



**Municipal Separate Storm Sewer System (MS4)  
Regional Stormwater Management Plan (SWMP)  
for the Bangor Area Stormwater Group (BASWG)**

**For Small Municipal Separate Storm Sewer Systems (MS4)  
MER041000 Final Permit Dated October 15, 2020 and effective  
July 1, 2022 - June 30, 2027**

**First Submitted to Maine DEP: March 26, 2021**

**Last Revised: June 18, 2021**

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## **1.0 Introduction**

This section of the plan describes the Maine MS4 Program, the BASWG’s regional plan, permit requirements around initial and modified plans. It also includes information on how the plan will be implemented, made available to the public, and updated over time. This section of the plan concludes with key contacts for the BASWG membership, executive committee, the BASWG’s organizational structure, and a map of the Bangor Urbanized Area (BUA).

### **1.1. MS4 Program**

The Maine Department of Environmental Protection (MDEP) reissued the Municipal Separate Storm Sewer System (MS4) General Permit (GP) on July 1, 2022 (included as Attachment A). The GP authorizes the direct discharge of stormwater from regulated MS4s to waters of the State, other than groundwater, pursuant to Water Pollution Control Law 38 M.R.S.A. § 413. The GP only covers operations or activities associated with stormwater runoff within the identified EPA-designated Urbanized Area of each regulated MS4. The GP requires that permittees shall develop, implement, and enforce a Stormwater Management Plan (SWMP) that is designed to reduce or eliminate polluted stormwater runoff to the maximum extent practicable from its regulated MS4.

### **1.2 Regional Plan Development**

This Regional SWMP was developed in accordance with the terms and conditions of the MDEP General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4) MER041000 Final Permit Dated October 15, 2020, and becomes effective on July 1, 2022. The GP required the following six Minimum Control Measures (MCMs) be addressed in a SWMP.

- I. Public Education and Outreach on Stormwater Impacts
- II. Public Involvement and Participation
- III. Illicit Discharge Detection and Elimination
- IV. Construction Site Stormwater Runoff Control
- V. Post-Construction Stormwater Management in New and Re-development
- VI. Pollution Control/Good Housekeeping for Municipal Operations

During the previous MS4 permit cycles (2003-2021), the twelve municipal or federally owned MS4s located in the Bangor Urbanized Area (BUA) of Maine decided to develop a Regional SWMP. The purpose of the regional SWMP was to take advantage of ongoing MS4 permit compliance activities that were performed in an efficient, collaborative effort. The MDEP supported the development of multiple cycles of regional SWMPs in the BUA, recognizing that regional collaboration among the regulated MS4s has proven to be an effective means of achieving compliance. Notably, the BASWG members have selected to collaborate on those

MCMs which evaluation has shown regionalization increases efficiency, effectiveness and reduces costs to MS4s.

As a result, this Regional SWMP is limited to collaborative work on two MCMs:

- I. Public Education and Outreach on Stormwater Impacts
- II. Public Involvement and Participation

As of the submission of this plan, the MDEP has yet to finalize the 2022 MS4 General Permit for state or federally owned MS4 facilities. BASWG has a total of five members that are regulated under the state or federally owned MS4 General Permit (the Dorothea Dix Psychiatric Center, Eastern Maine Community College, the Maine National Guard, the University of Maine Augusta – Bangor Campus, and the University of Maine. The BMPs included in this plan were developed following the requirements associated with the 2021 General Permit for the Discharge of Stormwater from Small MS4s, and therefore, may not be entirely applicable to state or federally owned facilities. Given this, these MS4s will comply with all BMPs included in this plan that are relevant to their permit, once it is available. If following the release of the state or federally owned MS4 General Permit, additional BMPs are required, these will be included as an attachment to this plan and submitted to MDEP for approval.

### **1.3 Initial and Modified SWMPs**

As required in Part IV.A, this plan represents the BASWG’s initial SWMP and is submitted to MDEP with a Notice of Intent (NOI) describing how the BASWG will implement the plan. The initial plan will be updated within 60 days of the initial plan authorization by MDEP to document how the BASWG will meet the requirements of the MDEP order.

In compliance with requirements in Part IV.B, a modified SWMP will be developed and submitted to MDEP within 60 days of permit authorization to include how the BASWG will meet all requirements in the MDEP order. The modified SWMP will include a summary of the comments received during the MS4s public comment period and any corresponding changes to the SWMP made in response to the comments. The BASWG will submit the updated SWMP to MDEP indicating how the BASWG has modified the SWMP to be consistent with the GP and permittee-specific MDEP order. BASWG will file an application on a MDEP form with the MDEP that includes a justification to formally modify the original permittee-specific MDEP order.

### **1.4 SWMP Implementation**

This Regional SWMP should be implemented in conjunction with individual SWMPs developed independently with each of the twelve (12) regulated MS4 entities within the BUA (submitted under separate cover). This SWMP addresses all Best Management Practices (BMPs) for specific MCMs that will be implemented as a collaborative group effort to comply with the current issuance of the MS4 GP. Individual permittees in the BUA will continue to participate in

and support regional BMPs that are outlined in the Regional SWMP. Each individual MS4 is responsible for meeting the terms and conditions of the GP. Each regulated MS4 in the Greater Bangor Urbanized Area acknowledges that they must meet the requirements of the GP. This plan provides a regional methodology for accomplishing what each individual MS4 is responsible to do independently. No MS4 will be responsible for the non-compliance of another. Individual MS4s will be held accountable for participating in regional activities in order to be given credit for group activities in annual reporting to MDEP. Responsible parties and primary contacts are listed in Section 2.0 of this SWMP for each member MS4.

## 1.5 Plan Availability and Keeping Plans Current

In compliance with Part IV.B.1, a signed copy of the BASWG’s modified SWMP will be available in each BASWG member MS4 office and on each MS4 website. Each MS4 must make a copy of the SWMP available upon request to EPA, the operator of any MS4 with an adjacent or interconnected storm sewer system, a public water supply company (if the MS4 stormwater discharges to a supply watershed), and members of the public. The BASWG will keep the SWMP plan current. The BASWG will allow the public to comment on any changes to the SWMP at a minimum of once per year (Part IV.B.2.).

## 2.0 BASWG Information

### BASWG Member Organizations and Primary Contact Person

City of Bangor	Richard May, Stormwater Utility Technician
City of Brewer	Kenneth Locke, Director of Environmental Services
Town of Hampden	Victor Smith, Public Works Director
Town of Milford	Sarah Comeau, Town Administrator
Town of Orono	Belle Ryder, Assistant Town Manager
City of Old Town	John Rouleau, Director of Public Works
Town of Veazie	Mark Leonard, Town Manager
Dorothea Dix Psychiatric Center	Mark Faulkner, Facilities Management
Eastern Maine Community College	George Hanson, Facilities Maintenance Engineer
Maine Air National Guard	Chris Cronin, Federal Environmental Manager
University of Maine	Jodi Munster, Assistant Director of Administration and Environmental Compliance
University of Maine Augusta Bangor Campus	Patrick Decker, Facilities Maintenance Manager

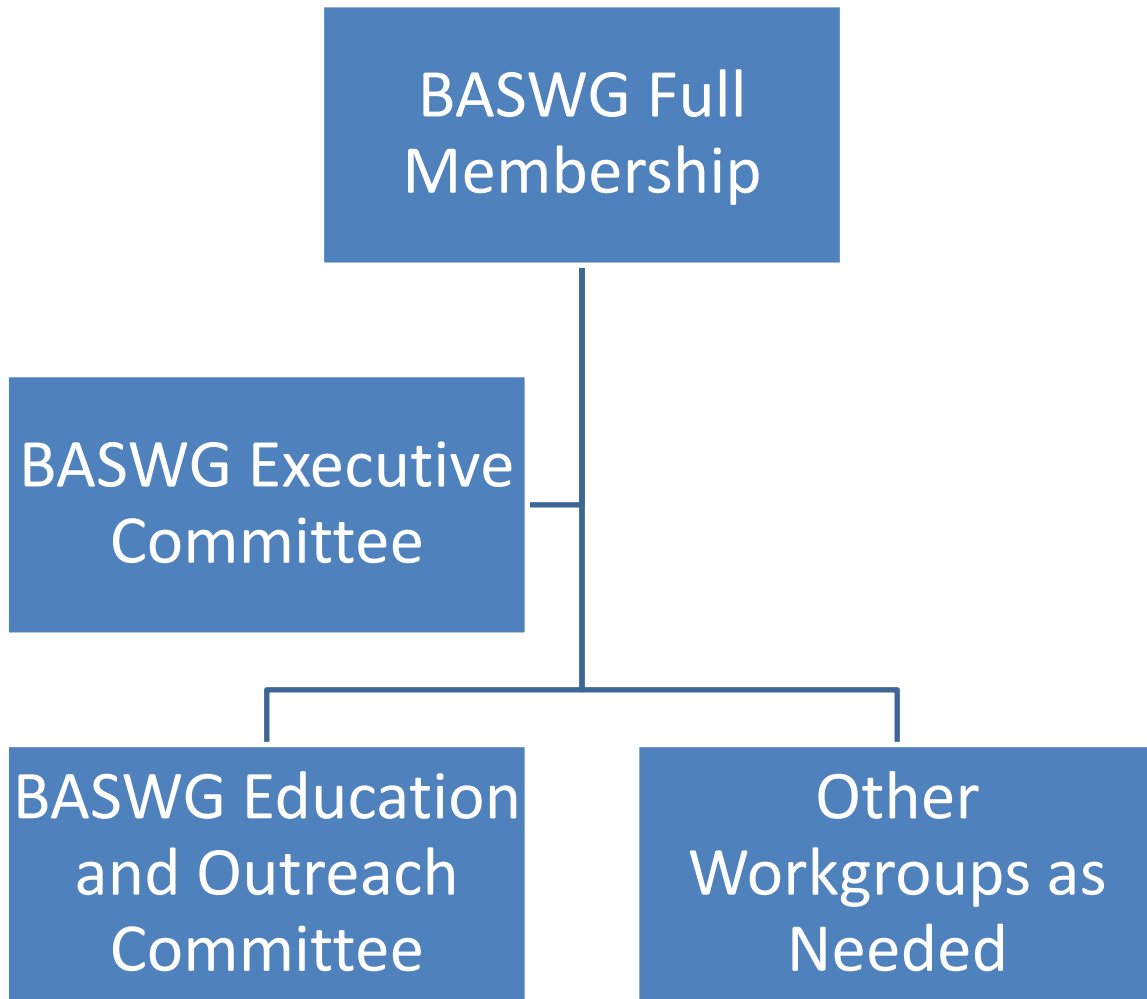
### BASWG Executive Committee – As of March 2021

- Chair – Richard May, City of Bangor
- Vice Chair – John Rouleau, City of Old Town
- Secretary – Victor Smith, Town of Hampden
- Treasurer – Kyle Drexler, Town of Orono

### BASWG Facilitator

- Brenda Zollitsch, Facilitator, Bangor Area Stormwater Group Consultant Facilitator

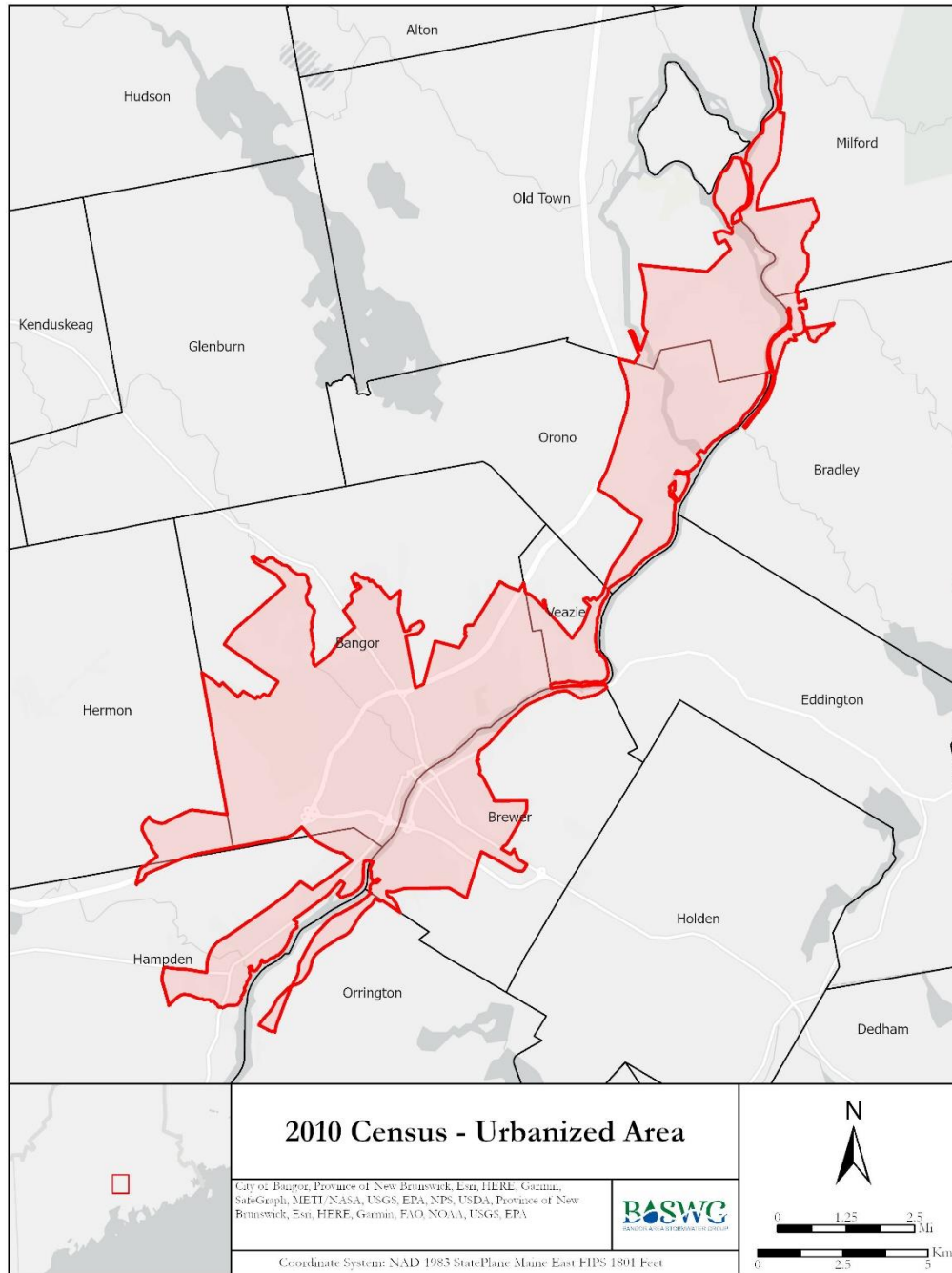
**BASWG Organizational Structure**



## 2.1. Urbanized Area Map

The Greater Bangor Urbanized Area Map was developed from the inclusive sum of the United States Census Bureau census conducted in 2003 and 2010 and is included in Figure 1.

**Figure 1. Bangor Urbanized Area Map**





## 3.0 Minimum Control Measures

This plan includes for each of the MCMs the following information:

1. Measurable goals by which the BMP will be evaluated.
2. The responsible parties for implementing the BMP
3. The date by which the BMP will be implemented, including as appropriate, timelines and milestones for implementation.

### 3.1 MCM 1: Education/Outreach Program

The BASWG will develop and implement an ongoing Education/Outreach Program addressing discharges and impacts on water bodies and steps that can be taken to reduce pollutants in stormwater runoff. The BASWG's program is designed to address stormwater issues of significance. The ultimate goal is to educate the audience and change the behavior of the target audiences so that pollutants in stormwater are reduced. *Each BMP is labeled with a reference to MS4 Permit numbering.*

#### **BMP 1.g.1. Outreach to Raise Awareness Campaign of Stormwater Pollution Issues**

**Description:** The BASWG will develop a campaign to raise awareness of stormwater pollution issues targeted at the general public and one additional audience (municipal, commercial, development/construction; or institutions).

This campaign will consist of two campaigns during the term of the permit:

1. A campaign targeted to the general public; and
2. Another campaign targeted to one of the audiences cited above.

#### **Campaign Targeted to the General Public**

This general public outreach campaign has been developed to increase awareness of stormwater pollution, its sources, impacts, and personal actions members of the public can take to reduce it. The campaign has been designed to make measurable gains in awareness based on metrics listed under the evaluation section of this campaign plan.

#### **Target Audience**

The BASWG will conduct outreach to the general public, targeting residents of the Greater Bangor Urbanized Area (BUA) ages 25-55.

## Specific Messages

1. Stormwater is rain and snow melt that could carry pollutants to our local waterways and lakes.
2. Most stormwater is not “treated” before it is released to the nearest waterbody.
3. Stormwater sewers are different from sanitary sewers, which flow through closed systems to a water treatment plant.
4. Residents must be mindful of what enters our stormwater systems and reduce/eliminate the entry of items that contribute to stormwater pollution.
5. Stormwater can become contaminated with many different pollutants, including those associated with sediment, automotive care, industrial practices, salt, and litter.
6. There are many ways to prevent stormwater pollution, including actions that can be taken at the individual level to reduce stormwater pollution:
  - a. reducing chloride applications during winter maintenance,
  - b. picking up litter and pet waste and properly disposing of them,
  - c. lawn care practices that reduce the use of chemicals, etc.)
7. A community effort to keep stormwater free from pollutants will contribute to clean local waterways.

## Message Delivery/Implementation Tools

The BASWG’s outreach to the general public will deliver at least three (3) of the following outreach tools per year:

- **Outreach Tool #1:** Online digital marketing campaigns that use purchased ads on search engines (e.g. Google ads), and social media (e.g. “boosted” posts) to drive targeted users to electronic landing pages with additional information on stormwater pollution and prevention, including the BASWG’s website and online landing pages. These ads seek to provide outreach to both existing BASWG social media followers and non-followers in the Bangor UA.
- **Outreach Tool #2:** The use of social media (e.g. BASWG’s Facebook, Twitter and Instagram accounts) as a regular outreach tool, including delivery of targeted messaging through ongoing use of strategically-timed, seasonally-focused content on stormwater pollution prevention. These posts are designed to provide outreach to both current followers and, through paid “boosts” to attract new viewers and followers as specified in Outreach Tool #1.
- **Outreach Tool #3:** Distribution and display of stormwater outreach printed materials in public areas. Flyers and stickers will be available for the public to take at events, such as the Maine Science Festival, (once in-person events resume, as COVID-19 pandemic restrictions end and the public can safely gather again). One informational poster will be displayed in each member’s MS4 public-serving offices where they can be viewed by visitors to the offices.

- **Outreach Tool #4** (i.e. COVID-19 pandemic safety concerns can be met): Engagement of the public at targeted in-person events, including the BASWG’s participation in the Maine Science Festival and other BASWG public events that are part of BASWG’s targeted behavior change events, such as street and stream clean-ups and stormdrain marking events with the public or schools. BASWG MS4s have built a strong relationship with community members through in person stormwater outreach events. These events have the ability to provide face-to-face messaging and affirm citizen engagement on the issue.
- **Outreach Tool #5** Display educational materials at the Maine Discovery Museum that include specific messaging about stormwater pollution mechanisms. This will include at a minimum: Incorporation of a stormwater feature in the exhibit which demonstrates connectivity between stormwater systems and local waterways, BASWG brand display including a QR code to the BASWG website.

*Optional additional outreach activities that may augment required outreach activities:*

1. Links on BASWG sites to the Thinkbluemaine.org website, Yardscapers website, and other relevant web resources where additional stormwater messaging resides.
2. Messaging on street and stream clean-up event t-shirts and other giveaway items.

**Measurable Goals:**

1.g.1.	The BASWG will conduct a campaign to raise awareness of stormwater pollution issues targeted at the general public
1.h.1.	The BASWG will conduct baseline evaluation prior to each outreach campaign
1.h.2.	The BASWG will conduct an evaluation in PY5 of this permit to assess the overall effectiveness of the program.

**Responsible Party** – BASWG Executive Committee

**Evaluation Methods**

General Public Outreach Campaign evaluation will include an online survey of the general public and electronic media analytics on exposure, use, and engagement.

The BASWG may collect data for both general public outreach and behavior change using the same or different evaluation instruments in PY1 and PY5, or at any time evaluation occurs prior to a new outreach or behavior change activity.

- **Evaluation Mechanism 1: Online Survey of the General Public:** The BASWG will build on its successful, research-based survey tool to gather data on public awareness of the general public in the Greater Bangor Urbanized Area. The survey will be delivered via

Survey Monkey or another online survey mechanism. The survey will be disseminated to the campaign's target audience through online outreach, including the BASWG website, social media, push prompts, MS4 websites, and other mechanisms.

Measurable Goals:

The BASWG secured guidance on what an achievable impact would be from the proposed outreach activities. Pulse Marketing from Bangor has advised the BASWG to set outreach goals as a 10% increase<sup>1</sup> between a PY1 baseline and PY5.

- 10% increase in **general awareness** of stormwater pollution between the baseline established in PY1 and the evaluation in PY5.
- 10% increase in awareness of **impacts** of stormwater pollution between the baseline established in PY1 and the evaluation in PY5.
- 10% increase in awareness of **individual actions** that can be taken to reduce stormwater pollution between the baseline established in PY1 and the evaluation in PY5.

- ***Evaluation Mechanism 2: Electronic Media Analytics:***

The BASWG will collect and evaluate the following information annually, with baseline data collected in PY1 and summative analysis of the five-year cycle conducted in PY5.

**A. BASWG Targeted Online Display Ad Campaigns**

The BASWG will include a survey on each ad campaign landing page,

- Including specific questions around their awareness of stormwater pollution, its sources, impacts, and actions that can be taken to reduce it.

The BASWG will also document the following analytics:

- The number and content of the individual seasonal ad campaigns that are delivered;
- The number of individuals that view each of BASWG's outreach campaign online advertisements;
- The number and percentage of individuals that click through to the BASWG targeted messages to each campaign's landing pages; and
- Amount of time individuals spend viewing content via landing page;
- The number and percentage of individuals that interact with each campaign's landing page content.

**B. BASWG Social Media Accounts and Posts**

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<sup>1</sup> A 10% increase would mean either a 10% increase in the number of correct answers to the survey questions (i.e. 100 to 110) or a 10% increase in the percentage of correct answers (i.e. 30% to 33%).

The BASWG will document and analyze the following social media analytics:

- Descriptive information about targeted social media outreach content;
- Number of Visitors to each social media platform (e.g., Facebook, Twitter, Instagram); Number of followers for each social media platform;
- Audience growth of each social media platform over the reporting period;
- Number of click-throughs for any targeted social media posts designed to take the user to another landing page or site; and
- Information on which social media posts garnered the greatest number of views, engagements, and shares.

### **C. Interactions with BASWG.org Website**

The BASWG will document and analyze the following website analytics:

- Descriptive information about targeted website outreach content;
- Number of unique website users;
- Number of return users;
- Number of click-throughs to additional pages on the website; and
- Data on which website pages are visited the most often.

- ***Evaluation Mechanism 3: In-person Events***

**In-person Events will include the following additional measures:**

The BASWG will document for each event annually:

- Number of event participants;
- MS4 representative staff involvement in the event;
- Messages shared with the public at the event;
- Anecdotal feedback from participants in the event.

### **Implementation Schedule**

During each permit year, three of the four outreach tools will be used. A baseline evaluation will be conducted in PY1 and an impact evaluation in PY5, utilizing evaluation mechanisms 1, 2 and 3.

### **Second Outreach Campaign**

BASWG members have decided that this second outreach campaign will be undertaken individually by each MS4 member entity. However, over the permit period, MS4s may consider coordination and collaboration to meet this permit requirement.

### **Measurable Goals:**

BMP 1.h.1.	The BASWG will include Second Outreach Campaign Measures for individual MS4s, if requested, in its baseline evaluation in PY1
BMP 1.h.2.	The BASWG will include Second Outreach Campaign Measures for individual MS4s, if requested, in its PY5 evaluation to assess the overall effectiveness of individual MS4 second outreach campaigns.

## **BMP 1.g.2. Outreach to Change Behavior Campaign**

The BASWG will develop a campaign to promote and reinforce desirable behaviors designed to reduce stormwater pollution. This campaign will promote at least one behavior change to two audiences using a minimum of three different outreach tools per year.

### **Campaign to Reduce Stormwater Pollution from Chlorides**

#### **Background**

Chlorides are a major component of winter road maintenance for snow and ice removal. Chloride pollution likely contributes to the detriment of water quality in stormwater. This campaign will build on efforts over the last permit cycle to make MS4 winter maintenance decision-makers aware of the negative impacts of chlorides on local waters and actions that can be taken to reduce chloride impacts.

For these reasons, the BASWG will conduct a behavior change campaign to address chloride pollution in the Greater Bangor Urbanized Area. The campaign has been designed to reduce chloride use in the UA by promoting behaviors that maximize the effectiveness of deicing products. Chloride reductions must be balanced with Public Safety concerns as the public has come to expect clear roads shortly after winter storm events.

The BASWG's behavior change campaign will focus on two different target audiences:

- 1) MS4 entity winter maintenance managers (WMMs) from the 12 regulated MS4s within the Greater Bangor Urbanized Area, and
- 2) Homeowners aged 25-55 years who manage their own snow and ice removal within the Greater Bangor Urbanized Area.

#### **Measurable Goals**

BMP 1.g.1.	The BASWG will conduct two campaigns to change winter maintenance behaviors that contribute to stormwater pollution (one targeted at MS4 Winter Maintenance Managers and one targeted at Homeowners)
BMP 1.h.1.	The BASWG will conduct baseline evaluation prior to each targeted behavior change campaign
BMP 1.h.2.	The BASWG will conduct an evaluation in PY5 of this permit to assess the overall effectiveness of the behavior change campaigns.

## **Behavior Change Campaign Target Audience 1: MS4 Winter Maintenance Managers**

The BASWG will support MS4 winter maintenance managers in self-assessment of their winter maintenance practices. This self-assessment will foster the desired behavior change of the adoption, or increase in adoption, of best management practices (BMPs) to reduce chloride pollution in the region's waters.

**Target Audience:** The BASWG's first behavior change target audience is MS4 winter maintenance managers (or winter maintenance contractor supervisor if the MS4 does not have winter maintenance managers) that provide services to the MS4 from the 12 regulated MS4s within the BUA. This target audience shall hereafter be referred to as winter maintenance managers, or WMM.

### **Behavior Change Message Delivery/Implementation Tools**

Behavior change messages will be delivered to MS4 employee WMMs. In MS4s where winter maintenance activities are completed through a contractor, WMMs will modify their winter maintenance practices through their management of their winter maintenance contractors.

- **Behavior Change Implementation Tool #1:** The BASWG will provide annual training to MS4 winter maintenance managers on winter maintenance BMPs and ways to implement them. The BASWG may engage experts such as Maine Local Roads or Maine DEP staff in helping to deliver trainings. Specific training will be conducted on the importance of the following BMPs:
  - **Pre- and post-storm meetings and analysis**
  - **The use of pre-wetted salt**
  - **Anti-icing and pretreatment**
  - **Calibration of product spreaders**
  - **Material storage and loading**
- **Behavior Change Implementation Tool #2:** The BASWG will create a Chloride Tracking Tool (CTT) for public works and winter maintenance managers to track the amount of chlorides (brines and solid materials) used and storm event data. The tool will be developed to focus on amount of chlorides per storm. Other factors such as the precipitation type, precipitation amount, temperature, and BMPs used will be included in this tool. These factors will help managers compare the amount of deicing materials between storms, which will allow them to gauge the effectiveness of the BMPs in their chloride reduction efforts.
- **Behavior Change Implementation Tool #3:** Facilitate sharing of successes and failures between the different MS4 managers to aide in BMP selection. The BASWG will host MS4 winter maintenance managers at a meeting of the BASWG annually to discuss their progress working towards the plan's winter maintenance goals and share technical

challenges and opportunities. Peer-to-peer sharing is a primary learning tool for public works staff. The focus of this meeting is to learn from others and compare approaches. MS4s commit to incorporating lessons learned and brainstorm any additional improvements. In the fifth year of the plan, BASWG will host a roundtable discussion of these managers to present regional comparisons and discuss future strategies for winter road maintenance chloride BMPs.

- **Measurable Goals**

By the end of PY5,

- 100% of MS4 winter maintenance managers will receive annual training on the following best management practices:
  - Proper material handling practices to reduce waste and limit chloride content site runoff
  - Proper chloride use of chemicals used for deicing measures, including storage, handling, and application
- The BASWG will make a Chloride Tracking Tool available to all members to track the amount of deicing product used each storm which will also include storm data. The CTT may have features/data that do not apply to all MS4s.
- At least 80% of BASWG MS4s will utilize the BASWG's Chloride Tracking Tool, or otherwise track:
  - Usage of deicing products and number of storm events.
  - The amount of salt and brines used per event, the number and dates of storm events, which may include storm characteristics such as precipitation type, accumulation totals, duration, and temperature.
- As a result of using the CTT tool, at least 80% of MS4s will use their own CTT data to modify their management strategies to reduce salt usage.
- At least 65% of BASWG MS4s will report adoption of new BMPs, or an increase in adoption of existing BMPs. These BMPs will include, but are not limited to:
  - Holding pre-and post-storm team meetings
  - Calibrated spreading of deicing materials
  - Using additional chemicals to augment the effectiveness of salt/sand spread on treatment areas
  - Pre-wetting dry deicers
- The BASWG will host a focused chloride plan discussion among BASWG MS4 winter maintenance managers at a meeting of the BASWG annually and a PY5 roundtable to evaluate progress and next steps.
- By the end of PY5, all MS4s have reviewed and, if needed, revised their winter maintenance level of service plan.

## **Evaluation**



Annual MS4 Winter Maintenance Manager Survey	The BASWG will collect data on use of winter maintenance BMPs annually from MS4 winter maintenance managers in MS4s. The results will be shared at annual roundtable meetings. PY1 and PY5 data will be used to document the impact of this behavior change campaign (aka 80% are using chloride tracking tool, 65% adopted at least the 4 specified BMPs).
Training Evaluations	The BASWG will conduct pre-and post-training evaluations to determine the impact of training activities.
PY 2-4 Annual focused chloride plan discussion at BASWG Meeting	Documentation of MS4 participation and summary notes of meeting discussion and decisions; identification of practices that can be shared to increase efficient use of products and reduce chloride use.
Reviewed Winter Maintenance Service Plans	Each BASWG MS4 will share any changes that have been made to their service level plans as a result of their analysis during the roundtable
PY5 Roundtable Participation and Outcomes	Documentation of MS4 participation and summary notes of roundtable discussion and decisions. Identification of key next steps for strengthening the use of or adopting new winter snow and ice control BMPs in the region.

**Implementation Schedule**

The BASWG will deliver this campaign according to the following implementation schedule:

**PY1:**

- BASWG conducts baseline evaluation for behavior change campaign target audience 1.
- BASWG delivers annual training to MS4 winter maintenance managers (prior to the winter maintenance season if possible)
- BASWG develops Chloride Tracking Tool and guidance on how to use these tools
- BASWG hosts annual MS4 Winter Maintenance Manager Discussion (following the winter maintenance season if possible)
- 

**PY2:**

- BASWG delivers annual training to MS4 winter maintenance managers

- MS4s use Chloride Tracking Tool and BASWG provides technical assistance
- BASWG hosts annual MS4 Winter Maintenance Manager Discussion

**PY3:**

- BASWG delivers annual training to MS4 winter maintenance managers
- MS4s use Chloride Tracking Tool and BASWG provides technical assistance
- BASWG hosts annual MS4 Winter Maintenance Manager Discussion

**PY4:**

- BASWG delivers annual training to MS4 winter maintenance managers
- MS4s use Chloride Tracking Tool and BASWG provides technical assistance
- BASWG hosts annual MS4 Winter Maintenance Manager Discussion
- MS4s review their winter maintenance service level plans in light of received BMP trainings and MS4 analysis of chloride use. BASWG continues to provide support to MS4s as needed in this process.

**PY5:**

- BASWG delivers annual training to MS4 winter maintenance managers
- MS4s use Chloride Tracking Tool and BASWG provides technical assistance
- BASWG hosts annual MS4 Winter Maintenance Manager Discussion
- MS4s incorporate changes into their winter service level plans to address any identified areas for improvement. BASWG continues to provide support to MS4s as needed in this process.
- BASWG conducts evaluation of overall effectiveness of the behavior change campaign for Target Audience 1.

**Responsible Party**

- 1) BASWG Executive Committee

**Behavior Change Campaign Target Audience 2: Homeowners**

The BASWG seeks to encourage homeowners to adopt stormwater-friendly chloride application planning and application practices to reduce the amount of chlorides entering local waters.

**Target Audience:** The BASWG’s second behavior change target audience is homeowners between the ages of 25 and 55 who manage their own snow and ice removal within the Greater Bangor Urbanized Area.

**Background**

Chlorides are a major component of winter road maintenance for snow and ice removal. Chloride pollution likely contributes to the detriment of water quality in stormwater. This campaign will build on efforts over the last permit cycle to make MS4 winter maintenance

decision-makers aware of the negative impacts of chlorides on local waters and actions that can be taken to reduce chloride impacts. Chloride reductions must be balanced with Public Safety concerns as the public has come to expect clear roads shortly after winter storm events.

This campaign will build on initial efforts over the two years to make target audience homeowners aware that their winter maintenance activities can impact stormwater, lead to pollution, its impacts, and that there are specific actions they can take to reduce these impacts. BASWG led a regional ad campaign via electronic media to share messaging on this issue in 2019-2021.

### **Behavior Change Messages:**

Initial feedback from homeowners in the BUA in March 2021 indicates that safety for the residents of the home is the primary reason homeowners apply chloride products. Additional reasons often include the safety of visitors and delivery persons, especially mail and oil deliveries, and concerns about liability. Other reasons are reported to play less of a role, such as influence of neighbor behaviors, because they have always done it that way, and concerns about aesthetics.

Based on the findings in the Maine Local Roads Winter Snow and Ice Control Best Management Practices Handbook, the Margaret Chase Smith Center Salt Project Research Report, and survey data from BASWG landing page surveys, the BASWG will use the following behavior change messages:

- Keep your walkways safe this winter with smart salt usage.
  - Always shovel before applying salt
  - Only apply salt when temperatures are above 15 degrees Fahrenheit and before any ice can form.
  - Read and follow the application instructions on the product packaging for best results.

### **Behavior Change Message Delivery/Implementation Tools**

Due to the seasonal nature of this behavior change campaign, these messages may only be delivered during the colder months of the year when ice and snow are present.

- **Outreach Tool #1:** Winter maintenance-focused online digital marketing campaigns that use purchased ads on search engines (e.g. Google ads), and social media (e.g. “boosted” posts) to drive targeted users to electronic landing pages with additional information on best practices for winter maintenance. These ads seek to provide outreach to both existing BASWG social media followers and non-followers in the Bangor UA.
- **Outreach Tool #2:** The use of social media (e.g. BASWG’s Facebook, Twitter and Instagram accounts) to communicate winter maintenance behavior change messages as a regular outreach tool, including delivery of targeted messaging through ongoing use of strategically-

timed, seasonally-focused snow and ice control content. These posts are designed to provide outreach to both current followers and, through paid “boosts” to attract new viewers and followers as specified in Outreach Tool #1.

- **Outreach Tool #3:** Distribution and display of winter snow and ice control behavior change messaging on printed materials in public areas, including posters and flyers at MS4 offices that serve the public and at an event (such as the Maine Science Festival) once in-person events resume as COVID-19 pandemic restrictions end and the public can safely gather again. In the meantime, the BASWG will place materials in open MS4 public-serving offices that are open and people can view these printed materials safely.

### **Measurable Objectives**

The BASWG secured guidance on what an achievable impact would be from the proposed behavior change efforts. Pulse Marketing from Bangor has advised the BASWG to set impact goals at 10% increase of the target audience adopting each targeted behavior between the PY1 baseline and PY5.

Between a PY1 baseline and PY5, 10% increase of homeowners 25-55 years of age in the BUA report:

- 10% increase in respondents that shovel snow before applying salt.
- 10% increase in respondents that read the product packaging before applying product
- 10% increase in respondents that follow the directions on the product package when applying it on their property
- 10% increase in respondents that apply salt only when temperatures are above 15 degrees Fahrenheit.

### **Evaluation**

The BASWG will evaluate the impact of the behavior change campaign for homeowners and renters through four evaluation methods:

- 1) The BASWG’s PY1 baseline and PY5 impact survey;
- 2) Analytics from the online behavior change ad campaign;
- 3) Social media analytics; and
- 4) BASWG.org website analytics. The BASWG may also utilize a landing page survey during specific years to gauge progress.

#### **1. BASWG Online Surveys**

The BASWG will conduct an online awareness and behavior change survey in PY1 and PY5, including specific targeted questions around winter maintenance behaviors of target audience homeowners. The BASWG will collect the following data from the target audience:

- Whether respondents read and followed the application instructions on the product packaging before applying product
- Whether respondents shovel snow before applying product
- Whether respondents apply salt only when temperatures are above 15 degrees Fahrenheit.
- Whether respondents apply salt before ice can form.

## **2. BASWG Targeted Online Behavior Change Ad Campaign on Winter Maintenance**

The BASWG will document and analyze:

- The number and content of the individual seasonal winter maintenance display campaigns that are delivered;
- The number of individuals that view each of the BASWG's display campaign online ads;
- The number and percentage of individuals that click through to the BASWG targeted messages to the campaign's landing page;
- The amount of time individuals spend viewing campaign content via the winter maintenance landing page;
- The number and percentage of individuals that interact with the campaign's landing page content.

## **3. BASWG Social Media Posts on Chloride Reduction and Winter Maintenance Practices**

The BASWG will document and analyze the following social media analytics:

- Descriptive information about targeted social media outreach content
- Number of Visitors to each social media platform (e.g., Facebook, Twitter, Instagram)
- Number of followers for each social media platform
- Number of click-throughs for any targeted social media posts designed to take the user to another landing page or site
- Information on which social media posts garnered the greatest number of views, engagements, and shares.

## **4. Interactions with BASWG.org Website Winter Practices Webpage**

The BASWG will document and analyze the following website analytics:

- Descriptive information about winter maintenance behavior change website content
- Number website users who visited the winter maintenance landing page; and
- Number of return users.

## **Implementation Schedule**

### **PY1:**

- Conduct baseline evaluation for behavior change campaign target audience
- Deliver winter maintenance behavior change online display ad campaign
- Deliver targeted messaging via BASWG's social media and website

- Develop and display posters on stormwater-friendly winter maintenance behaviors for target audience in MS4 public areas

**PY2:**

- Deliver winter maintenance behavior change online display ad campaign
- Deliver targeted messaging via BASWG’s social media and website
- Display posters on stormwater-friendly winter maintenance behaviors in MS4 public areas

**PY3:**

- Deliver winter maintenance behavior change online display ad campaign
- Deliver targeted messaging via BASWG’s social media and website
- Display posters on stormwater-friendly winter maintenance behaviors in MS4 public areas

**PY4:**

- Deliver winter maintenance behavior change online display ad campaign
- Deliver targeted messaging via BASWG’s social media and website
- Display posters on stormwater-friendly winter maintenance behaviors in MS4 public areas

**PY5:**

- Deliver winter maintenance behavior change online display ad campaign
- Deliver targeted messaging via BASWG’s social media and website
- Display posters on stormwater-friendly winter maintenance behaviors in MS4 public areas
- Conduct evaluation of overall effectiveness of winter maintenance behavior change campaign

**Responsible Party**

- 1) BASWG Executive Committee

**3.2 MCM 2 – Public Involvement and Participation**

**Public Notice**

To meet the requirements in MCM2a, the BASWG will comply with applicable state and local public notice requirements using effective mechanisms for reaching the public. The BASWG will comply with the requirements of the Maine Freedom of Access Act (1 M.R.S. §401 et seq (“FOAA”) when involving stakeholders in the implementation of the GP. The BASWG will document meetings and attendance in the BASWG’s SWMP annual report to measure this goal.

## Measurable Goals

BMP 2.a.1	The BASWG will meet applicable state and local public notice requirements.
BMP 2.a.2	The BASWG will meet FOAA requirements.
BMP 2.a.3	The BASWG will document meetings and attendance in the BASWG's annual report.

## Public Event(s)

To meet the requirements in MCM2b, the BASWG will annually host/conduct/participate in one public event, with participation focusing on a pollution prevention and/or water quality theme. This/these events will be targeted at either the general public in the seven regulated communities or a segment of this population the BASWG wishes to reach.

## Measurable Goal

BMP 2.b.1	The BASWG will host/conduct/participate in one public event focusing on a pollution prevention and/or water quality theme
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When public safety requirements can be met (i.e., COVID-19 pandemic safety concerns can be met), the BASWG will participate in the Maine Science Festival. If this event is not available, BASWG will select a comparable public event or conduct street and stream clean-ups or stormdrain marking events.

At times when in-person interaction is not possible due to public safety concerns (e.g., COVID-19 safety hazards), the BASWG will instead conduct public outreach via social media and an online ad campaign content (e.g. BASWG's ad campaign to limit the improper disposal of personal protective equipment, such as masks, gloves and sanitizer bottles during the pandemic, which was approved as an acceptable replacement for BASWG's planned activities by DEP in 2020-2021).

## Individual MS4s are Solely Responsible for Compliance Activities for MCMs 3-6

The BASWG plan does not address any specific requirements or activities in this plan related to compliance with Minimum Control Measures 3-6, which are:

- MCM 3: Illicit Discharge Detection and Elimination Program;
- MCM 4: Construction Site Stormwater Runoff Control;
- MCM 5: Post-Construction Stormwater Management in New Development and Redevelopment; and
- MCM 6: Pollution Prevention/Good Housekeeping for Municipal Operations.

Individual MS4s are responsible for compliance with these requirements. The BASWG may provide meeting time or other supports around these MCMs but is not required to do so in this plan.

#### **4.0 General Requirements**

The following section addresses BASWG's plans to comply with the compliance record and annual reporting required in the MS4 GP.

#### **4.1 Compliance Records**

In compliance with the requirements of the permit, the BASWG will keep all records required by this GP for at least three (3) years following its expiration or longer if requested by the Department or the U.S. Environmental Protection Agency (EPA). The BASWG will also make records, including its SWMP, available to the public during regular business hours.

#### **4.2 Annual Reporting**

In compliance with the requirements of the permit, the BASWG will submit electronically an Annual Compliance Report to the Department for review by September 15 of each year, using any Standardized Annual Compliance Report forms provided by the Department or provide an alternative form to the Department for review and approval.

The BASWG's Annual Compliance Report will include the following:

- The status of compliance with the terms and conditions of this GP and permittee specific DEP Order permit modification based on the implementation of the permittee's SWMP for each permit year, an assessment of the effectiveness of the components of its stormwater management program, an assessment of the appropriateness of identified BMPs, progress towards achieving identified measurable goals for each of the MCMs and progress toward achieving the goal of reducing the discharge of pollutants to the MEP.
- A summary of information collected and analyzed, including monitoring data, if any, during the reporting period.
- A summary of the stormwater activities the permittee intends to undertake pursuant to its SWMP to comply with the terms and conditions of this GP and permittee specific DEP Order permit modification during the next reporting cycle.
- A change in any identified BMPs or measurable goals that apply to the SWMP.
- A description of the activities, progress, and accomplishments for each of the MCMs #1 and #2, including such items as the status of education and outreach efforts and public involvement activities. Where applicable, the MS4 will quantify steps/measures/activities taken to comply with this GP and its SWMP including reporting on the types of trainings presented, the number of municipal and contract staff that received training, the length of the training and training content delivered as well as any changes in municipal operations.



Changes to the report based on the Department's review comment(s) must be submitted to the Department within 60 calendar days of the receipt of the comment(s).

## **5.0 Appendices**

Appendix A: MS4 General Permit