2. For outdoor material storage, confine to designated covered areas that are away from high traffic areas, outside of drainage pathways, and on impervious surfaces.
3. To facilitate leak inspection and to prevent contact with wet floors, store containers on pallets, or equivalent.
4. Store materials and waste in materially compatible containment units
5. Keep hazardous materials in their original container.
6. If not in their original container (e.g. used motor oil), clearly label all storage containers with the name of the chemical, expiration date and handling instructions.
7. Maintain an inventory of all raw and waste materials to identify leakage and to reduce stored stock.
8. Provide secondary containment measures for storage tanks and drums with sufficient volume to store 110 percent of the volume of the material's container.
9. Provide sufficient aisle space to allow for routine inspections and access for spill cleanup.
10. Inspect storage areas for spills or leaks and containment units for corrosion or other failures.

Outdoor Storage
1. Dumpsters should be located on a flat, paved surface, and located away from surface water bodies whenever possible.
2. All dumpsters must have lids to keep rain water out.
3. Bulk materials should be stored under cover.
4. Waste containers should be closed after each use.
5. Berms or curbs should be installed around storage area.
6. Waste containers and dumpsters should not be washed outdoors.

Composting Area
The composting area is located on the west side of the facility. This area is used by the public for disposing natural wood, leaves, brush, yard waste, and sod. Along with these items, Elk River accepts oils, filters, and antifreeze. This area should have measures installed to prevent distribution of pollutants. These measures include but are not limited to: covering the stock piles, installing appropriate erosion control measures, maintaining a buffer strip before discharging into a water body, and sweeping area to prevent tracking.

Vehicle and Equipment Maintenance
The main building contains storage of city vehicles along with a service area for them. While these practices take place within the building, the following should be considered:

1. Implement good housekeeping including emptying and cleaning drip pans and containers rather than leaving them full and open around the shop.
2. Dispose of greasy rags, oil filters, air filters, batteries, spent coolant, and degreasers following MPCA or county hazardous waste guidelines.
3. Use drip pans, drain boards, and drying racks to direct drips back to a fluid holding tank for reuse or proper disposal.
4. Avoid hosing down areas that would result in polluted runoff discharging to a stormwater system.
5. Do not pour liquid waste into sinks, floor drains, storm drain inlets, or sewer connections.
6. Clean equipment and vehicles regularly to remove accumulated dust and residue.
7. Perform all cleaning operations indoors or under cover when possible. The following considerations should be made either on a municipal-wide or site specific scale (whichever is relevant).
   - Use wash racks that discharge to a separate system from the storm sewer. Wash rack design should include designated, paved wash areas that are bermed or sloped to contain and direct wash water to a sump connected to the sanitary sewer, an on-site treatment system or an enclosed recycling system.
   - Direct effluent wash water to an onsite detention area for evaporation and/or infiltration.
   - Clean all vehicles and machinery at an MS4-operated vehicle washing facility.
Specific Materials Spill Prevention

Petroleum
The fueling station is located on the east side of the maintenance facility and is used to refuel the City’s equipment. There is an 8,000 gallon gasoline and an 8,000 gallon diesel underground storage tank located underneath the concrete fuel slab. The following are some general methods to prevent and handle spills of petroleum products.

1. Sorbent materials should be kept stocked in the immediate vicinity of where petroleum products are handled (e.g. fueling station, vehicle maintenance garage).
2. Equipment such as brooms, shovels, empty drums, sorbent materials, drip pans, and buckets should be kept on site.
3. Tanks, pipes, hoses, and valves should be inspected frequently for possibly leaks.

Fertilizers and Pesticides
1. Shelves for smaller containers should have a lip to keep the containers from sliding off easily. Steel shelves are easier to clean than wood if a spill occurs.
2. If storing large bulk tanks, provide a containment area large enough to confine 110 percent of the contents of the largest bulk container.

Road Salt and De-Icing Additives
The salt storage area is located on the west side of the facility. This is a covered open air structure that stores road salt. The following are general methods to prevent spills of road salt and de-icing additives.

1. Provide cover and impervious pads for storage and mixing.
2. If not feasible to provide cover for covered operation, collect runoff.
3. Do not leave material piles exposed between operations.
4. BMP guidance for application of salt and de-icing should consult the Minnesota Snow and Ice Control: Field Handbook for Snowplow Operators, UMN Center for Transportation and the Winter Parking lot and Sidewalk Maintenance Manual, MPCA.

Spill Response/Control
Note: for specific chemicals, refer to MSDS for guidance.
Spill Response Flowchart

Stop the spill source

Contain the spill (absorbents, berm)

Prevent from entering a waterway (streams, storm drains are waterways)

Isolate the spill area

Always report and clean up all spills

REPOR

Report all spills to the Public Works Director

In MN, reportable spills include any amount of oil to waters of the state or oil spills to land of 5 gallons or more.*

Minnesota Pollution Control Agency (MPCA) State Duty Officer:
800-422-0798 or 651-649-5451

Spills that impact surface waters of the U.S. are reported to the National Response Center at 800-424-8802

Public Works employees must document all releases.

Reporting information:
- Time
- Date
- Location
- Source
- Amount spilled
- Surfaces involved
- Clean up

SMALL LOCALIZED SPILLS
Controllable at the time of release by employees

Obtain a Spill Kit

Remove all visible traces of contaminated soil and debris, plus 1 lateral foot.

Clean all solid surfaces.

Containerize debris and mark barrel lid with:
- PCS – non RCRA Hazardous
- SPILL DATE

Coordinate with an appropriate waste disposal company to transport spill clean-up material.

LARGE SPILLS
Requires response by trained professionals

Acquire the use of heavy equipment, certified clean-up and disposal contractors, and consultants to perform soil sampling to ensure clean-up meets state requirements with bills-of-lading/manifests completed for disposal at approved disposal facilities.

* Oil Discharge reporting is required in MN unless ALL of the following conditions are met:
1. The discharge is less than 5 gallons.
2. The discharge is immediately contained.
3. The discharge and/or contamination are completely removed within 24 hours.
4. There is no impact or potential impact to groundwater or surface water.
General
For quick reference, an oil spill response flow chart has been developed and is provided in the previous section of this document. The procedures include internal and external notification procedures for initiating a response, and control and countermeasures for handling spills. The following actions are recommended for mitigating the release of oil products:

1. Assess and evaluate health, safety and fire hazards.
2. If at all possible, stop the source of the spill immediately. Close the valves, shut down the pump, or take whatever actions are possible to stop a release and/or prevent further contamination. If conditions are hazardous (for example, fire or potential explosion), do not approach. If safety is not an issue, call other nearby employees for assistance in stopping the release.
3. Confine the release to the smallest area possible.
   a. Use booms or sandbags, dig small trenches, or place absorbent pads to stop the spread.
   b. Take immediate action to prevent the spill from exiting the plant or reaching surface waters.
   c. If the release reaches water, attempt to place booms to contain the release, or, if necessary, block drainage downstream of the spill to prevent further spread.
4. Properly store and dispose of contaminated soils.

For small localized spills that are controllable at the time of release by personnel (such as small equipment leaks) promptly control, contain and clean up any discharge using a spill response kit. All visible traces of contaminated soil and debris will be removed. All solid surfaces will be cleaned. Waste will be properly collected, stored, and disposed.

For large spills, personnel will attempt to control and contain any discharge using a spill response kit or other control equipment. Clean-up of large spills may require the response by trained professionals. When necessary, acquire the use of heavy equipment, certified clean-up and disposal contractors and consultants to perform soil sampling to ensure clean-up measures have met state requirements. Waste will be properly disposed of properly.

Petroleum
1. Upon discovery of a petroleum spill, the first step is to stop the spill or leak if this can be done safely. Turn off nozzles or close valves from the leaking container or system. Use a wooden plug, bolt, band or putty on a puncture-type hole.
2. Sand, kitty litter, ground corn cobs, and other sorbent can control the spread of oils until it can be picked up. Synthetic sorbent pads and booms can be lowered into sewers, placed at sewer outfalls or placed across waterways to catch oil. A temporary berm should be built around flowing liquid.
3. Petroleum sheen can usually be distinguished by attempting to break up the sheen. When disturbed, a petroleum sheen will quickly try to reform, whereas a bacterial sheen will typically break into small platelets. Odor can also help determine if the spilled substance is a petroleum product.

Fertilizers and Pesticides
For fertilizers and pesticides spills, stay upwind, out of low areas, and ventilate closed spaces before entering. Shut off ignition sources; keep flares, smoking or flames out of hazard area. For small spills, take up with a
sorbent material. Avoid the use of sawdust or sweeping compounds if the pesticide is a strong oxidizer, as it could create a fire hazard.

**Reporting**

An Emergency Release Follow-Up Report must be submitted to the Minnesota Emergency Planning and Community Right-to-Know Act (EPCRA) Program within seven days of a release.

**Internal Notification**

Report all spills to the Public Works Director.

**Immediate External Notification**

1. Report spills that may cause pollution, such as spills of toxic, flammable, corrosive and dangerous industrial chemicals. Also report spills of environmentally damaging materials, including milk, coal, animal parts, batteries, etc.
2. Notification is not required for a discharge of five gallons or less of petroleum.
3. All reportable spills should be directed to the Minnesota Duty Officer by calling (651) 649-5451 or (800) 422-0798. This is a 24 hour service.
4. Call 911 if fire or public safety hazards are created.
5. The National Response Center must be notified immediately if a discharge of oil violates an applicable water quality standard, or causes a sheen on the surface of a water. Call 800-424-8802 (24 hours).

**Spill Disposal**

Note: MPCA will likely suggest a disposal protocol for the specific spill when it is reported.

**Petroleum**

Used sorbent materials can be thin-spread on acceptable ground for bacterial degradation. Or, they can be sent to an asphalt plant or incinerator that has the proper air pollution controls and permits. Manufactured fabric sorbents can be disposed of in the permitted incinerators. The MPCA maintains lists of permitted treatment facilities and incinerators in the state that can treat or dispose of contaminated sorbent.

**Fertilizers and Pesticides**

Disposal should be handled by a professional waste contractor. Contact MPCA for guidance.

**MPCA Recommended Emergency Response Contractors**

**Full Service**
Bay West Environmental
5 Empire Dr.
Saint Paul, MN 55103-1867
Contact: Bill Lazarz (williaml@baywest.com) or ER Lead On-call
Contracting inquiries: Bill Lazarz (williaml@baywest.com) or Bryan Murdock (bryanm@baywest.com)
24-hour emergency spill response: (800) 279-0456
Office phone: (651) 291-0456 or (800) 279-0456
Fax: (651) 291-0099

**Limited Service**
Midamerica Technical & Environmental Services, Inc.
6989 N. 55th St., Suite C2
Oakdale, MN 55128
Contact: Jim Harms (jim@midamericaenv.com)
Office phone: (651) 779-1900 or (888) 314-2042
24-hour phone answering: (888) 314-2042

Record Keeping
All records generated with this plan (spill notifications, inspection worksheets, integrity testing results, repair
records, and training records) must be maintained for a minimum of 3 years. These records are filed in the
SPC records or in the facility operating records. A copy of this SPC Plan is kept at the public works facility.

Training
Training is required for oil-handling employees and employees that perform inspections under this plan.
Personnel at the public works facility will be trained in the following areas:

- Laws and regulations regarding spills, releases, and pollution control
- Contents of the Spill Plan
- Operation and maintenance of equipment to prevent discharges
- General plant operations.
- Discharge procedure protocols
- Known discharges or failures and malfunctioning components
- Recently developed precautionary measures

MAINTENANCE YARD INSPECTION
Routine inspections of all oil storage containers and oil-filled operational equipment are performed. Bulk
storage containers are inspected monthly according to industry standards (Steel Tank Institute, 2011). Bulk
storage containers should be inspected for:

- Container integrity and visible leaks on barrels and drums. Containers will be stored so that all
  sides are visible (i.e. the container has no contact with the ground). If the container starts to show
  signs of degradation (e.g. begins to rust or oxidize), the contents of the container should be
  transferred to a new drum compatible with the material. These controls are expected to provide
  environmental protection equivalent to integrity testing.
- Presence of oil products in secondary containment and on surrounding floor and/or evidence of
  any leakage.

Pollution from stormwater is a significant problem in Minnesota’s waterways. The health of waterbodies are
strained when Best Management Practices (BMPs) are not adequate, practiced, installed or maintained
properly. One focal point of potential impacts to downstream waterbodies is municipal operations and
maintenance yards. Good housekeeping practices on these sites minimize the risk of pollutant mobilization
and transport to downstream waterbodies. The Municipal Separate Storm Sewer Systems (MS4) permit
requires that the permittee shall conduct quarterly inspections of stockpiles, and storage and material handling
areas as identified below, to determine needs and proper function of BMPs.

- Waste disposal and storage, including dumpsters
- Management of temporary and permanent stockpiles of materials such as street sweepings, snow,
  deicing materials (e.g., salt), sand and sediment removal piles
- Vehicle fueling, washing and maintenance

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• Routine street and parking lot sweeping
• Emergency response, including spill prevention plans
• Cleaning of maintenance equipment, building exteriors, dumpsters, and the disposal of associated waste and wastewater
• Use, storage, and disposal of significant materials
• Landscaping, park, and lawn maintenance
• Road maintenance, including pothole repair, road shoulder maintenance, pavement marking, sealing, and repaving
• Right-of-way maintenance, including mowing
• Application of herbicides, pesticides, and fertilizers
• Cold-weather operations, including plowing or other snow removal practices, sand use, and application of deicing compounds

Procedure and Schedule
At minimum, City Staff should record, at each inspection for each site, the following information:

• Site name and location
• Date and time of inspection
• Description of site activities
• Description of site BMPs
• Receiving waterbody

Inspection Schedule
• Inspection 1 – March
• Inspection 2 – May
• Inspection 3 – July
• Inspection 4 – September

Inspection Form

Date:
Time:
Name of inspector:
Facility being inspected:

<table>
<thead>
<tr>
<th>Vehicle and Equipment Maintenance</th>
<th>Y/N/NA</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicles are stored indoors (if possible)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicle maintenance is performed in a covered facility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drip pans are used during vehicle maintenance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leaking vehicles are stored under a roof, or drained</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some vehicles are parked over a storm drains</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there any excessive scrap piles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance areas have been swept recently</td>
<td></td>
<td></td>
</tr>
<tr>
<td>There is a designated area to wash vehicles</td>
<td></td>
<td></td>
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<tr>
<td>-------------------------------------------</td>
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</tbody>
</table>

### Vehicle and Equipment Fueling

<table>
<thead>
<tr>
<th>Item</th>
<th>Y/N/NA</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>A well-labeled spill kit is located nearby</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personnel are within view of hoses during fueling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spill Response Procedure are posted nearby</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fueling of small equipment (lawn mowers, etc) is conducted over a paved area.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tanks, pipes, pumps related to fuel dispensing are in good condition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absorbent cleanup materials are disposed of promptly and properly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storm drains are covered during fuel loading/transfer</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Material Storage

<table>
<thead>
<tr>
<th>Item</th>
<th>Y/N/NA</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazardous materials and wastes are stored in sealed, labeled containers on containment structures (e.g. pallets)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dumpsters are located on a flat, paved surface</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All dumpsters have lids</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulk materials are covered</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Berms or curbs surround the storage area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waste containers are not washed outdoors</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Deicing Material and Sand Storage

<table>
<thead>
<tr>
<th>Item</th>
<th>Y/N/NA</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salt and sand stockpiles are stored in a permanent structure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If a permanent structure is not available, seasonal tarping is implemented</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Deicing Material and Sand Storage

<table>
<thead>
<tr>
<th>Item</th>
<th>Y/N/NA</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage and loading areas have been swept recently</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMPs are in place to limit tracking of materials in loading areas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outdoor sand stockpiles are not in close proximity to stormwater conveyance infrastructure</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### General Housekeeping

<table>
<thead>
<tr>
<th>Item</th>
<th>Y/N/NA</th>
<th>Comments</th>
</tr>
</thead>
</table>

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| **Spill logs and site inspection records are maintained** |  |
| **Outdoor work areas are not hosed where water may flow somewhere other than a sanitary sewer line** |  |
| **Areas with exposed soils are stabilized during rainfall events** |  |
| **Perimeter sediment controls are implemented where necessary** |  |

**POND ASSESSMENT PROCEDURES AND SCHEDULE**

Part III.D.6.d and Part III.D.6.e of the NPDES Permit requires the permittee to develop procedures and a schedule for all permittee owned and/or operated ponds to determine the effectiveness of total suspended solids and total phosphorus removal.

Procedures
- Assessment criteria
- Assessment guidance

Cartegraph and ArcGIS are the systems that the City is using to manage their pond inventory. Cartegraph is the main tool that will be used for pond inspections. Work orders are set up in Cartegraph to inspect and maintain ponds as necessary. During the pond inspections there are eight maintenance items that are rated in order to calculate which ponds are healthy and which ones require attention. Along with rating the qualities of the pond, pictures should be taken of the overall pond, outlets, and other notable features such as access, erosion, or other areas of concern. Figure 3 is an example of how this information is reported.

**Pond Rating Scale**

Version 1: 2014-06-09

Notes: 1-5 numbering corresponds to star rating scale on Cartegraph inspection software. Half-star ratings are allowed (i.e. Rating of 3.5).

**Maintenance Item #1 – Embankment and Emergency Spillway**
1. Embankment is showing signs of erosion, damaged, or is at risk of erosion (animal burrows, deep-rooted trees, etc). Armoring such as riprap is failing. Emergency spillway is obstructed with debris. Seepage or leaking is noticed or heavily suspected. The embankment in general is in poor health and needs immediate attention.
2. Embankment is beginning to erode or is at risk of future erosion. Emergency spillway has debris that would significantly restrict flow. Armoring such as riprap is being moved around. Seepage or leaking is suspected.
3. Embankment is showing minor signs of erosion due to exposed soil but does not yet pose a significant structural risk. Debris is collecting in the emergency spillway.
4. Embankment is in overall good condition. Any debris collecting in the emergency spillway would not significantly restrict flow. Armoring such as riprap is functioning well. The embankment is has good vegetative coverage.
5. Embankment is in good condition. Emergency spillway is clear of debris. Armoring such as riprap is functioning well. The embankment is has full (to design) vegetative coverage.

**Maintenance Item #2 – Riser and Principal Spillway**
1. Low flow orifice is obstructed. Trash rack is clogged with debris. Substantial sediment accumulation inside riser. Riser is in very poor condition (cracking or spalling concrete, deteriorating metal). Control valve is obstructed or seized. Trash racks or outlet risers with locking mechanisms are not able to be secured. Outfall channels are obstructed or eroding. Low flow orifice and/or trash rack is clogged with debris. Sediment accumulation inside the riser. Riser condition is deteriorating (cracking or spalling concrete, severely rusting metal). Control valve is obstructed or seized. Trash racks or outlet risers with locking mechanisms are not able to be secured. Outfall channels are obstructed with debris or showing signs of erosion. Low flow orifice and/or trash rack is collecting debris. Minor sediment accumulation inside the riser. Outfall channels are collecting debris. Riser condition is slightly deteriorating but overall still good. Trash racks or outlet risers with locking mechanisms not properly secured.

4. Debris surrounding the low flow orifice and/or trash rack does not restrict flow. Outfall channels have minor debris and no erosion. Trash racks or outlet risers with locking mechanisms are secured. Overall riser condition is good (no cracking, spalling, significant rusting).

5. Low flow orifice and trash rack are free of debris. Outfall channels are free of debris. Trash racks or outlet risers with locking mechanisms are secured. Riser is in good condition.

**Maintenance Item #3 – Permanent Pool**

Notes: Pool should be at or near lower orifice/weir

1. Pond level is either extremely low or extremely high. Likely causes are leaks in outlet/embankment or severe clogging of orifice/weir. Sediment buildup is severe enough to alter pond function. Heavy vegetation is impeding outlet flow. Immediate maintenance is required.

2. Pond level varies from normal range (too high or low), weir/orifice is heavily clogged or leaks are suspected. Sediment is building and will likely require dredging soon. Heavy vegetation is causing problems at outlet.

3. Pond level varies from normal range but could potentially be a result of recent precipitation events, or excess evapotranspiration. Vegetation starting to grow at outlet has potential to block flow as it grows.

4. Some debris obstructing weir/orifice, but not enough to cause significant problems. Pond level may be slightly lower or higher than expected.

5. Pool is functioning well. Normal pond depth. Weir/orifice is clear of debris.

**Maintenance Item #4 – Sediment Forebays**

1. Significant sedimentation has occurred. Current depth is <<50% of design depth.

2. Significant sedimentation has occurred. Current depth is <50% of design depth.

3. Sediment is collecting and approaching 50% of design depth.

4. Sedimentation is occurring at minor rates. No cleanout required at this point.

5. Forebay is almost sediment-free

**Maintenance Item #5 – Dry Ponds**

1. Vegetation coverage is significantly lacking. Undesirable vegetation is present (deep-rooted trees, highly invasive species, etc). Low flow channels are blocked by debris. Significant standing water or wet spots are present. Significant sediment or trash has collected in the pond.

2. Vegetation coverage is less than design coverage. Undesirable vegetation is beginning to develop (deep-rooted trees, highly invasive species, etc). Some standing water or wet spots are present. Low flow channels have collected debris. Significant sediment or trash has collected in the pond.

3. Vegetation coverage slightly below desired coverage. Undesirable vegetation is starting to sprout (deep-rooted trees, highly invasive species, etc). Minor amounts of standing water or wet spots are present. Low flow channels have collected debris but would not restrict flow. Some sediment or trash has collected in the pond.
4. Vegetation coverage is good. Pond is free of undesirable vegetation (deep-rooted trees, highly invasive species, etc). Almost no standing water or wet spots are present (or what exists is expected due to recent storms). Low flow channels are clear of debris. Pond is mostly free of sediment and trash.
5. Vegetation coverage is good. Pond is free of undesirable vegetation (deep-rooted trees, highly invasive species, etc). No standing water or wet spots are present. Low flow channels are clear of debris. Pond is free of sediment and trash.

**Maintenance Item #6 – Outfalls**
1. Armoring such as riprap has failed. Significant slope erosion has occurred. Pipes have moved or are in poor condition (significant rust, cracking, etc). Endwalls/headwalls are not holding. Outfall channels have significant debris.
2. Armoring such as riprap is not holding. Slope erosion has occurred. Pipes have moved or are in poor condition (significant rust, cracking, etc). Endwalls/headwalls are deteriorating. Outfall channels have debris that could restrict flow.
3. Some armoring such as riprap has moved but is overall holding. None to very minor erosion is spotted. Pipes are in decent condition (minor rusting, etc). Endwalls/headwalls may have some damage (not assumed to be structurally significant). Outfall channels have some debris.
4. Armoring such as riprap is holding. No erosion is observed. Pipes are in good condition. Endwalls/headwalls are in good condition. Outfall channels are mostly clear of debris (nothing that would restrict flow).
5. Armoring is holding. No erosion is observed. Pipes are in good condition. Endwalls/headwalls are in good condition. Outfall channels are free of debris. Outfalls are overall in great condition.

**Maintenance Item #7 – Other**
1. A large encroachment on pond, wetland, or easement area is observed. Significant or frequent complaints have been voiced by residents. Pond or easement area is a visual “eyesore” (lack of grass, doesn’t fit well with surrounding area). Significant graffiti on endwalls/headwalls requires removal. Maintenance access routes are in poor condition (overgrown, eroded, etc).
   Hydrocarbon build-up is noticed (oily sheen on water, contaminated soil, smell, etc).
2. An encroachment on pond, wetland, or easement area is suspected. Significant or frequent complaints have been voiced by residents. Pond or easement area is a visual “eyesore” (lack of grass, doesn’t fit well with surrounding area). Some graffiti on endwalls/headwalls requires removal. Maintenance access routes are in poor condition (overgrown, eroded, etc).
   Hydrocarbon build-up is noticed (oily sheen on water, contaminated soil, smell, etc).
3. A minor encroachment on pond, wetland, or easement area is suspected. Minor complaints have been voiced by residents. Pond or easement area has lower aesthetics than intended. Some minor graffiti on endwalls/headwalls is noticed. Maintenance access routes are slightly overgrown. A minor hydrocarbon build-up is suspected (oily sheen on water, contaminated soil, smell, etc).
4. No encroachment on pond, wetland, or easement area is suspected. Minor complaints have been voiced by residents but don’t warrant immediate attention. Pond or easement area has slightly lower aesthetics than intended (lacking grass in some spots). Very minor graffiti on endwalls/headwalls is noticed. Maintenance access routes are slightly overgrown. A minor hydrocarbon build-up is suspected (oily sheen on water, contaminated soil, smell, etc).
5. No encroachment on pond, wetland, or easement area is suspected. No complaints have been voiced by residents. Pond or easement area is aesthetically pleasing. No graffiti on endwalls/headwalls. Maintenance access routes are in good condition. No hydrocarbon presence is suspected (oily sheen on water, contaminated soil, smell, etc).

**Maintenance Item #8 – Wetland Vegetation**
1. Major problems with wetland plants. Vegetation has drastically changed from initial design. Plants are not as abundant as expected or are completely dominated by one or two aggressive species.
Sediment accumulations have significantly altered pool and/or “choked out” plants. Severe eutrophication in wet ponds. Bare, exposed soil on embankment. Sizable deep rooted trees are growing in vicinity of BMP.

2. Wetland vegetation warrants attention. Distribution of vegetation has changed from initial design. Aggressive species are choking out other plants. Some algae growth that may pose eutrophic threats.

3. Vegetation distribution showing a trend separating from initial design. Some bare areas of soil, but not problematic. A few species out-competing others, but not completely dominant. Some undesirable plants sprouting.

4. Vegetation distribution is good. Minor variations from design, but may be related to seasonal transitions. Good mix of species with slight favor of a few.

5. Vegetation coverage performing as designed. Plant species are mixed and doing well. No major bare spots or wetland growth.
Figure 3. Example Cartograph
Schedule
Under the permit the City is required to inspect and maintain ponds as required to ensure that the ponds are effective at removing pollutants. The City plans to inspect and maintain 20% of the municipally owned/operated ponds each year. The ponds have been inspected and a rating has been given to the pond in order to start the rotation of inspections and maintenance. There may be ponds that need to be maintained or inspected out of rotation in order to maintain effectiveness of pollutant removal.

Asset Management System
The pond inspections and maintenance records need to be documented in order to understand what has been completed and which ones require attention.

Operation
- Cartegraph system
- Cartegraph operation

The city is using Cartegraph as their asset management system. Cartegraph is a system that was designed for public sector use. The Cartegraph Stormview Module was created using the City’s GIS information including the storm ponds, structures, and pipes. The system can be used as a viewer or a system that creates work orders that include inspections and maintenance for the City’s stormwater assets. The system is linked to GPS and the internet which helps field personnel complete their required work within an interactive viewer in real time.

Total Maximum Daily Load (TMDL)
The Clean Water Act requires states to monitor, assess, and develop a list of impaired waters that require a Total Maximum Daily Load (TMDL) study in order to determine if the water quality standards are being met to promote the beneficial uses of water resources and its associated aquatic life. States are required to generate a list of impaired waters that require TMDL studies and submit it to the U.S. EPA every even number year for approval. As part of a TMDL project that was approved by the U.S. EPA prior to the effective date of the latest NPDES Permit reissuance, MS4 Permittees with assigned Waste Load Allocations (WLA) must address additional information in their Stormwater Pollution Prevention Program (SWPPP). Permittees must develop a compliance schedule that outlines interim milestones it will achieve during the permit term, strategies for continued implementation beyond the permit term, and target dates to achieve the applicable WLAs.

Part III.E of the Permit states the following:

For each applicable WLA approved prior to the effective date of this permit, the BMPs included in the compliance schedule at application constitute a discharge requirement for the permittee. The permittee shall demonstrate continuing progress toward meeting each discharge requirement, on a form provided by the Commissioner, by submitting the following:

1. An assessment of progress toward meeting each discharge requirement, including a list of all BMPs being applied to achieve each applicable WLA. For each structural stormwater BMP, the permittee shall provide a unique identification (ID) number and geographic coordinate. If the listed structural stormwater BMP is also inventoried as required by Part III.C.2, the same ID number shall be used.
2. A list of all BMPs the permittee submitted at the time of application in the SWPPP document compliance schedule(s) and the stage of implementation for each BMP, including any BMPs specifically identified for the small MS4 in the TMDL report that the permittee plans to implement.

3. An up-dated estimate of the cumulative reductions in loading achieved for each pollutant of concern associated with each applicable WLA.

4. An up-dated narrative describing any adaptive management strategies used (including projected dates) for making progress toward achieving each applicable WLA.

Proposed 2014 Impaired Waters List
The Impaired Waters List is updated every two years and is made up of three major components: the 303(d) (TMDL) List, the Inventory of Impaired Waters, and an “Appendix A” (waterbodies part of the Statewide Mercury TMDL). The TMDL List contains impairments that require Total Maximum Daily Load (TMDL) “cleanup” studies. The Inventory waters includes impairments in need of TMDLs, those with completed TMDLs that have not yet been restored, “non-pollutant” impairments, and impairments due to natural sources. Appendix A is a list of mercury impairments, mainly for fish tissue concentration exceedences but also for water column mercury concentration exceedences.

Listed Impaired Waters in Elk River
The 2012 list of impaired waters in or near Elk River were determined in the Surface Water Management Plan in December 2013. The MPCA lists the following bodies of water in or near Elk River:

- Elk River (ID – 07010203-548) from St. Francis River to Orono Lake is listed due to E-coli and Mercury.
- Elk River (ID – 07010203-525) from Orono Lake to Mississippi River is listed due to Mercury.
- Tibbets Brook (ID – 07010203-522) is listed due to E-coli.
- Upper Orono Lake (ID – 71-0013-01) is listed due to Nutrients and Mercury.
- Lower Orono Lake (ID – 71-0013-02) is listed due to Nutrients and Mercury. A TMDL is reported as approved.
- Mississippi River (ID – 07010203-510) from Clearwater River to Elk River is listed due to fecal coliform, fish biology and mercury.
- Mississippi River (ID -07010203-503) from Elk River to Crow River is listed due to PCB in fish tissue and mercury.

The 2014 List of Impaired Waters is still in draft form, but there is potential for updated limits of discharge into the Mississippi River pending the approval of the South Metro Mississippi River Total Suspended Solids Total Maximum Daily Load report.

Waste Load Allocations
As part of the TMDL, wasteload allocations are enforced to limit the amount of pollutants an impaired water body receives. Permitted discharges include wastewater treatment facilities, industrial point source discharges and regulated stormwater discharges from construction and industrial facilities and Municipal Separate Storm Sewer Systems (MS4s).
Stormwater discharges are regulated under the state’s NPDES program, and allocations of nutrient reductions are considered as a portion of the wasteload allocation that must be divided among permit holders. Below is a description of the sources included in the nutrient TMDL WLAs.

In accordance with the state’s NPDES Permit, the City’s Stormwater Program was designed to reduce the amount of pollution that is transported to surface water bodies and ground water during or shortly after a storm event. The program implements Best Management Practices (BMPs) to address WLAs and created a stormwater pollution prevention program (SWPPP) that incorporates BMPs applicable to their MS4. The SWPPP includes the following six minimum control measures:

- Public education and outreach
- Public participation/involvement
- Illicit discharge, detection and elimination; Mississippi River (St. Cloud) Watershed TMDL Draft Report
- Construction site runoff control
- Post-construction site runoff control
- Pollution prevention/good housekeeping

All of these components together work to reduce the pollutant load to the receiving bodies of water.

Nutrient TMDLs: MS4 permit holders in the Lake TMDL watersheds and the permit ID numbers assigned to these permit holders are as follows:

**Table 5. MS4 Permit Holder’s in the Impaired Watersheds**

<table>
<thead>
<tr>
<th>Permit Holder</th>
<th>Permit Number</th>
<th>Area (Acres) developed only</th>
<th>TMDL Watershed Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Big Lake Township</td>
<td>MS400249</td>
<td>686</td>
<td>Birch Lake</td>
</tr>
<tr>
<td>Benton County MS4</td>
<td>MS440067</td>
<td>12</td>
<td>Donovan Lake</td>
</tr>
<tr>
<td>St. Cloud City MS4</td>
<td>MS400052</td>
<td>66</td>
<td>Donovan Lake</td>
</tr>
<tr>
<td>Minden Township MS4</td>
<td>MS400147</td>
<td>68</td>
<td>Donovan Lake</td>
</tr>
<tr>
<td>MNDOT Outstate District MS4 (non-trad)</td>
<td>MS400180</td>
<td>12</td>
<td>Donovan Lake</td>
</tr>
<tr>
<td>Elk River City MS4</td>
<td>MS400089</td>
<td>11,406</td>
<td>Orono Lake</td>
</tr>
<tr>
<td>Big Lake Township MS4</td>
<td>MS400234</td>
<td>17,468</td>
<td>Orono Lake</td>
</tr>
<tr>
<td>Big Lake City MS4</td>
<td>MS400249</td>
<td>3,356</td>
<td>Orono Lake</td>
</tr>
<tr>
<td>Total Phosphorus</td>
<td>TMDL Lbs. per day</td>
<td>TMDL Lbs. per year</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>-------------------</td>
<td>--------------------</td>
<td></td>
</tr>
<tr>
<td>Loading Capacity</td>
<td>139.123</td>
<td>50,814.83</td>
<td></td>
</tr>
<tr>
<td>Margin of Safety</td>
<td>13.912</td>
<td>5,081.50</td>
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</tr>
<tr>
<td><strong>Wasteload Allocation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zimmerman WWTP(^1)</td>
<td>2.529</td>
<td>923.74</td>
<td></td>
</tr>
<tr>
<td>Becker WWTP(^4)</td>
<td>5.450</td>
<td>1990.77</td>
<td></td>
</tr>
<tr>
<td>Aspen Hills WWTP(^3)</td>
<td>0.163</td>
<td>59.52</td>
<td></td>
</tr>
<tr>
<td>Construction Stormwater</td>
<td>0.641</td>
<td>234.05</td>
<td></td>
</tr>
<tr>
<td>“Straight Pipe” Septic Systems</td>
<td>0.000</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td><strong>MS4 Communities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City of Elk River</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City of Big Lake</td>
<td>1.282</td>
<td>468.11</td>
<td></td>
</tr>
<tr>
<td>Town of Big Lake</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CAFOs</strong></td>
<td>0.000</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td><strong>Load Allocation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Watershed</td>
<td>62.158</td>
<td>22,703.26</td>
<td></td>
</tr>
<tr>
<td>Upstream Lakes (Big Elk Lake)</td>
<td>51.310</td>
<td>18,740.85</td>
<td></td>
</tr>
<tr>
<td>Internal</td>
<td>1.252</td>
<td>460.99</td>
<td></td>
</tr>
<tr>
<td>Atmospheric + Groundwater</td>
<td>0.416</td>
<td>152.03</td>
<td></td>
</tr>
</tbody>
</table>
References


https://library.municode.com/index.aspx?clientId=13427&stateId=23&stateName=Minnesota


http://elkrivermn.gov/Facilities/Facility/Details/Kliever-Marsh-Park-42


Gulliver, J.S., A.J. Erickson, and P.T. Weiss (editors). (2010)."Stormwater Treatment: Assessment and Maintenance." University of Minnesota, St. Anthony Falls Laboratory. Minneapolis, MN.
http://stormwaterbook.safl.umn.edu/


Appendices
Appendix A – Figures
Figure 1: Vicinity Map
Figure 2: Storm Sewer Map
Figure 3: Storm Sewer Map
Figure 4: Storm Sewer Map
Figure 5: Storm Sewer Map
Figure 6: Storm Sewer Map
Figure 7: High Risk Areas
Figure 8: High Risk Areas
Figure 9: High Risk Areas
Appendix B – Sample Site Inspection Form

From the Center for Watershed Protection Illicit Discharge Detection and Elimination Technical Appendices (Center for Watershed Protection, 2004)
OUTFALL RECONNAISSANCE INVENTORY/ SAMPLE COLLECTION FIELD SHEET

Section 1: Background Data

Subwatershed: 
Outfall ID: 

Today’s date: 
Time (Military): 

Investigations: 
Form completed by: 

Temperature (°F): 
Rainfall (in.): Last 24 hours: Last 48 hours: 

Latitude: 
Longitude: 
GPS Unit: 
GPS LMK #: 

Camera: 
Photo #: 

Land Use in Drainage Area (Check all that apply):

- [ ] Industrial
- [ ] Ultra-Urban Residential
- [ ] Suburban Residential
- [ ] Commercial
- [ ] Other:

Known Industries: 

Notes (e.g., origin of outfall, if known):

Section 2: Outfall Description

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>MATERIAL</th>
<th>SHAPE</th>
<th>DIMENSIONS (IN.)</th>
<th>SUBMERGED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closed Pipe</td>
<td></td>
<td></td>
<td>Diameter/Dimensions</td>
<td>In Water:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Circular</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>RCP</td>
<td>Single</td>
<td></td>
<td>Partially</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>Double</td>
<td></td>
<td>Fully</td>
</tr>
<tr>
<td></td>
<td>PVC</td>
<td>Triple</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HDPE</td>
<td>Other: _______</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Steel</td>
<td>Other: _______</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other:</td>
<td>Other: _______</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open drainage</td>
<td></td>
<td></td>
<td>Depth: ____</td>
<td>With Sediment:</td>
</tr>
<tr>
<td></td>
<td>Concrete</td>
<td>Trapezoid</td>
<td>Top Width: ____</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Earthen</td>
<td>Parabolic</td>
<td>Bottom Width: ____</td>
<td>Partially</td>
</tr>
<tr>
<td></td>
<td>rip-rap</td>
<td>Other: _______</td>
<td></td>
<td>Fully</td>
</tr>
<tr>
<td></td>
<td>Other:</td>
<td>Other: _______</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-Stream</td>
<td>(applicable when collecting samples)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Flow Present?  
[ ] Yes  [ ] No  
If No, Skip to Section 3

Flow Description  
(IF present)  
[ ] Trickle  [ ] Moderate  [ ] Substantial

Section 3: Quantitative Characterization

FIELD DATA FOR FLOWING OUTFALLS

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>RESULT</th>
<th>UNIT</th>
<th>EQUIPMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow #1: Volume</td>
<td></td>
<td>Liter</td>
<td>Bottle</td>
</tr>
<tr>
<td>Time to fill</td>
<td></td>
<td>Sec</td>
<td></td>
</tr>
<tr>
<td>Flow depth</td>
<td></td>
<td>In</td>
<td>Tape measure</td>
</tr>
<tr>
<td>Flow width</td>
<td>_______</td>
<td>Ft, In</td>
<td>Tape measure</td>
</tr>
<tr>
<td>Measured length</td>
<td>_______</td>
<td>Ft, In</td>
<td>Tape measure</td>
</tr>
<tr>
<td>Time of travel</td>
<td></td>
<td>S</td>
<td>Stop watch</td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
<td>°F</td>
<td>Thermometer</td>
</tr>
<tr>
<td>pH</td>
<td></td>
<td>pH Units</td>
<td>Test strip/Probe</td>
</tr>
<tr>
<td>Ammonia</td>
<td></td>
<td>mg/L</td>
<td>Test strip</td>
</tr>
</tbody>
</table>

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## Outfall Reconnaissance Inventory Field Sheet

### Section 4: Physical Indicators for Flowing Outfalls Only

Are Any Physical Indicators Present in the Flow?  
☐ Yes  ☐ No  
(If No, Skip to Section 5)

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>CHECK IF Present</th>
<th>DESCRIPTION</th>
<th>RELATIVE SEVERITY INDEX (1-3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td></td>
<td></td>
<td>1 - Noticeable from a distance</td>
</tr>
<tr>
<td></td>
<td>Clear</td>
<td></td>
<td>2 - Easily detected</td>
</tr>
<tr>
<td></td>
<td>Turbidity</td>
<td></td>
<td>3 - Clearly visible in outfall flow</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See severity</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

### Section 5: Physical Indicators for Both Flowing and Non-Flowing Outfalls

Are physical indicators that are not related to flow present?  
☐ Yes  ☐ No  
(If No, Skip to Section 6)

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>CHECK IF Present</th>
<th>DESCRIPTION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infall Damage</td>
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<tr>
<td>Deposits/Slates</td>
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<tr>
<td>Abnormal Vegetation</td>
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<tr>
<td>Poor soil quality</td>
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<tr>
<td>Pipe bentic growth</td>
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</table>

### Section 6: Overall Outfall Characterization

☐ Unlikely  ☐ Potential (presence of two or more indicators)  ☐ Suspect (one or more indicators with a severity of 3)  ☐ Obvious

### Section 7: Data Collection

1. Sample for the lab?  
   ☐ Yes  ☐ No
2. If yes, collected from:  
   ☐ Flow  ☐ Pool
3. Intermittent flow trap set?  
   ☐ Yes  ☐ No  
   If Yes, type: ☐ OBM  ☐ Caulk dam
Appendix C – Incident Tracking Sheet

*From the Environmental Protection Agency* (Environmental Protection Agency, 2014)
### Illicit Discharge Hotline Incident Tracking Sheet

**Incident ID:**

<table>
<thead>
<tr>
<th>Responder Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call taken by:</td>
</tr>
<tr>
<td>Call time:</td>
</tr>
<tr>
<td>Call date:</td>
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<tr>
<td>Precipitation (inches) in past 24-48 hrs:</td>
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</table>

<table>
<thead>
<tr>
<th>Reporter Information</th>
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<tbody>
<tr>
<td>Incident time:</td>
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<tr>
<td>Incident date:</td>
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</tbody>
</table>

**Caller contact information (optional):**

**Incident Location (complete one or more below):**

- **Latitude and longitude:**
- **Stream address or outfall #:**
- **Closest street address:**
- **Nearby landmark:**

**Primary Location Description**

- Stream corridor
  - (In or adjacent to stream)
- Upland area
  - (Land not adjacent to stream)

**Secondary Location Description:**

- Outfall
- In-stream flow
- Along banks
- Near storm drain
- Near other water source (storm water pond, wetland, etc.)

**Narrative description of location:**

**Upland Problem Indicator Description**

- Dumping
- Oil/solvents/chemicals
- Sewage
- Wash water, suds, etc.
- Other

**Stream Corridor Problem Indicator Description**

**Odor**

- None
- Sewage
- Rancid/Sour
- Petroleum (gas)
- Sulfide (rotten eggs)
- Other: Describe in "Narrative" section

**Appearance**

- "Normal"
- Oil sheen
- Cloudy
- Suds
- Other: Describe in "Narrative" section

**Floatables**

- None
- Sewage (toilet paper, etc.)
- Algae
- Dead fish
- Other: Describe in "Narrative" section

**Narrative description of problem indicators:**

**Suspected Violator (name, personal or vehicle description, license plate #, etc.):**
<table>
<thead>
<tr>
<th>Investigation Notes</th>
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</thead>
<tbody>
<tr>
<td><strong>Initial investigation date:</strong></td>
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<tr>
<td>☐ No investigation made</td>
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<tr>
<td>☐ Referred to different department/agency:</td>
</tr>
<tr>
<td>☐ Investigated: No action necessary</td>
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<tr>
<td>☐ Investigated: Requires action</td>
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<td><strong>Hours between call and investigation:</strong></td>
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<td><strong>Date case closed:</strong></td>
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</tbody>
</table>
| | Notes:
Appendix D – Sample Monitoring Results Record

From the Center for Watershed Protection Illicit Discharge Detection and Elimination Technical Appendices (Center for Watershed Protection, 2004)
### Example 1 Monitoring Results Record (Page 1 of 2)

<table>
<thead>
<tr>
<th>Sample number</th>
<th>Sampling Location</th>
<th>Date</th>
<th>pH</th>
<th>Spec. cond. (μS/cm)</th>
<th>Temp. (°F)</th>
<th>Turb. (NTU)</th>
<th>Color (APHA Platinum Cobalt Units)</th>
<th>F (mg/L)</th>
<th>Hard. (mg/L as CaCO₃)</th>
<th>Detergent (mg/L as MBAO)</th>
<th>Fluorescence (raw signal strength)</th>
<th>Fluorescence (mg/L as &quot;Turb&quot;)</th>
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### Example 1 Sample Monitoring Results Record (Page 2 of 2)

<table>
<thead>
<tr>
<th>Sample number</th>
<th>Sampling Location</th>
<th>Date</th>
<th>K (mg/L)</th>
<th>NH₃ (mg/L as N)</th>
<th>NH₃/N (ratio)</th>
<th>B (mg/L)</th>
<th>Total Coliforms (MPN/100 mL)</th>
<th>E. coli (MPN/100 mL)</th>
<th>Enterococci (MPN/100 mL)</th>
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*Data provided by Richard Pitt, University of Alabama*
<table>
<thead>
<tr>
<th>Sample #</th>
<th>Conductivity (µS/cm)</th>
<th>Fluoride (mg/L)</th>
<th>Hardness (mg/L) (as CaCO₃)</th>
<th>Detergent (mg/L)</th>
<th>Fluorosis (% scale)</th>
<th>Potassium (mg/L)</th>
<th>Ammonia (mg/L)</th>
<th>pH</th>
<th>Color (units)</th>
<th>Chlorine (mg/L)</th>
<th>Toxicity (ICP% reduc)</th>
<th>Copper (mg/L)</th>
<th>Phenolic (mg/L)</th>
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<td>95% conf limits (mean ± x)</td>
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Appendix E – Stormwater Ordinance Related to Discharge and Enforcement

From the City of Elk River Code of Ordinances (6/18/2007)

ARTICLE VII. - STORMWATER MANAGEMENT

Sec. 30-2172. - Generally.

(a) The purpose of this article is to satisfy SWPPP obligations for a regulatory mechanism to control stormwater pollution and illegal discharges under the statewide general permit for small MS4s. This article sets forth minimum requirements for stormwater management to diminish threats to public health, safety, public and private property and natural resources of the community by establishing standards that will:

1. Protect life and property from dangers associated with flooding;
2. Protect public and private property from damage resulting from runoff or erosion;
3. Ensure site design minimizes the generation of stormwater and maximizes pervious areas for stormwater treatment;
4. Promote regional stormwater management by watershed;
5. Protect, maintain and/or restore water quality from nutrients, pathogens, toxics and debris;
6. Promote infiltration and groundwater recharge;
7. Promote water quality treatment for new development, redevelopment, and linear construction projects.

(b) No person shall develop any land for residential, commercial, industrial, or institutional uses without having provided the stormwater management measures set forth herein to control or manage runoff from such development. All water entering the storm drain system generated on any developed and undeveloped lands, unless explicitly exempted by the city, shall be protected from illegal disposal/discharge and illegal connections.

(Ord. No. 07-05, § 1, 6-18-2007)

Sec. 30-2173. - Definitions.

Unless specifically defined below, the words or phrases used in this article shall have the same meaning as they have in common usage. When not inconsistent with the context, words used in the present tense include the future tense, words in the plural number include the singular number, and words in the singular number include the plural number. The words "shall" and "must" are always mandatory and not merely directive.

Applicant means any person or entity that applies for a building permit, subdivision approval, or a permit to allow land-disturbing activities. Applicant also means that person's agents, employees, and others acting under this person's direction.

Best management practices (BMP's) means erosion and sediment control and water quality management practices that are the most effective and practicable means of controlling, preventing, and minimizing the degradation of surface water, including construction-phasing,
minimizing the length of time soil areas are exposed, prohibitions, and other management practices published by state or designated area-wide planning agencies. (Examples of BMP's can be found in the current versions of the Minnesota Pollution Control Agency's publications, "Protecting Water Quality in Urban Areas," and, "Storm-Water and Wetlands: Planning and Evaluation Guidelines for Addressing Potential Impacts of Urban Storm-Water and Snow-Melt Runoff on Wetlands," the United States Environmental Protection Agency's, "Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices," (as a reference for BMP's) and the Minnesota Department of Transportation's, "Erosion Control Design Manual.")

**Buffer** means a protective vegetated zone located adjacent to a natural resource, such as a water of the state, that is subject to direct or indirect human alteration. Such a buffer strip is an integral part of protecting an aquatic ecosystem through filtering, pollutants and providing adjacent habitat. The width of a buffer strip is the width along each bank of a stream. Therefore, a 30-foot wide stream with 100-foot buffer strips has a total width of 230 feet. Acceptable buffer vegetation includes preserving existing predevelopment vegetation and/or planting locally distributed native Minnesota trees, shrubs and grassy vegetation. Alteration of buffers is strictly limited. Buffer areas are designated with permanent markers.

**Construction activity or grading activity** means a disturbance to the land that results in a change in the topography, existing soil cover (both vegetative and non-vegetative), or the existing soil topography that may result in accelerated stormwater runoff and/or additional runoff volume, leading to soil erosion and movement of sediment into surface waters or drainage systems. Examples of construction activity may include clearing, grading, filling, and excavating. Construction activity includes the disturbance of land area that is a part of a larger common plan of development or sale if the larger common plan will ultimately disturb 10,000 square feet or more.

**Developer** means a person, firm, corporation, sole proprietorship, partnership, state agency, or political subdivision thereof engaged in a land disturbance activity.

**Discharge** means the release, conveyance, channeling, runoff, or drainage, of stormwater, including snowmelt, from a construction site.

**Energy dissipation** means the methods employed at pipe outlets to prevent erosion. Examples include, but are not limited to; aprons, riprap, splash pads, and gabions that are designed to prevent erosion.

**Erosion** means any process that wears away the surface of the land by the action of water, wind, ice, or gravity. Erosion can be accelerated by the activities of people and nature.

**Erosion control** Refers to methods employed to prevent erosion. Examples include soil stabilization practices, horizontal slope grading, temporary or permanent cover, and construction phasing.

**Erosion and sediment practice specifications or practice** means the management procedures, techniques, and methods to control soil erosion and sedimentation as officially adopted by either the state, county, city or local watershed group, whichever is more stringent.

**Exposed soil areas** means all areas of the construction site where the vegetation (trees, shrubs, brush, grasses, etc.) or impervious surface has been removed, thus rendering the soil more prone to erosion. This includes topsoil stockpile areas; borrow areas and disposal areas within the construction site. It does not include stockpiles or surcharge areas of gravel, concrete or bituminous. Once soil is exposed it is considered "exposed soil," until it meets the definition of "final stabilization."
Filter strips means a vegetated section of land designed to treat runoff as overland sheet flow. They may be designed in any natural vegetated form from a grassy meadow to a small forest. Their dense vegetated cover facilitates pollutant removal and infiltration.

Final stabilization means that all soil disturbing activities at the site have been completed, and that a uniform perennial vegetative cover with a density of 75 percent of the cover for unpaved areas and areas not covered by permanent structures has been established, or equivalent permanent stabilization measures have been employed. Simply sowing grass seed is not considered final stabilization. (Examples of vegetative cover practices can be found in the current version of the Minnesota Department of Transportation's publication, "Supplemental Specifications to the (year of the latest update) Standard Specifications for Construction.")

Hazardous materials means any material, including any substance, waste, or combination thereof, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, a substantial present or potential hazard to human health, safety, property, or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Hydric soils means soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part.

Hydrophytic vegetation means Macrophytic (large enough to be observed by the naked eye) plant life growing in water, soil or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content.

Illegal discharge means any direct or indirect non-storm water discharge to the storm drain system, except as exempted in this ordinance.

Illicit connection means any drain or conveyance, whether on the surface or subsurface that allows an illegal discharge to enter the storm drain system including but not limited to any conveyances that allow any non-storm water discharge including sewage, process wastewater, and wash water to enter the storm drain system and any connections to the storm drain system from indoor drains and sinks, regardless of whether said drain or connection had been previously allowed, permitted, or approved by an authorized enforcement agency or, any drain or conveyance connected from a commercial or industrial land use to the storm drain system that has not been documented in plans, maps, or equivalent records and approved by the City.

Impervious surface means a constructed hard surface that either prevents or retards the entry of water into the soil, and causes water to run off the surface in greater quantities and at an increased rate of flow than existed prior to development. Examples include rooftops, sidewalks, patios, driveways, parking lots, storage areas, and concrete, asphalt, or gravel roads.

Industrial activity means any activity subject to NPDES Industrial Storm Water Permits as defined in 40 CFR, Section 122.26 (b)(14).

Land disturbance activity means any land change that may result in soil erosion from water or wind and the movement of sediments into or upon waters or lands within this government’s jurisdiction, including clearing and grubbing, grading, excavating, transporting and filling of land. Within the context of this rule, land disturbance activity does not mean:

(1) Individual home gardens, minor landscaping, repairs, and maintenance work.

(2) Construction, installation, and maintenance of fences, signs, posts, poles, and electric, telephone, cable television, utility lines or individual service connections to these utilities, which result in creating under 5,000 square feet of exposed soil.
(3) Tilling, planting, or harvesting of agricultural, horticultural, or silvicultural (forestry) crops.

(4) Emergency work to protect life, limb, or property and emergency repairs, unless the land disturbing activity would have otherwise required an approved erosion and sediment control plan, except for the emergency. If such a plan would have been required, then the disturbed land area shall be shaped and stabilized in accordance with the city's requirements as soon as possible.

**Municipal Separate Storm Sewer System (MS4) means the system of conveyances** (including sidewalks, roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) owned and operated by the city and designed or used for collecting or conveying storm water, and that is not used for collecting or conveying sewage.

*Native vegetation* means the presettlement group of plant species native to the local region, that were not introduced as a result of European settlement or subsequent human introduction.

*Non-stormwater discharge* means any discharge to the storm drain system that is not composed entirely of stormwater.

*Ordinary high water mark* means the boundary elevation where the vegetation changes from predominately aquatic (Where "aquatic" broadly means that the vegetation can survive moist conditions) to terrestrial. This elevation delineates the highest water level, which has been maintained for a sufficient period of time to leave evidence upon the landscape, commonly that point where the natural vegetation changes from predominately aquatic to predominately terrestrial. Water often reaches this elevation in spring. For rivers and streams the ordinary high water mark is usually the top of the bank. It is less well defined for lakes and wetlands. The definition in Minnesota Statute 103G.005, subdivision 14 says that the " . . . "Ordinary high water level" means the boundary of waterbasins, watercourses, public waters, and public waters wetlands, and:

(1) The ordinary high water level is an elevation delineating the highest water level that has been maintained for a sufficient period of time to leave evidence upon the landscape, commonly the point where the natural vegetation changes from predominately aquatic to predominately terrestrial;

(2) For watercourses, the ordinary high water level is the elevation of the top of the bank of the channel; and

(3) For reservoirs and flowages, the ordinary high water level is the operating elevation of the normal summer pool.

The term "ordinary high water mark" is further defined in Minnesota Rule 6120.2500, subpart 11. The Minnesota Department of Natural Resources' area hydrologist determines ordinary high water marks.

*Owner* means the person or party possessing the title of the land on which the construction activities will occur; or if the construction activity is for a lease, easement, or mineral rights license holder, the party or individual identified as the lease, easement or mineral rights license holder; or the contracting government agency responsible for the construction activity.

*Paved surface* means a constructed hard, smooth surface made of asphalt, concrete or other pavement material. Examples include, but are not limited to, roads, sidewalks, driveways and parking lots.
Permanent cover means "final stabilization." Examples include grass, gravel, asphalt, and concrete. See also the definition of "final stabilization."

Pollutant means anything which causes or contributes to pollution. Pollutants may include, but are not limited to: paints, varnishes, and solvents; oil and other automotive fluids; non-hazardous liquid and solid wastes and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects, ordinances, and accumulations, so that same may cause or contribute to pollution; floatables; pesticides, herbicides, and fertilizers; hazardous substances and wastes; sewage, fecal coliform and pathogens; dissolved and particulate metals; animal wastes; wastes and residues that result from constructing a building or structure; and noxious or offensive matter of any kind.

Public waters means all water basins and watercourses that are described in Minn. Stat. 103G.005 subd. 15.

Receiving waters means creeks, streams, rivers, lakes, estuaries, groundwater formations, or other bodies of water into which surface water, treated waste, or untreated waste are discharged.

Sanitary waste facility means all property, real or personal, including negative and positive easements and water and air rights, which is or may be needed or useful for the processing or disposal of waste, except property for the collection of the waste and property used primarily for the manufacture of scrap metal or paper. Waste facility includes but is not limited to transfer stations, processing facilities, and disposal sites and facilities.

Sediment means the product of an erosion process; solid material both mineral and organic, that is in suspension, is being transported, or has been moved by water, wind, or ice, and has come to rest on the earth's surface either above or below water level.

Sedimentation means the process or action of depositing sediment.

Sediment control means the methods employed to prevent sediment from leaving the development site. Sediment control practices include silt fences, sediment traps, earth dikes, drainage swales, check dams, subsurface drains, pipe slope drains, storm drain inlet protection, and temporary or permanent sedimentation basins.

Soil means the unconsolidated mineral and organic material on the immediate surface of the earth. For the purposes of this document stockpile of gravel, aggregate, concrete or bituminous materials are not considered "soil" stockpiles.

Stabilized means the exposed ground surface after sod, erosion control blanket, riprap, or other material that prevents erosion has covered it. Simply sowing grass seed is not considered stabilization.

Stormwater under Minnesota Rule 7077.0105, subpart 41b storm water, "means precipitation runoff, storm water runoff, snow melt runoff, and any other surface runoff and drainage." (According to the Federal Code of Regulations under 40 CFR 122.26 [b][13], "Storm water means storm water runoff, snow melt runoff and surface and drainage."). Stormwater does not include construction site dewatering.

Stormwater pollution prevention plan or SWPPP means a joint storm water and erosion and sediment control plan that is a document containing the requirements of Section IV of the NPDES permit, that when implemented will decrease soil erosion on a parcel of land and off-site nonpoint pollution. It involves both temporary and permanent controls erosion prevention, sediment control, and pollution prevention practices. Structure means anything manufactured, constructed or erected, which is normally attached to or positioned on land, including portable structures, earthen structures, roads, parking lots, and paved storage areas.
**Structure** means anything manufactured, constructed, or erected, which is normally attached to or positioned on land, including portable structures, earthen structures, roads, parking lots, and paved storage areas.

**Subdivision** means any tract of land divided into building lots for private, public, commercial, industrial, etc. development. Minnesota Rule 6120.2500, subpart 17 defines subdivision as, "... land that is divided for the purpose of sale, rent, or lease, including planned unit development."

**Temporary protection** means short-term methods employed to prevent erosion. Examples of such protection include: straw, mulch, erosion control blankets, wood chips, and erosion netting.

**Vegetated or grassy swales** means a vegetated earthen channel that conveys stormwater, while treating the stormwater by biofiltration. Such swales remove pollutants by both filtration and infiltration.

**Waters of the state** As defined in Minnesota Statutes § 115.01, subdivision 22 the term "... "waters of the state" means all streams, lakes, ponds, marshes, watercourses, waterways, wells, springs, reservoirs, aquifers, irrigation systems, drainage systems and all other bodies or accumulations of water, surface or underground, natural or artificial, public or private, which are contained within, flow through, or border upon the state or any portion thereof."

**Wet detention facility** means a manmade structure, containing a permanent pool of water, used for the temporary storage of runoff.

**Wet retention facility** means a manmade structure, containing a permanent pool of water, used for the permanent storage of runoff.

**Wetlands** As defined in Minnesota Rules 7050.0130, subpart F, "... "wetlands" are those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Constructed wetlands designed for wastewater treatment are not waters of the state. Wetlands must have the following attributes:

1. A predominance of hydric soils;
2. Inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in a saturated soil condition; and
3. Under normal circumstances support a prevalence of such vegetation.

(Ord. No. 07-05, § 1, 6-18-2007)

Sec. 30-2174. - Stormwater and urban runoff control.

(a) **Illegal disposal/dumping.**

1. No person shall throw, deposit, place, leave, maintain, or keep any substance upon any street, alley, sidewalk, storm drain, inlet, catch basin conduit or drainage structure, business place, or upon any public or private plot of land, so that the substance might be or become a pollutant, except in containers, recycling bags, or other lawfully established waste disposal facility.
(2) No person shall intentionally dispose of grass, leaves, dirt, or landscape material into a water resource, buffer, street, road, alley, catch basin, culvert, curb, gutter, inlet, ditch, natural watercourse, flood control channel, canal, storm drain or any fabricated natural conveyance.

(b) Illicit discharges and connections:

(1) No person shall cause any illicit discharge to enter the storm sewer system or any surface water unless such discharge:

a. Consists of non-stormwater that is authorized by an NPDES point source permit obtained from the MPCA; or

b. Is associated with fire fighting activities or other activities necessary to protect public health and safety; or

c. Is one of the following exempt discharges: water line flushing or other potable water sources, landscape irrigation or lawn watering, diverted stream flows, rising ground water, groundwater infiltration to storm drains, uncontaminated pumped groundwater, foundation or footing drains (not including active groundwater dewatering systems), crawl-space sumps, air conditioning condensation, springs, non-commercial washing of vehicles, natural riparian habitat or wetland flows, dechlorinated swimming pools and any other water source not containing pollutant.

(2) Dye testing is an allowable discharge, but requires a verbal notification to the city prior to the time of the test.

(3) No person shall use any illicit connection to convey non-stormwater to the city’s storm sewer system.

(4) The construction, use, maintenance or continued existence of illicit connections to the storm sewer system is prohibited. This prohibition expressly includes, without limitation; illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection.

(5) A person is considered to be in violation of this article if the person connects a line conveying sewage to the storm sewer system, or allows such a connection to continue.

(c) Good housekeeping provisions. Any owner or occupant of property within the city shall comply with the following good housekeeping requirements:

(1) No person shall leave, deposit, discharge, dump, or otherwise expose any chemical or septic waste in an area where discharge to streets or storm sewer system may occur. This section shall apply to both actual and potential discharges.

a. Septic systems must be maintained to prevent failure.

b. No part of any individual septic system requiring on-land or in ground disposal of waste shall be located closer than 150 feet from the ordinary high water level in the case of DNR protected waters, or 25 feet from the wetland boundary in the case of all other water bodies, unless it is proven by the applicant that no effluent will immediately or gradually reach the water bodies because of existing physical characteristics of the site or the system.

c. Recreational vehicle sewage shall be disposed of at a proper sanitary waste facility. Waste should not be discharged in an area where drainage to streets or storm sewer systems may occur.
d. For pools, water shall be allowed to sit seven days without the addition of chlorine to allow for chlorine to evaporate before discharge.

(2) Runoff of water from residential property shall be minimized to the maximum extent practicable. Runoff of water from the washing down of paved areas in commercial or industrial property is prohibited unless necessary for health or safety purposes and not in violation of any other provisions in city codes.

(3) Mobile washing companies (carpet cleaning, mobile vehicle washing, etc.) shall dispose of wastewater to the sanitary sewer. Wastewater shall not be discharged where drainage to streets or storm sewer systems may occur.

(4) Storage of materials, machinery, and equipment
   a. Objects, such as motor vehicle parts, containing grease, oil or other hazardous substances, and unsealed receptacles containing hazardous materials, shall not be stored in areas susceptible to runoff.
   b. Any machinery or equipment that is to be repaired or maintained in areas susceptible to runoff shall be placed in a confined area to contain leaks, spills, or discharges.

(5) Debris and residue shall be removed, as noted below:
   a. All motor vehicle parking lots and private streets shall be swept, at a minimum of once a year in the spring to remove debris. Such debris shall be collected and properly disposed.
   b. Fuel and chemical residue or other types of potentially harmful material, such as animal waste, garbage or batteries shall be removed as soon as possible and disposed of properly. Hazardous waste must be disposed of at an appropriate disposal site and shall not be placed in a trash container.

(d) **Industrial or construction activity discharges.** Any person subject to an industrial or construction activity NPDES stormwater discharge permit shall comply with all provisions of such permit. Proof of compliance with said permit may be required in a form acceptable to the city prior to the allowing of discharges to the storm sewer system. All facilities that have stormwater discharges associated with industrial activity, including construction activity must adhere to the following guidelines:

(1) The owner or operator of a commercial or industrial establishment shall provide, at their own expense, reasonable protection from accidental discharge of prohibited materials or other wastes into the storm sewer system or watercourses through the use of structural and non-structural BMPs.

(2) Any person responsible for a property or premise, which is, the source of an illicit discharge, shall be required to implement, at said person's expense, additional structural and non-structural BMPs to prevent the further discharge of pollutants to the storm sewer system. These BMPs shall be part of a storm water pollution prevention plan (SWPPP) as necessary for compliance with requirements of the NPDES permit.

(e) **Construction and building site activity.** Construction sites and landscaping projects are especially susceptible to erosion and pollution. For this reason, construction site operators must control waste such as discarded building materials, concrete truck washout, chemicals, petroleum products, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality. The developer shall be held responsible for adherence to these required prevention and control measures:
(1) A designated area shall be provided on site for concrete truck washout. The area shall be constructed so as to contain washout material and be located at least 50 feet away from any storm drain inlet or receiving water during construction. Upon completion of construction activities the concrete washout material will be removed and properly disposed of prior to the area being restored.

(2) The guidelines below should be followed concerning debris storage and disposal:

   a. Daily cleanup of construction site shall be performed to ensure that all litter is contained in an appropriate enclosure or container so as not to accumulate on the ground.
   b. Operators must keep solid waste materials in either a container or an enclosed waste collection area.
   c. Empty/unused chemical containers must be disposed of in accordance with label instructions.
   d. Potentially hazardous waste must be separated from non-hazardous waste.
   e. Recycling of waste materials is encouraged when possible.
   f. All construction site wastes must be disposed of at authorized disposal facilities.

(3) Rock construction entrances shall be constructed at all city-approved entrances. Construction accesses not approved by the city should be adequately blocked to prevent unwanted traffic.

   a. Site access roads shall be graded or otherwise protected with silt fences, diversion channels, or dikes and pipes to prevent sediment from exiting the site via the access roads.
   b. Individual lots shall each be required to install and maintain a rock construction entrance throughout building construction until a dust free access has been installed.

(4) Sanitary waste facilities shall be provided on site and be located as far from storm sewer inlets and receiving waters as practical on the construction site.

(5) Chemicals, paint, petroleum, fertilizer, and pesticides must be stored in a covered enclosure and as far from receiving waters as practical on the construction site.

(f) Notification of spills. Not withstanding other requirements of law, as soon as any person responsible for a facility or operation, or responsible for emergency response for a facility or operation has information of any known or suspected release of materials which are resulting or may result in illegal discharges or pollutants discharging into the storm sewer system, or water of the state said person shall take all necessary steps to ensure the discovery, containment, and cleanup of such release. In the event of such a release of hazardous materials said person shall immediately notify emergency response agencies of the occurrence via emergency dispatch services. In the event of a release of non-hazardous materials, said person shall notify the city no later than the next business day.

(g) Access to buildings for inspection, monitoring and/or dye testing.

   (1) The city shall be permitted to enter and inspect all buildings under this article as often as may be necessary to determine compliance with this article.
(2) Facility operators shall allow the city ready access to all parts of the premises for the purposes of inspection, sampling, dye testing, examination and copying of records that relate to the discharge of stormwater.

(3) The city shall have the right to set up at any building such devices as are necessary to conduct monitoring, sampling and/or dye testing of the facility's stormwater discharge.

(4) The city has the right to require the discharger to install monitoring equipment as necessary.

(5) Unreasonable delays in allowing the city access to a facility is a violation of this article.

(6) If the city has been refused access to any part of the premises from which stormwater is discharged, and is able to demonstrate probable cause to believe that there may be a violation of this section, or that there is a need to inspect and/or sample as part of a routine inspection and sampling program designed to verify compliance with this article or any order issued hereunder, or to protect the overall public health, safety, and welfare of the community, then the city may seek issuance of a search warrant from any court of competent jurisdiction.

(h) **Suspension of storm sewer system access.**

(1) Suspension due to illicit discharges in emergency situations. The city may, without prior notice, suspend storm sewer system discharge access to a person when such suspension is necessary to stop an actual or threatened discharge which presents or may present imminent and substantial danger to the environment, or to the health or welfare of persons, or to the storm sewer system or waters of the state. If the violator fails to comply with a suspension order issued in an emergency, the city may take such steps as deemed necessary to prevent or minimize damage to the storm sewer system or waters of the state, or to minimize danger to persons.

(2) Suspension due to the detection of illicit discharge. Any person discharging to the storm sewer system in violation of this article may have their storm sewer system access terminated if such termination would abate or reduce an illicit discharge. A person commits an offense if the person reinstates storm sewer system access to premises terminated pursuant to this section, without the prior approval of the city.

(a) **Applicability**

(1) A City approved Stormwater Pollution Prevention Plan (SWPPP) and Permit shall be required prior to any construction or grading activity that meets any of the criteria immediately below, unless otherwise exempted in this ordinance.

a. **Construction or grading activity involving between 10,000 square feet and one (1) acre of land disturbance.**

b. **Any construction or grading activity, regardless of size, that the City determines is likely to cause an adverse impact to an environmentally sensitive area or other property.**

Construction or grading activity that exceeds one (1) acre of land disturbance and is subject to NPDES Construction Stormwater General Permit regulations is considered in compliance with this section with an approved NPDES coverage card. Proof of NPDES coverage and the approved SWPPP shall be provided to the City prior to construction. NPDES compliance shall be maintained through the duration of the project. In the event that the NPDES permit is closed or expired, City Permit regulations shall be followed until a final certificate of occupancy has been
provided by the City, as applicable in accordance with the development’s zoning classification. Instances of non-compliance with NPDES regulations are subject to the City’s enforcement procedures described at the end of this section.

(b) Exemptions

(1) The following activities shall be exempt from all of the requirements of this ordinance:
   a. Emergency work necessary to protect life, limb, or property.
   b. Routine agricultural activity such as tilling, planting, harvesting, and associated activities. Other agricultural activities are not exempt including activities such as construction of structures.

(c) Permit Review Process

(1) Application review
   a. The applicant shall not commence any construction activity subject to this ordinance until a permit (herein referred to as “City Permit”) has been authorized by the city. A complete review of the City Permit application shall be done within ten (10) business days of the receipt of a complete City Permit application from the applicant. The city will work with the necessary state, county, and local agencies to complete the review as appropriate. The city shall review all information in the City Permit application including proposed stormwater practices, hydrologic models, and design methodologies for compliance with this ordinance.

(2) City Permit authorization
   a. If the city determines that the application meets the requirements of this ordinance, the city may issue approval authorizing the project or activity. The approval shall be valid for one year. Approval will be in written or electronic format from the city to the applicant.

(3) City Permit denial
   a. If the city determines the application does not meet the requirements of this ordinance the application will be denied. If the application is denied, the applicant will be notified of the denial in written or electronic format, including reasons for the denial. Once denied, a new application shall be resubmitted for approval before any activity may begin. All building permits shall be suspended until the applicant has an authorized City Permit.

(4) Plan information requirements
   a. The minimum information shown in the applicant’s plan shall be consistent with the erosion and sediment control requirements in the most recent version of the NPDES Construction Stormwater General Permit and shall include a fully completed application.

(5) Modification of permitted plans
   a. The applicant must amend an approved plan to include additional requirements such as additional or modified stormwater best management practices (BMPs) designed to correct problems whenever:
      i. There is a change in design, construction, operation, maintenance, weather or seasonal conditions that has a significant effect on the discharge of pollutants to surface water or underground water.
      ii. Inspections or investigations by site operators, local, state or federal officials indicate the plans are not effective in eliminating or significantly minimizing the
discharge of pollutants to surface water or underground water or that the
discharges are causing water quality standard exceedances.

iii. The plan is not achieving the general objectives of minimizing pollutants in
stormwater discharges associated with the activity on the permitted site.

(6) City Permit completion

a. Before work under the City Permit is deemed complete, the permittee must submit as-
builds, a long term maintenance plan and information demonstrating that the stormwater
facilities conform to design specifications.

b. All soil disturbing activities at the site have been completed and all soils are stabilized by
a uniform perennial vegetative cover with a density of 70 percent of its expected final
growth density over the entire pervious surface area, or other equivalent means
necessary to prevent soil failure under erosive conditions.

c. A final certificate of occupancy has been provided by the City, as applicable according to
the zoning classification of the development.

(d) Site design considerations

(1) Design process

a. New and redevelopment projects shall be designed to incorporate erosion control and
stormwater management features and to meet the minimum requirements outlined in
the most recent version of the NPDES Construction Stormwater General Permit.

b. Whenever possible, new development projects shall be designed using the Better Site
Design Techniques of the current version of the Minnesota Stormwater Manual. Better
Site Design involves techniques applied early in the design process to preserve natural
areas, reduce impervious cover, distribute runoff and use pervious areas to more
effectively treat stormwater runoff. Site design should address open space protection,
im pervious cover minimization, and runoff distribution and minimization, and runoff
utilization.

(e) Inspections and maintenance

(1) Applicant responsibilities

a. The applicant is responsible for inspections, maintenance, and record keeping during
construction for all stormwater BMPs on the site.

(2) Right of entry

a. The issuance of a City Permit or NPDES Construction Stormwater General Permit
constitutes a right-of-entry for the city or its agent to enter upon the construction site.
The applicant shall allow the city and their authorized representatives, upon presentation
of credentials, to:

i. Enter upon the permitted site for the purpose of obtaining information,
examination of records, conducting investigations or surveys

ii. Bring such equipment upon the permitted development as is necessary to conduct
such surveys and investigations

iii. Examine and copy any books, papers, records, or memoranda pertaining to
activities or records required to be kept under the terms and conditions of the
applicable permit(s)

iv. Inspect the stormwater pollution control measures

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v. Sample and monitor any items or activities pertaining to stormwater pollution control measures

(3) City inspections
   a. The city reserves the right to conduct inspections on a regular basis to ensure that both temporary and permanent stormwater management and erosion and sediment control measures are properly installed and maintained prior to construction, during construction, and at the completion of the project.

(f) Maintenance Schedule
   (1) Generally
      a. All nonfunctional BMPs must be repaired, replaced, or supplemented with functional BMPs by the end of the next business day after discovery, or as soon as field conditions allow access unless another time frame is specified below.

   (2) Perimeter control devices
      a. All perimeter control devices and inlet protection devices must be repaired, replaced, or supplemented when they become nonfunctional or the sediment reaches one-half (1/2) the height of the device. These repairs must be made by the end of the next business day after discovery, or thereafter as soon as field conditions allow access.

   (3) Sedimentation basins
      a. Temporary and permanent sedimentation basins must be drained and the sediment removed when the depth of the sediment collected in the basin reaches one-half (1/2) the storage volume. Drainage and removal must be completed within 72 hours of discovery, or as soon as field conditions allow access.

   (4) Surface waters
      a. The permittee must remove all deltas and sediment deposited in surface waters, including drainage ways, catch basins, and other drainage systems. Areas where sediment removal results in exposed soil must be re-stabilized. The removal and stabilization must take place within seven (7) days of discovery unless precluded by legal, regulatory, or physical access constraints. The permittee is responsible for contacting all local, regional, state, and federal authorities and receiving any applicable permits, prior to conducting any work in surface waters.

   (5) Sediment tracking
      a. All sediment that escapes the site or that is tracked onto paved surfaces must be removed within 24 hours of discovery, or if applicable, within a shorter time.

(g) Enforcement Actions
   (1) Notification of non-compliance
      a. The City shall notify the permittee if the construction or grading activity is not compliant with NPDES rules or City code, or is ineffective in achieving the goals of these regulations. Notification may be verbal, written, or electronic format.

   (2) Corrective work
      a. The permittee shall perform corrective work in the manner and time frame outlined above, and consistent with other regulatory requirements as applicable. The maintenance schedule and enforcement response schedule is based on the date that the City issues a
notification of non-compliance, not to be contingent upon receipt or review by the permittee.

b. The City reserves the right to perform corrective work in emergency situations at the City’s discretion, if the permittee is unable to do so in a time frame that the City finds satisfactory.

(3) Failure to perform corrective work

a. When an applicant fails to conform to any provision of this policy, through final completion and occupancy of the development as applicable, the City may take the following actions:

   i. Permit Revocation - Revoke any permit issued or authorized by the City to the applicant for the site in question or any other of the applicant’s sites within the City’s jurisdiction.

   ii. Correction by the City – The City reserves the right to perform mitigation measures to prevent public harm or nuisance, such as recovering sediment that has escaped the site onto a City street or into a stormwater conveyance or BMP. The applicant will be required to reimburse the City for all costs incurred in performing mitigation work.

   iii. In the event the alleged violator fails to take remedial measures set forth in the manner and time frame specified above, the City impose a penalty not to exceed $1,000 (depending on the severity of the violation) for each day the violation remains unremedied after notice of non-compliance.

   iv. Stop Work Order - The City reserves the right to issue a stop work order, withhold the scheduling of inspections, and/or the issuance of a Certificate of Occupancy in the event that other enforcement actions are not achieving the desired level of compliance.

Sec. 30-2175. - Post construction stormwater management.

The purpose of this section is to prevent or reduce water pollution within the city after construction has been completed. This section establishes standards for new development, redevelopment, and linear construction projects in order to minimize the stormwater pollution, soil erosion, and sedimentation.

(a) The applicant shall consider reducing the need for stormwater management performance standards by incorporating the use of natural topography and land cover. It shall also:

1. Minimize impact to significant natural features.

2. Review the site for wetlands, wooded areas of significance, rare and endangered species habitat, areas designated by the County Biological Survey (1993), and/or Elk River Natural Resource Inventory (NRI) (December 2004). These areas should not be developed.

3. Minimize impervious surface coverage to the maximum extent practicable.

4. In designated shoreland areas the development shall meet the impervious surface requirements of the shoreland ordinance regardless of conveyance systems.

5. Volume control. Designer shall be required to provide soil boring analysis to determine the infiltration rate prior to approval of plans. The design shall meet the
following requirements depending on the type of project in accordance with the MS4 NPDES permit:

a. **New development.** For new, nonlinear developments that create more than one acre of new impervious surface on sites without restrictions, stormwater runoff volumes will be controlled and the post-construction runoff volume shall be retained on site for 1.1 inches of runoff from all impervious surfaces on the site.

b. **Redevelopment.** Nonlinear redevelopment projects on sites without restrictions that create one or more acres of new and/or fully reconstructed impervious surfaces shall capture and retain on site 1.1 inches of runoff from the new and/or reconstructed impervious surfaces.

c. **Linear development.** Linear projects on sites without restrictions that create one or more acres of new and/or fully reconstructed impervious surfaces shall capture and retain the larger of the following:

   i. 0.55 inches of runoff from new and/fully reconstructed impervious areas on the site

   ii. 1.1 inches of runoff from the net increase in impervious areas on the site

7. **Water quality.**

a. Total suspended solids. Treatment also must achieve an 80 percent removal of suspended solids.

b. **Phosphorus control.** Stormwater shall be treated to remove 60 percent of the post-development phosphorus load on an annual basis before discharge to natural water bodies. The amount of total phosphorus removed should be modeled using the MIDS calculator or an equivalent water quality modeling program. Where water quality ponding is exclusively used to meet the phosphorus removal requirement, the ponds must be sized to store the site runoff from a two and one-half inch rainfall below the normal outlet elevation.

c. **Oil and grease control.** For all storm water plans for commercial or industrial developments and all other uses where the potential for pollution by oil or grease, or both, exists, the first one-half inch of runoff will be treated using the best oil and grease removal technology available. This requirement may be waived by the city when the applicant can demonstrate that installation of such practices is not necessary.

8. **Rate Control.** For post-construction rate control modeling a minimum curve number of 84 shall be used on all disturbed/graded soil areas, due to soil compaction impacts, unless Soil Protection/Compaction Remediation specifications have been incorporated into the Proposal (Plan Set, Stormwater Management Plan, etc.) and are approved by the City Engineer. Atlas 14 shall be used in all rate-control estimates.

a. **New construction.** Projects shall have no increase in runoff from the predevelopment peak runoff rates for the 2 year, 10 year, and 100 year, 24 hour storm events.

b. **Redevelopment.** Projects shall have no increase in runoff from the pre-project peak runoff rates for the 2 year, 10 year, and 100 year, 24 hour storm events.

9. **Treatment design sequencing for sites with restrictions** (as found in the MIDS Design Sequence Flowchart).
Applicant shall fully attempt to comply with the appropriate performance goals described above. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site. If full compliance is not possible due to any of the factors listed below, the applicant must document the reason. If site constraints or restrictions limit the full treatment goal, the following treatment design sequence shall be followed:

Applicant shall document the treatment sequence starting with Alternative #1. If Alternative #1 cannot be met, then Alternative #2 shall be analyzed. Applicants must document the specific reasons why Alternative #1 cannot be met based on the factors listed below. If Alternative #2 cannot be met then Alternative #3 shall be met. Applicants must document the specific reasons why Alternative #2 cannot be met based on the factors listed below. When all of the conditions are fulfilled within an alternative, this sequence is completed.

Volume reduction techniques considered shall include infiltration, reuse & rainwater harvesting, and canopy interception & evapotranspiration and/or additional techniques included in the MIDS calculator and the Minnesota Stormwater Manual.

Higher priority shall be given to BMPs that include volume reduction. Secondary preference is to employ filtration techniques, followed by rate control BMPs. Factors to be considered for each alternative will include:

i. Karst geology
ii. Shallow bedrock
iii. High groundwater
iv. Hotspots or contaminated soils
v. Drinking Water Source Management Areas or within 200 feet of drinking water well
vi. Zoning, setbacks or other land use requirements
vii. Excessive cost
viii. Poor soils (infiltration rates that are too low or too high, problematic urban soils)

Alternative #1: Applicant attempts to comply with the following conditions:

i. Achieve at least 0.55" volume reduction from all impervious surfaces if the site is new development or from the new and/or fully reconstructed impervious surfaces for a redevelopment site.

ii. Remove 75% of the annual TP load from all impervious surfaces if the site is new development or from the new and/or fully reconstructed impervious surfaces for a redevelopment site.

iii. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site.

Alternative #2: Applicant attempts to comply with the following conditions:

i. Achieve volume reduction to the maximum extent practicable.
ii. Remove 60% of the annual TP load from all impervious surfaces if the site is new development or from the new and/or fully reconstructed impervious surfaces for a redevelopment site.

iii. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site.

Alternative #3: Off-site Treatment. Mitigation equivalent to the performance of 1.1 inches of volume reduction for new development or redevelopment as described above in this section, (including banking or cash) can be performed off-site to protect the receiving water body. Off-site treatment shall be achieved in areas selected in the following order of preference:

i. Locations that yield benefits to the same receiving water that receives runoff from the original construction activity.

ii. Locations within the same Department of Natural Resource (DNR) catchment area (Hydrologic Unit 08) as the original construction activity.

iii. Locations within the next adjacent DNR catchment area upstream.

iv. Locations anywhere within the community's jurisdiction.

Impervious Surface Area Calculations shall include all disturbed/graded soil areas, due to soil compaction impacts, unless Soil Protection/Compaction Remediation specifications have been incorporated into the Proposal (Plan Set, Stormwater Management Plan, etc.) and are approved by the City Engineer.

Designers shall be required to provide estimates of BMP-site specific infiltration rates to the City Engineer for approval prior to site plan review. For information on estimation of infiltration rates, see the Minnesota Stormwater Manual (http://stormwater.pca.state.mn.us).

The MIDS Design Sequence Flowchart can be found in the Minnesota Stormwater Manual: http://stormwater.pca.state.mn.us/index.php/Flexible_treatment_options

All volume control practices and site design specifications shall conform to the current version of the Minnesota Stormwater Manual.

(b) Stormsewer sizing At a minimum, the storm sewer system shall be designed for the 10 year storm event. Low areas must have an acceptable overland drainage route with the proper transfer capacity when the event is exceeded.

(c) Outlets. Discharges from new construction sites must have a stable outlet capable of carrying designed flow at a non-erosive velocity. Outlet design must consider flow capacity and flow duration. This requirement applies to both the site outlet and the ultimate outlet to the storm sewer system or waterbody. Measures to trap floatables for energy dissipation must also be constructed.

(d) Better site design. Whenever possible, projects shall be designed using better site design techniques early in the design process to preserve natural areas, reduce impervious cover, distribute runoff and pervious area more effectively to treat stormwater runoff. The applicant shall attempt to limit the impervious surface of the developed site or subdivision by incorporating the following design considerations, consistent with zoning, subdivision, and PUD requirements:
1. **Open space protection and restoration**
   a. Maximizing open space while incorporating smaller lot sizes to conserve natural areas and reduce the amount of stormwater runoff generated at the site.
   b. Conservation of natural vegetation wherever practical.
   c. Reforestation
   d. Reestablishment of prairies and wetlands
   e. Increase buffers around streams, steep slopes, and wetlands to protect from flood damage and provide additional water quality treatment.

2. **Reduction of impervious cover**
   a. Reduce new impervious area through redevelopment of existing sites and use existing roadways, trails, etc.
   b. Minimize street widths, parking space size, driveway length, sidewalk width
   c. Reduce impervious structure footprint.
   d. Use shared parking facilities consistent with zoning requirements.
   e. Install semi-permeable/permeable or porous paving.

3. **Distribution and minimization of runoff**
   a. Utilize vegetated areas for stormwater treatment
   b. Look for vegetated areas that can filter sheet flow, removing sediment and other pollutants, and increasing the time of concentration.
   c. Disconnect impervious areas by allowing runoff from small impervious areas to be directed to pervious areas where it can be infiltrated or filtered
   d. All runoff from downspouts, driveways and other impervious areas shall be directed to pervious surfaces, where feasible, or unless the applicant can demonstrate that the practice is likely to result in groundwater contamination.
   e. Eliminate curb and gutter where practicable, and use vegetated swales or equivalent.
   c. Encourage infiltration and soil storage of runoff through grass channels, soil compost amendment, vegetated swales, rain gardens, etc.
   d. Plant vegetation that does not require irrigation beyond natural rainfall and runoff from site

(f) **Regional ponding.** If the city determines the site is not suitable for on-site treatment, off-site stormwater management and associated fees may be established, provided that provisions are made to manage stormwater by an off-site facility, and provided that all of the following conditions for the off-site facility are met:

1. The facility is in place or the city has knowledge of future regional ponding on site;
2. The facility is designed and adequately sized to provide a level of stormwater control that at least meets the ordinance standards;
3. The city is satisfied that the facility has a legally obligated entity responsible for its long-term operation and maintenance.
(g) **Accepted alternatives to stormwater pond treatments.** Alternative treatments may be installed and shall be reviewed and approved by the city. Alternative treatments are included but are not limited to those stated in the Minnesota Stormwater Manual.

(h) **Maintenance of private stormwater facilities.** All private stormwater facilities shall be maintained by the owner in proper condition consistent with the performance standards for which they were originally designed.

1. All settled materials from sumps, grit chambers, and other devices, including settled solids, shall be removed and properly disposed of on an annual basis. One- to five-year waivers from this requirement may be granted by the city when the owner presents evidence that the facility has additional capacity to remove settled solids in accordance with the original design capacity.

2. Ponds shall be inspected at least once every five years to determine if settled materials should be removed. Settled materials shall be removed and properly disposed of when the pond is no longer functioning at the original design capacity.

3. When requested by the city, a maintenance plan must be provided that defines who will conduct the maintenance, the type of maintenance and the maintenance intervals of a private stormwater facility before the facility is approved.

4. All stormwater facilities must be designed to minimize the need for maintenance, to provide easy vehicle and personnel access for maintenance purposes, and be structurally sound. It shall be the responsibility of the applicant to obtain any necessary easements or other property interests to allow access to the facilities for inspection or maintenance.

5. The city shall have the right to request and review inspection and maintenance records and shall have the right to perform an inspection of stormwater facilities at any time if the city has probable cause to believe that the facilities are not being properly maintained or inspected. A charge based on current wages will be assessed to the owner for any inspections or maintenance that needs to be performed.

(Ord. No. 07-05, § 1, 6-18-2007)

Sec. 30-2176. - Enforcement.

(a) **Notice of violation.**

1. **Upon discovering that a person has violated a prohibition or failed to meet a requirement of this section, under the provisions of this article the city administrator or designee shall serve a notice upon the owner of the property upon which the nuisance exists.** Such notice shall be given by certified mail at the last known address as shown on the property tax records of the county. Such notice shall advise that a nuisance exists and require the property owner to abate the nuisance within a reasonable time, as established by the city administrator or designee and stated in the notice. Such time shall not be less than 14 days. Such notice may require without limitation:

   a. The performance of monitoring, analyses, and reporting;

   b. The elimination of illicit connections or discharges;

   c. That violating discharges, practices, or operations shall cease and desist;

   d. The abatement or remediation of stormwater pollution or contamination hazards and the restoration of any affected property; and
e. Payment of a fine to cover administrative and remediation costs; and

f. The implementation of source control or treatment BMPs.

(2) Such notice shall also advise the property owner of the right to request a hearing before the city administrator or designee to contest the contents of the notice.

(3) If requested by the person upon whom the notice is served under subsection (a) of this section, a hearing before the city administrator or designee shall be held at which the person may contest the contents of the notice. The request for such a hearing must be made within five days after receipt of the notice provided for in subsection (a) of this section. After such hearing the city administrator or designee may affirm the notice, modify the notice or quash the notice.

(4) If the property owner does not abate the nuisance as required by the notice provided for in subsection (a) of this section and has not requested a hearing before the city administrator or designee under subsection (2) of this section, authorized agents of the city shall abate the nuisance. The cost of such abatement shall be collected as a special assessment against the property upon which the nuisance was located.

(5) If the property owner requests a hearing before the city administrator or designee under subsection (2) of this section, no abatement actions shall be taken until the hearing is held. If after the hearing the city administrator or designee affirms or modifies the notice and the nuisance is not abated as provided in the notice as affirmed or modified, authorized agents of the city shall abate the nuisance. The cost of such abatement shall be collected as a special assessment against the property upon which the nuisance was located.

(6) Nothing in this section prevents abatement by the city of a public nuisance without notice and hearing in the case of an emergency in which there is an immediate and direct threat to the public health or safety. The expense of such an emergency abatement shall be collected as a special assessment against the property upon which the nuisance was located.

(Ord. No. 07-05, § 1, 6-18-2007)

Sec. 30-2177. – Financial Securities.

(a) The city may require bonds in such form and amounts necessary to assure that the work is completed in accordance with the approved plans and specifications.

(b) In lieu of a surety bond the applicant may file a cash bond or instrument of credit with the city in an amount equal to that which would be required in the surety bond.

(c) If requested by the applicant, the amount of the financial security may be reduced by the city. Such reduction will be based upon the extent to which the grading and restoration have been completed and shall consider the continued need for erosion control.
### Appendix F – Construction Site Plan Review Form

<table>
<thead>
<tr>
<th>#</th>
<th>Topic</th>
<th>Question</th>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
<th>Comments</th>
</tr>
</thead>
</table>
| 1  | Contact Information        | Does the Applicant have ALL required contact information for both the Owner and the Contractor?  
• Name  
• Address  
• Phone Number  
• Email Address |     |    |     |         |
<p>| 2  | Project Location          | Is the name and location of the project provided on the application?     |     |    |     |         |
| 3  | Applicability             | Does the proposed construction activity disturb at least 10,000 sq. ft.? Document the disturbed area in the comments. |     |    |     |         |
| 4  | Certification             | Are the SWPPP and construction plans signed and certified by an accredited professional? |     |    |     |         |
| 5  | MPCA Coverage             | Is proof of coverage under the MPCA’s NPDES permit included for construction activity that disturbs greater than one (1) acre? |     |    |     |         |
| 6  | Impervious Surfaces       | Is the impervious surface for pre- and post-construction conditions specified? Document impervious area in the comments. |     |    |     |         |
| 7  | Project Narrative         | Does the SWPPP include a description of the proposed construction activities? |     |    |     |         |
| 8  | Project Schedule          | Does the SWPPP include a schedule of major construction activities, including the start and end of construction? |     |    |     |         |
| 9  | Responsible Parties       | Is a chain of responsibility for SWPPP implementation included, i.e. responsible party contacts? |     |    |     |         |
| 10 | Training                  | Is training documented and adequate for SWPPP responsibilities?          |     |    |     |         |
| 11 | Quantities                | Are estimated preliminary BMP and earthwork quantities provided?         |     |    |     |         |</p>
<table>
<thead>
<tr>
<th>#</th>
<th>Topic</th>
<th>Question</th>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Site Maps</td>
<td>Is a site map or series of site maps attached with the following:</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• Existing and final grades</td>
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<td></td>
<td></td>
<td>• Flow directions for pre- and post-construction conditions</td>
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<td></td>
<td></td>
<td>• Areas of steep slopes, defined as at least 3:1 (H:V)</td>
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<tr>
<td></td>
<td></td>
<td>• Impervious surfaces</td>
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<td></td>
<td></td>
<td>• Soil types</td>
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<td></td>
<td></td>
<td>• Locations of pollutant-generating activities</td>
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<td></td>
<td></td>
<td>• Locations of areas not to be disturbed, i.e. buffer zones</td>
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<td></td>
<td></td>
<td>• Surface waters and wetlands within one (1) mile of the project</td>
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</tr>
<tr>
<td>13</td>
<td>Erosion Control Plan</td>
<td>Is an erosion control plan provided including locations of proposed BMPs, grading sections, and BMP details?</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>14</td>
<td>T&amp;E Species</td>
<td>Are stormwater BMPs designed to accommodate threatened/endangered species expected to be at the site, i.e. wildlife friendly erosion control blanket?</td>
<td></td>
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<tr>
<td>15</td>
<td>Chemical Treatments</td>
<td>Are controls described to adequately control chemical treatments and processes that are present at the project, i.e. if flocculent is used for a sediment basin?</td>
<td></td>
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<tr>
<td>16</td>
<td>Pollution Prevention</td>
<td>Are building products, fertilizers, hazardous materials, and solid wastes protected to minimize exposure to stormwater?</td>
<td></td>
<td></td>
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<tr>
<td>17</td>
<td>Fueling &amp; Equipment Maintenance</td>
<td>Will fueling and equipment maintenance be performed in a contained area?</td>
<td></td>
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</tr>
<tr>
<td>18</td>
<td>Vehicle &amp; Equipment Washing</td>
<td>Is vehicle and equipment washing limited to a defined area of the site, with runoff contained in a sediment basin or equivalent control?</td>
<td></td>
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<tr>
<td>#</td>
<td>Topic</td>
<td>Question</td>
<td>YES</td>
<td>NO</td>
<td>N/A</td>
<td>Comments</td>
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</tr>
<tr>
<td>19</td>
<td>Concrete Washout</td>
<td>Is effective containment provided for all liquid and solid wastes generated by washout operations? Will a sign be installed next to each washout facility?</td>
<td></td>
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<tr>
<td>20</td>
<td>Sanitary Facilities</td>
<td>Are portable restrooms positioned so that they are secure and not tipped or knocked over?</td>
<td></td>
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<tr>
<td>21</td>
<td>Soil Compaction</td>
<td>Are methods used to minimize soil compaction and preserve topsoil described? Note that minimizing soil compaction is not required where the function of a specific area dictates that soil is compacted.</td>
<td></td>
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<tr>
<td>22</td>
<td>Perimeter Controls</td>
<td>Are sediment control BMPs established on all down-gradient perimeters, with a plan to install such BMPs prior to the commencement of upgradient land disturbance?</td>
<td></td>
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</tr>
<tr>
<td>23</td>
<td>Stockpile Protection</td>
<td>Are sediment control BMPs provided around stockpiles? Note that stockpiles may not be placed in natural buffers, surface waters, or other conveyances.</td>
<td></td>
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<tr>
<td>24</td>
<td>Slope Breaks</td>
<td>Are slope breaks or ditch checks provided in drainageways and other areas with extended, continuous slope?</td>
<td></td>
<td></td>
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<tr>
<td>25</td>
<td>Vehicle Tracking</td>
<td>Are Vehicle Tracking Controls (VTCs) included for all areas where construction vehicles exit the site?</td>
<td></td>
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<tr>
<td>26</td>
<td>Natural Buffers</td>
<td>Is a 50-foot natural buffer provided between disturbed areas and surface waters? If not, are redundant perimeter controls provided?</td>
<td></td>
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<tr>
<td>27</td>
<td>Inlet Protection</td>
<td>Are all culverts and catch basins protected with adequate inlet protection?</td>
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<tr>
<td>28</td>
<td>Outlet Protection</td>
<td>Are pipe outlets provided with adequate energy dissipation within 24 hours after connection?</td>
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<tr>
<td>29</td>
<td>Dewatering</td>
<td>Are dewatering activities planned to discharge in a manner that does not cause nuisance condition or downstream erosion?</td>
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<tr>
<td>#</td>
<td>Topic</td>
<td>Question</td>
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<td>NO</td>
<td>N/A</td>
<td>Comments</td>
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<tr>
<td>30</td>
<td>Sediment Basins</td>
<td>Are temporary or permanent sediment basins designed to prevent the discharge of floating debris, are they designed with a stabilized emergency overflow, and is energy dissipation provided at the basin outlet?</td>
<td></td>
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<tr>
<td>31</td>
<td>Infiltration BMP Prohibitions</td>
<td>Are infiltrations BMPs located away from areas where infiltration is prohibited, as described by the state’s NPDES permit in Section III.D.1.?</td>
<td></td>
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<tr>
<td>32</td>
<td>Infiltration BMP Protection</td>
<td>Are infiltration BMPs protected with rigorous erosion prevention and sediment controls and staked off to prevent soil compaction?</td>
<td></td>
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<tr>
<td>33</td>
<td>Infiltration BMP Pre-treatment</td>
<td>Is a pre-treatment device provided, such as a vegetated filter strip, to settle particles and prevent clogging of infiltration BMPs?</td>
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<tr>
<td>34</td>
<td>Special / Impaired Waters</td>
<td>Does the SWPPP address all additional requirements that apply to special/impaired waters as outlined in Appendix A of the state’s NPDES permit?</td>
<td></td>
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<tr>
<td>35</td>
<td>Waters with Approved TMDL/WLA</td>
<td>Does the SWPPP include BMPs identified in the receiving water TMDL to satisfy the TMDL or Waste Load Allocation (WLA) requirements, as applicable to pollutants or stressors identified in Appendix A of the state’s NPDES permit?</td>
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<tr>
<td>36</td>
<td>Permanent Stormwater Management</td>
<td>Does the project include a permanent stormwater management system? Is a maintenance plan included identifying who is responsible for long-term maintenance of the system?</td>
<td></td>
<td></td>
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<tr>
<td>37</td>
<td>Design Calculations</td>
<td>Are design calculations or model results provided for permanent stormwater management systems?</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>38</td>
<td>BMP Suitability</td>
<td>Do BMPs appear to be designed to adequately handle runoff? Consider off-site drainage areas, channelized flows, impervious surfaces, steep slopes, and nearby sensitive areas.</td>
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<tr>
<td>#</td>
<td>Topic</td>
<td>Question</td>
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<td>NO</td>
<td>N/A</td>
<td>Comments</td>
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<tr>
<td>39</td>
<td>General Stabilization</td>
<td>Does the applicant specify the appropriate timeline for stabilizing disturbed areas, i.e. within 14 days of construction ending in that area, or 7 days for areas that are within 1 mile and drain to special/impaired waters?</td>
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<tr>
<td>40</td>
<td>Drainageway Stabilization</td>
<td>Is the last 200 lineal feet of any drainageway specified to be stabilized within 24 hours of connecting to a surface water / property edge?</td>
<td></td>
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<tr>
<td>41</td>
<td>Channelized Stabilization</td>
<td>Is erosion control blanket specified for stabilization in channelized flow areas?</td>
<td></td>
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<tr>
<td>42</td>
<td>Final Stabilization</td>
<td>Are final stabilization methods adequate for the site, including the seed mix to be used?</td>
<td></td>
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<tr>
<td>43</td>
<td>Inspections</td>
<td>Does the applicant specify inspections every seven (7) days and within 24 hours of a storm event that produces at least 0.5-inches of rain in a 24-hour period?</td>
<td></td>
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<tr>
<td>44</td>
<td>Perimeter Control Maintenance</td>
<td>Will perimeter controls be repaired, replaced, or supplemented when they become nonfunctional or the sediment reaches one-half (1/2) the height of the device? Will the repairs be made by the end of the next business day after discovery, or as soon as field conditions allow access?</td>
<td></td>
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<tr>
<td>45</td>
<td>Sediment Basin Maintenance</td>
<td>Will sediment basins be drained and the sediment removed when the depth of sediment collected in the basin reaches one-half (1/2) the height of the device? Will the drainage and removal be completed within 72 hours of discovery, or as soon as field conditions allow access?</td>
<td></td>
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<tr>
<td>46</td>
<td>Surface Water Maintenance</td>
<td>Will all deltas and deposited sediment be removed from surface waters, including drainage ditches and conveyance systems, within seven (7) days of discovery, or as soon as field conditions allow access?</td>
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<tr>
<td>47</td>
<td>Off-Site Sediment Recovery</td>
<td>Will tracked sediments be removed from all paved surfaces, adjacent roadways, and other off-site areas, within 24 hours of discovery?</td>
<td></td>
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<tr>
<td>#</td>
<td>Topic</td>
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<tr>
<td>48</td>
<td>Infeasibility and Exemptions</td>
<td>If the applicant determined that any SWPPP requirements are infeasible, are such determinations based on reasonable premise and documented accordingly?</td>
<td></td>
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</tbody>
</table>

### Submittal Review Closeout

**Reviewer:**

**Signature:**

**Date:**

*Check the box appropriate box below to complete your review:*

- The site plans meet the criteria above and the applicant may obtain permit coverage.
- The site plans must be corrected for the deficiencies below prior to obtaining permit coverage:
  - **Deficiencies, if applicable:**

---

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## Appendix G – Erosion Control Inspections

### Background

<table>
<thead>
<tr>
<th>Site Name:</th>
<th>Developer:</th>
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<tbody>
<tr>
<td>Site Address:</td>
<td>Contractor:</td>
</tr>
<tr>
<td>Inspector Name:</td>
<td>Responsible Party for Erosion Control:</td>
</tr>
<tr>
<td>Active Construction (Y/N):</td>
<td>Inspection Date:</td>
</tr>
<tr>
<td>Inspection Type (circle):</td>
<td>Inspection Time:</td>
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<tr>
<td>Routine Complaint</td>
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### Weather

<table>
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<tr>
<th>Current Temperature (°F):</th>
<th>Recent Precipitation (in.):</th>
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</thead>
<tbody>
<tr>
<td>Cloud Cover (circle):</td>
<td>Forecasted Precipitation (Y/N):</td>
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<tr>
<td>Sunny Mix</td>
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</tr>
<tr>
<td>Sunny</td>
<td>Cloudy</td>
</tr>
<tr>
<td>Appx. Wind Speed (mph):</td>
<td>Forecasted Precipitation Date(s):</td>
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### Previous Inspections / Complaints

<table>
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<th>Previous Inspection Date:</th>
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<tr>
<td>Responsive Actions Due:</td>
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<tr>
<td>Recent Complaints:</td>
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<tr>
<td>Date(s) of Complaints:</td>
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<tr>
<td>#</td>
<td>Question</td>
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<td>----</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Is the SWPPP available at the project site?</td>
</tr>
<tr>
<td>2</td>
<td>Have sediment control BMPs been installed on all necessary down-gradient perimeters, including culvert and catch basin inlets?</td>
</tr>
<tr>
<td>3</td>
<td>Are sensitive areas adequately protected with BMPs, multiple if necessary?</td>
</tr>
<tr>
<td>4</td>
<td>Are all erosion and sediment control measures in proper functioning condition?</td>
</tr>
<tr>
<td>5</td>
<td>Are stockpiles located, protected, and stabilized correctly?</td>
</tr>
<tr>
<td>6</td>
<td>Do discharge points (e.g. drainage ways, outlets, outfalls) and basins (retention/detention) need maintenance?</td>
</tr>
<tr>
<td>7</td>
<td>Is turbid water leaving the site?</td>
</tr>
<tr>
<td>8</td>
<td>Is trash, debris and/or hazardous waste in work area collected &amp; disposed of properly?</td>
</tr>
<tr>
<td>9</td>
<td>Are vehicle tracking controls present and functional where vehicles leave the site?</td>
</tr>
<tr>
<td>10</td>
<td>Has sediment been tracked onto paved roads?</td>
</tr>
<tr>
<td>11</td>
<td>Is dust adequately controlled?</td>
</tr>
<tr>
<td>12</td>
<td>Are concrete and equipment washout areas properly located, labeled, and used?</td>
</tr>
<tr>
<td>13</td>
<td>Did any BMPs fail to operate as designed or prove inadequate for a particular location?</td>
</tr>
<tr>
<td>14</td>
<td>Have stabilization measures been initiated for exposed soil in areas where construction is temporarily suspended or complete?</td>
</tr>
<tr>
<td>15</td>
<td>Are there any action items to be addressed not outlined above?</td>
</tr>
<tr>
<td>Corrective Actions Needed (Check Which Apply)</td>
<td>Permit Response/Maintenance Period</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
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</tr>
<tr>
<td>Post the SWPPP at the construction site</td>
<td></td>
</tr>
<tr>
<td>Install or maintain perimeter controls</td>
<td></td>
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<tr>
<td>Install or maintain inlet protection devices</td>
<td></td>
</tr>
<tr>
<td>Clean trash or other debris</td>
<td></td>
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<tr>
<td>Install or maintain vehicle tracking controls</td>
<td></td>
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<tr>
<td>Sweep/clean paved roads</td>
<td></td>
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<tr>
<td>Apply dust control measures</td>
<td></td>
</tr>
<tr>
<td>Maintain surface waters and drainageways</td>
<td></td>
</tr>
<tr>
<td>Initiate stabilization measures</td>
<td></td>
</tr>
<tr>
<td>Recover off-site sediment deposition(s)</td>
<td></td>
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<tr>
<td>Other (describe):</td>
<td></td>
</tr>
</tbody>
</table>

**Inspection Report Closeout**

Signature:  

Date:  

Appendix H – Post-Construction Stormwater Management Review Program

<table>
<thead>
<tr>
<th>#</th>
<th>Topic</th>
<th>Question</th>
<th>YES</th>
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<th>N/A</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Plan Review Part III.D.5a(1)</td>
<td>Have the owners submitted site plans with post-construction stormwater management BMPs to the permittee for review and approval, prior to start of construction activity?</td>
<td></td>
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</tbody>
</table>

**Conditions of Post-Construction Stormwater Management**

<table>
<thead>
<tr>
<th>#</th>
<th>Topic</th>
<th>Question</th>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
<th>Comments</th>
</tr>
</thead>
</table>
| 2  | Runoff Volume Part III.D.5a(2) | - Does the stormwater discharge for new development projects have no net runoff increase from pre-project conditions?  
- Does the stormwater discharge for redevelopment projects have a net reduction in runoff from pre-project conditions? (Exceptions stated in Part III.D.5a(3)) | | | | |
| 3  | Total Suspended Solids (TSS) Part III.D.5a(2) | - Does the stormwater discharge for new development projects have no net TSS increase from pre-project conditions?  
- Does the stormwater discharge for redevelopment projects have a net reduction in TSS from pre-project conditions? | | | | |
| 4  | Total Phosphorus (TP) Part III.D.5a(2) | - Does the stormwater discharge for new development projects have no net TP increase from pre-project conditions?  
- Does the stormwater discharge for redevelopment projects have a net reduction in TP from pre-project conditions? | | | | |

**Stormwater Management Limitations and Exceptions - Part III.D.5a(3)**

**Limitations - Part III.D.5a(3)a**

The City prohibits the use of infiltration techniques to achieve the conditions for post-construction stormwater management in Part III.D.5a(2) when the infiltration structural stormwater BMP will receive discharges from, or be constructed in areas:

<table>
<thead>
<tr>
<th>#</th>
<th>Topic</th>
<th>Question</th>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Part III.D.5a(3)(a)(1)a</td>
<td>Where industrial facilities are not authorized to infiltrate industrial stormwater under an NPDES/SDS Industrial Stormwater Permit issued by the Agency</td>
<td></td>
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<tr>
<td>6</td>
<td>Part III.D.5a(3)(a)(1)b</td>
<td>Where vehicle fueling and maintenance occurs</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>7</td>
<td>Part III.D.5a(3)(a)(1)c</td>
<td>With less than three (3) feet of separation distance from the bottom of the infiltration system to the elevation of the seasonally saturated soils or the top of bedrock</td>
<td></td>
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<tr>
<td>8</td>
<td>Part III.D.5a(3)(a)(1)d</td>
<td>Where high levels of contaminants in soil or groundwater will be mobilized by the infiltrating stormwater</td>
<td></td>
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</tbody>
</table>

The City restricts the use of infiltration techniques to achieve the conditions for post-construction stormwater management, without higher engineering review, sufficient to provide a functioning treatment system and prevent adverse impacts to groundwater, when the infiltration device will be constructed in areas:
<table>
<thead>
<tr>
<th>#</th>
<th>Topic</th>
<th>Question</th>
<th>YES</th>
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<tbody>
<tr>
<td>9</td>
<td>Part III.D.5.a(3)(a)(2)a</td>
<td>With predominately Hydrologic Soil Group D (clay) soils</td>
<td></td>
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<td>10</td>
<td>Part III.D.5.a(3)(a)(2)b</td>
<td>Within 1,000 feet up-gradient, or 100 feet down-gradient of active karst features</td>
<td></td>
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<td>11</td>
<td>Part III.D.5.a(3)(a)(2)c</td>
<td>Within a Drinking Water Supply Management Area (DWSMA) as defined in Minn. R. 4720.5100, subp. 13</td>
<td></td>
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<tr>
<td>12</td>
<td>Part III.D.5.a(3)(a)(2)d</td>
<td>Where soil infiltration rates are more than 8.3 inches per hour</td>
<td></td>
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<tr>
<td>13</td>
<td>Part III.D.5.a(3)(a)(3)</td>
<td>For linear projects where the lack of right-of-way precludes the installation of volume control practices that meet the conditions for post-construction stormwater management in Part III.D.5.a(2), the City may allow exceptions as described in Part III.D.5.a(3)(b). The City shall ensure that a reasonable attempt be made to obtain right-of-way during the project planning process.</td>
<td></td>
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</table>

**Exceptions for Stormwater Discharge Volume - Part III.D.5a(3)b**

The City may allow for lesser volume control on the site of the original construction activity than that in Part III.D.5.a(2) only under the following circumstances:

<table>
<thead>
<tr>
<th>#</th>
<th>Topic</th>
<th>Question</th>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>14</td>
<td>Part III.D.5.a(3)(b)(1)</td>
<td>The owner and/or operator of a construction activity is precluded from infiltrating stormwater through a designed system due to any of the infiltration related limitations described above, AND</td>
<td></td>
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<tr>
<td>15</td>
<td>Part III.D.5.a(3)(b)(2)</td>
<td>The owner and/or operator of the construction activity implements, to the MEP, volume reduction techniques, other than infiltration, (e.g., evapotranspiration, reuse/harvesting, conservation design, green roofs, etc.) on the site of the original construction activity that reduces stormwater discharge volume, but may not meet the conditions for post-construction stormwater management in Part III.D.5.a(2).</td>
<td></td>
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**Mitigation Provisions - Part III.D.5a(4)**

There may be circumstances where the permittee or other owners and operators of a construction activity cannot effectively meet the conditions for post-construction stormwater management for TSS and/or TP in Part III.D.5.a(2) on the site of the original construction activity. For this purpose, the permittee shall identify, or may require owners or operators of a construction activity to identify, locations where mitigation projects can be completed. The City shall ensure that any stormwater discharges of TSS and/or TP not addressed on the site of the original construction activity are addressed through mitigation and, at a minimum, shall ensure the following requirements are met:

<table>
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<tr>
<th>#</th>
<th>Topic</th>
<th>Question</th>
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<th>NO</th>
<th>N/A</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>16</td>
<td>Part III.D.5.a(4)(a)</td>
<td>Mitigation project areas are selected in the following order of preference:</td>
<td></td>
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<tr>
<td>17</td>
<td>Part III.D.5.a(4)(a)(1)</td>
<td>Locations that yield benefits to the same receiving water that receives runoff from the original construction activity</td>
<td></td>
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<tr>
<td>18</td>
<td>Part III.D.5.a(4)(a)(2)</td>
<td>Locations within the same Department of Natural Resource (DNR) catchment area as the original construction activity</td>
<td></td>
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<tr>
<td>19</td>
<td>Part III.D.5.a(4)(a)(3)</td>
<td>Locations in the next adjacent DNR catchment area up-stream</td>
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<tr>
<td>#</td>
<td>Topic</td>
<td>Question</td>
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<tr>
<td>20</td>
<td>Part III.D.5.a(4)(a)(4)</td>
<td>Locations anywhere within the permittee’s jurisdiction</td>
<td></td>
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</tr>
<tr>
<td>21</td>
<td>Part III.D.5.a(4)(b)</td>
<td>Mitigation projects must involve the creation of new structural stormwater BMPs or the retrofit of existing structural stormwater BMPs, or the use of a properly designed regional structural stormwater BMP</td>
<td></td>
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<tr>
<td>22</td>
<td>Part III.D.5.a(4)(c)</td>
<td>Routine maintenance of structural stormwater BMPs already required by this permit cannot be used to meet mitigation requirements of this Part.</td>
<td></td>
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<tr>
<td>23</td>
<td>Part III.D.5.a(4)(d)</td>
<td>Mitigation projects shall be completed within 24 months after the start of the original construction activity.</td>
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<tr>
<td>24</td>
<td>Part III.D.5.a(4)(e)</td>
<td>The permittee shall determine, and document, who is responsible for long-term maintenance on all mitigation projects of this Part.</td>
<td></td>
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<tr>
<td>25</td>
<td>Part III.D.5.a(4)(f)</td>
<td>If the permittee receives payment from the owner and/or operator of a construction activity for mitigation purposes in lieu of the owner or operator of that construction activity meeting the conditions for post-construction stormwater management in Part III.D.5.a(2), the permittee shall apply any such payment received to a public stormwater project, and all projects must be in compliance with Part III.D.5.a(4)(a)-(e).</td>
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</tbody>
</table>

**Long-term maintenance of structural stormwater BMPs - Part III.D.5a(5)**

The City shall provide for the establishment of legal mechanism(s) between the permittee and owners or operators responsible for the long-term maintenance of structural stormwater BMPs not owned or operated by the permittee, that have been implemented to meet the conditions for post-construction stormwater management in Part III.D.5a(2). This only includes structural stormwater BMPs constructed after the effective date of this permit, that are directly connected to the permittee’s MS4, and that are in the permittee’s jurisdiction. The legal mechanism shall include provisions that, at a minimum:

<table>
<thead>
<tr>
<th>#</th>
<th>Topic</th>
<th>Question</th>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>Part III.D.5.a(5)(a)</td>
<td>Allow the permittee to conduct inspections of structural stormwater BMPs not owned or operated by the permittee, perform necessary maintenance, and assess costs for those structural stormwater BMPs when the permittee determines that the owner and/or operator of that structural stormwater BMP has not conducted maintenance.</td>
<td></td>
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<tr>
<td>27</td>
<td>Part III.D.5.a(5)(b)</td>
<td>Include conditions that are designed to preserve the permittee’s right to ensure maintenance responsibility, for structural stormwater BMPs not owned or operated by the permittee, when those responsibilities are legally transferred to another party.</td>
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<tr>
<td>#</td>
<td>Topic</td>
<td>Question</td>
<td>YES</td>
<td>NO</td>
<td>N/A</td>
<td>Comments</td>
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<tr>
<td>28</td>
<td>Part III.D.5.a(5)(c)</td>
<td>Include conditions that are designed to protect/preserve structural stormwater BMPs and site features that are implemented to comply with Part III.D.5.a(2). If site configurations or structural stormwater BMPs change, causing decreased structural stormwater BMP effectiveness, new or improved structural stormwater BMPs must be implemented to ensure the conditions for post-construction stormwater management in Part III.D.5.a(2) continue to be met.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Site Plan Review Part III.D.5.b</td>
<td>The program shall include written procedures for site plan reviews conducted by the permittee prior to the start of construction activity, to ensure compliance with requirements of the Regulatory Mechanism(s).</td>
<td></td>
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</tr>
<tr>
<td>30</td>
<td>Documentation Part III.D.5.c(1)</td>
<td>Any supporting documentation used by the permittee to determine compliance with Part III.D.5.a, including the project name, location, owner and operator of the construction activity, any checklists used for conducting site plan reviews, and any calculations used to determine compliance</td>
<td></td>
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</tr>
<tr>
<td>31</td>
<td>Documentation Part III.D.5.c(2)</td>
<td>All supporting documentation associated with mitigation projects authorized by the permittee</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Documentation Part III.D.5.c(3)</td>
<td>Payments received and used in accordance with Part III.D.5.a(4)(f)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Documentation Part III.D.5.c(4)</td>
<td>All legal mechanisms drafted in accordance with Part III.D.5.a(5), including date(s) of the agreement(s) and name(s) of all responsible parties involved</td>
<td></td>
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</table>

**Elk River City Code – Article VII Stormwater Management**

<table>
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<tr>
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<th>YES</th>
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<th>N/A</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>34</td>
<td>Impervious Runoff Volume Elk River City Code Sec. 30-2175 (a)6(a/b)</td>
<td>For new construction and redevelopment projects, is 1.1 inches of runoff over the area of new and/or fully redeveloped impervious surfaces captured and retained on site?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 35 | Impervious Runoff Volume Elk River City Code Sec. 30-2175 (a)6(c) | For linear projects, is the larger of the two following captured and retained on site?  
- 0.55 inches of runoff from new and fully reconstructed impervious areas  
- 1.1 inches of runoff from the net increase in impervious areas |     |    |     |          |
| 36 | Total Suspended Solids (TSS) Elk River City Code Sec. 30-2175 (a)7(a) | Does the stormwater discharge for new development projects have an 80% TSS removal from pre-project conditions? |     |    |     |          |
| 37 | Total Phosphorus (TP) Elk River City Code Sec. 30-2175 (a)7(b) | Does the stormwater discharge for projects have a 60% post-development removal of TP from pre-project conditions? |     |    |     |          |
# Submittal Review Closeout

**Reviewer:**  

**Signature:**  

**Date:**  

---

**Check the box appropriate box below to complete your review:**

<table>
<thead>
<tr>
<th>The site plans meet the criteria above and the applicant may obtain permit coverage.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The site plans must be corrected for the deficiencies below prior to obtaining permit coverage:</td>
<td></td>
</tr>
<tr>
<td>Deficiencies, if applicable:</td>
<td></td>
</tr>
</tbody>
</table>
Appendix I – Social Media
Factsheet Title

- **HEADING 1**
  - Text
  - Bullets
  - Bullets
  - Bullets

- **HEADING 2**
  - Text

Contact us!
  - email@elkrivermn.org
  - XXX.XXX.XXXX
  - www.elkrivermn.org/EXAMPLE

IMAGE

IMAGE
Factsheet Title

**HEADING 1**
Text
- Bullets
- Bullets
- Bullets

**HEADING 2**
Text
Click to edit Master text styles

- Second level
  - Third level
    - Fourth level
      » Fifth level
Click to edit Master text styles

- Second level
  - Third level
    - Fourth level
      » Fifth level

Click to edit Master text styles

- Second level
  - Third level
    - Fourth level
      » Fifth level
Click to edit Master text styles

– Second level
  • Third level
    – Fourth level
      » Fifth level
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Appendix J – Staff Training Presentations
Purpose of this training...

- To learn about contamination issues;
- To prevent discharge of contaminants into water resources;
- Main Objective 3

Contact Information
Vehicle Maintenance & Storage

Vehicles add a number of contaminants like petroleum, suspended solids, heavy metals, and salts are released during maintenance activities. Stormwater runoff can pick up these contaminants and transports them to drainage systems.

The EPA considers wash water to be a non-stormwater discharge, and therefore wash water must be sent to a sanitary sewer or treated on-site.

Prevent Contamination Runoff: Maintenance

Where
• Store vehicles indoors or covered facility.
• Avoid parking over a storm drain.

How
• Use drip pans and other containment measures.
• Dispose of greasy rags, oil filters, air filters, batteries, spent coolant, and degreasers following MPCA or county hazardous waste guidelines.
• Tag vehicles that have been drained of fluids.

When
• Sweep maintenance areas daily to remove dirt and debris.
• Inspect vehicles and equipment for leaks regularly.
• Scrap metal should be disposed of regularly.
Prevent Contamination Runoff: Washing

Where
- Wash vehicles in a designated covered area.
- Wash vehicles over a wastewater collection or treatment system.

How
- If wastewater collection or treatment system is unavailable, haul contents of holding tank to a treatment plant.
- In areas with a storm sewer, block or plug the storm sewer and sump or vacuum out wash water then dispose of it in a sanitary sewer or holding tank.

Prevent Contamination Runoff: Fueling

- Spill Response Protocols shall be well labeled and posted near the fueling area.
- A spill kit and covered container should be near the fueling area or inside each vehicle if off-site.
- Report and replace any leaking equipment immediately!
- Personnel must always be outside the vehicle and within view of the hose.

- Always use a funnel when pouring fuel from a can.
- Small equipment should be fueled over a paved or contamination area.
- Do not “top off” vehicles or tanks.
- Wash work areas only where wastewater can drain into a sanitary sewer.
### Prevent Contamination Runoff: Storage

#### General
- Avoid loading/unloading materials during rain events or provide cover for activities.
- Inspect container structural integrity prior to loading or unloading.
- Label all containers and store materials indoors or provide cover if outside.
- Inspect storage areas for spills or leaks and verify that containment units for corrosion or failure are present.
- Plug or disconnect floor drains that lead to stormwater system.

#### Hazardous Materials
- Maintain an inventory of all raw and waste materials and keep all materials in their original containers.
- Store sufficient volumes of material with secondary containment measures capable of storing 110% of the volume.
- Provide sufficient aisle clearance to allow for routine inspection and access for cleanup.
- For materials less than 50 gallons, use spill trays and pallets to keep material off the ground and to collect minor spills and leaks.
### Prevent Contamination Runoff: Storage

| Store waste and bulk materials in designated covered areas, away from high-traffic areas, and on an impervious surface. |
| Whenever possible, dumpsters should be located on flat, paved surfaces, and located away from surface water bodies. Lids should be fully operational and free from holes. |
| Berms or curbs should be installed around the storage area for diversion, collection, or runoff and to prevent vehicular damage to dumpsters. |
| Waste containers and dumpsters should not be washed outdoors. |

### Spill Prevention: General

- Sorbent materials should be kept stocked in the immediate vicinity of where materials are handled (e.g. fueling station, maintenance garage, storage area).
- Equipment such as brooms, shovels, empty drums, drip pans, and buckets should be nearby and easily accessible.
- Tanks, pipes, hoses, and valves should be inspected frequently for possible leaks.
- Shelves for smaller containers should have a lip to keep containers from sliding off easily.
- Large storage vessels should have a containment area large enough to hold 110% of the contents.
Spill Prevention: Petroleum

- Upon discovering a spill, safely stop the spill or leak, if possible.
- Turn off nozzles or close valves from the leaking container or system.
- Use a wooden plug, bolt, band, or putty on a puncture hole.
- Sand, cat litter, ground corn cobs, or other sorbent materials can control the spread until it can be picked up.
- Synthetic sorbent pads can be lowered into sewers, or placed across waterways.
- Build a temporary berm around a flowing liquid.
- A petroleum sheen can usually be distinguished by attempting to break it up. When disturbed, a petroleum sheen will quickly try to reform while a bacterial sheen will break into small platelets. Odor can also be an indicator.

Spill Prevention: Fertilizers & Pesticides

- Stay upwind, out of low areas, and ventilate closed spaces before entering.
- Shut off ignition sources; keep flares, smoking, or flames out of the affected area.
- For small spills, take up with a sorbent material.
- Avoid the use of sawdust or sweeping compounds if the pesticide is a strong oxidizer, as it could create a fire hazard.
Spill Reporting

- Report spills that may cause pollution, such as spills of toxic, flammable, corrosive and dangerous industrial chemicals.
- Also report spills of environmentally damaging materials, including milk, coal, animal parts, batteries, etc.
- Notification is not required for a discharge of five gallons or less of petroleum.
- All reportable spills should be directed to the Minnesota Duty Officer by calling (651) 649-5451 or (800) 422-0798. This is a 24 hour service.
- Call 911 if fire or public safety hazards are created.

Spill Disposal

Petroleum:
- Sorbent materials can be thin-spread on acceptable ground for bacterial degradation.
- Send to an asphalt plant or incinerator that has the proper air pollution controls and permits.
- Manufactured fabric sorbents can be disposed of at permitted incinerators.

Fertilizers and Pesticides:
- Disposal should be handled by a professional waste contractor. Contact MPCA for guidance.
Emergency Response Contractors

**Full Service:**
Bay West Environmental  
5 Empire Dr.  
Saint Paul, MN 55103-1867  
Contact: Bill Lazarz  
(williaml@baywest.com) or ER Lead On-call  
24-hour emergency spill response: (800) 279-0456  
Office phone: (651) 291-0456  
or (800) 279-0456

**Limited Service:**
Midamerica Technical & Environmental Services, Inc.  
6989 N. 55th St., Suite C2  
Oakdale, MN 55128  
Contact: Jim Harms  
(jim@midamericaenv.com)  
Office phone: (651) 779-1900  
or (888) 314-2042
Integrated Pest Management

Fertilizers, herbicides, and insecticides are useful but can also harm the environment when used improperly. These can either be directly toxic to organisms, or can indirectly cause problems such as rapid aquatic plant growth depleting a lake’s dissolved oxygen (eutrophication).

- **Cultural Control**: Selected timing and location of plantings to avoid pests.
- **Host Resistance**: Planting vegetation that is resistant to pests.
- **Mechanical Control**: Weeding, setting insect traps.
- **Biological Control**: Insects to attack invaders, protecting insect predators, parasites, and pathogens.
- **Chemical Control**: Using the least toxic pesticides available as a last resort.
**BMPS: Chemical Preparation**

- Select the least toxic products available to minimize waste and applicator exposure.
- Read and follow all labels.
- Review Material Safety Data Sheets (MSDS) for each chemical.
- Inspect, maintain, and calibrate equipment used for mixing and application.
- Prepare only as much herbicide/pesticide as is needed.

**BMPS: Chemical Handling**

**Cleanup**

- Be prepared with cleanup materials to cleanup spills immediately; use dry cleanup methods (e.g. squeegee and dust pan) rather than hosing down the spill site.
- Cleanup supplies should be located in an easy accessible location and well labeled.
- Dispose of rinse water properly and recycle containers properly. For pesticides, triple rinsing or pressure rinsing with reuse of rinse water for future pesticide applications is recommended. Proper rinsing of pesticide containers is also a requirement of Minnesota State and federal law.

**Storage**

- Monitor all fertilizer/pesticide application quantities and sites in order to provide guidance for future treatments.
- Keep products in their original containers and mark the date of purchase on each container. Use older materials first.
- Properly close containers tightly after each use.
- Store chemicals safely in a ventilated, well lit area that is away from drinking water wells or any other water bodies.
BMPs: Chemical Application

- Consider having the soil tested before applying fertilizer in order to determine what nutrients must be added. This can help prevent overuse and save both the money and the environment’s health.
- Consider causes such as poor soils, insects, disease, or current weather patterns before applying fertilizer as a remedy for poor growth.

Lawn:
Fertilize in fall to prevent shallow root growth

Trees & Shrubs:
Fertilize in early spring or late fall when plants are dormant

BMPs: Chemical Application

- Apply when sufficient calm, dry weather is in the forecast to prevent drift and wash off.
- If accidentally used on an impervious surface, sweep granular fertilizer back onto the grass to prevent it from washing into the storm sewer system.

Bare & Eroding Soil
Streams & Lakes
Wells
BMPs: Chemical Application

Do not over fertilize

- Too much nitrogen will cause plants to grow shallow roots and create a less hardy landscape that requires extra watering.
- Excess phosphorus can lead to eutrophication in waterbodies.
- Healthy trees and shrubs do not require annual fertilizing.

Fertilizer Alternatives: Part 1

**Organic**
- Most organic fertilizers release nutrients more slowly and contain lower concentrations of nutrients.
- Slow release fertilizers are good for sandy soils. Fast-release fertilizers can leach nutrients into the ground water.
- Fast-release fertilizers are more effective for heavy clay or compacted soils.
- Organic fertilizers recycle waste that would otherwise contribute to landfills.

**Grass Clippings**
- Mulching mowers create fine grass clippings that will break down and add nitrogen and organic matter to the soil.
- Leaving grass clippings on the lawn over the season to provides the equivalent of one regular fertilizer application and will not cause thatch.

**Aerate**
- Aerating a compacted lawn allows air, water, and nutrients to reach the roots.
- Leave the small plugs of thatch and soil after aeration and they will quickly decompose.
- The best time to aerate is in the early fall.
Fertilizer Alternatives: Part 2

**Compost**
- Apply a thin layer of compost (1/4” or less) to provide nutrients and additional water-retention properties to combat dry periods.
- High-quality compost is available in nurseries by the bag or in bulk, or you can make your own.
- The best time to apply compost to lawn is in the spring using a wheelbarrow, shovel and lawn rake.
- A 1/4” layer requires about one cubic yard of compost per 1,500 to 2,000 square feet of lawn area.

**Soybeans**
- Michigan State University began using soybeans as turf fertilizer in 2000. Their studies suggest that soybeans perform equal to or better than chemical fertilizers.
- Soybeans add nitrogen, phosphorus, and other plant material to soil in addition to soybeans are phosphorus-free.
- Ground soybeans provide a slow-release of nutrients to the lawn and are harmless.
- Because they are organic, each application improves the growing media, and they will not burn the grass.

Cost Reduction

- A soil sample and nutrient test typically cost less than $25 per sample and is easily the best value for fertilizer minimization. (MPCA MS4 Pollution prevention Guide)
- Soybean and organic fertilizers can be up to three times the cost of standard chemical fertilizer, but reduced labor costs associated with fewer applications (in larger amounts) can help to offset the cost.
- Alternative practices employed in place of fertilizers (see above) can easily be less expensive than chemical application.
Background

Stormwater systems must be properly maintained to remain effective. Clogging and illicit discharges are two of the most common problems these systems face. Structural integrity can also be an issue in older or poorly implemented systems. Keeping these systems well maintained protects the water quality of natural waterbodies and reduce flooding risk.
Catch Basins

- Cleaning catch basins limits conveyance of sediment deposits further downstream.
- Sediment and debris removed from catch basins can potentially be classified as a hazardous waste and must be disposed of properly.
- Catch basins should be inspected at least annually to determine if they need to be cleaned.
- A catch basin should be cleaned if the depth of deposits is greater than or equal to one third of the invert.
- If a catch basin frequently exceeds the 1/3 depth standard, it should be inspected more frequently.

Inspection Schedule:
- Late Fall (after leaves have fallen and prior to first snowfall)
- Spring (soon after the snow melts)

Inlet Protection

- BMPs such as sand bags or commercial inserts can be used to filter stormwater runoff before it enters a catch basin.
- Proper use of inlet guards will decrease stress on the stormwater system and possibly the frequency of cleanings.
- The most common problem with inlet protection BMPs in the winter is clogging due to ice build-up. If ice build-up does occur, it is necessary to manually break-up the ice for removal or use steam to instigate melting. Under no circumstance should salt be used to remove ice around the inlet.

Figure 1. Example of catch basin inlet guard
Figure 2. Catch basin inlet insert
Cleaning Techniques

1. Catch basins can be cleaned either manually or with a vacuum pump.
2. Materials are typically disposed of in a typical municipal landfill.
3. Before disposal, a chemical analysis should be performed to determine if the materials meet the EPA criteria for hazardous waste.
4. Catch basin cleaning with a vacuum truck results in three types of waste:
   1. Decant wastewater which is discharged from the vacuum truck with a sediment trap and hose.
   2. Dump wastewater which is the discharge of both sludge and water from the vacuum truck.
   3. Rinse wastewater which is the discharge resulting from cleaning the inside of the truck after a dump discharge.
   4. These wastes should be disposed of in a sanitary sewer and are prohibited from being discharged back into the storm sewer system, or a surface water body.

Figure 3. Catch basin clearing using a vacuum truck

Disposal

1. If screened for trash and debris, catch basin sediment is exempt from Minnesota solid waste storage standards.
2. Unscreened sediment is classified as industrial solid waste and must be stored in accordance with solid waste storage standards (Minn. R. 7035.2855) and disposed of at a permitted solid waste facility.
3. If you are working at a spill site, hazardous waste cleanup site, or other contaminated area, contact MPCA for disposal instructions.
Screened Sediment

Screened sediment can be reused in any of the following ways without MPCA approval:

- Mixed with new salt/sand mixture for winter application to roads, parking lots, or sidewalks.
- Used as daily cover material at a permitted solid waste landfill that is approved to use the sweepings as Alternative Daily Cover.
- Used as material in commercial and industrial development projects, road restoration, or construction projects.

Sources

- MPCA Stormwater Inlet Protection, 2009
- stormwater.wef.org
- MPCA Pollution Prevention and the MS4 Program.
- MDOE et al. (2008) Resource for Implementing a Street Sweeping Best Practice.
Parking Lots & Street Cleaning

Elk River, MN
2014

Why is Street Sweeping Important?

Appearance:
- Roadway aesthetics present the public with a positive view of special areas. Diligent sweeping presents a pleasing environment for prospective customers, often resulting in increased economic viability for a business district or shopping area.
- Debris can lead to clogging of stormwater systems and flood roads.

Air Quality:
- Particles less than 10 micrometers (microns) in diameter pose a health risk, particularly to those with asthma or respiratory problems. Referred to as PM10 particles of this size, from both natural and anthropogenic sources, are of particular concern.
- Street sweepers listed as “PM10-certified” are capable of a picking-up greater than or equal to 80% of particles less than 10 microns in diameter.
Why is Street Sweeping Important?

Roadway Maintenance Cleanup:
- Sweeping is conducted before and after pavement maintenance such as crack sealing, seal coating, and pothole filling.
- Routine sweeping related to sediment from nearby development projects. This is typically done by a company hired by the developer.

Safety:
- Fine materials may increase the risk of skidding and loss of vehicle control. This is a particular concern with abrasives which are applied during winter.
- Debris can lead to clogging of stormwater systems and flood roads.

Why is Street Sweeping Important?

Water Quality:
- Water quality issues from stormwater runoff typically involve fine particulate matter from roadways. Pollutants bind to the particles and are carried into natural water bodies by stormwater.
Street Sweeping: Timing

Streets should be swept at least twice per year.

Once during the spring after snowmelt. Since the finer particles are more likely to adsorb pollutants, prompt sweeping reduces not only the amount of sediment in catch basins, but also reduces the amount of pollutants entering surface water bodies.

Once during the fall to manage clogging from leaf litter.

Street Sweeping: Parking

The USEPA suggests three strategy for managing parking during sweepings:

- Institute a parking policy to restrict parking in problematic areas during periods of street sweeping.
- Post permanent street sweeping signs in problematic areas; use temporary signs if installation of permanent signs is not possible.
- Develop and distribute flyers notifying residents of street sweeping schedules.
Street Sweeping: Special Attention

Special attention should be given to:

- Roadways with contributing land uses (high level of imperviousness, high level of industrial activity) that would be expected to show high pollutant concentrations.
- Roadways that have consistently accumulated proportionately greater amounts of materials (pounds per mile swept) between currently scheduled sweeps.

Collected Material: Reuse

Screened street sweepings can be reused in any of the following ways without MPCA approval:

- Mixed with new salt/sand mixture for winter application to roads, parking lots, or sidewalks.
- Used as daily cover material at a permitted solid waste landfill that is approved to use the sweepings as Alternative Daily Cover.
- Used as material in commercial and industrial development projects, road restoration, or construction projects. See table 2 for stabilization requirements.

To estimate the size of the storage location, estimate the volume of sweepings either on a ton-per-street mile or on pounds-per-capita basis. An average collection amount for urban areas is 20.25 tons-per street-mile (McCarthy, 2005).
Collected Material: Reuse

Collected Materials can be reused if screened for trash and debris. Street sweepings are exempt from Minnesota solid waste storage standards.

Unscreened sweepings are classified as industrial solid waste and must be stored in accordance with solid waste storage standards (Minn. R. 7035.2855) and disposed of at a permitted solid waste facility.

If you are working at a spill site, hazardous waste cleanup site, or other contaminated area, contact MPCA for disposal instructions.

Collected Material: Reuse

Street sweepings from normal sweeping operations are for reuse in many areas excluding:

- Playgrounds
- Children’s play areas
- Residential yards
- Areas where human contact occurs on a continuous basis
- Areas near drinking water wells
- Wellhead protection areas for public drinking-water supplies
- Sites with karst features, including sinkholes, disappearing streams and caves.
- Near wetlands or surface water
Collected Material: Application

Table 1: Disposal Restrictions

<table>
<thead>
<tr>
<th>Sweepings Applied Near:</th>
<th>Must be Applied No Closer Than:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lakes, rivers, streams, wetlands, intermittent streams, tile inlets, and karst features</td>
<td>200 feet</td>
</tr>
<tr>
<td>Groundwater</td>
<td>3 feet</td>
</tr>
<tr>
<td>Fractured bedrock</td>
<td>3 feet</td>
</tr>
<tr>
<td>Potable water wells</td>
<td>50 feet</td>
</tr>
</tbody>
</table>

Source: MPCA 2010

Street Sweeping Equipment: Chain & Paddle

Pros:
- Effective for wet leaves and sweeping packed dirt
- Able to sweep millings and coarse sand better than belt sweepers
- Less daily build up than belt sweepers
- Requires less power than regenerative air and vacuum sweepers

Cons:
- Paddles limit debris size to 6” diameter or smaller
- Needs to be replaced more often than belt
- Does not pick up fine materials as well as other sweepers
- Particles that do not get picked up are spread across the street surface

Source: MDOT 2008
Street Sweeping Equipment: Belt

**Pros:**
- Able to pick up large debris
- (plastic bottles, cans, branches)
- Effective for wet leaves and sweeping packed dirt
- Requires less power than regenerative air and vacuum sweepers

**Cons:**
- Conveyor must be cleaned daily
- Chip seal aggregate and winter abrasive (sand) can build up inside belt
- Does not pick up fine materials as well as other sweepers
- Particles that do not get picked up are spread across the street surface

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Street Sweeping Equipment: Regenerative Air Sweepers

**Pros:**
- Can remove fine sand and silt, but surface must be dry
- Ability to pick-up materials entrained within cracks
- Can have a larger than average hopper
- Can have vacuum hose attachment
- Regenerative head reaches up to eight feet in width

**Cons:**
- Debris is limited to diameter of air out hose
- Difficulty in picking up wet/matted leaves
- Particles that do not get picked-up are spread across the roadway
- Requires more power than mechanical broom sweepers
- Noisy
- Should be used in above freezing temperatures only
- More efficient operation on flat pavement surface
Street Sweeping Equipment: Vacuum Sweepers

Pros:
- Removes fine sand and silt, but surface must be dry
- Best for situations with most debris in gutter
- Will vacuum material directly from gutter
- Ability to pick up entrained material within cracks under vacuum head
- Can have vacuum hose attachment

Cons:
- Difficulty picking up wet/matted leaves
- Cannot pick up tree brush
- Water must be used in the hopper for dust suppression
- Debris is limited to 3-inch diameter or smaller
- Requires more power than mechanical broom sweepers
- Noisy
- Excessive fan wear will occur if water is not used
- More efficient operation on flat pavement surface
- Should be used in above freezing temperatures only

References
- MDOT et al. (2008) Resource for Implementing a Street Sweeping Best Practice.
- USEPA. NPDES Parking Lot and Street Cleaning - Pollution Prevention/Good Housekeeping for Municipal Operations
Background: Risks

The concentration of chloride is increasing in our surface and ground water largely due to stormwater runoff from road salt storage piles, areas of excessive application, or buildup from years of repeated application.

- Chloride in road salt can create toxic conditions for fish, insects and vegetation.
- Sodium from road salt can compromise soil structure thereby reducing its water retention capacity and increasing the potential for erosion. It can also reach levels in ground water that pose drinking water problems.
- Other materials that could also pose water quality problems could include sand (anti-skid agent), ferrocyanide for anti-caking, and phosphorus (from both salt and the sand).
**Background: Chlorine**

*Figure 1.* Comparison of chloride concentrations in 39 Twin Cities lakes and rock salt use by the state of Minnesota. (Novotny et al. 2007).

**Background: Protective Measures**

- Minnesota Statute 160.215 states that the application of salt and chemicals for snow removal and road de-icing shall be restricted to reduce the pollution of waters.
- Proper road salt storage, handling, and application reduce the risk of downstream water resources pollution.
- Ground water is the source of approximately 70% of the drinking water in Minnesota. Best management practices (BMPs) can help protect GW quality.
- Efficient storage, handling, and application rates can also reduce materials costs.
**Administrative Measures**

- Assign responsibility for monitoring and recording to ensure the task is accomplished.
- Example benchmark data collected could include:
  - Amount of salt/sand applied by driver and road covered.
  - Calibration and maintenance history for each application vehicle.
  - Annual amount of salt applied per unit of weather/precipitation.
- Any data that help the community track use and allow for increased efficiency and decreased overall salt use will be helpful to document.
- Annually review the previous year’s salt management practices and results.
- Use the annual review report to guide next year’s plan and identify new opportunities for BMPs.
- Update the plan to reflect new strategies.
- Communicate progress to staff, senior management, the public and local politicians.

**Equipment Calibration**

Calibration is an essential procedure to measure the amount of material applied to the roadway at various auger settings in relation to truck speed.

- Always calibrate or verify calibration annually.
- Because spreaders vary, calibrate each truck.
- Recalibrate if:
  - Changes are made to the hydraulic system
  - The augers have extensive wear or are resurfaced or replaced
  - A different material is used.
- Follow the manufacturer’s guidelines for calibration, and contact the manufacturer for training.
- Calibrate separately for salt & sand mix vs. salt or sand alone.
- Determine flow rate or calibrate liquid application systems at the same time as the dry systems.
**Equipment Calibration: Sanders**

For manual sander controls, place a chart in your truck to see how much material is applied at each setting, at various speeds.

- Automatic sander controllers:
  - Open-loop controllers monitor only truck speed during operation.
  - Closed-loop controllers monitor both truck speed and spreader discharge.

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**Stockpiles**

- Salt and sand stockpiles should be stored in a permanent covered structure whenever possible. Seasonal taping may serve as an interim BMP until a permanent covered structure is built.
- Sand may be stored outside and uncovered if not in close proximity to storm sewer inlets, or other stormwater conveyance systems.
- Sweeping of storage and loading areas should be done on a regular basis.
- Set up and load under cover and on a level surface wherever possible.
**Stockpiles: Salt and Sand Treating**

**Salt treating**
- Treat with a liquid deicing chemical.
- When treating the stockpile, apply at 4-6 gallons/ton.
- Because leach risk is increased, store the pile on an impervious pad.

**Sand treating**
- Apply treatment of salt brine at 4 gallons/ton.

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**Anti-Icing: Part I**

- Liquids are the most efficient and may be applied days in advance of an event, but closer to the event start time, is best due to dilution from traffic.
- Similar applications of pretreated salts will also work. Use less than 100 lbs/two-lane mile; apply as close to the start of event as possible.
- Apply liquids only with stream nozzles to maintain some bare pavement between sprayed areas to reduce slipperiness.
**Anti-Icing: Part II**

- Schedule applications on bridge decks and critical areas if temperature and conditions could produce frost or black ice.
- Consider spot-applications on hills, curves, and intersections if predicted conditions warrant.
- Use the appropriate chemical for the temperature range (see upcoming slides).
- When frost on the shoulder starts to move into the travel lanes, reapply anti-icing product.

**Figure 2.** Effectiveness of dry vs wet salt

**Anti-Icing: Part III**

- Don’t anti-ice under blowing conditions or areas prone to drifting.
- Reapplication isn’t always necessary if there is still a residual. The residual can remain effective for up to five days if precipitation or traffic wear does not dilute the initial application.
- Don’t apply before a predicted rain.
- For the first application after a prolonged dry-spell, apply liquids at half the rate.
**Abrasives: Sand**

- Use winter sand and other abrasives when temperatures are too cold for deicing chemicals to be effective.
- Be aware that sand does not melt anything - it provides temporary traction.
- Sand clogs sewers, ditches, and streams so it should only be used when needed.

**Abrasives: Sand & Salt Mix**

- A salt/sand mix is generally not recommended.
- Salt reduces the effectiveness of sand, and sand reduces the effectiveness of salt. However, a salt/sand mix may be helpful in limited situations such as a freezing rain event where the salt is washed away quickly.
- Use abrasives in slow-moving traffic areas such as intersections and curves.
- If your purpose is melting, use salt only.
- Sweep up sand frequently, after each event if feasible.
Plowing: Part 1

- Plow to remove snow and loose ice before deicing applications.
- If snow accumulates before or after applications, plowing directly before your next application will minimize product dilution.
- Plow first before applying deicers to avoid dilution of the salt.
- Coordinate plowing activities to eliminate windrows at intersections and prevent plowing off another operator's material.

Plowing: Part 11

- Remove snow from roads as quickly as possible to reduce compaction; use of underbody blades helps remove compacted or slushy snow.
- When available, use a carbide, flexible or rubber-encapsulated plow edge.
- Adjust blade angle to maximize cutting efficiency or snow throwing capabilities.
- Avoid pushing snow over bridge rails onto roads below.
- Reduce your speed to minimize snow clouds.
Cost Reduction

Rather than creating an additional expense, implementation of BMPs reduced material usage by 33%-51%. Materials reductions translated directly into cost savings. Increased efficiencies from operator training can similarly save an MS4 both staff and materials costs.

1 ton of rock salt (~$50) can cause more than $1,450 in corrosion damage to bridges. (Sohanhpurwala 2008).

Because pretreating and prewetting cause material to stick to the road, 20 to 30 percent less material is used - saving money and reducing environmental impacts.

Sand is not cheap when you consider the handling, clean up, and disposal costs.

Generally, you can use 1/3 less material if you pretreat salts.

Application Guidance: Light Snow

Table 1. Light Snow

<table>
<thead>
<tr>
<th>PREPARED TEMPERATURE RANGE</th>
<th>CHEMICAL APPLICATION</th>
<th>MATERIAL USAGE</th>
<th>SUPPLEMENTAL MATERIALS</th>
<th>DRY CHEMICAL SPREAD RATE</th>
<th>MATERIAL USAGE</th>
<th>SUPPLEMENTAL MATERIALS</th>
<th>DRY CHEMICAL SPREAD RATE</th>
<th>MATERIAL USAGE</th>
<th>SUPPLEMENTAL MATERIALS</th>
<th>DRY CHEMICAL SPREAD RATE</th>
</tr>
</thead>
</table>
| Snow (0°C, 1°C) | Cold or light snow cover | Apply liquid chemical | Dry | 1/2 (101) | No | No | No | No | No | No | No | 0.5
| Snow (0°C, 1°C or less) | Cold or light snow cover | Apply liquid chemical | Dry | 1/2 (101) | No | No | No | No | No | No | No | 0.5
| Snow (3°C) | Cold or light snow cover | Apply liquid chemical | Dry | 1/2 (101) | No | No | No | No | No | No | No | 0.5
| Snow (3°C) | Cold or light snow cover | Apply liquid chemical | Dry | 1/2 (101) | No | No | No | No | No | No | No | 0.5
| Snow (3°C) | Cold or light snow cover | Apply liquid chemical | Dry | 1/2 (101) | No | No | No | No | No | No | No | 0.5
| Snow (3°C) | Cold or light snow cover | Apply liquid chemical | Dry | 1/2 (101) | No | No | No | No | No | No | No | 0.5
| Snow (3°C) | Cold or light snow cover | Apply liquid chemical | Dry | 1/2 (101) | No | No | No | No | No | No | No | 0.5
| Snow (3°C) | Cold or light snow cover | Apply liquid chemical | Dry | 1/2 (101) | No | No | No | No | No | No | No | 0.5

Notes:
- CHEMICAL APPLICATIONS: (1) True initial and subsequent chemical applications to prevent destructive conditions or development of packed and bonded snow, (2) Apply chemical ahead of traffic, (3) Pack ice, (4) Loose snow.
- PLOWING: If needed, give before chemical applications or that excess snow, debris or ice is removed and pavement is wet, slightly or lightly snow covered when treated.
### Application Guidance: Mixed Snow

#### Table 2. Light snow with periods of moderate or heavy snow.

<table>
<thead>
<tr>
<th>PERMANENT</th>
<th>TEMPERATURE</th>
<th>RANGE AND TEND.</th>
<th>PERIODIC</th>
<th>INITIAL OPERATION</th>
<th>SUBSEQUENT OPERATIONS</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snow (12°F), deadly or disabling</td>
<td>Day, night, or light snow</td>
<td>None, not recommended</td>
<td>None, not recommended</td>
<td>None, not recommended</td>
<td>None, not recommended</td>
<td>None, not recommended</td>
</tr>
<tr>
<td>Snow (11°F), deadly or disabling</td>
<td>Day, night, or light snow</td>
<td>Apply liquid or powdered solid</td>
<td>20</td>
<td>100</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>Snow (10°F), deadly or disabling</td>
<td>Night, day, or light snow</td>
<td>Apply liquid or powdered solid</td>
<td>20</td>
<td>100</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>Snow (9°F), deadly or disabling</td>
<td>Day, night, or light snow</td>
<td>Place as needed, apply liquid or solid</td>
<td>Place as needed, apply liquid or solid</td>
<td>Place as needed, apply liquid or solid</td>
<td>Place as needed, apply liquid or solid</td>
<td>Place as needed, apply liquid or solid</td>
</tr>
</tbody>
</table>

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### Application Guidance: Moderate/Heavy

#### Table 3. Moderate or heavy snow storm.

<table>
<thead>
<tr>
<th>PERMANENT</th>
<th>TEMPERATURE</th>
<th>RANGE AND TEND.</th>
<th>PERIODIC</th>
<th>INITIAL OPERATION</th>
<th>SUBSEQUENT OPERATIONS</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snow (12°F), deadly or disabling</td>
<td>Day, night, or light snow</td>
<td>None, not recommended</td>
<td>None, not recommended</td>
<td>None, not recommended</td>
<td>None, not recommended</td>
<td>None, not recommended</td>
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<tr>
<td>Snow (11°F), deadly or disabling</td>
<td>Day, night, or light snow</td>
<td>Apply liquid or powdered solid</td>
<td>20</td>
<td>100</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>Snow (10°F), deadly or disabling</td>
<td>Night, day, or light snow</td>
<td>Apply liquid or powdered solid</td>
<td>20</td>
<td>100</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>Snow (9°F), deadly or disabling</td>
<td>Day, night, or light snow</td>
<td>Place as needed, apply liquid or solid</td>
<td>Place as needed, apply liquid or solid</td>
<td>Place as needed, apply liquid or solid</td>
<td>Place as needed, apply liquid or solid</td>
<td>Place as needed, apply liquid or solid</td>
</tr>
</tbody>
</table>

---
### Application Guidance: Frost/Black Ice

#### Table 4. Frost or Black Ice

<table>
<thead>
<tr>
<th>TEMPERATURE</th>
<th>CONDITION</th>
<th>INITIAL OPERATION</th>
<th>SUBSEQUENT OPERATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 0°C</td>
<td>Light rain</td>
<td>Apply ice control</td>
<td>Apply ice control</td>
</tr>
<tr>
<td>0°C to 3°C</td>
<td>Snowing</td>
<td>Apply ice control</td>
<td>Apply ice control</td>
</tr>
<tr>
<td>3°C to 10°C</td>
<td>Snowing</td>
<td>Apply ice control</td>
<td>Apply ice control</td>
</tr>
<tr>
<td>&gt; 10°C</td>
<td>Snowing</td>
<td>Apply ice control</td>
<td>Apply ice control</td>
</tr>
</tbody>
</table>

### Application Guidance: Freezing Rain

#### Table 5. Freezing rain storm.

<table>
<thead>
<tr>
<th>TEMPERATURE</th>
<th>INITIAL OPERATION</th>
<th>SUBSEQUENT OPERATION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 0°C</td>
<td>Snow, sleet, or snowing</td>
<td>Apply ice control</td>
<td>Apply ice control</td>
</tr>
<tr>
<td>0°C to 3°C</td>
<td>Snow, sleet, or snowing</td>
<td>Apply ice control</td>
<td>Apply ice control</td>
</tr>
<tr>
<td>3°C to 10°C</td>
<td>Snow, sleet, or snowing</td>
<td>Apply ice control</td>
<td>Apply ice control</td>
</tr>
<tr>
<td>&gt; 10°C</td>
<td>Snow, sleet, or snowing</td>
<td>Apply ice control</td>
<td>Apply ice control</td>
</tr>
</tbody>
</table>

#### Notes:

**Chemical Applications:**
1. Apply chemical in areas where frost and black ice conditions are present.
2. Apply chemical in areas where there is a risk of freezing rain.
3. Apply chemical in areas where there is a risk of snowfall.
4. Apply chemical in areas where there is a risk of sleet.
5. Apply chemical in areas where there is a risk of hail.

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*Elk River Nature*
Table 6. Sleet storm.

<table>
<thead>
<tr>
<th>TEMPERATURE RANGE, AND TREND</th>
<th>MAINTENANCE ACTION</th>
<th>SNOW/FROST ACTION</th>
<th>RECOMMENDATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above O°C (1°F) needing to be treated</td>
<td>None, no comments</td>
<td>None, no comments</td>
<td>None, no comments</td>
</tr>
<tr>
<td>-5°C to -3°C (23°F to 26°F) prevailing</td>
<td>Apply prevent solid chemical</td>
<td>Keep as needed, supply prevent solid chemical when needed</td>
<td>Note prevent temperature and precipitation closely</td>
</tr>
<tr>
<td>BCR ≤ 15°C (59°F) prevailing</td>
<td>Apply prevent solid chemical</td>
<td>Keep as needed, supply prevent solid chemical when needed</td>
<td>None, no comments</td>
</tr>
<tr>
<td>Below -1°C (30°F), mostly or falling</td>
<td>Prevent as needed</td>
<td>Prevent as needed</td>
<td>None, no comments</td>
</tr>
</tbody>
</table>

References