CITY OF PLYMOUTH

STORM WATER POLLUTION PREVENTION PROGRAM (SWPPP)

DRAFT

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INTRODUCTION

Surface water resources such as lakes, wetlands, and creeks are an important component of the quality of life for residents in the City of Plymouth. The Plymouth Storm Water Pollution Prevention Program (SWPPP) promotes citizen involvement and provides a strategy for dealing with the quantity and quality of the water resources in Plymouth.

The City of Plymouth has developed and will implement its SWPPP to reduce the discharge of pollutants from its drainage system to the maximum extent practicable to protect water quality and to satisfy the appropriate water quality requirements of the Clean Water Act. The City is committed to sustainable management of its natural resources and minimum control measures are listed which will assist the City in attaining its goals.

HISTORY

The first recorded settlement in Plymouth was on the east shoreline of Medicine Lake in 1853. The first major storm drainage improvements were undertaken in Plymouth in the mid-1960s. This initial Storm Drainage Program was subsequently updated with the 1973 Storm Drainage Plan which presented an overall layout of major drainage facilities in Plymouth, including storm sewers, ponding areas, and major drainageways. The main purpose of the 1973 plan was to provide an adequate and economical means of conveying storm water runoff through Plymouth. The City completed a revision to the 1973 plan in 1980. The 1980 revisions were based on recent platting and development proposals, storm drainage improvements, and the Land Use Guide Plan. The plan provided information on storm sewer and open channel sizes, storm water flows, pond storage volumes, water levels, and costs.

A major undertaking began by the City of Plymouth in 1995 and 1996 to update its Storm Water Management Plan to include integrated resource management. The focus of the new Plymouth Water Resources Management Plan was to manage and protect both water quality as well as water quantity. The 2000 Water Resources Management Plan established a clear view of existing conditions, established goals for managing the City's surface water resources, and set a new process for public input in developing the plan. In 2008, the City expanded surface water management to include new requirements such as the Minnesota Pollution Control Agency's Total Maximum Daily Load (TMDL) and Non-Degradation requirements. The 2018 Surface Water Management Plan includes several major elements:

1. Goals and Polices
2. Official Controls
3. Watershed Assessments
4. Regulatory Program
5. Water Quality Improvement Implementation Program

Other efforts included Parkers Lake Watershed and Lake Management Plan (1993); Minnesota Rules 8410, Metropolitan Area Local Water Management Plan (1992); Local Watershed Management Plans; Plymouth Natural Area Survey (1994); Wetland Inventory and Ordinances, (1994, updated in 2019); Hennepin County Ground Water Plan (1994); up-date of Erosion Control and Shoreland Ordinances; Phosphate Free Fertilizer Use and Sale Restrictions (1995, up-dated in 2000), Land Resource Inventory (2006), Non-Degradation Report (2007), TMDL Reports, and establishing and initiating continuous work on developing educational activities throughout the City.

Since the submittal of the first SWPPP in 2003, the City has implemented and initiated many other projects, such as:

1. The completion of the Phase I & Phase II of Medicine Lake Watershed Management and Implementation Plans. The ultimate goals of these plans were to reduce at least 1000 pounds of phosphorous from the watershed and to implement an aquatic vegetation management plan to reduce internal loading by at least 15%.
2. Establishing Aquatic Vegetation Management Plans for Medicine, Parkers, Bass, and Schmidt Lakes.
3. Completed implementation of Parkers Lake Management and Implementation Plan
4. Developed and implemented Schmidt Lake Management Plan
5. Developed and implemented Gleason Lake Management Plan
6. Completion of the Hydrologic and Hydraulic study of the 2020 Urban Expansion Area
7. Establishing the Plymouth Pond Maintenance Policy
8. Expanding the Plymouth surface water monitoring program
9. Providing grant funds for area residents for projects that reduce turf grass, incorporate native plants, or conserve water
10. Studied and adopted an alternative fuel policy
11. Expanded street sweeping program
12. Continued expansive Environmental Education Programs
13. Reviewed, up-dated, and expanded the City's Goose management
14. Expanded the Purple loosestrife bio-control project
15. Established a Plants, Ponds, and Practices Tour
16. Completed the required Non-Degradation Report
17. Completed various flood protection/erosion repair projects
18. Assisted with development of TMDL and Implementation Plans
19. Participates on the Bassett, Elm, and Shingle Creek watershed technical advisory committees.
20. Supported the Pike Lake Subwatershed Assessment through the Shingle Creek Watershed.

The City is also actively partnering and collaborating with its three watershed joint powers organizations, one watershed district, the Metropolitan Council, the Minnesota Department of Natural Resources, the Minnesota Board of Water and Soil Resources, and Hennepin County on a variety of different grants, projects, and environmental education.

AREA DESCRIPTION:

Location. Plymouth is located in the western portion of the seven county metropolitan area in central Hennepin County Minnesota. It is bounded on the north by Maple Grove, on the east by Golden Valley and New Hope, the south by St. Louis Park, Minnetonka, and Wayzata, and on the west by Orono, and Medina.

Topography. The topography of Plymouth can be described as rolling with isolated marsh lands, swamps, lakes, and steep slopes. Approximately 150 feet in elevation changes varying from 1030 feet above sea level in the west central part of the city to about 880 feet above sea level in the northeastern part of the city. Water drains naturally through most of the city. Approximately 20% of the City is covered with water. Eight major lakes cover an area of about 1,542 acres with 2,857 acres of wetland areas.

Soils. The soil in Plymouth can be generally described as dense clay with few instances of lenses of mixed sand and gravel. The three basic soil types encountered include sandy clay till from the Des Moines Ice Slope of the Wisconsin Glaciations, natural sand and top soil and organic silt deposits. Bedrock is found between elevations 700 and 800 feet.

Watersheds. Plymouth lies within the larger Mississippi River basin in east central Minnesota. There are four local watersheds in the City, Shingle Creek, Bassett Creek, Minnehaha Creek, and Elm Creek with 19%, 53%, 16%, and 12% of the city in these watersheds respectively.

Growth. Plymouth has experienced rapid but steady growth over the past three decades. In 2010, the population of Plymouth was 70,576 per the U.S. Census. Both industrial and commercial sectors have also been growing along with the population growth. The City is almost 85% developed with land use of commercial, industrial, and residential land uses.

Climate. The climate is typical of the metro area. The mean annual temperature is 44 degrees Fahrenheit and the mean monthly temperature varies from 12 degrees Fahrenheit in January, to 73 degrees Fahrenheit in July. The average annual liquid precipitation is approximately 30.5 inches, of which annual average snowfall is 44 inches.

SWPPP DEVELOPMENT:

City staff attended workshops organized by the League of Minnesota Cities to gather information on how to develop the Storm Water Pollution Prevention Program in accordance with Minnesota Pollution Control Agency's requirements. The process of self-assessment included several components:

- Staff attended the workshop organized by the League of Minnesota Cities and the Minnesota Pollution Control Agency;
- The City conducted a review of existing ordinances;
- Review and up-date of the existing storm water pollution prevention policies and practices currently in use;
- Educational and training programs which focus on storm water pollution prevention were evaluated and reviewed;
- Regular internal staff meetings were conducted to discuss collaboration between the existing programs, proposed new programs, to identify any gaps in meeting the requirement of SWPPP, and finally selecting appropriate best management practices to meet the plan's objectives.

The internal staff meetings have been a major component of the self-assessment part of the Plymouth SWPPP. A number of City staff from different departments and divisions have all been actively involved in this process. The group established and identified existing Best Management Practices and looked for areas where the City could improve to maximum extent practicable to meet the plan's objectives and requirements.

FUNDING MECHANISM:

The City of Plymouth has established a Storm Water Utility fee that is assessed against utility bills. The City's Storm Water Utility Revenue is generated by fees according to land use. At present, the rate is $8.09 per month per residential parcel, $26.82 per acre, per month for multi-family, and

$57.98 per acre, per month for commercial and industrial. Other land uses are evaluated individually based on the amount of impervious coverage and parcel size. Details on the City's Storm Water Utility Fee can be found in Section 725 and Section 1015 of the City Code.

TOTAL MAXIMUM DAILY LOAD (TMDL)

The City of Plymouth is currently subject to 32 water quality impairments (excluding mercury) and nine EPA approved TMDL plans. TMDL implementation plans are expected in the future for each of the other impairments.

A. Shingle Creek Chloride TMDL

In 1998, Shingle Creek was listed on the Federal Clean Water Act's 303(d) list of impaired waters for exceeding the chloride standard for aquatic life. The listing of Shingle Creek as impaired resulted from a limited sampling of chloride completed in 1996 by the US Geological Survey (USGS) at their discharge monitoring station at the Queen Avenue Bridge in Minneapolis. After reviewing the USGS data from Queen Avenue, the Shingle Creek Watershed Management Commission (SCWMC) has been sampling routinely for chloride in Shingle Creek. This TMDL was developed to address the 1998 listing for the impairment of aquatic life and recreation based on chloride exceedances.

The City of Plymouth is a stakeholder in the Shingle Creek Watershed. The Shingle Creek Chloride TMDL was prepared by the watershed. Stakeholders in the watershed agreed to work collectively to achieve a 71% reduction in chloride use to achieve the standard understanding that each stakeholder was working under unique financial, public safety and perception, and feasibility limitations.

The SCWMC will be the lead on the implementation of the Chloride TMDL, however, individual stakeholders (City of Plymouth) will be ultimately responsible for implementing the identified BMPs. Implementation strategies can be found in Table 1.

TABLE 1. Shingle Creek Chloride Reduction Strategies.

Implementation Item	SWPPP reference	Progress
Product application, equipment, and decisions	Appendix A 6.a.1	Ongoing
Deicer stockpiles	Appendix A 6.b.4	Ongoing
Operator training	Appendix A 1.c.1	Annually
Cleanup and snow stockpiling	Appendix A 6.a.2	Annually
Ongoing research into salt alternatives	Appendix A 6.a.1	Annually
SCWMC Activities	Appendix A 1.c.1	SCWMC
Monitoring	Appendix A 6.c.1	SCWMC
Street Sweeping	Appendix A 6.a. 2	Annually

The City of Plymouth will continue to implement the Shingle Creek Chloride TMDL plan and support the monitoring of the creek.

B. Schmidt, Pomerleau, and Bass Lakes Nutrient TMDL

In 2002, Schmidt, Pomerleau, and Bass Lakes were listed on the Federal Clean Water Act's 303(d) list of impaired waters for aquatic recreation because the lakes exceed the water quality standard for nutrients. The goal of this TMDL is to quantify the pollutant reductions

needed to meet the water quality standards for nutrients in Schmidt, Pomerleau and Bass Lakes. The Schmidt, Pomerleau and Bass Lakes TMDL has been established in accordance with Section 303(d) of the Clean Water Act. This TMDL provides waste load allocations (WLAs) and load allocations (LAs) for these three lakes. Based on the State standard for nutrients, the TMDL establishes a numeric target of 40 µg/L total phosphorus concentration for Pomerleau Lake and 60 µg/L total phosphorus for Schmidt and Bass Lakes. Implementation strategies to meet the goals of this TMDL can be found in Table 2.

TABLE 2. Schmidt, Pomerleau, and Bass Lakes Nutrient Reduction Strategies.

Implementation Item	SWPPP reference	Progress
Annual Education	Appendix A 1.c.1	Annually
Street Sweeping	Appendix A 6.a.2	Annually
Rain Gardens	Appendix A IV.D-2	Complete (2008)
Shoreline Management and Restoration Projects	Appendix A IV.D-2	Complete
Additional Development and Redevelopment Regulations	Appendix A IV.D-2	Ongoing
Storm Drain Filters for Schmidt Lake Watershed	Appendix A IV.D-2	Complete (2011)
Feasibility Study for ponding in the Bass Lake Watershed	Appendix A IV.D-2	Complete (2012)
Schmidt Lake Wetland Restoration	Appendix A IV.D-2	TBD
Schmidt Lake Neighborhood Rain garden Project	Appendix A IV.D-2	Complete (2011)
Bass and Pomerleau Lakes Alum Treatment Project	Appendix A IV.D-2	2019 & 2020

C. Cedar Island, Pike, and Eagle Lakes Nutrient TMDL

Of the three lakes identified in this TMDL (Cedar Island, Pike, and Eagle), only Pike Lake lies within the City of Plymouth, however, surface water entering Pike Lake will eventually drain into Eagle Lake. Meeting the goals for Pike Lake is anticipated to meet Plymouth's requirements for Eagle Lake. No drainage from Plymouth goes to Cedar Island Lake. In 2002, Pike Lake was listed on the Federal Clean Water Act's 303(d) list of impaired waters for aquatic recreation because the lakes exceed the water quality standard for nutrients. Eagle Lake was added in 2008 for the same reasons. The goal of this TMDL is to quantify the pollutant reductions needed to meet the water quality standards for nutrients in Cedar Island, Pike, and Eagle Lakes. This TMDL has been established in accordance with Section 303(d) of the Clean Water Act and provides waste load allocations (WLAs) and load allocations (LAs) for these three lakes. Based on the State standard for nutrients, the TMDL establishes a numeric target of 40 µg/L total phosphorus concentration for Eagle Lake and 60 µg/L total phosphorus for Cedar Island and Pike Lakes. Implementation strategies to meet the goals of this TMDL for Pike and Eagle Lakes can be found in Table 3.

TABLE 3. Pike Lake Nutrient Reduction Strategies.

Implementation Item	SWPPP reference	Progress
Annual Education	Appendix A 1.c.1	Annually
Street Sweeping	Appendix A 6.a.2	Annually
Development and Redevelopment Regulations	Appendix A IV.D-3	Ongoing
Rough Fish Management	Appendix A IV.D-3	TBD
Illicit Discharge Detection including City Record Review	Appendix A IV.D-3	Ongoing

D. Medicine Lake Excess Nutrient TMDL

The Medicine Lake watershed is located in the metropolitan area of the Upper Mississippi River Basin and includes portions of the cities of Plymouth, Medicine Lake, Minnetonka, Golden Valley, New Hope, and Medina. The outlet of Medicine Lake is the

headwater of Bassett Creek. Medicine Lake is the second largest lake in Hennepin County and is considered the most important recreational water body in the City of Plymouth. The Medicine Lake watershed (nearly 12,000 acres) is fully developed. Runoff from the watershed enters the lake from creeks, storm sewer outfalls, and culverts at various points along the lakeshore. The volume and pollutant levels of storm water runoff from the watershed, combined with releases of phosphorus from sediments and plants in the lake, result in periods of poor lake water quality. Available data indicates that Medicine Lake violates the State's water quality standards. The combination of high phosphorus and high chlorophyll-*a* (a measurement of algae growth) supports including Medicine Lake on the Minnesota Pollution Control Agency's (MPCA) impaired waters list.

The Clean Water Act and Environmental Protection Agency (EPA) regulations require states to develop Total Maximum Daily Loads (TMDLs) for water bodies that are not meeting water quality standards. The TMDL process establishes the allowable loading of pollutants for a water body. By following the TMDL process, states can establish controls to reduce pollution and restore and maintain the quality of the water resource. Therefore, a TMDL was designed to allow Medicine Lake to meet water quality goals.

The primary water quality target for this TMDL is the average growing season total phosphorus concentration in Medicine Lake. The State standard is 40 µg/L. The City of Plymouth has established a goal of 38 µg/L for Medicine Lake. This TMDL has been developed to meet the 38 µg/L target. The more conservative target of 38 µg/L is considered an explicit Margin of Safety (MOS) for this TMDL.

TABLE 4. Medicine Lake Nutrient Reduction Strategies.

Implementation Item	SWPPP reference	Progress
Annual Education	Appendix A 1.c.1	Annually
Street Sweeping	Appendix A 6.a.2	Annually
Development and Redevelopment Regulations	Appendix A IV.D-4	Ongoing
County Road 9/61 Erosion Repair	Appendix A IV.D-4	Complete (2007)
Wood Creek Erosion Repair	Appendix A IV.D-4	Complete (2009)
Timber Creek Erosion Repair	Appendix A IV.D-4	Complete (2010)
Plymouth Creek Water Quality Ponds	Appendix A IV.D-4	Complete (2011)
Plymouth Creek Stream Restoration	Appendix A IV.D-4	Complete (2012)
Plymouth Creek Stream Restoration – Plymouth Creek Park	Appendix A IV.D-4	Complete (2016)
Kilmer Park Street Reconstruction Project	Appendix A IV.D-4	Complete (2018)
Neighborhood Drainage Improvement Project	Appendix A IV.D-4	Complete (2019)
2020 Street Reconstruction Project	Appendix A IV.D-4	Complete (2021)
JPA for Street Sweeping – City of Medicine Lake	Appendix A 6.a.2	Annually (2021)
2022 Street Reconstruction Project	Appendix A IV.D-4	In Progress(2022)

E. Shingle Creek & Bass Creek Impaired Biota and Dissolved Oxygen TMDL

The Shingle Creek & Bass Creek Impaired Biota and Dissolved Oxygen TMDL study addresses the dissolved oxygen impairment in Shingle Creek and biotic integrity impairments in Shingle and Bass Creeks, in Hennepin County, Minnesota. The goal of this TMDL is to quantify the pollutant reductions needed to meet State water quality standards for dissolved oxygen in Shingle Creek and State Index of Biotic Integrity standards in Shingle and Bass Creeks.

The Shingle Creek watershed covers 44.7 square miles in east-central Hennepin County, Minnesota. Shingle Creek begins at the junction of Bass Creek and Eagle Creek in the City of Brooklyn Park, flows easterly, then southerly for a total of 11.3 miles before discharging into the Mississippi River in Minneapolis. Bass Creek is the outlet of Bass Lake, and is about 2.4 miles long. Bass Creek is formed at the weir that controls the level of Boulder Ridge Pond, the last in a series of wetlands downstream of Bass Lake. The watershed is fully developed with dense urban and suburban land uses

Shingle Creek has been substantially altered from conditions documented in the 1855 Public Land Survey. A portion was straightened and dredged in 1910 to serve as County Ditch #13. Over time most of the rest of the stream has been channelized, widened and dredged to better convey stormwater discharged to the stream. Bass Creek appears to be an historically intermittent channel too small to be recorded on the Public Land Survey and then later ditched to drain wetlands and/or provide agricultural drainage, or it was created to provide those functions.

A Stressor Identification study evaluated the potential causes of the impaired biotic integrity of both streams. Potential candidate causes of the impairments that were ruled out include: temperature, pH, nutrients, turbidity/TSS, and toxic chemicals. Five stressors that are potential candidate causes were examined in more detail: low dissolved oxygen; altered habitat; loss of connectedness; altered hydrology; and ionic strength, specifically chloride. The evidence for altered hydrology is strongest followed closely by low dissolved oxygen and lack of habitat. While the loss of connectedness and ionic strength are plausible stressors and are likely contributing to the impairment, there is less direct evidence of their role.

Hydraulic models for Shingle Creek were developed to assess the conditions resulting in persistent low dissolved oxygen. A scenario assessment determined that the likely causes were low-oxygen discharge from headwaters wetlands and excessive sediment oxygen demand resulting from the overwide channel. Stream restoration on both Shingle Creek and Bass Creek to create a low-flow channel, add reaeration structures, and enhance habitat and improvements to headwaters wetlands would have the most impact in increasing dissolved oxygen and improving biotic integrity.

TABLE 4. Shingle Creek & Bass Creek Impaired Biota and Dissolved Oxygen Improvement Strategies.

Implementation Item	SWPPP reference	Progress
Annual Education	Appendix A 1.c.1	Annually
Street Sweeping	Appendix A 6.a.2	Annually
Development and Redevelopment Regulations	Appendix A IV.D-5	Ongoing
Monitoring	Appendix A IV.D-5	Ongoing

F. Minnehaha Creek Lake Hiawatha Nutrient TMDL

A TMDL has been developed for Lake Hiawatha to address a nutrient impairment. Chlorophyll-*a* or Secchi depth observations coupled with ambient water quality monitoring data indicate that excess total phosphorus (TP) is causing the impairments in Lake Hiawatha. The City of Plymouth has been allocated a reduction of 19.6 pounds annually.

TABLE 5. Lake Hiawatha Nutrient TMDL Improvement Strategies.

Implementation Item	SWPPP reference	Progress
Annual Education	Appendix A 1.c.1	Annually
Street Sweeping	Appendix A 6.a.2	Annually

G. Upper Minnehaha Creek Watershed Nutrient and Bacteria TMDL

This Total Maximum Daily Load (TMDL) study addresses nutrient impairments in twenty lakes and an *E. coli* impairment in Painter Creek within the Minnehaha Creek Watershed District (MCWD), which is located within the Upper Mississippi River Basin. The City of Plymouth is not affected by the *E. coli* impairment. The MCWD covers approximately 178 square miles in Hennepin and Carver Counties, including parts of Minneapolis, Minnesota and its western suburbs. The watershed drains to Minnehaha Creek and ultimately the Mississippi River. The water bodies addressed in this study are located within a distinct hydrologic basin within the MCWD referred to as the "Upper Watershed," which drains through agricultural land and suburbs west of Minneapolis to Lake Minnetonka, which outlets into Minnehaha Creek. The goal of this TMDL is to quantify the pollutant reductions needed to meet State water quality standards for nutrients in the lakes and *E. coli* standards in Painter Creek.

Fifteen of these lakes are defined as deep lakes for which the North Central Hardwood Forest ecoregion numeric water quality standards are a summer average total phosphorus concentration of 40 µg/L, 14 µg/L chlorophyll-*a*, and greater than 1.4 meter in Secchi depth. The other six lakes are shallow, for which the numeric water quality standards are a summer average total phosphorus concentration of 60 µg/L, 20 µg/L chlorophyll-*a*, and greater than one meter in Secchi depth.

Nutrient budgets were developed for all twenty lakes along with lake response models to set the TMDL and Load and Wasteload Allocations. A robust lake and stream monitoring dataset was available and was the basis of the nutrient budget calculations. Wasteload reductions ranging from no reduction to a 93 percent reduction and load reductions ranging from no reduction to 79 percent reduction will be necessary to meet water quality standards.

TABLE 6. Gleason Lake TMDL Improvement Strategies (185lb reduction needed).

Implementation Item	SWPPP reference	Progress
Annual Education	Appendix A 1.c.1	Annually
Street Sweeping	Appendix A 6.a.2	Annually
City View Acres Rain Gardens	Appendix A IV.D - 6	Complete (2008)
City View Acres Storm Water Pond	Appendix A IV.D - 6	Complete (2008)
Meadow Wood Drainage Improvement Project	Appendix A IV.D - 6	Complete (2020)
Maple Creek Stream Restoration	Appendix A IV.D - 6	Proposed (2023)
Chelsea Woods Drainage Improvement Project	Appendix A IV.D - 6	Proposed (2023)
19th and Dunkirk Storm Water Pond Enhancement	Appendix A IV.D - 6	Proposed (2024)

TABLE 7. Holy Name Lake TMDL Improvement Strategies (5lb reduction needed).

Implementation Item	SWPPP reference	Progress
Annual Education	Appendix A 1.c.1	Annually
Street Sweeping	Appendix A 6.a.2	Annually

TABLE 8. Mooney Lake TMDL Improvement Strategies (50lb reduction needed).

Implementation Item	SWPPP reference	Progress
Annual Education	Appendix A 1.c.1	Annually
Street Sweeping	Appendix A 6.a.2	Annually
Pond Maintenance	Appendix A IV.D – 6	Complete (2014)

TABLE 9. Kreatz Lake (listed as Snyder in TMDL document) TMDL Improvement Strategies (3lb reduction needed).

Implementation Item	SWPPP reference	Progress
Annual Education	Appendix A 1.c.1	Annually
Street Sweeping	Appendix A 6.a.2	Annually

TABLE 10. Hadley Lake TMDL Improvement Strategies (21lb reduction needed).

Implementation Item	SWPPP reference	Progress
Annual Education	Appendix A 1.c.1	Annually
Street Sweeping	Appendix A 6.a.2	Annually
Hawthorne Ponds Rain Garden	Appendix A IV.D - 6	Complete (2008)
Candlelight Terrace Street Reconstruction Project	Appendix A IV.D - 6	Complete (2019)

H. Twin Cities Metro Area Chloride TMDL

The Twin Cities 7-county metropolitan area (TCMA) includes 186 cities and townships and a population of approximately 3,000,000 people. It covers approximately 3,000 square miles with about one-third in urbanized areas. It is a vibrant and growing community. The area is fortunate to be home to nearly 1,000 lakes and wetlands, small streams and large rivers, as well as shallow and deep groundwater aquifers. These water resources hold high value to the community and visitors to the area.

The Twin Cities receives approximately 54 inches of snow each year on average. The thousands of miles of streets and highways in the TCMA, along with parking lots and sidewalks, must be maintained to provide safe conditions throughout the winter. Winter maintenance of these surfaces currently relies heavily on the use of salt, primarily sodium chloride (NaCl), to prevent ice build-up and remove ice where it has formed. The chemical properties of sodium chloride make it effective at melting ice, but these properties also result in the chloride dissolving in water and persisting in the environment. The dissolved chloride moves with the melted snow and ice, largely during spring warm-ups, and ends up in the water resources.

Residential water softener use is also a significant source of chloride. Residential water softeners use chloride to remove hardness, which is typically caused by high levels of calcium and/or magnesium. In areas with hard water, residential water softeners which use salt are common. The chloride from water softeners makes its way to the environment either through discharge to a septic system or by delivery to a municipal wastewater treatment plant (WWTP). Chloride is not removed from wastewater using treatment methods.

Elevated chloride concentrations have been found in waterbodies throughout the TCMA. At levels exceeding the WQS, chloride is toxic to aquatic life. Water samples from lakes, wetlands, streams and groundwater show high chloride levels in urban areas across the state. While monitoring has only been conducted for about 10% of the surface waterbodies in the TCMA, the available data indicates 39 waterbodies in the TCMA currently exceed chloride levels protective of the aquatic community. Two of these impaired waterbodies, Shingle Creek and Nine Mile Creek, already have approved Total Maximum Daily Loads (TMDLs). This report presents the development of the TMDLs for the remaining 37 waterbodies in the TCMA impaired for chloride.

A TMDL quantifies the allowable pollutant loading to a lake or stream that will result in water quality standards being attained. The water quality target (WQT) for the TMDLs was set to the chronic water quality criterion for chloride of 230 mg/L. The total allowable load, or TMDL, is allocated to the various Twin Cities Metropolitan Area (TCMA) viii sources contributing chloride as well as consideration of a margin of safety (MOS) and reserve capacity (RC). A simple 0-dimensional, steady-state modeling approach was selected through consultation with a Technical Advisory Committee for calculating the allowable load from runoff, including permitted Municipal Separate Storm Sewer System (MS4) areas and non-permitted areas. This approach assumes that chloride from winter maintenance activities and all other sources eventually makes its way to surface waterbodies through runoff. This approach was chosen for the following reasons: 1) chloride is a conservative substance and is in the dissolved phase in the water environment; therefore, complex fate and transport assessments are not needed; 2) determining the time for a system to respond to reduced chloride loads was not necessary to inform the TMDL or Chloride Management Plan (CMP); and 3) the large number of lakes and streams needing a TMDL and the limited data available for a significant portion of them prohibited a more complex approach. This approach assumes eventual complete flushing in an impaired waterbody over the long-term.

Deicing salt is the most common and the preferred method for meeting the public's winter travel expectations. There is currently no environmentally safe and cost-effective alternative that is effective at melting ice. Therefore, continued use of salt as the predominant deicing agent for public safety in the TCMA is expected. Setting a specific chloride load reduction target for each individual winter maintenance chloride source is challenging, as is measuring actual chloride loads entering our surface and groundwater from deicing salt and other nonpoint sources in the TCMA. Therefore, priority should be put on improving winter maintenance practices to use only a minimal amount of salt, also referred to as smart salting, across the entire TCMA. With these considerations in mind, the implementation approach for achieving the TMDLs and protecting all waters in the TCMA is to focus on performance of improved winter maintenance practices as well as continuing to monitor trends in local waterbodies. The Minnesota Pollution Control Agency (MPCA) and stakeholders worked together to develop a plan to achieve the TCMA chloride TMDLs.

The CMP incorporates water quality assessment, source identification, implementation strategies, monitoring recommendations, and measurement and tracking of results into a performance-based adaptive approach for the TCMA. The goal of the plan is to develop the framework to assist local partners in minimizing salt (chloride) use and provide safe and desirable conditions for the public. The CMP also includes performance-based strategies to reduce salt (chloride) from other sources such as water softening, wastewater discharges, and agricultural sources.
The City of Plymouth is a stakeholder in the Shingle Creek Watershed. The Shingle Creek Chloride TMDL was prepared by the watershed. Stakeholders in the watershed agreed to work collectively to achieve a 71% reduction in chloride use to achieve the standard understanding that each stakeholder was working under unique financial, public safety and perception, and feasibility limitations.

The SCWMC will be the lead on the implementation of the Chloride TMDL, however, individual stakeholders (City of Plymouth) will be ultimately responsible for implementing the identified BMPs. Implementation strategies can be found in Table 1.

TABLE 1. Twin Cities Metro Area Chloride Reduction Strategies.

Implementation Item	SWPPP reference	Progress
Product application, equipment, and decisions	Appendix A 6.a.1	Ongoing
Deicer stockpiles	Appendix A 6.b.4	Ongoing
Operator training	Appendix A 1.c.1	Annually
Cleanup and snow stockpiling	Appendix A 6.a.2	Annually
Ongoing research into salt alternatives	Appendix A 6.a.1	Annually
MPCA Activities	Appendix A 1.c.1	MPCA
Monitoring	Appendix A 6.c.1	MPCA/Plymouth
Street Sweeping	Appendix A 6.a. 2	Annually

The City of Plymouth will continue to implement the Twin Cities Metro Area Chloride TMDL plan and support the monitoring of water resources.

I. Elm Creek Watershed Management Commission Watershed TMDL

This Total Maximum Daily Load (TMDL) study addresses 22 impairments in the Elm Creek Watershed and 2 impairments in the Crow River Watershed, both of which are HUC-8 watersheds located in the upper Mississippi River Basin. Those in the Elm Creek Watershed include nutrient impairments in Fish Lake, Rice Lake, Diamond Lake, Goose Lake, and Henry Lake; Escherichia Coli (E. coli) bacteria impairments in Rush Creek-South Fork, Rush Creek mainstem, Diamond Creek, and Elm Creek; low dissolved oxygen (DO) impairments in Rush Creek mainstem, Diamond Creek, and Elm Creek; and both fish and Macroinvertebrate biotic integrity impairments for upper and lower reaches of the Rush Creek South Fork, Rush Creek mainstem, Diamond Creek, and Elm Creek. The TMDL also includes nutrient impairments in Cowley Lake and Sylvan Lake in the Crow River Watershed.

All impaired water bodies lay within the jurisdictional limits of the Elm Creek Watershed Management Commission (ECWMC), who partnered with Minnesota Pollution Control Agency (MPCA) on this effort. The area within the jurisdictional limits of the ECWMC is about 83,600 acres (of which about 66,400 acres is the Elm Creek Watershed) and located in northwestern Hennepin County, Minnesota. The goal of this TMDL is to quantify the pollutant reductions needed to meet state water quality standards for the impaired lakes and streams. This TMDL is established in accordance with Section 303(d) of the Clean Water Act and provides wasteload allocations (WLAs) and load allocations (LAs) for the water bodies included.

Bacteria

Flow and bacteria monitoring data in Rush Creek-South Fork, Rush Creek mainstem, Diamond Creek, and Elm Creek were used to establish load duration curves (LDCs) to define the reductions necessary to meet the E. coli numeric standard. The TMDL, WLAs, and LAs were established for five flow categories: very high, high, mid-range, low and dry flow conditions. The necessary bacteria reductions range from no reduction to a 66% reduction during certain flow regimes to meet E. coli concentration standards. Implementation activities for the E. coli-impaired subwatersheds should focus on manure

and pasture management initiatives, limiting livestock access to streams, septic system upgrades or hook-ups to regional sanitary collection and treatment facilities, and pet waste control measures.

Lakes

Nutrient budgets were developed for all seven lakes along with lake response models to set the WLAs and the Las for the TMDLs. Total nutrient reductions required to meet the lake water quality standards range from about 14% for Fish Lake (a deep lake) to between 73% and 89% to meet the shallow lake standards in the other six lakes. Nutrient reduction implementation strategies for all lakes should focus on both watershed and internal load reductions.

Fish/Macroinvertebrates and Low DO

The MPCA has developed an IBI to evaluate the biological health of streams in the state. There are IBIs for both fish and macroinvertebrates. Three stream reaches in the Rush Creek Subwatershed, as well as one reach each on Diamond Creek and Elm Creek, were listed as impaired for both fish and macroinvertebrate IBI. Impairment of the biological communities was most severe in the three stream reaches in the Rush Creek Subwatershed (Including the South Fork Subwatershed), moderate in Diamond Creek, and moderate to low in the Elm Creek, depending on the reach. In general, the analyses xiii suggest that multiple factors appear to be impacting fish communities, while the macroinvertebrate communities are impacted by a narrower range of stressors.

A stressor identification (SID) report was completed by Lehr (2015) based on the U.S. Environmental Protection Agency's (EPA's) Causal Analysis/Diagnosis Decision Information System (CADDIS) approach. The outcome of the SID process provided guidance to address the non-pollutant stressors of altered hydrology and altered physical habitat and established the need to prepare TMDLs using a LDC approach to address the pollutant stressors of total suspended solids (TSS) and total phosphorus (TP). Recently adopted stream water quality standards for TSS and TP were used to determine which stream reaches required TMDLs, with Diamond Creek and Elm Creek (but not Rush Creek) showing moderate exceedances of the TSS standard and all five stream reaches showing significant exceedances of the TP standard. The frequency and magnitude of exceedances for both parameters were generally highest in the upper reaches of each of the affected streams, where rural and agricultural land uses currently dominate.

Multiple implementation elements to address impairments are presented. These include the following:

- Application of stringent stormwater mitigations standards adopted by the ECWMC. The standards are based in part on the MPCA's Minimal Impacts Design (MIDs) project, which establish an initial abstraction of 1.1 inches of runoff from new impervious surfaces as the basis for achieving the performance objective. The ECWMC will apply those standards to development projects submitted for review after January 1, 2015. Application of these standards will significantly reduce existing TP, TSS, and other pollutant loadings from landscapes where intensive agricultural uses are replaced with urban uses meeting the mitigation standards. It will also hold to "no net increase" pollutant loads from low-export predevelopment land uses that are converted to urban land uses

- Adoption and execution of standards governing the siting and management of new nonproduction livestock operations, such as those often associated with "hobby" farms.
- Outreach to existing agricultural operations to identify and implement projects to reduce winter spreading of manure, limit access of livestock to riparian areas, install buffer strips between cropland and/or livestock holding areas and water bodies, and promote fertilizer applications to cropland based on soil test results and crop nutrient needs.
- Education of urban residents on good housekeeping practices, such as use of no-phosphorus fertilizers were appropriate, proper disposal of pet waste, and establishing unmaintained buffer strips adjacent to water bodies.
- Promoting projects to enhance physical stream habitat, promote infiltration to reduce surface water runoff and enhance stream baseflows, and address internal loading affecting lakes where needed through management of rough fish, curly-leaf pondweed, and enriched sediments.

TABLE 4. Elm Creek Watershed Improvement Strategies.

Implementation Item	SWPPP reference	Progress
Annual Education	Appendix A 1.c.1	Annually
Street Sweeping	Appendix A 6.a.2	Annually
Development and Redevelopment Regulations	Appendix A IV.D-5	Ongoing
Monitoring	Appendix A IV.D-5	Ongoing

MINIMUM CONTROL MEASURES SUMMARY:

This minimum control measures summary lists the existing Best Management Practices (BMP) chosen by the City of Plymouth (see Appendix B for BMP Summary Sheets). The minimum control measures outlined in this plan will be met through a variety of measurable goals such as educational efforts, training programs, and development of ordinances and policies. Measurable goals and implementation schedules are included in each minimum control measure sheet and submitted with the annual report.

Minimum Control Measure #1: Public Education and Outreach:

Key to Unique BMP ID Numbers	Required BMP Title	Permit Reference
1a-1	Distribute Educational Materials	**V.G.1.a**
1b-1	Implement an Education Program	**V.G.1.b**
1c-1	Education Program: Public Education and Outreach	**V.G.1.c**
1c-2	Education Program: Public Participation	**V.G.1.c**
1c-3	Education Program: Illicit Discharge Detection and Elimination	**V.G.1.c**
1c-4	Education Program: Construction Site Run-off Control	**V.G.1.c**
1c-5	Education Program: Post-Construction Stormwater Management in New Development and Redevelopment	**V.G.1.c**
1c-6	Education Program: Pollution Prevention/Good Housekeeping for Municipal Operations	**V.G.1.c**
1d-1	Coordination of Education Program	**V.G.1.d**
1e-1	Annual Public Meeting	**V.G.1.e**

Minimum Control Measure #2: Public Participation and Involvement:

Key to Unique BMP ID Numbers	Required BMP Title	Permit Reference
2a-1	Comply with Public Notice Requirements	**V.G.2.a**
2b-1	Solicit Public Input and opinion on the Adequacy of the SWPPP	**V.G.2.b**
2c-1	Consider Public Input	**V.G.2.c**

Minimum Control Measure #3: Illicit Discharge Detection and Elimination:

Key to Unique BMP ID Numbers	Required BMP Title	Permit Reference
3a-1	Storm Sewer System Map	**V.G.3.a**
3b-1	Regulatory Control Program	**V.G.3.b**
3c-1	Illicit Discharge Detection and Elimination Plan	**V.G.3.c**
3d-1	Public and Employee Illicit Discharge Information Program	**V.G.3.d**
3e-1	Identification of Non Stormwater Discharges and Flows	**V.G.3.e**

Minimum Control Measure #4: Construction Site Stormwater Runoff Control:

Key to Unique BMP ID Numbers	Required BMP Title	Permit Reference
4a-1	Ordinance or other Regulatory Mechanism	**V.G.4.a**
4b-1	Construction Site Implementation of Erosion and Sediment Control BMPs	**V.G.4.b**
4c-1	Waste Controls for Construction Site Operators	**V.G.4.c**
4d-1	Procedure for Site Plan Review	**V.G.4.d**
4e-1	Establishment of Procedures for the Receipt and Consideration of Reports of Stormwater Noncompliance	**V.G.4.e**
4f-1	Establishment of Procedures for Site Inspections and Enforcement	**V.G.4.f**
4g-1	Erosion and Sediment Control Training	
4h-1	Engineering Guidelines for Developers	

Minimum Control Measure #5: Post Construction Stormwater Management in New Development and Redevelopment:

Key to Unique BMP ID Numbers	Required BMP Title	Permit Reference
5a-1	Development and Implementation of Structural and/or Non-structural BMPs	**V.G.5.a**
5b-1	Regulatory Mechanism to Address Post Construction Runoff from New Development and Redevelopment	**V.G.5.b**
5c-1	Long-term Operation and Maintenance of BMPs	**V.G.5.c**
5d-1	Ordinances	
5e-1	NEMO	

Minimum Control Measure #6: Pollution Prevention/Good Housekeeping:

Key to Unique BMP ID Numbers	Required BMP Title	Permit Reference
6a-1	Municipal Operations and Maintenance Program	V.G.6.a
6a-2	Street Sweeping	
6b-2	Annual Inspection of All Structural Pollution Control Devices	V.G.6.b.2
6b-3	Inspection of a Minimum of 20 percent of the MS4 Outfalls, Sediment Basins and Ponds Each Year on a Rotating Basis	V.G.6.b.3
6b-4	Annual Inspection of All Exposed Stockpile, Storage and Material Handling Areas	V.G.6.b.4
6b-5	Inspection Follow-up Including the Determination of Whether Repair, Replacement, or Maintenance Measures are Necessary and the Implementation of the Corrective Measures	V.G.6.b.5
6b-6	Record Reporting and Retention of all Inspections and Responses to the Inspections	V.G.6.b.6
6b-7	Evaluation of Inspection Frequency	V.G.6.b.7
6c-1	Monitoring	

APPENDIX A

BMP SUMMARY SHEETS

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 1 – PUBLIC EDUCATION AND OUTREACH

Unique BMP Identification Number: 1a-1

***BMP Title:** Distribute Educational Materials
BMP Description: In conjunction with BMP 1c-1, educational materials will be prepared and distributed to targeted audiences.
***Measurable Goals:** See BMP 1c-1
Specific Components and Notes: See BMP 1c-1
***Responsible Party for this BMP:** Name: Amy Riegel, Senior Engineering Technician Department: Plymouth Public Works Department Phone: 763-509-5500 E-mail: ariegel@plymouthmn.gov

**Indicates a REQUIRED field. Failure to complete any required field will result in rejection of the application due to incompleteness.*

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 1 – PUBLIC EDUCATION AND OUTREACH

Unique BMP Identification Number: 1b-1

***BMP Title:** Implement an Education Program
BMP Description: In conjunction with BMP 1c-1, an educational program will be implemented to educate targeted audiences in Plymouth. Target audiences include all residents and businesses in the City of Plymouth. Current high-priority target audiences include K-12 students, winter maintenance contractors, construction contractors, and business owners.
***Measurable Goals:** See BMP 1c-1
Specific Components and Notes: See BMP 1c-1
***Responsible Party for this BMP:** Name: Amy Riegel, Senior Engineering Technician Department: Plymouth Public Works Department Phone: 763-509-5500 E-mail: ariegel@plymouthmn.gov

**Indicates a REQUIRED field. Failure to complete any required field will result in rejection of the application due to incompleteness.*

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 1 – PUBLIC EDUCATION AND OUTREACH

Unique BMP Identification Number: 1c-1

***BMP Title:** Education Program: Public Education and Outreach

Audiences Involved:
All City of Plymouth residents, property owners, local officials, contractors, City employees, business owners and school children in grades K – 12.

***Educational Goals for Each Audience:**
Increase public awareness and understanding of storm water issues within the City. Inform and educate the public about the impacts on water quality of storm water runoff. Increase public participation in storm water best management practices. Increase public support for best management practices instituted by the City and other units of government. Implement the Shingle Creek Chloride, Schmidt, Pomerleau, and Bass Lakes Excess Nutrient TMDL plan, Cedar Island, Pike, and Eagle Lakes Nutrient TMDL plan and support the activities of the Shingle Creek Watershed Management Commission.

***Activities Used to Reach Educational Goals:**
Develop and implement an education plan in cooperation with the Bassett Creek, Elm Creek and Shingle Creek WMOs, Plymouth's Environmental Quality Committee and a number of divisions within the City of Plymouth (as enumerated in 1b-1) to integrate MS4, watershed plans, Plymouth's Water Resources Management Plan and other water resource education programs in the City of Plymouth. All six of the Minimum Control Measures will be addressed in the education plan. Plan will include:

1. Training and outreach in collaboration with other government and non-government organizations
    a) Bassett Creek Watershed Management Organization, Elm Creek Watershed Management Organization and Shingle Creek Watershed Management Organization education committees
        - West Metro Water Alliance (WMWA)
    b) Watershed Partners' Clean Water MN campaign
    c) Street and parking lot salt management workshops
    d) Blue Thumb – PLANTING FOR CLEAN WATER committee and overall participation

2. Distribute articles and information on:
    a) Stormwater management
    b) Illicit discharges
    c) Construction site erosion control
    d) Post-construction erosion control
    e) Salt application practices to protect water quality
    f) Shoreline management
    g) Composting
    h) Pollution prevention
    i) Low impact development
    j) Landscaping for water quality
    k) Storm drains lead to lakes and streams

3. Provide water quality information at City and community events including:
    a) Discover Plymouth
    b) Music In Plymouth
    c) Plymouth Environmental Academy
4. Utilize local media outlets to promote stormwater awareness and to encourage best management practices.
5. Hold an MS4 public meeting.
6. Provide speakers and workshops for property owners on shoreline, landscaping and yard care BMPs to protect water quality.
7. Work with area schools to incorporate information on stormwater management into classroom learning.
8. Highlight stormwater issues through City sponsored community events and programs that focus on public participation.
    a) Volunteer Adopt-A-Storm Drain program
    b) Volunteer Adopt-A-Street program
    c) Volunteer Adopt-A-Stream program
    d) Volunteer pet waste cleanup at City Park
    e) Volunteer pet waste station monitor
9. Provide grants to individuals and organizations within the City to promote rain gardens.
10. Provide stormwater and water quality information to movie audience.

***Activity Implementation Plan**

Activity #1

Years 1-5) Collaborate in planning and projects with the education committees of the Bassett Creek, Elm Creek and Shingle Creek Watershed Management Organizations.

Years 1-5) Participate in planning and support of metro-wide stormwater education campaign with Watershed Partners. This includes ads on cable TV, radio and in newspapers, among other stormwater education initiatives.

Years 2-5) Promote participation in salt application workshops to reduce the amount of salt applied to streets and parking lots to all applicators in the City and staff.

Activity #2

Year 1-5) Address stormwater management at least once per year in the *Plymouth News* newsletter published one time each year.

Year 1-5) Publish illicit discharge regulations on City web site.

Year 1-5) Publish *Requirements for Builders, Remodelers and Property Owners* erosion control brochure.

Year 1, 4) Publish *Housekeeping and BMP Guide for Property Managers* brochure.

Year 1-5) Publish *A salt reduction guide for your business* brochure.

Year 1-5) Publish *Shoreline buffers protect property and your lake* brochure.

Year 1-5) Publish *Plymouth Yard Care Guide* with sections on back yard composting.

Year 1-5) Publish pollution prevention articles in *Plymouth News*.

Year 1-5) Produce engineering memos for each City-approved project that outline requirements for low impact building and landscaping upon request.

Year 1-5) Publish articles in the *Plymouth News* and brochures for workshops and events on landscaping for water quality.

Year 1-5) Articles in *Plymouth News*, brochures and lake association newsletters address the issue that storm drains lead to lakes and streams.

Activity #3

Year 1-5) Include watershed and water quality lessons in classroom curricula of Environmental Quality Fair host school, including aquatic invertebrate investigation and watershed experiment. Invite exhibitors with stormwater best management information to the event.

Year 1-5) Include stormwater, lawn care best management practices and landscaping for clean water exhibits in the Plymouth Home Expo.

Year 1-5) Include stormwater, lawn care best management practices, streets to streams, and landscaping for clean water presentations and exhibits in the Family Eco-Footprint Learning Center at the Plymouth Home Expo and at the City Sampler.

Activity #4

Year 1-5) Submit press releases and news alerts to local media on water quality projects and issues, including watershed clean up events and student action for water quality. Schedule appearances on local cable TV channel to highlight water quality issues, including landscaping for water quality and explanations of watersheds.

Activity #5

Year 1-5) Publish a notice of MS4 Public Meeting as legal notice in local newspaper.

Activity #6

Year 1-5) Schedule at least one workshop to address landscaping for water quality for property owners.

Activity #7

Year 1-5) Provide watershed and water quality lessons in classroom curricula of public schools, including aquatic invertebrate investigation and watershed experiment. Participate in Earth Day presentations and game to inform grade 3 students of water quality issues and best practices.

Activity #8

Year 1-5) Recruit and train volunteers to inspect and clean debris from storm drains in their neighborhood. Provide educational mailings to all volunteers six times a year.

Year 1-5) Recruit and train volunteers to remove litter from assigned length of City streets. Place signs along the street to highlight the program and the individual.

Activity #9

Year 1-5) Award grants to property owners to incorporate landscape best management practices like rain gardens, shoreline plantings, native plant gardens, pervious pavers, and/or irrigation controllers on their property.

***Performance Measures**

Activity #1

- Track number of meetings and joint projects undertaken by collaborators.
- Track number of TV, radio and newspaper ads produced and aired by Watershed Partners' media campaign.
- Track the number of "hits" on the Watershed Partners' CleanwaterMN web site.
- Track number of participants in salt reduction workshops.

Activity #2

- Publish stormwater articles at least one time each year in the *Plymouth News* newsletter that is sent to all addresses in the City of Plymouth.
- Maintain and update stormwater information on the City's web site, including regulations on illicit discharge.
- Track number of erosion control brochures distributed.
- Track number of *Housekeeping and BMP Guide for Property Managers* erosion control brochures are distributed.
- Mail salt management brochure to all addresses receiving commercial billing in the City.
- Track number of shoreline brochures distributed.
- Distribute *Plymouth Yard Care Guide* to all new Plymouth residents in new resident packets. Track number of new resident packets distributed. Mail *Recyclopedia* to all addresses in the City every-other year. Track the use of the City's yard waste site for dropping off yard waste for composting and for picking up finished compost.
- Publish pollution prevention articles at least one time each year in the *Plymouth News* newsletter that is sent to all addresses in the City of Plymouth and in the *Recyclopedia* that is sent every-other year to all addresses in the City.
- Track number of engineering memos establishing low impact components generated.
- Track attendance at workshops and events promoted in the *Plymouth News*.
- Track number articles, newsletters and brochures that address the issue of storm drains leading to lakes and streams.

Activity #3

- Track number of students involved in classroom stormwater curricula.
- Track attendance at Discover Plymouth.
- Track attendance at Plymouth Environmental Academy
- Track number of materials distributed at events.
- Track number of requests from lake associations for materials and support.

Activity #4

- Track number of press releases submitted and number of TV appearances made.

Activity #5

- Track number of people attending MS4 public meeting.

Activity #6

- Track number of workshop attendees.

Activity #7

- Track the number of students participating in water quality lessons and number of third grade students participating in Earth Day presentations.

Activity #8

- Track the number of Adopt-A-Storm Drain volunteers.
- Track the number of Adopt-A-Street volunteers.
- Track the number of Adopt-A-Stream volunteers.

Activity #9

- Track the number of grants awarded and conduct periodic reviews of completed grant projects.

Activity #10

- Track number of presentations.

***Responsible Party for this BMP:**

Name: Amy Riegel, Senior Engineering Technician
Department: Plymouth Public Works Department
Phone: 763-509-5500
E-mail: ariegel@plymouthmn.gov

*****Indicates a REQUIRED field. Failure to complete any required field will result in rejection of the application due to incompleteness.*

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 1 – PUBLIC EDUCATION AND OUTREACH

Unique BMP Identification Number: 1c-2

***BMP Title:** Education Program: Public Participation
Audiences Involved: See BMP 1c-1
***Educational Goals for Each Audience:** See 1c-1
***Activities Used to Reach Educational Goals:** The City will hold a public information meeting (in conjunction to the annual meeting on the SWPPP) to update citizens on the City's progress toward implementing the SWPPP and to provide information on stormwater related issues. Technical assistance, cost-share and BMP programs implemented by the City and watershed organizations within the City will be coordinated with the MS4 SWPPP activities
***Activity Implementation Plan** See BMP 1c-1
***Performance Measures:** Event and activity participation.
***Responsible Party for this BMP:** Name: Ben Scharenbroich, Water Resources Supervisor Department: Plymouth Public Works Department Phone: 763-509-5500 E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 1 – PUBLIC EDUCATION AND OUTREACH

Unique BMP Identification Number: 1c-3

***BMP Title:** Education Program: Illicit Discharge Detection and Elimination
Audiences Involved: See BMP 1c-1
***Educational Goals for Each Audience:** See BMP 1c-1
***Activities Used to Reach Educational Goals:** See BMP 1c-1
***Activity Implementation Plan** See BMP 1c-1
Performance Measures: See BMP 1c-1
***Responsible Party for this BMP:** Name: Amy Riegel, Senior Engineering Technician Department: Plymouth Public Works Department Phone: 763-509-5500 E-mail: ariegel@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 1 – PUBLIC EDUCATION AND OUTREACH

Unique BMP Identification Number: 1c-4

***BMP Title:** Education Program: Construction Site Run-off Control
Audiences Involved: See 1c-1
***Educational Goals for Each Audience:** See BMP 1c-1
***Activities Used to Reach Educational Goals:** See BMP 1c-1
***Activity Implementation Plan** See BMP 1c-1
Performance Measures: See BMP 1c-1
***Responsible Party for this BMP:** Name: Amy Riegel, Senior Engineering Technician Department: Plymouth Public Works Department Phone: 763-509-5500 E-mail: ariegel@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 1 – PUBLIC EDUCATION AND OUTREACH

Unique BMP Identification Number: 1c-5

***BMP Title:** Education Program: Post-Construction Stormwater Management in New Development and Redevelopment
Audiences Involved: See 1c-1
***Educational Goals for Each Audience:** See BMP 1c-1
***Activities Used to Reach Educational Goals:** See BMP 1c-1
***Activity Implementation Plan** See BMP 1c-1
Performance Measures: See BMP 1c-1
***Responsible Party for this BMP:** Name: Amy Riegel, Senior Engineering Technician Department: Plymouth Public Works Department Phone: 763-509-5500 E-mail: ariegel@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 1 – PUBLIC EDUCATION AND OUTREACH

Unique BMP Identification Number: 1c-6

***BMP Title:** Education Program: Pollution Prevention/Good Housekeeping for Municipal Operations
Audiences Involved: See 1c-1
***Educational Goals for Each Audience:** See BMP 1c-1
***Activities Used to Reach Educational Goals:** See BMP 1c-1
***Activity Implementation Plan** See BMP 1c-1
Performance Measures: See BMP 1c-1
***Responsible Party for this BMP:** Name: Amy Riegel, Senior Engineering Technician Department: Plymouth Public Works Department Phone: 763-509-5500 E-mail: ariegel@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 1 – PUBLIC EDUCATION AND OUTREACH

Unique BMP Identification Number: 1d-1

***BMP Title:** Coordinating Educational Programs

***BMP Description:**

The City of Plymouth is a party to three joint powers organizations and participates in the Watershed Partners program. The City is represented on the Bassett Creek Watershed Management Commission (BCWMC) and technical advisory committee (TAC), the Shingle Creek Watershed Management Commission (SCWMC) and TAC, as well as the Elm Creek Watershed Management Commission (ECWMC) and TAC. The City's Environmental Education Coordinator also participates on the BCWMC and SCWMC Education and Public Outreach Committee (EPOC) where Three Rivers Park District is a participant.

The City of Plymouth has also historically coordinated educational mailings with the Association for Medicine Lake Area Citizens, the Schmidt Lake Association, and the Gleason Lake Improvement Association.

***Measurable Goals:**

The number of area residents participating and attending events.
The number of workshops and events attended by City staff.
Educational brochures flyers

***Timeline/Implementation Schedule:**

Years 1-5: Attend BCWMC, SCWMC, and ECWMC meetings and TAC meetings; participate in EPOC; coordinate with AMLAC and the Schmidt Lake Association.

Specific Components and Notes:

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor
Department: Public Works Department
Phone: 763-509-5500
E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 1 – PUBLIC EDUCATION AND OUTREACH

Unique BMP Identification Number: 1e-1

***BMP Title:** Annual Public Meeting

***BMP Description:**

The City of Plymouth held its annual public meeting on our Storm Water Pollution Prevention Plan on May 12, 2021. The meeting was in advance in the City's official paper – the Sun Sailor, and on the City's website.

***Measurable Goals:**

The goal of the annual public meeting was to provide residents with an opportunity to review the City's SWPPP and offer comments, both verbal and written. One staff members, seven members of the City's Environmental Quality Committee and no residents attended the meeting. This BMP is measured by number of people attending.

***Timeline/Implementation Schedule:**

Annually in May or June of each year.

Specific Components and Notes:

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor
Department: Public Works Department
Phone: 763-509-5500
E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 2 – PUBLIC PARTICIPATION/INVOLVEMENT

Unique BMP Identification Number: 2a-1

***BMP Title:** Comply with Public Notice Requirements
***BMP Description:** The City of Plymouth holds annual public meetings in May or June of each year. This is an opportunity for City residents to review and comment on the City's Storm Water Pollution Prevention Plan. The annual public meeting needs to be noticed 30 days prior to the meeting date.
***Measurable Goals:** This BMP is measured by the number of residents attending. In 2021, zero residents attended the Annual Public Informational Meeting.
***Timeline/Implementation Schedule:** Annual in May or June of each year.
Specific Components and Notes:
***Responsible Party for this BMP:** Name: Ben Scharenbroich, Water Resources Supervisor Department: Public Works Department Phone: 763-509-5500 E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 2 – PUBLIC PARTICIPATION/INVOLVEMENT

Unique BMP Identification Number: 2b-1

***BMP Title:** Solicit Public Input and Opinion on the Adequacy of the SWPPP
***BMP Description:** A copy of the City's SWPPP was available for review and comment, although no residents attended the meeting. The SWPPP is also available during regular business hours at the Public Works Department at Plymouth City Hall.
***Measurable Goals:** Zero comments were received from residents on the SWPPP in 2021.
***Timeline/Implementation Schedule:** On-going. The City of Plymouth is always willing to accept comments on the adequacy of our SWPPP.
Specific Components and Notes:
***Responsible Party for this BMP:** Name: Ben Scharenbroich, Water Resources Supervisor Department: Public Works Department Phone: 763-509-5500 E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 2 – PUBLIC PARTICIPATION/INVOLVEMENT

Unique BMP Identification Number: 2c-1

***BMP Title:** Consider Public Input

***BMP Description:**

The City of Plymouth holds annual public meetings in April, May or June of each year. This is an opportunity for City residents to review and comment on the City's Storm Water Pollution Prevention Plan. No comments were received at this time, however, the meeting was attended by several staff members.

***Measurable Goals:**

This BMP is measured by the number of residents commenting on the SWPPP. In 2021, zero residents attended the Annual Public Informational Meeting and no comments were received from residents on the plan in 2021. Minor comments were received from EQC.

***Timeline/Implementation Schedule:**

On-going. The City of Plymouth is always willing to consider public input on the adequacy of our SWPPP.

Specific Components and Notes:

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor
Department: Public Works Department
Phone: 763-509-5500
E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 3 – ILLICIT DISCHARGE DETECTION AND ELIMINATION SYSTEM

Unique BMP Identification Number: 3a-1

***BMP Title:** Storm Sewer System Map
***BMP Description:** The City has completed detailed mapping of its storm sewer system. The mapping includes all pipes, outfall and outlet structures. Additionally, the map includes NURP ponds and Natural Basins (wetlands).
***Measurable Goals:** The storm sewer map is continually update with new information from development plans (utility plans), City projects, or regular inspections. The City has purchased two GPS units to improve accuracy of the map.
***Timeline/Implementation Schedule:** This BMP is updated regularly and its implementation is on-going.
Specific Components and Notes:
***Responsible Party for this BMP:** Name: Ben Scharenbroich, Water Resources Supervisor Department: Public Works Department Phone: 763-509-5500 E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 3 – ILLICIT DISCHARGE DETECTION AND ELIMINATION SYSTEM

Unique BMP Identification Number: 3b-1

***BMP Title:** Regulatory Control Program
***BMP Description:** Public Works and Engineering staff regularly attend MPCA sponsored seminars on City's jurisdiction and responsibilities. Additionally, City staff works with developers and residents to ensure compliance with water resources regulations at the local, regional, and state levels. Plymouth City Code Section 725 regulates public and private sewers and drains. Ponds and wetlands are inspected every 5 years as required by the MPCA. Discharges not consistent with storm water are investigated. Illicit discharges are addressed through City Code Section 725.
***Measurable Goals:** The number of illicit discharges detected and rectified is measurable.
***Timeline/Implementation Schedule:** This BMP is on-going and is implemented on a daily basis.
Specific Components and Notes:
***Responsible Party for this BMP:** Name: Ben Scharenbroich, Water Resources Supervisor Department: Public Works Department Phone: 763-509-5500 E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 3 – ILLICIT DISCHARGE DETECTION AND ELIMINATION SYSTEM

Unique BMP Identification Number: 3c-1

***BMP Title:** Illicit Discharge Detection and Elimination Plan

***BMP Description:**

At least 20% of all outfalls and ponds in the City are inspected each year through our Pond Maintenance Program adopted in 2005. Additionally, each inspected outfall is also inspected for evidences of any illicit discharge.

Evidence of illegal dumping is investigated and possibilities of hazardous wastes are referred to the Minnesota Duty Officer at 651-649-5451.

The City is in the process of creating a program to remedy illegally dumped materials.

***Measurable Goals:**

Staff will attend workshops or seminars on illicit discharge when available.

At least 20% of all outfalls will be annually inspected and investigated for illicit discharge. This is documented in our Pond Maintenance Files in our Public Works Department. In 2021, approximately 8 square miles of the City's drainage system was inspected.

A program to remove illegally dumped materials from the drainage system.

***Timeline/Implementation Schedule:**

This BMP and potential program is implemented annually during the summer months (May-Sept.).

Specific Components and Notes:

The City hires and intern to perform inspections and document with photos.

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor
Department: Public Works Department
Phone: 763-509-5500
E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 3 – ILLICIT DISCHARGE DETECTION AND ELIMINATION SYSTEM

Unique BMP Identification Number: 3d-1

***BMP Title:** Public and Employee Illicit Discharge Information Program

***BMP Description:**

Records of all documented illicit discharges are available through the City of Plymouth Public Works Department during regular business hours. Illicit discharge detection is a part of the City's pond maintenance inspection program. City Code Section 725 address's discharges to the City's sewers.

City Code Section 725 is available on the City website. Additionally, a city wide brochure our article will educate employees, businesses and the general public the hazards associated with illegal discharges of non-stormwater fluids and illegal dumping.

***Measurable Goals:**

Staff will attend workshops or seminars on illicit discharge when available.

At least 20% of all outfalls will be annually inspected and investigated for illicit discharge. This is documented in our Pond Maintenance Files in our Public Works Department.

City wide brochure or article will reach over 20,000 households and hundreds of businesses.

***Timeline/Implementation Schedule:**

This BMP is implemented annually during the summer months (May-September).

Specific Components and Notes:

The City hires and intern to perform inspections and document with photos.

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor
Department: Public Works Department
Phone: 763-509-5500
E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 3 – ILLICIT DISCHARGE DETECTION AND ELIMINATION SYSTEM

Unique BMP Identification Number: 3e-1

***BMP Title:** Identification of Non-Stormwater Discharge and Flows

***BMP Description:**

The City of Plymouth identifies the following non-stormwater discharges as contributors of pollutants to our small MS4:

1. Lawn watering
2. Individual residential car washing
3. Swimming pool discharges

Over watering lawns may contribute to excess nutrient loading into City ponds, streams, wetlands, and lakes. The City of Plymouth enforces a sprinkling ordinance to reduce the contribution of pollutants coming from excess lawn watering. City residents are encouraged to wash vehicles on grass surfaces and not driveways. Lastly, swimming pool water discharges are enforced through ordinance and require stilling of the water for 7 days prior to discharge into the City's storm drains.

***Measurable Goals:**

City Ordinances
Seasonal fines for violations of the sprinkler ordinance

***Timeline/Implementation Schedule:**

Annually

Specific Components and Notes:

The City hires and intern to perform inspections and document with photos.

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor
Department: Public Works Department
Phone: 763-509-5500
E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 4-CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

Unique BMP Identification Number:

4	a	1

***BMP Title:** Ordinance or other Regulatory Mechanism

***BMP Description:**

Plymouth City Code (attached) requires an approved erosion control and grading plan for earth disturbing activities prior to the issuance of grading or building permits (Section 425). Additionally, subdivisions are required to be reviewed by staff and are subject to various erosion control requirements including silt fence, rock construction entrances, inlet protection, seed and mulch, street sweeping , temporary sedimentation basins and other best management practices (Section 526).

***Measurable Goals:**

Documentation of letters, project reviews and administrative fees for non-compliant projects.

Completion of the Erosion Control review and update through the City's Environmental Quality Committee.

***Timeline/Implementation Schedule:**

Ongoing

Specific Components and Notes:

The City also works with local watershed management organizations to review, inspect, reduce and/or eliminate erosion from construction sites.

***Responsible Party for this BMP:**

Name: Amy Riegel, Senior Engineering Technician

Department: Public Works Department

Phone: 763-509-5500

E-mail: ariegel@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 4-CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

Unique BMP Identification Number:

4	b	1

***BMP Title:** Construction Site Implementation of Erosion and Sediment Control BMP's

***BMP Description:**

City Code requires proposed construction develop and implement an onsite erosion control plan. Additionally, the City requires the qualified developers to provide the City with their SWPPP.

***Measurable Goals:**

Compliance by all developments that have an erosion control (or SWPPP) completed for their project.

***Timeline/Implementation Schedule:**

This is typically an on-going procedure.

Specific Components and Notes:

City staff inspects approximately 28 active development sites and numerous individual building sites on a bi-weekly basis.

***Responsible Party for this BMP:**

Name: Amy Riegel, Senior Engineering Technician
Department: Public Works Department
Phone: 763-509-5500
E-mail: ariegel@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 4-CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

Unique BMP Identification Number:

4	c	1

***BMP Title:** Waste Controls for Construction Site Operations

***BMP Description:**

The City's prohibits onsite disposal of any construction waste or washing of equipment. Concrete washout areas are required, and must be properly maintained.

During the commercial site plan review process, drawings are noted to require specific wash out areas on-site.

***Measurable Goals:**

City staff prepares an annual report of all erosion control inspections and violations. This is an ongoing procedure. The city is in the process of preparing a standard detail for concrete washout stations.

***Timeline/Implementation Schedule:**

Typically, this is an ongoing procedure however most activity takes place during the spring, summer and fall months.

Specific Components and Notes:

Weekly inspections by staff.

***Responsible Party for this BMP:**

Name: Amy Riegel, Senior Engineering Technician
Department: Public Works Department
Phone: 763-509-5500
E-mail: ariegel@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 4-CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

Unique BMP Identification Number:

4	d	1

***BMP Title:** Procedure for Site Plan Review

***BMP Description:**

The City of Plymouth has established a detailed process for all site plan reviews. All development plans are submitted to the Community Development Department. They are routed to the Public Works Department for review of erosion and sedimentation control measures. Reviews include: erosion control, drainage concerns and implementation of Best Management Practices such as rain gardens, infiltration basin and green roofs. Approved plans are subject to a pre-construction meeting at which time staff reviews erosion and sediment control on the approved plan and City policies. Prior to issuance of a grading permit, erosion and sediment controls such as silt fence and rock construction entrances are inspected by staff to confirm they are in place. Once project activity has begun, sites are subject to weekly inspections by City staff.

***Measurable Goals:**

All development plans are reviewed (100%). Non-development construction is also reviewed when staff has concerns.

***Timeline/Implementation Schedule:**

This is typically an ongoing procedure, however, the Engineering Guidelines are updated annually, most recently in January 2022.

Specific Components and Notes:

The City also has a policy to inspect lake front home sites where existing homes are torn down, and new homes are built.

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor
Department: Public Works Department
Phone: 763-509-5500
E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 4-CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

Unique BMP Identification Number:

4	e	1

***BMP Title:** Establishment of Procedures for the Receipt and Consideration of Reports of Stormwater Noncompliance

***BMP Description:**

Possible violations of City erosion and sediment control policies are submitted to the City's erosion control inspector by other City staff, watershed management organizations, or citizens. All complaints of possible violations are inspected by staff. If sites are found to be in violation, phone calls and/or letters are used to contact the project manager (contractor or developer). Continued non-compliance is subject to a $500.00 administrative penalty and/or stop work order.

***Measurable Goals:**

City regularly receives calls from citizens concerned with a specific project. The City does keep track of the number of calls received, letters sent, administrative penalties applied, and stop work orders issued.

***Timeline/Implementation Schedule:**

This is typically an ongoing procedure.

Specific Components and Notes:

***Responsible Party for this BMP:**

Name: Amy Riegel, Senior Engineering Technician
Department: Public Works Department
Phone: 763-509-5500
E-mail: ariegel@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 4-CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

Unique BMP Identification Number:

4	f	1

***BMP Title:** Establishment of Procedures for Site Inspections and Enforcement

***BMP Description:**

The City has established a strong inspection program. Annually, in addition to trained and certified staff, the City has hired summer engineering interns to inspect construction sites biweekly during the construction season. Violations will be re-inspected after contact is made with the contractor or developer (i.e. responsible party). Continued violations are subject to a $500.00 administrative penalty and/or a stop work order.

***Measurable Goals:**

Number of all developments inspected and number of inspections during their active period. Violations is not used as a measurable goal, since the goal is to minimize all violations.

***Timeline/Implementation Schedule:**

This is typically an ongoing procedure.

Specific Components and Notes:

Additionally, staff can "flag" sites through the Community Development Department to ensure follow-up inspections of construction sites.

***Responsible Party for this BMP:**

Name: Amy Riegel, Senior Engineering Technician
Department: Public Works Department
Phone: 763-509-5500
E-mail: ariegel@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 4-CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

Unique BMP Identification Number: 4-g-1

***BMP Title:** Erosion and Sediment Control Training

***BMP Description:**

Continued education in erosion and sediment control methods and requirements. Staff is trained, at a minimum, as an Erosion and Sediment Control Specialist - Inspector/Installer through the University of Minnesota Sediment and Erosion Control certification program.

***Measurable Goals:**

Passing of state test and certification as Erosion and Sediment Control Specialist - Inspector/Installer.

***Timeline/Implementation Schedule:**

Bi-annual certification.

Specific Components and Notes:

Staff also attends annual erosion and sediment control conferences and workshops

***Responsible Party for this BMP:**

Name: Amy Riegel, Senior Engineering Technician
Department: Public Works Department
Phone: 763-509-5500
E-mail: ariegel@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 4-CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

Unique BMP Identification Number: 4-h-1

***BMP Title:** Engineering Guidelines for Developers

***BMP Description:**

The City offers developers Engineering Guidelines and literature to assist with compliance of City policies and to include with submittal of construction plans for review. Guidelines are available through the Public Works Department or on the City website. Guidelines include:

ST-12 TYPICAL TREATMENT POND DETAIL
ST-16 TYPICAL RAIN GARDEN DETAIL
ST-18 SILT FENCE DETAIL
ST-19 ROCK CONSTRUCTION ENTRANCE DETAIL

***Measurable Goals:**

Inclusion of all applicable Engineering Guidelines for sediment and erosion control onto construction plans

***Timeline/Implementation Schedule:**

2006 and ongoing. Evaluated and updated annually as needed.

Specific Components and Notes:

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor
Department: Public Works Department
Phone: 763-509-5500
E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 5-POST-CONSTRUCTION STORMWATER MANAGEMENT IN NEW DEVELOPMENT AND REDEVELEOPMENT

Unique BMP Identification Number:

5	a	1

***BMP Title:** Development and Implementation of Structural and/or Non Structural BMP's

***BMP Description:**

The City of Plymouth has developed a list of potential BMP's that can be utilized in the city for development. Additionally, the City of Plymouth has incorporated several BMP's into various watersheds.

***Measurable Goals:**

The number and type of BMP is used for documentation. The running total is as follows: Ponds (161), Rain Gardens (63), Filtration/Infiltration Basins (60), Underground Stormwater Systems (17), Water Quality Monitoring Stations (11), Canada Geese Removal (1000+), Shoreline Restorations (36), Large Drainage/Erosion projects (12).

***Timeline/Implementation Schedule:**

This BMP is part of annual work conducted by the City.

Specific Components and Notes:

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor
Department: Public Works Department
Phone: 763-509-5500
E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 5-POST-CONSTRUCTION STORMWATER MANAGEMENT IN NEW DEVELOPMENT AND REDEVELEOPMENT

Unique BMP Identification Number:

5	b	1

***BMP Title:** Regulatory Mechanism to Address Post Construction Runoff from New Development and Redevelopment

***BMP Description:**

All development and re-development projects greater than 0.5 acres are subject to rate control requirements and shall have no net increase in runoff for the 2, 10, and 100-year storm events. All development or redevelopment projects adding or reconstructing an acre or more of impervious surface shall meet Minimal Impact Design Standards (MIDS).

***Measurable Goals:**

Reduction in TSS, phosphorous, and discharge rates leaving the City. Will be monitored as part of the City's non-degradation plan and load assessment.

***Timeline/Implementation Schedule:**

This BMP is implemented with every plan review, approximately once a week throughout the year.

Specific Components and Notes:

The City of Plymouth contracts for water quality monitoring at over a dozen locations throughout the city.

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor
Department: Public Works Department
Phone: 763-509-5500
E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 5-POST-CONSTRUCTION STORMWATER MANAGEMENT IN NEW DEVELOPMENT AND REDEVELEOPMENT

Unique BMP Identification Number:

5	c	1

***BMP Title:** Long-term Operation and maintenance of BMPs

***BMP Description:**

The City has an established Pond Maintenance program and local surface water management plan. Ponds, outfalls, and outlets are inspected every 5 years. The City budgets funds for maintenance of previously constructed BMPs such as rain gardens, shoreline restorations, and water quality ponds. Additionally, the City budgets for both routine water resources projects and long term capital projects to ensure proper functionality.

The City also requires maintenance agreements for BMPs, both development and others, for long term maintenance of such structures. Maintenance agreements may be required for rain gardens, sump manholes, storm water vaults, street and/or parking lot sweeping, or others.

***Measurable Goals:**

The City conducts dozens of maintenance projects annually to assess best management practices associated with our drainage system. Maintenance includes restoring rain gardens and water quality ponds to their designed condition, repairing stream bank erosion, and removing accumulated sediments from sump manholes and hydrodynamic separators.

***Timeline/Implementation Schedule:**

Maintenance to ensure the long-term operation of BMPs is done on an annual basis. Erosion repair, pond dredging, removal of sediments from sump manholes, and maintenance of rain gardens and shoreline restorations on an annual basis ensures the long term viability of these implemented BMPs.

Specific Components and Notes:

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor
Department: Public Works Department
Phone: 763-509-5500
E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 5-POST-CONSTRUCTION STORMWATER MANAGEMENT IN NEW DEVELOPMENT AND REDEVELEOPMENT

Unique BMP Identification Number:

5	d	1

***BMP Title:** Ordinances

***BMP Description:**

The City is in the process of reviewing all related ordinances such as erosion control and lawn fertilizer application, and preparing to implement new non-degradation policies for all new and redevelopment.

***Measurable Goals:**

This BMP will be measured by a reduction in TSS, phosphorous, and water volume.

***Timeline/Implementation Schedule:**

This BMP is part of annual development/redevelopment plan review work conducted by the City.

Specific Components and Notes:

The City of Plymouth submitted a Non-degradation plan to the MPCA on October 1, 2007.

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor
Department: Public Works Department
Phone: 763-509-5500
E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 5-POST-CONSTRUCTION STORMWATER MANAGEMENT IN NEW DEVELOPMENT AND REDEVELEOPMENT

Unique BMP Identification Number:

5	e	1

***BMP Title:** NEMO

***BMP Description:**

Non-point source Education for Municipal Officials. NEMO is an educational program for local land use officials and addresses the relationship of land use to natural resource protection. The goal is to present this national program to as many of the City's decision makers as possible. This presentation has been made to various City leaders and staff.

***Measurable Goals:**

This BMP is measured by changes in City policy that reflect the importance of natural resources. One example is the City's proposed non-degradation policy. Additionally, this BMP can be measured by:

1. Number of NEMO presentations given
2. Number of NEMO presentations requested

***Timeline/Implementation Schedule:**

This BMP is part of annual work conducted by the City.

Specific Components and Notes:

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor
Department: Public Works Department
Phone: 763-509-5500
E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 6-POLLUTION PREVENTION/GOOD HOUSEKEEPING

Unique BMP Identification Number:

6	a	1

***BMP Title:** Municipal Operations and Maintenance Program

***BMP Description:**

The City will conduct or attend annual training based on US EPA educational materials on reducing pollutant runoff from parks, open space, fleet, city-owned buildings, and city development.

In addition, to meet the goals of the Shingle Creek Chloride TMDL, the City will:

1. Annually calibrate spreaders
2. Use the Road Weather Information Service (RWIS) and other sensors such as truck mounted or hand held sensors to improve application decisions such as the amount and timing of application where feasible and cost effective.
3. Evaluate new technologies such as pre-wetting and anti-icing as equipment needs to be replaced. These technologies will be adopted where feasible and practical.
4. Investigate and adopt new products (such as Clear Lane, a commercially available pretreated salt) where feasible and cost effective.
5. Annually investigate salt application technologies.

***Measurable Goals:**

Training provided to staff and number of new BMP's adopted by the City.

***Timeline/Implementation Schedule:**

On-going, at least one event per year.

Specific Components and Notes:

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor
Department: Public Works Department
Phone: 763-509-5500
E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 6-POLLUTION PREVENTION/GOOD HOUSEKEEPING

Unique BMP Identification Number:

6	a	2

***BMP Title:** Street Sweeping

***BMP Description:**

The City of Plymouth has developed a strong Street Sweeping Program. Starting in 2006, all city streets are swept three to five times (using vacuum street sweepers) during the spring/summer months. Detailed records are kept of the areas and the amount of materials collected for each area.

The City expects street sweeping to help meet the goals of the following TMDLs:

1. Shingle Creek Chloride
2. Schmidt, Pomerleau, and Bass Lakes Excess Nutrient TMDL
3. Cedar Island, Pike, and Eagle Lakes Excess Nutrient TMDL
4. Medicine Lake Excess Nutrient TMDL
5. Elm Creek Watershed Wide TMDL
6. Twin Cities Metro Area Chloride TMDL

***Measurable Goals:**

The quantity of all street sweeping material collected is recorded and tested. Goals are to reduce these amounts and their phosphorous concentrations.

***Timeline/Implementation Schedule:**

During after-spring thaw to mid-September.

Specific Components and Notes:

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor
Department: Public Works
Phone: 763-509-5500
E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 6-POLLUTION PREVENTION/GOOD HOUSEKEEPING

Unique BMP Identification Number:

6	b	2

***BMP Title:** Annual Inspection of All Structural Pollution Control Devices

***BMP Description:**

The City has identified, inventoried, and mapped all of its structural pollution control devices. These devices are inspected on a regular basis and maintained annually.

***Measurable Goals:**

To maintain these devices on a regular basis.

***Timeline/Implementation Schedule:**

On-going

Specific Components and Notes:

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor
Department: Public Works
Phone: 763-509-5500
E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 6-POLLUTION PREVENTION/GOOD HOUSEKEEPING

Unique BMP Identification Number:

6	b	3

***BMP Title:** Inspection of a Minimum of 20% of the MS4 Outfalls, Sediment Basins and Ponds Each Year on a Rotating Basis

***BMP Description:**

Since 2003, the City has adopted the Plymouth Pond Maintenance Policy which requires the inspection of all outfall structures. At a minimum, 20% of outcall structures are inspected on an annual basis.

The City inspected approximately 8 square miles of the drainage system in 2020.

***Measurable Goals:**

To inspect at least 20% of all outfall structures.

***Timeline/Implementation Schedule:**

On-going

Specific Components and Notes:

Water Resources Manager will hire seasonal interns or a permanent Water Resources Manager to inspect storm sewer pipe and structures as well as NURP ponds and wetlands per the City of Plymouth Pond Maintenance Policy.

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor
Department: Public Works
Phone: 763-509-5500
Email: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 6-POLLUTION PREVENTION/GOOD HOUSEKEEPING

Unique BMP Identification Number:

6	b	4

***BMP Title:** Quarterly Inspection of all Exposed Stockpile, Storage, and Material Handling Areas.

***BMP Description:**

The City inspects all of its sites on a regular basis including the City's salt stockpiles as required by the Shingle Creek Chloride TMDL implementation plan and the General Permit Authorization to Discharge Stormwater Associated with Small Municipal Separate Storm Sewer Systems Under the National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) Permit Program (MNR040000).

The number of stockpiles or disposal sites is limited to one or two. The City's salt stockpile is located 14,900 23rd Avenue North. The remaining stockpiles, storage, and material handling areas are located at the City Material Disposal Site (13825 Schmidt Lake Road) and the City Maintenance Yard (14900 23rd Ave N).

The stockpiles, storage, and material handling areas are identified in the MS4Front inventory system under the Municipal Facilities category.

***Measurable Goals:**

Regular, at least quarterly, inspection of all stockpiles, storage, and material handling areas.

***Timeline/Implementation Schedule:**

On-going

Specific Components and Notes:

***Responsible Party for this BMP:**

Name: Amy Riegel, Senior Engineering Technician
Department: Public Works
Phone: 763-509-5500
E-mail: ariegel@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 6-POLLUTION PREVENTION/GOOD HOUSEKEEPING

Unique BMP Identification Number:

6	b	5

***BMP Title:** Inspection Follow-Up, Including the Determination of whether Repair, Replacement, or Maintenance Measures are Necessary and the Implementation of the Corrective Measures

***BMP Description:**

In 2003, the City adopted a Pond Maintenance Policy. The Policy requires the City to inspect all of the basins and structures, and to develop a maintenance schedule for all necessary repairs.

***Measurable Goals:**

To comply with the City's Pond Maintenance Policy.

***Timeline/Implementation Schedule:**

On-going

Specific Components and Notes:

Water Resources Supervisor works in conjunction with maintenance division to determine maintenance schedule.

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor
Department: Public Works Department
Phone: 763-509-5500
E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 6-POLLUTION PREVENTION/GOOD HOUSEKEEPING

Unique BMP Identification Number:

6	b	6

***BMP Title:** Record Reporting and Retention of all Inspections and Responses to the Inspection

***BMP Description:**

In 2003, the City adopted a Pond Maintenance Policy. The Policy requires that the City provide regular reports of all inspections and their findings. All records are computerized and linked with the City's GIS for ease of reference. The City will follow the MPCA Inspection and Record Keeping Guidelines.

***Measurable Goals:**

A continuously updated data base and map of all inspected water resources facilities, ponds, basins, and structures. In 2007, our data base was updated to include wetland mitigation areas.

***Timeline/Implementation Schedule:**

On-going

Specific Components and Notes:

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor
Department: Public Works Department
Phone: 763-509-5500
E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 6-POLLUTION PREVENTION/GOOD HOUSEKEEPING

Unique BMP Identification Number:	6	b	7

***BMP Title:** Evaluation of Inspection Frequency

***BMP Description:**

The inspection and evaluation of all of the city water quality ponds, natural basins, pipes, and structures has been completed. It is expected than an inspection frequency of every five years will be sufficient to maintain the City's storm water conveyance system.

***Measurable Goals:**

To continue an efficient and routine inspection program.

***Timeline/Implementation Schedule:**

On-going

Specific Components and Notes:

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor
Department: Public Works Department
Phone: 763-509-5500
E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Minimum Control Measure: 6-POLLUTION PREVENTION/GOOD HOUSEKEEPING

Unique BMP Identification Number:

6	c	1

***BMP Title:** Monitoring

***BMP Description:**

The City of Plymouth monitors surface water quality at up to 13 sites in the Bassett Creek, Elm Creek, and Shingle Creek Watersheds. Monitoring assists the City implementation of projects to address impaired waters.

Water Quality parameters include TSS, P, N, and others. Additionally, the City of Plymouth supports implementation of the Shingle Creek Chloride TMDL implementation plan through the Shingle Creek Watershed. The SCWMC monitors water quality at two stations in the watershed (Zane Ave. and Humboldt Ave. near the outlet). Upon the initiation of the Shingle Creek Chloride TMDL study, the SCWMC has increased monitoring at these two stations to include grab samples of chloride and collection of conductivity at 15-minute intervals. The BCWMC and MCWD also monitor selected water bodies in the City of Plymouth.

***Measurable Goals:**

To continue an efficient and routine monitoring program. To implement the Shingle Creek Chloride TMDL

***Timeline/Implementation Schedule:**

On-going

Specific Components and Notes:

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor
Department: Public Works Department
Phone: 763-509-5500
E-mail: bscharenbroich@plymouthmn.gov

BMP Summary Sheet

MS4 Name: City of Plymouth

Permit Condition: IV.D Section 303 (d) listings

Unique BMP Identification Number: IV.D - 1

***BMP Title:** Impaired Waters Review Process

***BMP Description:**

The City of Plymouth will review all discharges from our MS4 system to impaired waters, as defined by the current USEPA approved 303 (d) list. For this review the City of Plymouth will utilize our updated Surface Water Management Plan to:

1. Identify the impaired waters that are likely to be impacted by stormwater discharge
2. Use a combination of storm sewer maps and field surveys to identify all potential stormwater discharges to impaired waters.
3. Delineate the watershed area that contributes to the discharges
4. Evaluate the hydrology, land use and other characteristics of the watershed areas that may impact the impaired water as a result of a stormwater discharge.

Based on the review above, the City of Plymouth will determine if any changes to the existing stormwater system or BMPs are needed to minimize the impact of discharges from our MS4 to the impaired waters. If modifications are necessary, the City of Plymouth will modify our SWPPP and submit those modifications to the MPCA with the current year's annual report. In our review, we will consider timing and long and short term costs. All assumptions, reasoning, and justification used to reach a conclusion on whether or not SWPPP revisions are necessary will be documented in the decision making process. A narrative summary of this review will then be prepared, and identify any associated SWPPP revisions that were made.

Location(s) in SWPPP of detailed information relating to this BMP:

***Measurable Goals:**

1. Completion of updated Surface Water Management Plan
2. Prepare a written inventory of impaired waters within the jurisdictional boundaries of the City of Plymouth
3. Map all impaired waters reasonably affected by discharges from the City of Plymouth.
4. Determine necessary revisions to SWPPP.
5. Prepare a schedule and timeline to incorporate changes to SWPPP

***Timeline/Implementation Schedule:**

2008: Complete Surface Water Management Plan
2008: Identify impaired waters
2009: Delineate watersheds contributing to impaired waters
2009: Develop a map of discharges
2010: Complete and evaluation of hydrology, land use, and other characteristics of watershed areas that may impact the impaired water as a result of storm water discharge.
2010: Include in annual report to MPCA the overview of the impaired waters review and any changes to the SWPPP which are necessary.

Specific Components and Notes:

***Responsible Party for this BMP:**	
Name:	Ben Scharenbroich, Water Resources Supervisor
Department:	Public Works Department
Phone:	763-509-5500
E-mail:	bscharenbroich@plymouthmn.gov

**Indicates a REQUIRED field. Failure to complete any required field will result in rejection of the application due to incompleteness.*

BMP Summary Sheet

MS4 Name: City of Plymouth

Permit Condition: IV.D Section 303 (d) listings and TMDL

Unique BMP Identification Number: IV.D - 2

***BMP Title:** Schmidt, Pomerleau, and Bass Lakes Excess Nutrient TMDL

***BMP Description:**

The City of Plymouth will review the adequacy of the SWPPP to determine if changes are required to meet the goals of the Schmidt, Pomerleau, and Bass Lakes Excess Nutrient TMDL.

Location(s) in SWPPP of detailed information relating to this BMP:

***Measurable Goals:**

1. Annual Education (see sheet 1.c.1)
2. Street Sweeping
3. Eight (8) Rain Gardens (3 Schmidt, 5 Bass)
4. Fourteen (14) Shoreline Management and Restoration Projects (4 Schmidt, 10 Bass)
5. Additional Development and Redevelopment Regulations
6. Fifty (50) Storm Drain Filters for Schmidt Lake Watershed
7. Feasibility Study for water quality ponding in the Bass Lake Watershed
8. Schmidt Lake Wetland Restoration
9. Schmidt Lake Neighborhood Rain garden Project
10. Bass & Pomerleau Lakes Alum Treatment Project

***Timeline/Implementation Schedule:**

2010: Annual Education (see sheet 1.c.1)
2010: Eight (8) Rain Gardens (3 Schmidt, 5 Bass)
2010-2011: Schmidt Lake Wetland Restoration
2010-2011: Schmidt Lake Neighborhood Rain Garden Project
2010-2014: Additional Development and Redevelopment Regulations
2011: Fifty (50) Storm Drain Filters for Schmidt Lake Watershed
2011-2013: Street Sweeping – five (5) vacuum assisted sweeps (see sheet 6.a.2)
2012-2013: Fourteen (14) Shoreline Management and Restoration Projects (4 Schmidt, 10 Bass)
2013: Feasibility Study for water quality ponding in the Bass Lake Watershed
2019: Bass & Pomerleau Lakes Alum Treatment Project – Phase 1
2020: Bass & Pomerleau Lakes Alum Treatment Project – Phase 2

Specific Components and Notes:

Annual cost over 10 years to implement this BMP is estimated to be $300,000.

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor
Department: Public Works Department
Phone: 763-509-5500
E-mail: bscharenbroich@plymouthmn.gov

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BMP Summary Sheet

MS4 Name: City of Plymouth

Permit Condition: IV.D Section 303 (d) listings and TMDL

Unique BMP Identification Number: IV.D - 3

***BMP Title:** Cedar Island, Pike, and Eagle Lakes Excess Nutrient TMDL

***BMP Description:**

The City of Plymouth will review the adequacy of the SWPPP to determine if changes are required to meet the goals of the Cedar Island, Pike, and Eagle Lakes Excess Nutrient TMDL.

Location(s) in SWPPP of detailed information relating to this BMP:

See below.

***Measurable Goals:**

1. Annual Education (see sheet 1.c.1)
2. Street Sweeping (see sheet 6.a.2)
3. Development and Redevelopment Regulations
4. Rough Fish Management
5. Coordinate efforts with MnDOT, TRPD, and Maple Grove
6. Illicit discharge detection including City Record Review
7. Post official "15 mph" signage

***Timeline/Implementation Schedule:**

2011: Annual Education (see sheet 1.c.1)
2011: Street Sweeping (see sheet 6.a.2)
2011: Development and Redevelopment Regulations
2012: Rough Fish Management
2011: Coordinate efforts with MnDOT, TRPD, and Maple Grove
2012: Illicit discharge detection including City Record Review
2012: Post official "15 mph" signage

Specific Components and Notes:

Annual cost over 10 years to implement this BMP is estimated to be $75,000.

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor
Department: Public Works Department
Phone: 763-509-5500
E-mail: bscharenbroich@plymouthmn.gov

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BMP Summary Sheet

MS4 Name: City of Plymouth

Permit Condition: IV.D Section 303 (d) listings and TMDL

Unique BMP Identification Number: IV.D - 4

***BMP Title:** Medicine Lake Excess Nutrient TMDL

***BMP Description:**

The City of Plymouth has reviewed the adequacy of the SWPPP to determine if changes are required to meet the goals of the Medicine Lake Excess Nutrient TMDL. Several projects have been completed and are included in the SWPPP to meet the goals of the Medicine Lake TMDL including education, street sweeping, regulations, erosion repair projects, stream restoration projects and water quality ponding projects.

Location(s) in SWPPP of detailed information relating to this BMP:

See below.

***Measurable Goals:**

1. Annual Education (see sheet 1.c.1)
2. Street Sweeping (see sheet 6.a.2)
3. Development and Redevelopment Regulations
4. Completion of County Road 9/61 Erosion Repair Project
5. Completion of Timber Creek Erosion Repair Project
6. Completion of Wood Creek Erosion Repair and Stream Restoration
7. Completion of Plymouth Creek Water Quality Ponds
8. Completion of Plymouth Creek Stream Restoration
9. Completion of Plymouth Creek Stream Restoration – Plymouth Creek Park
10. Completion of Kilmer Park Street Reconstruction Project
11. Completion of Neighborhood Drainage Improvement Project
12. Completion of 2020 Street Reconstruction Project

***Timeline/Implementation Schedule:**

2011: Annual Education (see sheet 1.c.1)
2011: Street Sweeping (see sheet 6.a.2)
2011: Development and Redevelopment Regulations
2007: Completion of County Road 9/61 Erosion Repair Project
2009: Completion of Wood Creek Erosion Repair and Stream Restoration
2010: Completion of Timber Creek Erosion Repair Project
2011: Completion of Plymouth Creek Water Quality Ponds
2012: Completion of Plymouth Creek Stream Restoration
2016: Completion of Plymouth Creek Stream Restoration Project – Plymouth Creek Park
2018: Completion of Kilmer Park Street Reconstruction Project
2019: Completion of Neighborhood Drainage Improvement Project
2020: Completion of 2020 Street Reconstruction Project
2021: Completion of 2021 Street Reconstruction Project

Specific Components and Notes:

Annual cost over 10 years to implement this BMP is estimated to be $6,200,000.

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor

Department: Public Works Department

Phone: 763-509-5500

E-mail: bscharenbroich@plymouthmn.gov

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BMP Summary Sheet

MS4 Name: City of Plymouth

Permit Condition: IV.D Section 303 (d) listings and TMDL

Unique BMP Identification Number: IV.D - 5

***BMP Title:** Shingle Creek & Bass Creek Biota and Dissolved Oxygen TMDL

***BMP Description:**

The City of Plymouth has reviewed the adequacy of the SWPPP to determine if changes are required to meet the goals of the Shingle Creek & Bass Creek Biota TMDL. Most of the improvements are expected to come through the City's regulatory program as properties develop and redevelop.

Location(s) in SWPPP of detailed information relating to this BMP:

See below.

***Measurable Goals:**

1. Annual Education (see sheet 1.c.1)
2. Street Sweeping (see sheet 6.a.2)
3. Development and Redevelopment Regulations
4. Monitoring

***Timeline/Implementation Schedule:**

2011: Annual Education (see sheet 1.c.1)
2011: Street Sweeping (see sheet 6.a.2)
2011: Development and Redevelopment Regulations
2012: Monitoring (see sheet 6.c.1)

Specific Components and Notes:

Annual cost over 10 years to implement this BMP is estimated to be $500,000.

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor

Department: Public Works Department

Phone: 763-509-5500

E-mail: bscharenbroich@plymouthmn.gov

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BMP Summary Sheet

MS4 Name: City of Plymouth

Permit Condition: IV.D Section 303 (d) listings and TMDL

Unique BMP Identification Number: IV.D - 6

***BMP Title:** Upper Minnehaha Creek Watershed Nutrient and Bacteria TMDL

***BMP Description:**

The City of Plymouth has reviewed the adequacy of the SWPPP to determine if changes are required to meet the goals of the Upper Minnehaha Creek Watershed Nutrient and Bacteria TMDL. Most of the improvements are expected to come through the City's regulatory program as properties develop and redevelop.

Location(s) in SWPPP of detailed information relating to this BMP:

See below.

***Measurable Goals:**

1. Annual Education (see sheet 1.c.1)
2. Street Sweeping (see sheet 6.a.2)
3. Development and Redevelopment Regulations
4. Monitoring

***Timeline/Implementation Schedule:**

Annual Education	Annually
Street Sweeping	Annually
City View Acres Rain Gardens (Gleason)	Complete 2008
Hawthorne Ponds Rain Garden (Hadley)	Complete 2008
City View Acres Storm Water Pond (Gleason)	Complete 2008
Pond Maintenance (Mooney Lake)	Complete 2014
Candlelight Terrace Street Reconstruction Project	Complete 2019
Meadow Wood Drainage Improvement Project (Gleason)	Complete 2020
Maple Creek Stream Restoration (Gleason)	Proposed 2023
Chelsea Woods Drainage Improvement Project (Gleason)	Proposed 2023
19th and Dunkirk Storm Water Pond Enhancement (Gleason)	Proposed 2024

Specific Components and Notes:

Cost to implement this BMP is estimated to be $5,750,000

***Responsible Party for this BMP:**

Name: Ben Scharenbroich, Water Resources Supervisor

Department: Public Works Department

Phone: 763-509-5500

E-mail: bscharenbroich@plymouthmn.gov

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