STORMWATER MANAGEMENT PROGRAM (SWMP)
CITY OF HOLYOKE, MASSACHUSETTS

EPA NPDES PERMIT NUMBER: MAR041000

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A Report Prepared by:

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STORMWATER MANAGEMENT PROGRAM (SWMP)

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LIST OF ACRONYMS

BMP	Best Management Practice
CGP	Construction General Permit
CWA	Clean Water Act (or the Federal Water Pollution Control Act, 33 U.S.C. §1251 et seq)
ESA	Endangered Species Act
IDDE	Illicit Discharge Detection and Elimination
MassDEP	Massachusetts Department of Environmental Protection
MCM	Maximum Control Measure
MGL	Massachusetts General Laws
MS4	Municipal Separate Storm Sewer System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
SWMP	Stormwater Management Program
SWPPP	Stormwater Pollution Prevention Plan
USEPA	U. S. Environmental Protection Agency
USFWS	U.S. Fish & Wildlife Service

1 CERTIFICATION

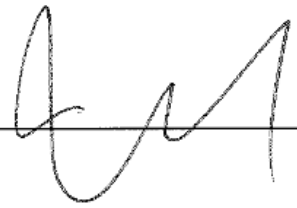
STORMWATER MANAGEMENT PROGRAM, CITY OF HOLYOKE, MASSACHUSETTS

Authorized Representative: All applications, reports, or information submitted to the Director shall be signed and certified by either a principal executive officer or ranking elected official (See 40 CFR 122.22).

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Printed Name: Joshua Garcia

Title: Mayor, City of Holyoke

Signature: 

Date: June 26, 2024

1.1 SWMP UPDATES

Updates to the Stormwater Management Program will be recorded in the following change log (Table 1) to reflect changes to the program.

Table 1: Change Log of SWMP Updates (Start Date: 5/31/2023)

Date	SWMP Section	Change	Reason
6/28/24	Section 2.5	Update to number of City outfalls	Number of outfalls was updated through ongoing mapping efforts and field investigations
	Section 3.1	Updates to Stormwater Team	Table has been updated to reflect current team members due to City staffing changes
	Section 3.1	Updates to Table 3	Updates to Table 3 were included to better clarify tasks to be completed by the City's current Sewer Operations Contractor, Veolia.
	Section 4.1.3	Updates to Table 6	Updated to include public education to industrial users in the City as noted in Table 3 under the responsibility of the City's Sewer Operations Contractor.
	Section 4.2	Updates to Table 7	Table 7 was updated to include designation of responsible departments and/or parties.
	Section 4.3.3	Additional information provided to indicate next steps taken by the City to address illicit discharge detection and elimination as well as mapping updates completed since May 2023	To provide updated information on the City's recently completed steps and current steps being taken to further address MCM Goal 3.
	Section 4.3.4	Updates to Table 8	Table 8 was updated to include designation of responsible departments and/or parties and to note recently completed items.

	Section 4.4.2	Additional information provided to indicate next steps taken by the City to address construction site runoff control.	To provide updated information on the City's current steps being taken to further address MCM Goal 4.
	Section 4.5.3	Additional information provided to indicate next steps taken by the City to address post-construction stormwater management.	To provide updated information on the City's current steps being taken to further address MCM Goal 5.
	Section 4.5.4	Updates to status of task identified in Table 10	Table 10 was updated to indicate that task previously noted as planned are now on-going.
	Section 4.6.3	Updated to include information on City's recent efforts to address MCM Goal 6.	To provide updated information on the City's current steps being taken to further address MCM Goal 6.
	Section 4.6.4	Updates to Table 11	Table 11 was updated to indicate that task previously noted as planned are now on-going.
	Section 7.1.1	Updates to Table 12	Table 12 was updated to include designation of responsible departments and/or parties.
	Section 7.1.1	Updates to include City's recent activities completed to date address nitrogen removal.	To provide updated information on the City's recent steps taken to address nitrogen removal and note that a Nitrogen Source Identification Report was submitted on January 31, 2024.

2 BACKGROUND

Municipal separate storm sewer systems (MS4s) are designed to reduce the impact of stormwater induced flooding and damage to infrastructure. Unfortunately, MS4s can convey pollutants to surface waters. As stormwater flows over roads, parking lots, lawns and developed areas it picks up pollutants (trash, oil, sediment, nutrients). Some of these pollutants are channeled through the MS4 and discharged into receiving waters. MS4 permits are designed to prevent pollutants from entering stormwater and receiving waterbodies. The City of Holyoke (hereinafter "the City" or "Holyoke") has had an MS4 permit since 2003. Recent updates to the Massachusetts MS4 general permit require the City to have a written Stormwater Management Program (SWMP).

A hardcopy of the SWMP is kept at the City Engineer's Office and is available to the public during normal business hours. The SWMP is also available to representatives from the US Environmental Protection Agency (EPA), Massachusetts DEP (MassDEP), US Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) at the time of an inspection or upon request.

The SWMP is posted on the City's website (https://www.holyoke.org/dpw-stormwater-information/).

2.1 STORMWATER REGULATION

The Stormwater Phase II Final Rule was promulgated in 1999 and was enacted as the next step after the 1987 Phase I Rule in the USEPA's effort to preserve, protect, and improve the nation's water resources from polluted stormwater runoff. The Phase II program expands the Phase I program by requiring additional operators of MS4s in urbanized areas and operators of small construction sites, through the use of National Pollutant Discharge Elimination Systems (NPDES) permits, to implement programs and practices to control polluted stormwater runoff. Phase II is intended to further reduce adverse impacts to water quality and aquatic habitat by instituting the use of controls on the unregulated sources of stormwater discharges that have the greatest likelihood of causing continued environmental degradation. Under the Phase II rule, all MS4s with stormwater discharges from Census-designated Urbanized Areas are required to seek NPDES permit coverage for those stormwater discharges.

2.2 PERMIT PROGRAM BACKGROUND

On May 1, 2003, USEPA Region 1 issued its Final General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (2003 Small MS4 permit) consistent with the Phase II rule. The 2003 Small MS4 permit covers "traditional" (i.e., cities and towns) and "non-traditional" (.e., federal and state agencies) MS4 operators located in the states of Massachusetts and New Hampshire. USEPA is the jurisdictional authority for this permit as neither Massachusetts nor New Hampshire has obtained delegated authority from the federal government to administer this program. This Permit expired on May 1, 2008, but remained in effect until operators were authorized under the 2016 MS4 General Permit, which became effective on July 1, 2018. The City of Holyoke negotiated a Consent Decree (**Appendix A**) which was finalized on March 22, 2023, which defines the terms that the City shall take to reach compliance with the MS4 program.

Holyoke's MS4 is classified as a small system (serving less than 100,000 people) and is regulated under USEPA's Phase II Stormwater Program. The Massachusetts's MS4 General Permit is issued and managed by the USEPA and Mass DEP. Holyoke's first General Permit (MAR041011) was issued in May 2003. On September 27, 2018, the City submitted a Notice of Intent (NOI) (**Appendix B**) for coverage under the updated Massachusetts MS4 General Permit (2016 MS4 permit) which became effective on July 1, 2018 (MAR041000). The joint Authorization Letter from USEPA and MassDEP is in **Appendix C**.

2.3 STORMWATER MANAGEMENT PROGRAM (SWMP, Consent Decree Term #19.a)

The SWMP describes and details the activities and measures that will be implemented to meet the terms and conditions of the 2016 MS4 permit and the 2023 Consent Decree. This document will be updated or modified as the City's activities are modified, changed, or updated to meet Permit and Consent Decree conditions.

The main elements of the SWMP are:

1. A public education program to affect public behavior contributing to stormwater pollution.
2. Opportunities for the public to participate and provide comments on the stormwater program.
3. A program to effectively find and eliminate illicit discharges within the MS4.
4. A program to effectively control construction site stormwater discharges to the MS4.

5. A program to ensure that stormwater from development projects entering the MS4 is adequately controlled by the construction of stormwater controls.
6. A good housekeeping program to ensure that stormwater pollution on municipal properties and from municipal operations are minimized.

2.4 CONSENT DECREE MS4 REQUIREMENTS

On March 22, 2023 a final filing of a Consent Decree was issued to the City of Holyoke stating non-compliance with the City's NPDES permit, Section 301(a) of the Clean Water Act (CWA), and the Massachusetts Clean Water Act, M.G.L. c. §§ 21, 26-53 by discharging pollutants into the waters of the United States from both combined sewer overflows (CSOs) and the City's MS4 storm drains. The Consent Decree includes requirements that the City must complete to regain compliance with Federal and State regulations. Provisions of the Consent Decree related to the City's MS4 system are included in this SWMP to ensure the City is actively working towards compliance as per the terms of the Consent Decree. Table 2 includes all Consent Decree requirements related to the MS4 system and the corresponding section of the SWMP that details steps the City is taking to comply with the Consent Decree requirements.

Table 2: Consent Decree Requirements Included in Stormwater Management Program

Consent Decree Section	Description of Requirement	SWMP Section
11-17	Identification, elimination, and prohibition of unauthorized discharges to MS4	5.3: MCM3 - Illicit Discharge Detection and Elimination
19 b ii	Ordinance to address post-construction runoff from new development and redevelopment	5.5: MCM5 – Post-Construction Stormwater Management in New Development and Redevelopment
19.a	Updated SWMP with Consent Decree requirements included *(due 5/31/2023)*	May 2023 SWMP (Entire document)
19.b.i	Semi-annual Message Distribution	5.1: MCM1 – Public Education & Outreach
19 b ii	Stormwater Management in New Development and Redevelopment	5.5: MCM5 – Post-Construction Stormwater Management in New Development and Redevelopment
19.b.iii	Good House Keeping and Pollution Prevention for Permittee Owned Operations	5.6: MCM6 – Pollution Prevention / Good Housekeeping
19.c	Nitrogen Source Identification Report *(due 1/30/2024)*	8.1.1: Connecticut River Watershed, the Housatonic River Watershed, or the Thames River Watershed Nitrogen Reduction
19.d	Potential Structural BMPs *(due 1/30/2024)*	8.1.1: Connecticut River Watershed, the Housatonic River Watershed, or the Thames River Watershed Nitrogen Reduction
20-21	Geographic Information System Maps (*due 12/31/2022)*	5.3: MCM3 – Illicit Discharge Detection and Elimination

2.5 HOLYOKE MS4 BACKGROUND

The City of Holyoke covers an area of approximately 22.8 square miles and is located on the Connecticut River. The requirements of the 2016 MS4 permit only apply to the areas of Holyoke's system that are served by the MS4 drainage system. The MS4 discharges to the following receiving streams, including three (3) that are listed on the 2018/2020 CWA 303(d) list of impaired water bodies for Massachusetts:

- Connecticut River
- Long Pond Cove
- Pequot Pond *(Outside City boundary)*

Based on the most recent mapping/evaluation the City has identified 103 MS4 outfalls that are regulated under the 2016 MS4 permit and the City's Consent Decree.

2.6 SEMI-ANNUAL UPDATES AND COMPLIANCE REPORTING (Consent Decree Term # 22)

Each year since 2003, the City has submitted an MS4 Annual Report to the USEPA. This annual requirement will continue. Per the compliance requirements of the Consent Decree, reporting will be due at the end of July and end of January. In addition, this SWMP is not intended to be a static document, and as the City's efforts progress and evolve, so too will this program. The SWMP will be updated periodically, but at a minimum at least once per year, and the most up-to-date version of this program will be available to the public on a timely basis via the City's website.

2.7 ELIGIBILITY

The City of Holyoke is in the Commonwealth of Massachusetts and its drainage system is defined as a small municipal storm sewer system as defined in 40 CFR §122.26(b)(16). The City is located within an urbanized area as determined by the 2000 census data provided by the Bureau of Census. The 2016 General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems authorizes storm water discharge from small, City-owned MS4 systems located within Massachusetts. A Notice of Intent was developed to obtain coverage for stormwater discharges to waters of the United States under this permit in 2016. Term 67 of the Consent Decree (page 34) requires that other permits in place are complied with, hence Holyoke is still subject to the 2016 MS4 General Permit.

2.8 ENDANGERED SPECIES

During the Notice of Intent (NOI) submission process, the City completed an Endangered Species Act (ESA) review and determined that the City of Holyoke's MS4 contains the Northern Long-eared Bat (*Myotis septentrionalis)* and Small Whorled Pogonia (*Istoria medeoloides*). Using the Endangered Species Act (ESA) eligibility criteria as referenced in the 2016 MS4 permit, Addendum A, The Endangered Species Guidance, the City certified eligibility according to the USFWS Criterion C. Criteria C indicates that no endangered species or critical habitat areas were identified through USFW's IPac's site. See **Appendix E** for the Threatened and Endangered Species List and the permit letter from USFWS.

2.9 HISTORIC PROPERTIES

The 2016 MS4 permit prohibits discharges that adversely affect properties listed (or eligible to be listed) on the National Register of Historic Places. Holyoke certified in the NOI that it meets eligibility Criteria A

for the National Historic Preservation Act (NHPA) since stormwater discharges do not have the potential to cause effects on historic properties.

Holyoke will consult with the NHPA, as necessary before installing a structural BMP that is not identified in the NOI. Installation of any new structural BMPs must stop if there is evidence of any prehistoric or historic artifacts.

3 STORMWATER MANAGEMENT PROGRAM TEAM

3.1 SWMP TEAM

The City of Holyoke DPW Department is the primary department responsible for coordinating SWMP-related activities. The Holyoke DPW Director and the Regional Manager at Veolia are in responsible charge for the aspects of the program for which the respective entity is responsible. The specific roles of team members are shown in Table 3. Holyoke works with PVPC for public educational materials.

Table 3: Responsible Parties for SWMP Implementation

City Items			
Responsible Charge	DPW Director		
Implementation	Victoria Houle and Miira Gates	VH: Interim City Engineer MG: Stormwater Coordinator	VH:(413) 322-5645 MG:(413) 322-5645 x5152
Coordination	• Schedule meetings to coordinate among different departments • Coordinate with PVPC, ensure implementation of public education initiatives • Provide opportunities for public review and input of SWMP • Attend CT River Stormwater Committee meetings • Construction stormwater management (erosion and sediment control; site plan review, and construction waste control)		
Public Education	• Dog Waste signage • Dog waste cleanup information		
Support Cleanup Initiatives	• CT River Source to Sea Cleanup		

City Items			
Pollution Prevention/Good Housekeeping/Advance Best Management Practices (BMPs)	• Optimize road salt use during winter operations. • Identify municipal properties for BMP initiatives to reduce impervious surfaces • Work to update ordinances to accommodate green infrastructure • Develop Street and parking lot design guidelines to support low impact design (LID) • Develop O&M plans and procedures • Maintain inventory of parks and open spaces • Employee trainings		
Veolia Items			
Responsible Charge	Veolia Regional Manager		
Implementation	Michael Williams	Project Manager	**(413) 534-2222**
Public Education	• Educate industrial users on BMPs		
Support Cleanup Initiatives	• Support cleanup initiatives		
Illicit Discharge Detection and Elimination	• Dry weather screening • Wet weather screening • Catchment investigations • Employee training on IDDE		
Pollution Prevention/Good Housekeeping	• Street sweeping plan • Catch basin cleaning schedule • Employee training		
Documentation	• Maintain sanitary sewer overflow (SSO) inventory • Maintain written IDDE program • Update MS4 map		

3.2 SWMP TEAM RESPONSIBILITIES

The SWMP Team is multidisciplinary and includes members with several roles. As a team, the City is responsible for fully adhering to the Consent Decree, 2016 MS4 permit and this SWMP. Team actions include reviewing and updating appropriate ordinances, legal enforcement, and disciplinary actions, maintaining records, City wide system mapping, and outfall screening and sampling. The Holyoke DPW is leading many of these tasks. One of the major data requirements is the City-wide system mapping. The SWMP coordinator is responsible for assembling, corroborating, maintaining, and presenting mapping data for the City's MS4 area. This is a critical role with respect to the IDDE program.

3.3 MS4 RECEIVING WATERS

According to the *Massachusetts Year 2018/2020 Integrated List of Waters,* which was approved by the USEPA in 2022, there are two (2) waterbodies with three (3) corresponding segments in Holyoke that are water quality limited. The Connecticut River, Log Pond Cove, and Pequot Pond in Southampton are Category 5 waters considered to be "water quality limited" because they do not meet water quality standards and one or more of their uses is either impaired or threatened. The MS4 permit prohibits increased discharges to Category 5 waters unless it can be demonstrated that there is no net increase in loading from the MS4 to the impaired water of the pollutant(s) for which the water body is impaired.

The City must comply with provisions in Appendix H of the 2016 MS4 permit that address E. coli and TSS in the Connecticut River and Log Pond Cove and Enterococcus in Pequot Pond.

Although TMDLs have not been established for the segments of the Connecticut River that receive stormwater discharges from the City, the river flows to Long Island Sound (LIS) which has a TMDL for nitrogen. Therefore, the City must meet additional requirements listed in Consent Decree Term 19 that are designed to reduce nitrogen in stormwater runoff. Table 4 lists all receiving waters, impairments, corresponding segment ID in *Massachusetts Year 2018/2020 Integrated List of Waters* and number of outfalls discharging to each waterbody segment. Outfall information is subject to change as changes are made to separate stormwater from CSOs.

Table 4: MS4 Receiving Waterbodies in the City of Holyoke

Waterbody segment that receives flow from the MS4	Number of outfalls into receiving water segment	Segment ID[1]	Pollutants Causing Impairments
Connecticut River	19	MA34-04 MA34-05	E. coli, Solids, TSS, Turbidity, PCBs in Fish Tissue
Log Pond Cove	0	MA34124	E. coli, Solids, TSS, Turbidity, PCBs in Fish Tissue
Broad Brook	19	NA	None
Tannery Brook	2	NA	None
Schoolhouse Brook	3	NA	None
Ashley Cutoff	3	NA	None
North Railroad Pond	3	NA	None
Wright Pond	2	NA	None

Pequot Pond[2]	4	MA32055	Chlorophyll-a, Enterococcus
Other (i.e., swamp, drainage swales, wetlands etc.)	14	NA	None

[1] *Massachusetts Year 2018/2020 Integrated List of Waters*
[2] Stormwater from four outfalls is directed to a tributary of Pequot Pond located in Southampton Massachusetts.

4 MINIMUM CONTROL MEASURES (MCM)

The City of Holyoke has existing programs and BMPs in compliance with the NPDES Stormwater Phase II Rule. The review of the existing conditions and identification of stormwater needs provided the framework for identifying best management practices under the six minimum control measures (MCMs). The aim of this stormwater management program is to reduce pollutant loads from stormwater systems to the maximum extent practicable, protect water quality, and meet the requirements under the Clean Water Act. As per Consent Decree Term 19, the City will identify and implement additional BMPs to reduce nitrogen discharges to waterbodies, or their tributaries. Some BMPs are on-going efforts that must be completed or updated on a semi-annual basis (per Term 19 of the Consent Decree). A summary of the MCM objectives and requirements are detailed in the following sections along with specific actions and measurable goals.

4.1 MCM 1: PUBLIC EDUCATION AND OUTREACH (Consent Decree Term #19.b)

4.1.1 Objective

The 2016 MS4 permit states that:
"The permittee shall implement an education program that includes educational goals based on stormwater issues of significance within the MS4 area. The ultimate objective of a public education program is to increase knowledge and change behavior of the public so that the pollutants in stormwater are reduced."

4.1.2 Permit Summary

Term 19.b.i of the Consent Decree requires that the City identify and implement additional or enhanced BMPs to reduce Nitrogen discharges to waterbodies, or their tributaries. To meet these requirements, the Public Education and Outreach Program will include focused educational information regarding both industrial and residential activities including illegal dumping into storm drains.

Education and outreach efforts may be performed in coordination with local groups (I.e., watershed associations, or schools). The materials may include, but are not limited to, targeted online pamphlets, fact sheets, brochures, public service announcements, and storm drain stenciling. These messages will consist of stormwater pollution and prevention topics that are relevant to the City. Additionally, the

program will educate the public on the proper management and disposal of pollutants of concern, which are listed in the Final Massachusetts Integrated List of Waters for the Clean Water Act 2018/2020 Reporting Cycle: https://www.mass.gov/doc/final-massachusetts-integrated-list-of-waters-for-the-clean-water-act-20182020-reporting-cycle/download. The City will focus on actions the public can take to reduce these pollutants at the source by disseminating educational materials on litter disposal, pet waste, household hazardous waste disposal, proper use of fertilizer and pesticides, and effects of impervious areas on water bodies. The pollutants of concern, their potential impacts to Holyoke's waterbodies, and the behaviors that can reduce those impacts are listed in Table 5.

Table 5: Pollutants of Concern

Pollutants of Concern	Waterbodies of Concern	Impact to Waterbodies	Targeted Sources	Desired Behaviors
Bacteria/ Pathogens	Connecticut River, Log Pond Cove, Pequot Pond	Can cause disease and make water unfit for recreation.	• Pet waste • Septic	• Properly dispose of pet waste • Properly operate and maintain septic systems • Properly dispose of septic waste
Nitrogen	Connecticut River	Excessive amounts of nitrogen can cause harmful algae blooms and create low oxygen conditions that harm aquatic life.	• Pet waste • Grass clippings • Lawn fertilizer • Leaf litter	• Properly dispose of pet waste • Use fertilizer sparingly and never before storms • Properly dispose of leaves and grass clippings
Solids, Oils & Grease (Hydrocarbons), or Metals	Connecticut River, Log Pond Cove	Reduce the penetration of light in the water and limit the growth of aquatic plants.	• Industrial facilities	• Proper pre-treatment of water entering storm drains

4.1.3 Updated Program

The City of Holyoke developed and implemented education and outreach requirements and is committed to informing residents on stormwater issues through engagement with public interest groups, leveraging existing educational materials, and maintaining a focus on reaching a diverse audience.

There are multiple education and outreach programs through which Holyoke seeks to raise the public's awareness to environmental and stormwater-specific issues. New programs and resources are continuously considered and implemented to enhance the Public Education and Outreach Program for the SWMP. The City plans to use various strategies and outreach media, including:

- Department websites, social media, and special programming,
- Cooperative efforts with local organizations and environmental advocates, such as the Pioneer Valley Planning Commission (PVPC).
- Informational materials (on leaf litter, grass clippings, pet waste management, etc.).

Holyoke's Public Education and Outreach Program and implementation plan is presented in Table 6. Each BMP includes a lead responsible department, and some BMPs also include supporting departments or parties, as well as names of individuals responsible for implementation.

The success of each BMP will be measured and evaluated against the metrics provided in the "Measurable Goal" category. Data collected for each BMP will be recorded by the City, and the efficacy of each BMP towards reaching the public education goals will be presented in each annual report.

Table 6: Implementation Program for MCM 1, Public Education and Outreach Program

BMP #	BMP Media/Category	BMP Description	Targeted Audience	Responsible Department/Parties	Measurable Goal	Status
1-1	City Webpage/social media	• Post a comprehensive flyer/pdf/fact sheet on the City website. Include educational messages on best practices for: stopping illegal discharges, automotive maintenance & washing, fertilizer management, septic system maintenance, swimming pool water disposal, grass clipping disposal, & pet waste disposal. • Post on social media about the following message topics at the appropriate times and link to the posted material: Grass clipping disposal (Spring), Fertilizer management (Spring), Pet Waste Disposal (Summer), Septic. • Post videos on any Stormwater Topics and promote on Social Media.	Residents; Business, Institutions, Developers, and Commercial Facilities	DPW Operations	Views or interactions each social media post.	Ongoing

BMP #	BMP Media/Category	BMP Description	Targeted Audience	Responsible Department/Parties	Measurable Goal	Status
1-2	Factsheets	• Links to the City Stormwater page with messages on best practices for building maintenance, use/storage of salt/sand or other de-icing material, pollution prevention, waste management, impervious surface maintenance, automotive maintenance, and swimming pool water disposal. • Post educational flyer on Erosion Controls, Low Impact Design (LID), and Green Infrastructure technologies on City website. • Educate industrial users on BMPs	Residents; Business, Institutions, Developers, and Commercial Facilities	DPW Operations, Planning & Economic Development and Licensing Dept., Veolia/City's Sewer Operations Contractor	Clicks or views on the city webpage	Planned
1-3	Pet Waste Management	• Insert Flyer/Brochure into Dog Licenses at the time of dog license issuance. Educate and encourage pet owners to pick up after their pets. • Work with Parks Department to post signs in public parks reminding pet owners to pick up after their pets.	Pet Owners	City Clerk's Office	Number of signs posted, number of bags distributed.	Ongoing

4.2 MCM 2: PUBLIC INVOLVEMENT AND PARTICIPATION

4.2.1 Objective

The 2016 MS4 permit states:
"All public involvement activities must comply with the State public notice requirements at MGL Chapter 30A Section 18-25 and local public notice requirements."

"The permittee must provide opportunity for the public to participate in the review and implementation of the storm water management program."

4.2.2 Permit Summary

Section 2.3.3. of the 2016 MS4 permit requires the City to provide opportunities for public participation in the implementation and review of the SWMP in accordance with Massachusetts General Law (MGL) Chapter 30A Section 18-25, which provided requirements for public accessibility to governmental meetings.

Therefore, the City shall comply with State public notice requirements (MGL Chap. 30A, Sections 18-25 – effective 07/10/2010) when conducting all public involvement activities. The SWMP, and all annual reports will be made available online for the public to see. Additionally, the City shall provide the public with annual opportunities to participate in the review and implementation of the SWMP. Public participation opportunities may include, but are not limited to, waterbody clean-ups; stream monitoring; formation of a stormwater management committee; websites; or phone hotlines. All public participation opportunities will be reported in the annual report.

4.2.3 Updated Program

Since signing the NOI for the 2016 MS4 permit, the City planned and implemented several on-going BMPs to meet the permit requirements to engage and solicit community participation in the implementation of the SWMP. Further Action will be taken to create an online form for the public to review and comment on the SWMP. The City is committed to pursuing further engagement opportunities with the public through various mediums and partnerships with other governmental/non-governmental entities and organizations. This may include interactive programs with schools, events with other City departments, or sponsoring local groups engaging in river cleanups.

Table 7: Implementation Program for MCM 2, Public Involvement and Participation

BMP #	BMP	BMP Description	Responsible Department/Parties	Additional Description/ Measurable Goal	Status
2-1	Public Review	SWMP Review	DPW Operations	Annual review of SWMP and posting of SWMP on website	On-going
2-2	Public Participation	Provide Contact information for Stormwater Manager on website	DPW Operations	Schedule public comment on SWMP	On-going
2-3	Public Participation	Support Annual Source to the Sea Cleanup	DPW Operations/ Veolia/City's Sewer Operations Contractor	Provide containers for waste collection and pickup waste at end of event	On-going
2-4	Public Participation	Hold annual Household Hazardous Waste (HHW) events	DPW Operations	Track quantity of waste collected and hold at least annually	On-going
2-5	Public Participation	Participate in CT River Stormwater Committee Incl. Public Events	DPW Operations	Attend 75% of meetings	On-going

4.30 MCM 3: ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) PROGRAM (Consent Decree Term #11-17)

4.30.1 Objective

The 2016 MS4 permit states:
"The permittee shall implement an IDDE program to systematically find and eliminate illicit sources of non-stormwater discharges to its municipal separate storm sewer system and implement procedures to prevent such discharges."

4.30.2 Permit Summary

The Consent Decree Term 12 requires the City to maintain an adequate legal authority to prohibit, investigate, and eliminate illicit discharges and implement appropriate enforcement mechanisms. The City drafted an IDDE plan to meet the requirements of this Consent Decree by the stipulated deadline of May 31, 2023 (**Appendix D**).

An illicit discharge is any discharge to a municipal separate storm sewer system that is not composed entirely of stormwater, except discharges pursuant to a NPDES permit. The IDDE plan is a systematic plan for identifying and eliminating such discharges.

Major components of the IDDE plan include storm water mapping, outfall inventory and ranking, outfall screening and sampling, catchment investigations, identification, and removal of illicit discharges to the MS4 system, and employee training. The IDDE plan is meant to be an iterative document with continued mapping, ranking, and investigations.

4.30.3 Updated Program

The City of Holyoke will develop specific IDDE Ordinances so that the IDDE implementation will be enforceable. The Ordinances will specifically prohibit illicit discharges from entering municipal storm drains that could contribute contaminants and additional flow to the City drain system. City Staff are working with the Board of Public Works and City Solicitor's Office to review and incorporate some of the recommendations made by the Pioneer Valley Planning Commission and the Regulatory Review Advisory Group in 2021, including adopting an Illicit Connections and Discharge Ordinance with enforcement actions.

The City of Holyoke drafted an IDDE Plan as a requirement for the Consent Decree Term 12. The Plan includes screening and monitoring of all known MS4 outfalls and interconnections in both dry and wet weather conditions (as defined in the Consent Decree), investigation of all catchment areas, and identification and removal of illicit discharges to the MS4 system. The City continues mapping outfalls and structures, has completed dry weather screening and sampling, and identified several potential illicit connections. The City will further update the IDDE Plan, as needed, to ensure consistency with any requirements in future NPDES Permits issued to the City. This IDDE program will also be updated with the progress that Holyoke will make towards understanding the extents and condition of their stormwater system and identifying possible illicit connections.

The City of Holyoke developed an updated stormwater map to address mapping requirements for the Consent Decree Term 20 (**Appendix A**). The City is actively updating the current version which includes West Holyoke in the mapping. The mapping will be further updated with the following information:

1. Outfalls and receiving waters;
2. Open channel conveyances;
3. Interconnections with other MS4s and other storm sewer systems;
4. Municipally owned stormwater treatment structures;
5. Waterbodies identified by name and indication of all use impairments; and
6. Initial catchment delineations identifying the contributing area that drains to each individual outfall or interconnection.

While the Consent Decree does not specifically include any SSO reporting requirements, as per 2016 MS4 permit, the IDDE plan is required to report any SSO's during the permit term, and the City shall comply with the reporting requirements for SSOs also stipulated in 314 C.M.R. § 12.03(8), Operation, Maintenance and Pretreatment Standards for Wastewater Treatment Works. Based on the review of available documentation pertaining to SSOs, the City of Holyoke has reported 14 SSO that discharged to the MS4 within the past five years. Moving forward the City will maintain an inventory that includes all SSOs.

4.30.4 Measurable Goals

Proper adherence to the 2016 MS4 permit and the Consent Decree includes an adequate legal authority and enforcement strategy for illicit discharges, an up-to-date SSO inventory, a robust system wide map, a written IDDE plan, trained field staff, and an enhanced understanding of catchments, interconnections, and water quality in the City. Each aspect of the IDDE program will be reported in the Semi-annual

Compliance Report, and the IDDE Plan will be updated to reflect reprioritizations, mapping, and other gathered data. The following summarizes requirements for MCM 3. The measurable goals consist of completing the requirements by the specified dates shown below.

Table 8: Implementation Program for MCM 3, Illicit Discharge Detection and Elimination (IDDE) Program

BMP	Responsible Department/Parties	Proposed Schedule	Status
Regulatory Mechanism/Ordinance	Veolia/City's Sewer Operations Contractor and City of Holyoke	2023	In Progress
Written IDDE Plan	Veolia/City's Sewer Operations Contractor	2023	Complete
Dry Weather Screening and Sampling	Veolia/City's Sewer Operations Contractor	2024	Completed May 2024
Wet Weather Sampling	Veolia/City's Sewer Operations Contractor	20 Outfalls per year	Ongoing with 24 outfalls sampled as of June 30, 2024
Catchment Investigations	Veolia/City's Sewer Operations Contractor	Begin by 2023 / Complete by 2027	Ongoing with 23 catchment investigations completed as of June 30, 2024
IDDE Training	Veolia/City's Sewer Operations Contractor	Annually	Ongoing

4.4 MCM 4: CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

4.4.1 Objective

The 2016 MS4 permit states:
"The permittee must develop, implement, and enforce a program to reduce pollutants in any storm water runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. The permittee must include disturbances less than one acre if part of a larger common plan."

4.4.2 Permit Summary

Based on 2016 MS4 permit requirements, the City will develop and enforce a construction site storm runoff control program in conjunction with the ordinance to reduce pollutants in construction site runoff. The ordinance and program shall not be applicable for construction sites with a waiver from USEPA under provisions of 40 CFR§122.26(b)(15)(i).

The 2016 MS4 permit requires specific elements for site plan review, site inspections, and measurable goals. The 2016 MS4 permit specifies that the Permittee have the following elements be reviewed during the preconstruction site plan review:

- Planned BMPs during construction.
- Planned BMPs for post-construction conditions, and
- Evaluating the incorporation of LID site planning and design strategies.

The 2016 MS4 permit requires Site Inspections to include inspections of BMPs during construction and also after construction to ensure they are working as described. Additionally, the 2016 MS4 permit distinguishes MCM4 requirements as a separate and distinct program from the USEPA Construction General Permit (CGP) which was introduced in 2017. The City will follow the 2016 MS4 permit as a guideline in structuring an effective and efficient construction site storm runoff control program.

4.4.3 Updated Program

The City will review existing ordinances (Article II. - Grading And Soil Erosion Control) and any other relevant legislation. As part of the Consent Decree requirements, the City is creating a plan to update the existing ordinances to reach compliance with the 2016 MS4 permit. In particular, the City will seek to update ordinance language pertaining, but not limited to, applicability requirements, proper waste management, BMP design standards and LID strategies. In addition to an ordinance review and update,

the City will review and update existing procedures for site plan review, site inspection, and enforcement.

City Staff are working with the Board of Public Works and City Solicitor's Office to review and incorporate some of the recommendations to various City Ordinance and Regulations pertaining to Construction Site Runoff Control made by the Pioneer Valley Planning Commission and the Regulatory Review Advisory Group in 2021.

4.4.4 Measurable Goals

The measurable goals for this program are listed in Table 9.

Table 9: Implementation Program for MCM 4, Construction Site Stormwater Runoff Control

BMP #	BMP Category	Measurable Goal(s)	Responsible Dept or Parties	Status
4-1	Site inspection and enforcement of Erosion and Sedimentation Control (ESC) measures	Review existing written site inspection and enforcement procedures for sediment and erosion control measures and confirm they comply with Section 2.3.5. c. i through c. v of the 2016 MS4 permit.	DPW/City Engineer	Ongoing
4-2	Site Plan Review	Review stormwater regulations and confirm that construction stormwater runoff control ordinances meet requirements of 2016 MS4 permit Section 2.3.5.c.i. ii, iii, and v	DPW/City Engineer	Ongoing
4-3	Erosion and Sedimentation control	Review existing written site inspection and enforcement procedures for sediment and erosion control measures and confirm they comply with Section 2.3.5. through c. v of the 2016 MS4 permit.	DPW/City Engineer	Ongoing
4-4	Waste Control	Adopt requirements to control wastes including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes 2.3.5 c iv of 2016 MS4 permit	DPW/City Engineer	Ongoing
4-5	Track, inspect and document	Written site plan review, inspection and enforcement procedures include processes to track the number of site plan reviews, site inspections and enforcement actions.	DPW/City Engineer	Ongoing

4.5 MCM 5: POST CONSTRUCTION STORMWATER MANAGEMENT IN NEW DEVELOPMENT AND REDEVELOPMENT

4.5.1 Objective

The 2016 MS4 permit states:
"The permittee must develop, implement, and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than or equal to one acre and discharge into the municipal system."

The Consent Decree (Term 19.b.ii.) states:
"The requirement for adoption/amendment of the permittee's ordinance or other regulatory mechanism shall include a requirement that new development and redevelopment stormwater management BMPs be optimized for nitrogen removal;"

4.5.2 Permit Summary

The City will develop and make effective an ordinance that will address post construction runoff from new development and redevelopment projects. The City will require that new development and redevelopment stormwater management BMPs be optimized for nitrogen removal. The City will utilize ordinance requirements for MCM5 from the 2016 MS4 permit as a guideline, as the 2016 MS4 permit provides details with greater relevance. The 2016 MS4 permit requires the regulatory mechanism or ordinance to require sites to incorporate LID site planning and design strategies to the maximum extent possible (**Appendix G**).

Many studies indicate that prior planning and design for the minimization of pollutants in post-construction stormwater discharges is the most cost-effective approach to stormwater quality management. Prior site planning is best accomplished through established municipal procedures/programs for project review during the proposal and permitting stages. Per the 2016 MS4 permit requirement, the City is required to develop, implement, and enforce a program to reduce pollutants in post-construction runoff to their MS4 from new development and redevelopment projects that result in land disturbance of greater than or equal to one acre. The 2016 MS4 permit requires the program to include procedures that will allow the City to require any applicant to ensure adequate long-term operation and maintenance of installed BMPs, and controls be put into place that will prevent or minimize water quality impacts. The City will utilize the 2016 MS4 permit MCM 5 requirements for

projects and require the submission of as-built drawings no later than two years after completion. The as-built drawings must depict structural and non-structural on-site controls. Ownership agreements and procedures for the long-term operation and maintenance of privately owned SW BMPS in the built system must also be submitted to the City upon completion.

4.5.3 Updated Program

The City will review and propose changes to the existing City of Holyoke Code of Ordinances Chapter 38, site plan review checklists, Zoning Regulations, and other relevant material. Changes will incorporate requirements for development to meet the pollutant removal standards specified in the MassDEP Stormwater Standards with a special emphasis for Nitrogen removal optimization. Additionally, the ordinance and program procedures will be updated to require developers to submit as-built drawings and long-term maintenance procedures for completed redevelopment and new development stormwater management systems.

City Staff are working with the Board of Public Works and City Solicitor's Office to review and incorporate some of the recommendations to various City Ordinance and Regulations pertaining to Post-Construction Stormwater Management made by the Pioneer Valley Planning Commission and the Regulatory Review Advisory Group in 2021.

4.5.4 Measurable Goals

The measurable goals for this program are listed in Table 10.

Table 10: Implementation Program for MCM 5, Post Construction Stormwater Management in New Development and Redevelopment

BMP #	BMP Category	Measurable Goal(s)	Responsible Department	Status
5-1	Review Written Stormwater runoff procedures, ordinances, and bylaws	• Review existing written procedures to comply with the MS4-2016 MS4 permit and modify as necessary to comply with Sections 2.3.6.a.i and 2.3.6.a.ii including provisions for the following: – Use to the maximum extent possible, of Low Impact Development (LID) and site planning and design strategies. – Design of treatment and infiltration practices that follow guidance in Vol 2 of the Massachusetts Stormwater Handbook, as amended, or other federally or state approved BMP design guidance. – Stormwater management systems on new development sites designed to meet Massachusetts Stormwater Handbook Standards 1, 2, 3, 5, 5, 6, and 9 and require systems to be designed to retain the first inch of runoff from all impervious surfaces and/or remove 90% total suspended solids (TSS) and 60% of total phosphorous (TP) generated from all impervious surfaces. • Require redevelopment sites meet Massachusetts Stormwater Handbook Standards 1, 2, 3, 5 and 6 and improve existing conditions by retaining the first 0.8 inch of runoff from all impervious surfaces and/or removing 80% of TSS and 50% of TP generated from all impervious surfaces. • Update ordinances and other regulatory mechanisms to require new development and redevelopment stormwater BMPs to be optimized for nitrogen removal.	DPW/ City Engineer	Ongoing
5-2	As built Plans for On-site stormwater control	• Require the submission of as-built drawings no later than 2 years after completion of construction projects in accordance with requirements in 2.3.6.a.iii including: • Long-term operation and maintenance (O&M) of BMPs including mechanisms such as escrow accounts, maintenance contracts, annual certification that maintenance of stormwater controls has been performed. • The City reports on measures to ensure long term maintenance of stormwater controls in its Annual Report	DPW/City Engineer	Ongoing
5-3	Street Design and parking lot guidelines	• Develop a report assessing requirements that affect the creation of impervious cover. The assessment will help determine if changes to design standards for streets and parking lots can be modified to support LID options. If assessment indicates changes can be made it shall include recommendations and schedules to incorporate changes to policies, standards, and procedures.	DPW, Planning Board, local transportation board	Ongoing

BMP #	BMP Category	Measurable Goal(s)	Responsible Department	Status
		• A status report of the assessment including planned or completed changes to local regulations and guidelines shall be included in the Annual Report		
5-4	Green Infrastructure Design Opportunities Report	• Develop a report assessing existing local regulations to determine the feasibility of making, at a minimum, the following practices allowable when appropriate site conditions exist: ○ Green roofs; ○ Infiltration practices such as rain gardens, curb extensions, planter gardens, porous and pervious pavements and other designs to manage stormwater using landscaping and structures or augmented soils; and ○ Water harvesting devices such as rain barrels and cisterns and the use of stormwater for non-potable uses If above practices are not allowed in the MS4, the assessment shall determine what changes may be made to make them allowable. The City reports annually on its findings and progress towards making green infrastructure allowable.	DPW	Ongoing
5-5	Inventory of Retrofit Property Opportunities	Identify a minimum of 5 permittee-owned properties that could be modified or retrofitted with BMPs designed to reduce the frequency, volume and pollutant loads including nitrogen loading of stormwater discharges due to impervious service area (IA). Municipal properties with significant IA (parking lots, buildings, and maintenance yards) will be considered. MS4 infrastructure to be considered includes existing street right-of-ways, outfalls and conventional stormwater conveyances (swales, detention bonds) that could readily be modified. Other factors such as access for maintenance, subsurface geology and infrastructure (sewers and septic), opportunities for public use and education, current level of service, control of discharges to water quality limited waters (nitrogen), public swimming areas, etc. shall be considered.	DPW	Ongoing

4.6 MCM 6: POLLUTION PREVENTION / GOOD HOUSEKEEPING

4.6.1 Objective

The 2016 MS4 permit states the following:
"The permittee shall implement an operations and maintenance program for permittee-owned operations that has a goal of preventing or reducing pollutant runoff and protecting water quality from all permittee-owned operations."

The Consent Decree (Term 19.b.iii) states the following:
"The City shall establish procedures to properly manage grass cuttings and leaf litter on City property."

4.6.2 Permit Summary

The 2016 MS4 permit requires that good housekeeping and pollution prevention programs be developed for the following municipal owned facilities (at a minimum):

- Rest areas along interstates
- Weigh stations
- Material storage yards
- New construction and land disturbance
- Roadway drainage system maintenance
- Storm water system maintenance

At transportation facilities in particular, programs must be developed with the goal of preventing or reducing pollutant runoff from the site and must include employee training. For all components of the good housekeeping program, a schedule for implementation needs to be developed that includes maintenance activities, inspections, and plans for long-term structural controls. Inspection procedures are likewise to be developed for all municipal properties requiring good housekeeping measures.

In addition to the requirements of the 2016 MS4 permit, the Consent Decree includes several additional requirements that fall under MCM 6:

- Increase the frequency of street sweeping for all municipal owned streets and parking lots (with the exception of rural uncurbed roads with no catch basins or high-speed limited access highways) to a minimum of two times per yar, once in the spring (following winter activities such as sanding) and at least once in the fall (Sep 1 – Dec 1; following leaf fall)
- Establish procedures to properly manage grass cuttings and leaf litter on City property, including prohibiting blowing organic waste materials onto adjacent impervious surfaces.

4.6.3 Updated Program

A Good Housekeeping Manual incorporating written procedures for municipal activities, written inventory of all City owned facilities, and good housekeeping procedures for parks, open spaces, municipal buildings, vehicles, and equipment has been developed and included in (**Appendix F**). Additional good housekeeping procedures for catch basin cleaning, street sweeping, proper management of sweepings and cleanings, use of salt and sand for winter road maintenance, and structural controls for maintenance of stormwater BMPs is included. The manual will serve as the City's reference for all Good Housekeeping and Pollution Prevention activities that municipal employees perform and will include a proposed schedule for all required inspections and regular maintenance activities.

The City implements ongoing pollution prevention and good housekeeping practices that were required under the 2016 MS4 permit. For all existing and new procedures, written procedures and schedules for implementation are included in the Good Housekeeping manual. A summary of existing Good Housekeeping and Pollution Prevention programs is outlined in Table 11.

Additionally, for municipal owned facilities that pose a particularly high risk for stormwater pollution, Stormwater Pollution Prevention Plans (SWPPPs) have been developed that outline facility-specific procedures to avoid potential pollution of the MS4 system. While SWPPPs are not a requirement for the City of Holyoke under the Consent Decree, the 2016 MS4 permit requires the development of SWPPPs. The City has developed SWPPPs for applicable properties and will include:

- Pollution Prevention Team
- Description of facility and potential pollutant sources
- Identification of stormwater controls
- Pollution management practices:
    - Minimization and/or prevention of exposure
    - Good housekeeping
    - Preventative maintenance
    - Spill prevention and response
    - Erosion and sediment control
    - Management of runoff
    - Salt storage
    - Employee training
    - Maintenance of control measures

The City of Holyoke has completed SWPPPs for the DPW Garage, the Parks and Maintenance Building at Springdale, Fire Station 1, Fire Station 3, Fire Station 5, and Fire Station 6. As a result of implementing SWPPPs for these properties there were improvements in the management of runoff at the Parks and Maintenance Building at Springdale, and improvements to the spill response and prevention at Fire Station 1 and the Parks and Maintenance Building at Springdale. The City of Holyoke will continue implementing SWPPPs for the Upland Maintenance Garage.

4.6.4 Measurable Goals

The measurable goals for this program are listed in Table 11.

Table 11: Implementation Program for MCM 6, Pollution Prevention / Good Housekeeping

BMP #	BMP	Measurable Goals	Responsible Department/Parties	Status
6-1	O&M Procedure	• Create written O&M procedures per 2.3.7.a.ii of the 2016 MS4 permit for parks and open spaces, buildings and facilities and equipment including: – Proper use storage and disposal and reduction of pesticides, herbicides, and fertilizers – Protective practices such as reduced mowing frequency, proper disposal of lawn clippings, leaf litter and pet waste. – Prohibition of blowing organic waste material onto adjacent impervious areas (IA) – BMPs for buildings and facilities for the use storage and disposal of petroleum products, employee training, dumpster management, parking lot sweeping. – BMPs for indoor storage of vehicles with leaks, procedures and design of fueling areas, procedures to ensure vehicle wash waters do not enter MS4. • The required use of slow-release fertilizers on City owned property that currently uses fertilizers. O&M procedures will be included in the SWMP.	DPW and other City Departments	Planned
6-2	Street Sweeping Program	Conduct street sweeping of all municipal owned streets and parking lots at a minimum frequency of twice per year.	Veolia/City's Sewer Operations Contractor	Ongoing
6-3	Inventory City-owned facilities	Inventory to include City owned property within the following categories: 1) Parks and Open space; 2) Buildings and facilities where pollutants are exposed to stormwater runoff (schools, town offices, police and fire stations, municipal pools and parking garages; and 3) Vehicles and equipment. The Status of inventory is documented in Annual Report	DPW and other City Departments	Planned

BMP #	BMP	Measurable Goals	Responsible Department/Parties	Status
6-4	Catch Basin Cleaning	Conduct ongoing catch basin cleaning to ensure no sump is more than 50% full during cleaning.	Veolia/City's Sewer Operations Contractor	Ongoing
6-5	Road Salt optimization	Establish practices for winter pavement maintenance including the use and storage of salt and sand, minimize the use of sodium chloride and other salts, and ensure that snow disposal activities do not result in disposal of snow, salt, and sand into receiving waters.	DPW	Ongoing
6-6	Inspection and Maintenance of Treatment Structures	• Establish and implement inspection and maintenance procedures and frequencies for stormwater treatment structures (water quality swales, retention/detention basins, infiltration structures, etc.) At a minimum, inspect all structures annually. • Veolia maintains a record of all inspections, training and maintenance activities.	DPW, Veolia/City's Sewer Operations Contractor	Planned
6-7	Stormwater Pollution Prevention Plan (SWPPP)	Identify and create an inventory of all maintenance garages, transfer stations, and other waste-handling facilities that drain to the MS4 system. Develop SWPPPs for all facilities.	DPW and other City Departments	Ongoing

5 ADDITIONAL REQUIREMENTS

5.1 GROUNDWATER RECHARGE AND INFILTRATION

The MS4 permit requires that:
"The permittee must evaluate physical conditions, site design, and best management practices to promote groundwater recharge and infiltration where feasible in the implementation of the control measures described above. During the implementation of the stormwater management program, the permittee must address recharge and infiltration for the minimum control measures, as well as any reasons for electing not to implement recharge and infiltration. Loss of annual recharge to ground water should be minimized through the use of infiltration measures to the maximum extent practicable."

Implementation Strategy:
While evaluating the suitability of infiltration practices, the City of Holyoke adheres to the following guidelines:

- A site must allow for complete drainage within 72 hours of a rainfall event.
- A site must provide for at least a two-foot separation between the bottom of any infiltration structure and the seasonal high groundwater table.
- The site must not contain contaminated soils or be comprised of fill material.
- Infiltration practices must not cause or contribute to ponding on the surface of the land.
- Infiltration practices must not cause or contribute to basement flooding of adjacent properties.

5.2 DISCHARGES TO PUBLIC DRINKING WATER SUPPLIES

The MS4 permit requires that:
"MS4s which discharge to public drinking water sources and their protection areas (Class A and B surface waters used for drinking water and wellhead protection areas) should consider these waters a priority in implementation of the stormwater management program.

Discharges to public drinking water supply sources and their protection areas (Zones I, II, Wellhead Protection areas, Zones A, B, and C as defined in 310 CMR 22.00) should provide pretreatment and spill control capabilities to the extent feasible.

Direct discharges to Class A waters and Zone I wellhead protection areas (as defined in 310 CMR 22.02) should be avoided to the extent feasible."

Implementation Strategy:
The Connecticut River is classified as a class B water with treated drinking water as a designated use. The City requires source control including spill prevention, spill response, and proper management of snow and deicing chemicals. Details of these practices are outlined in Section 5.6 (MCM 6: Pollution Prevention and Good Housekeeping) and is consistent with the Massachusetts Stormwater Management Standard 6.

6 SEMIANNUAL EVALUATION

Under the Consent Decree, the City of Holyoke must submit compliance reports semiannually until otherwise notified in writing from the USEPA. Compliance reports are due by January 31 and July 31 of each year and will cover the six-month periods ending June 30 and December 31, respectively. Each compliance report will include:

1. A description of activities undertaken during the reporting period directed at achieving compliance with the Consent Decree;
2. Identification of all plans, reports, and other deliverables required by the Consent Decree that have been completed and submitted during the Reporting Period;
3. A description of the expected activities to be taken during the next Reporting Period in order to achieve compliance with the Consent Decree.

In addition, the annual reporting requirement associated with the 2016 MS4 permit will remain a requirement and will not necessarily be covered by the semiannual evaluation which will focus on the requirements of the Consent Decree only.

7 IMPAIRMENTS AND WATER QUALITY LIMITED WATERS

7.1 CONSENT DECREE TERM 19 STORMWATER NITROGEN MINIMIZATION MEASURES

7.1.1 Connecticut River Nitrogen Reduction

The Connecticut River is classified as impaired for Nitrogen on the applicable USEPA-approved Massachusetts CWA § 303(d) Integrated List of Waters and does not have an USEPA approved Total Maximum Daily Load for the segments of the Connecticut River that receive stormwater discharges from the City. To address nitrogen discharges additional requirements for public education and enhanced stormwater management in new development and redevelopment are required per the 2016 MS4 Permit and the Consent Decree, the City will follow the enhanced public education and outreach program as outlined in Table 12 below.

Table 12: Additional or Enhanced BMP (Public Education and Outreach)

BMP	Responsible Department/Parties	Timeframe	Due
Distribute message encouraging proper use and disposal of grass clippings and slow-release fertilizers	DPW and Other City Departments	Spring – April/May	Annually
Distribute message encouraging the proper management of pet waste	DPW and Other City Departments	Summer – June/July	Annually
Distribute message encouraging the proper disposal of leaf litter	DPW and Other City Departments	Fall – August/September /October	Annually

For enhanced stormwater management in new development and redevelopment, the City will update ordinances or modify regulatory mechanisms to ensure that new development or redevelopment stormwater BMPs are optimized for Nitrogen removal (per Consent Decree Term 19.b.ii). For implementation of good housekeeping and pollution prevention BMPs, the City will use strategies to manage grass cuttings and leaf litter on City property, develop and implement procedures to manage yard litter (organic waste materials) from blowing onto impervious surfaces, and complete street cleanings after leaf fall in the fall (Sept 1 – Dec 1) and after winter sanding in the spring (per Consent Decree Term 19.b.iii).

Additionally, the City developed a Nitrogen Source Identification Report to identify catchments with high nitrogen loading and to identify potential retrofit opportunities for the installation of structural BMPs

(per Consent Decree Term 19.c.i) and it was submitted to USEPA on January 31, 2024 (per Consent Decree Term 19.c.ii). The report will include an analysis of the total MS4 area draining to the water quality limited receiving water segments or their tributaries, incorporating updated mapping of the MS4 and catchment delineations. It will also present the screening and monitoring results focused on the identified receiving water segment(s). Additionally, the report assess the impervious area and directly connected impervious area (DCIA) within the target catchment with a goal to identify, delineate, and prioritize potential catchments with high nitrogen loading. Finally, the report highlights potential retrofit opportunities or possibilities for installing structural best management practices (BMPs) during redevelopment, which may involve the removal of impervious areas.

The City evaluated City-owned properties identified in the Nitrogen Source Identification Report that could potentially be modified or retrofitted with BMPs designed to reduce the frequency, volume, and pollutant loads of stormwater discharges to and from its MS4 by December 31, 2023. The evaluation included: (a) the next planned infrastructure, resurfacing or redevelopment activity planned for the property (if applicable) or planned retrofit date; (b) the estimated cost of redevelopment or retrofit BMPs; and (3) the engineering and regulatory feasibility of redevelopment or retrofit BMPs. The City prepared a list of planned structural BMPs and an implementation plan and schedule that was submitted on January 31, 2024, as a part of the Compliance Report (per Consent Decree Term 19.d.ii). The City will plan and install a minimum of one structural BMP as a demonstration project within the drainage area of the water quality limited water or its tributaries by December 31, 2024 (per Consent Decree Term 32.d.ii). The demonstration project will be installed targeting a catchment with high Nitrogen load potential within the MS4 area. As per Term 32.d.ii, the City will install the remainder of the structural BMPs in accordance with the plan and schedule provided in the January 31, 2024, Compliance Report. The City will document details of any structural BMP (BMP type, total area treated by the BMP, the design storage volume of the BMP) and estimate the Nitrogen removal by the BMP, and this will be reported in each annual Compliance Report.

7.2 BACTERIAL IMPAIRMENTS

Due to the bacterial impairments in the Connecticut River, Log Pond Cove, and Pequot Pond (E. Coli), the City will distribute educational materials highlighting pet waste as a source of bacteria and pathogen impairments to dog owners at the time of issuance or renewal of their dog license. Owners of septic systems will be provided information about proper septic system maintenance in any catchment that discharges to a waterbody impaired for bacteria. Annual messages will be disseminated during summer encouraging proper management of pet waste. The City will designate any waterbody impaired with bacteria as problem or high priority in the IDDE Plan.

8 REFERENCES

Final Massachusetts Integrated List of Waters for the Clean Water Act 2018/2020 Reporting Cycle, Approved February 2, 2022.

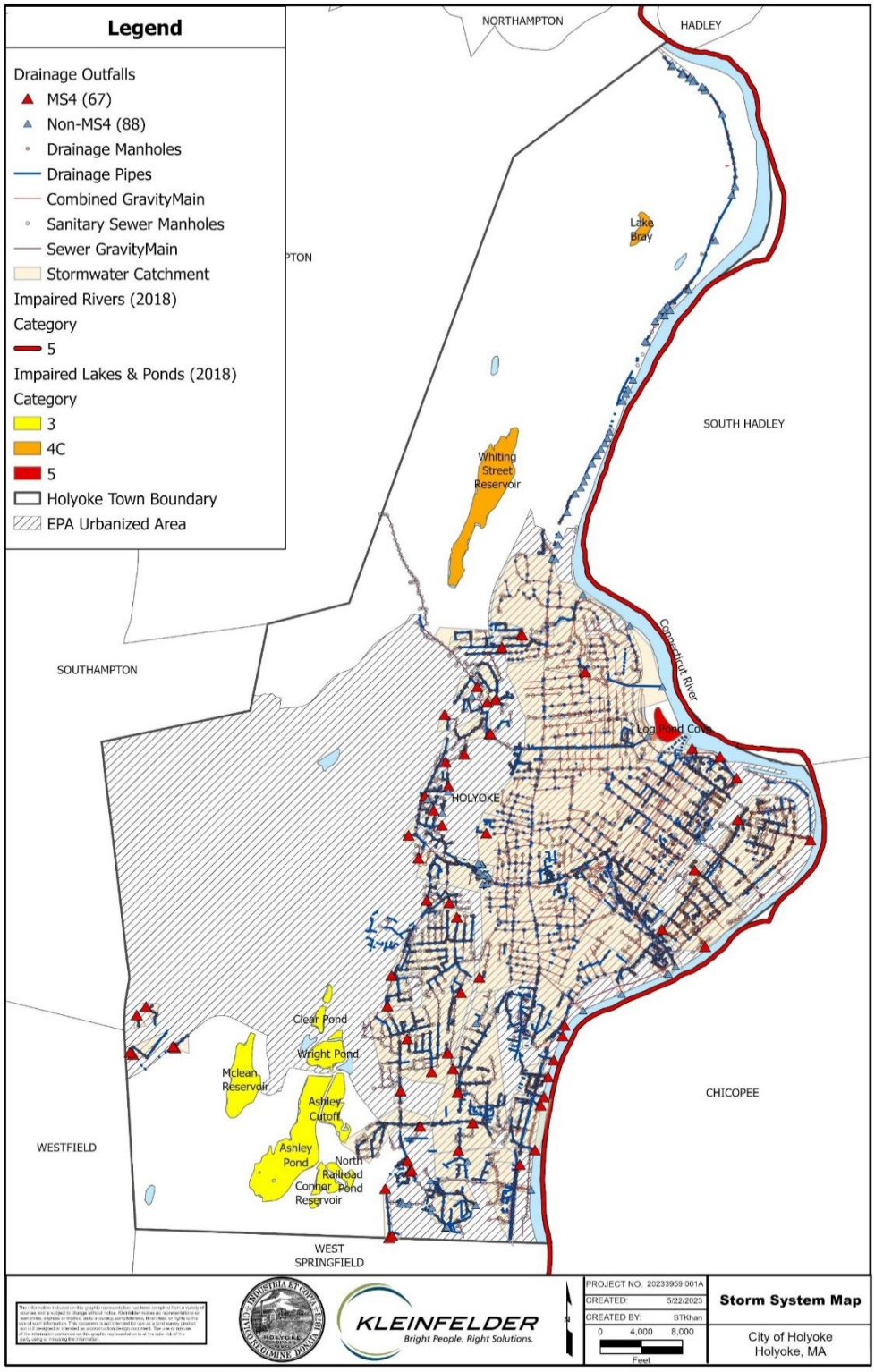
General Permits for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts. United States Environmental Protection Agency issued April 4, 2016.

General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts. United States Environmental Protection Agency issued May 1, 2003.

Massachusetts Stormwater Handbook

United States and Massachusetts v. City of Holyoke Consent Decree

APPENDIX A
STORMWATER SYSTEM MAP


Legend
Drainage Outfalls
MS4 (67)
Non-MS4 (88)
Drainage Manholes
Drainage Pipes
Combined GravityMain
Sanitary Sewer Manholes
Sewer GravityMain
Stormwater Catchment
Impaired Rivers (2018)
Category
5
Impaired Lakes & Ponds (2018)
Category
3
4C
5
Holyoke Town Boundary
EPA Urbanized Area
NORTHAMPTON
HADLEY
SOUTH HADLEY
SOUTHAMPTON
HOLYOKE
CHICOPEE
WESTFIELD
WEST SPRINGFIELD
Lake Bray
Whiting Street Reservoir
Connecticut River
Log Pond Cove
Clear Pond
Wright Pond
Mclean Reservoir
Ashley Cutoff
Ashley Pond
North Railroad Corner Pond Reservoir
KLEINFELDER
Bright People. Right Solutions.
PROJECT NO. 20233959.001A
CREATED: 5/22/2023
CREATED BY: STKhan
0 4,000 8,000
Feet
Storm System Map
City of Holyoke
Holyoke, MA

APPENDIX B

NOI

Notice of Intent (NOI) for coverage under Small MS4 General Permit

Part I: General Conditions

General Information

Name of Municipality or Organization: City of Holyoke State: MA

EPA NPDES Permit Number (if applicable): MAR041011

Primary MS4 Program Manager Contact Information

Name: Robert Peirent Title: City Engineer

Street Address Line 1: 63 Canal Street

Street Address Line 2:

City: Holyoke State: MA Zip Code: 01040

Email: peirentr@holyoke.org Phone Number: (413) 322-5605

Fax Number: (413) 322-5606

Other Information

Stormwater Management Program (SWMP) Location (web address or physical location, if already completed): City Engineers Office

Eligibility Determination

Endangered Species Act (ESA) Determination Complete? Yes

Eligibility Criteria (check all that apply): ☐ A ☐ B ☒ C

National Historic Preservation Act (NHPA) Determination Complete? Yes

Eligibility Criteria (check all that apply): ☒ A ☐ B ☐ C

☑ Check the box if your municipality or organization was covered under the 2003 MS4 General Permit

MS4 Infrastructure (if covered under the 2003 permit)

Estimated Percent of Outfall Map Complete? *(Part II, III, IV or V, Subpart B.3.(a.) of 2003 permit)* 100%

If 100% of 2003 requirements not met, enter an estimated date of completion (MM/DD/YY): 01/01/13

Web address where MS4 map is published:

If outfall map is unavailable on the internet an electronic or paper copy of the outfall map must be included with NOI submission (see section V for submission options)

See attached

Regulatory Authorities (if covered under the 2003 permit)

Illicit Discharge Detection and Elimination (IDDE) Authority Adopted? *(Part II, III, IV or V, Subpart B.3.(b.) of 2003 permit)* Yes

Effective Date or Estimated Date of Adoption (MM/DD/YY): 04/30/09

Construction/Erosion and Sediment Control (ESC) Authority Adopted? *(Part II,III,IV or V, Subpart B.4.(a.) of 2003 permit)* Yes

Effective Date or Estimated Date of Adoption (MM/DD/YY): 04/30/05

Post- Construction Stormwater Management Adopted? *(Part II, III, IV or V, Subpart B.5.(a.) of 2003 permit)* Yes

Effective Date or Estimated Date of Adoption (MM/DD/YY): 05/17/10

Notice of Intent (NOI) for coverage under Small MS4 General Permit

Part II: Summary of Receiving Waters

Please list the waterbodies to which your MS4 discharges. For each waterbody, please report the number of outfalls discharging into it and, if applicable, the segment ID and any impairments.

Massachusetts list of impaired waters: Massachusetts 2014 List of Impaired Waters- http://www.mass.gov/eea/docs/dep/water/resources/07v5/14list2.pdf

Waterbody that receives flow from the MS4 and segment ID if applicable	Number of outfalls into receiving water segment	Chloride	Chlorophyll-a	Dissolved Oxygen/ DO Saturation	Nitrogen	Oil & Grease/ PAH	Phosphorus	Solids/ TSS/ Turbidity	E. coli	Enterococcus	Other pollutant(s) causing impairments
Perennial Stream to Whiting Street Res.	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Wetlands affiliated with Broad Brook (MA34-18)	2	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Day Brook	8	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Tannery Brook	12	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Schoolhouse Brook	4	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Green Brook	13	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Connecticut River (MA34-05)	15	☐	☐	☐	☒	☐	☐	☒	☒	☐	PCBs
		☐	☐	☐	☐	☐	☐	☐	☐	☐	
		☐	☐	☐	☐	☐	☐	☐	☐	☐	
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Click to lengthen table

Notice of Intent (NOI) for coverage under Small MS4 General Permit

Part III: Stormwater Management Program Summary

Identify the Best Management Practices (BMPs) that will be employed to address each of the six Minimum Control Measures (MCMs). For municipalities/organizations whose MS4 discharges into a receiving water with an approved Total Maximum Daily Load (TMDL) and an applicable waste load allocation (WLA), identify any additional BMPs employed to specifically support the achievement of the WLA in the TMDL section at the end of part III.

For each MCM, list each existing or proposed BMP by category and provide a brief description, responsible parties/departments, measurable goals, and the year the BMP will be employed (public education and outreach BMPs also requires a target audience). **Use the drop-down menus in each table or enter your own text to override the drop down menu.**

MCM 1: Public Education and Outreach

BMP Media/Category (enter your own text to override the drop down menu)	**BMP Description**	**Targeted Audience**	**Responsible Department/Parties** (enter your own text to override the drop down menu)	**Measurable Goal**	**Beginning Year of BMP Imple-mentation**
Web Page	Develop a new web page linked to the Conservation and Sustainability page that focuses on what residents can to to improve stormwater quality with links to sites such as Think Blue	Residents	Conservation Director	Publish the new web page by then end of 2019 and track the number of visits	2019
Brochures/Pamphlets	Develop and distribute educational materials targeted to vehicle sales and maintenance facilities and distribute as part of annual licensing process	Businesses, Institutions and Commercial Facilities	Planning & Economic Development and Licensing Department	Distribute to 100% of license renewals and tabulate annually once developed	2019

Meeting	Invite developers that have applied for multiple stormwater permits from the City since regulations were developed in 2010 to a meeting that will focus on permitting and construction phase compliance requirements	Developers (construction)	Engineering	Prepare a list of invitees and compare to attendees at meeting. Target at least 50% attendance.	2020
Meeting	Meet with the Mayors Industrial Development Advisory Committee to discuss need for ongoing stormwater management system O&M and what can be done to assist with permit compliance	Industrial Facilities	Office of Planning and Economic Development with support from En	Meet twice over the permit cycle and target 50% attendance of invitees	2020
Displays/Posters/Kiosks	Install Dog Waste Cleanup Display at Community Field Dog Park	Residents	DPW Operations	Install display within 2 years and annually track quantity of dog waste bags distributed	2020
Individual Letters and Group Meeting	Improve compliance with annual stormwater management system O&M programs through education and enforcement	Businesses, Institutions and Commercial Facilities	Engineering	Develop a list of all stormwater permits issued by the City since 2010, correspond with 100% of permittees and hold a group meeting with a goal of 50% attendance.	2019

Brochures/Pamphlets and Inspection Check	Develop a brochure and checklist that focuses on key construction phase stormwater issues and distribute during stormwater site inspections	Developers (construction)	Engineering	Distribute during all initial site inspections	2019
Meeting	Develop a list of all Significant Industrial Users of the wastewater treatment facility and meet individually onsite to discuss stormwater management issues and best practices	Industrial Facilities	Suez and Engineering	A minimum of 3 site meetings per year to different SIUs during the permit term	2020

Notice of Intent (NOI) for coverage under Small MS4 General Permit

Part III: Stormwater Management Program Summary (continued)

MCM 2: Public Involvement and Participation

BMP Categorization	Brief BMP Description (enter your own text to override the drop down menu)	Responsible Department/Parties (enter your own text to override the drop down menu)	Additional Description/ Measurable Goal	Beginning Year of BMP Imple-mentation
Public Review	SWMP Review	Engineering	Allow annual review of stormwater management plan and posting of stormwater management plan on website	2019
Public Participation	Provide contact information for Stormwater Manager on website	Engineering	Allow public to comment on stormwater management plan annually	2019
Public Participation	Support Annual Source to Sea Cleanup	DPW Operations and Suez	Provide containers for waste collection and pickup waste at end of event	2018
Public Participation	Hold annual Household Hazardous Waste (HHW) events	DPW Operations and Casella	Track quantity of waste collected and hold at least annually	2018
Public Participation	Participate in CT River Stormwater Committee incl. Public Events	Engineering	Attend 75% of meetings	2018

Notice of Intent (NOI) for coverage under Small MS4 General Permit

Part III: Stormwater Management Program Summary (continued)

MCM 3: Illicit Discharge Detection and Elimination (IDDE)

BMP Categorization (enter your own text to override the drop down menu)	**BMP Description**	**Responsible Department/Parties** (enter your own text to override the drop down menu)	**Measurable Goal** (all text can be overwritten)	**Beginning Year of BMP Imple-mentation**
SSO inventory	Review and update SSO inventory in accordance of permit conditions	SUEZ	Complete within 1 year of effective date of permit	2019
Storm sewer system map	Review and update map	SUEZ	Update map within 2 years of effective date of permit and complete full system map 10 years after effective date of permit	2020
Written IDDE program	Review and update written IDDE program	SUEZ	Complete within 1 year of the effective date of permit and update as required	2019
Implement IDDE program	Implement updated catchment investigations according to program and permit conditions	SUEZ	Complete 10 years after effective date of permit	2019
Employee training	Continue to train employees on IDDE implementation	SUEZ	Train annually	2019
Conduct dry weather screening	Conduct in accordance with updated outfall screening procedure and permit conditions	SUEZ	Complete 3 years after effective date of permit	2020
Conduct wet weather screening	Conduct in accordance with updated outfall screening procedure	SUEZ	Complete 10 years after effective date of permit	2020

Notice of Intent (NOI) for coverage under Small MS4 General Permit

Part III: Stormwater Management Program Summary (continued)

MCM 4: Construction Site Stormwater Runoff Control

BMP Categorization (enter your own text to override the drop down menu or entered text)	**BMP Description**	**Responsible Department/Parties** (enter your own text to override the drop down menu)	**Measurable Goal** (all text can be overwritten)	**Beginning Year of BMP Imple-mentation**
Site inspection and enforcement of Erosion and Sediment Control (ESC) measures	Review and update written procedures of site inspections and enforcement procedures	DPW/ CITY ENGINEER	Complete within 1 year of the effective date of permit	2019
Site plan review	Review and update written procedures of site plan review and begin implementation	DPW/ CITY ENGINEER	Complete within 1 year of the effective date of permit	2010
Erosion and Sediment Control	Review and update requirements for construction operators to implement a sediment and erosion control program	DPW / CITY ENGINEER	Complete within 1 year of the effective date of permit	2010
Waste Control	Review and update requirements to control wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes	DPW/ CITY ENGINEER	Complete within 1 year of the effective date of permit	2019

Notice of Intent (NOI) for coverage under Small MS4 General Permit

Part III: Stormwater Management Program Summary (continued)

MCM 5: Post-Construction Stormwater Management in New Development and Redevelopment

BMP Categorization (enter your own text to override the drop down menu or entered text)	**BMP Description**	**Responsible Department/Parties** (enter your own text to override the drop down menu)	**Measurable Goal** (all text can be overwritten)	**Beginning Year of BMP Imple-mentation**
As-built plans for on-site stormwater control	Review and update procedures to require submission of as-built drawings and ensure long term operation and maintenance will be a part of the SWMP	CITY ENGINEER	Require submission of as-built plans for completed projects	2010
Target properties to reduce impervious areas	Identify at least 5 permittee-owned properties that could be modified or retrofitted with BMPs to reduce impervious areas and update annually	DPW	Complete 4 years after effective date of permit and report annually on retrofitted properties	2022
Allow green infrastructure	Develop a report assessing existing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist	DPW	Complete 4 years after effective date of permit and implement recommendations of report	2022
Street design and parking lot guidelines	Develop a report assessing requirements that affect the creation of impervious cover. The assessment will help determine if changes to design standards for streets and parking lots can be modified to support low impact design options.	DPW	Complete 4 years after effective date of permit and implement recommendations of report	2022

Ensure any stormwater controls or management practices for new development and redevelopment meet the retention or treatment requirements of the permit and all applicable requirements of the Massachusetts Stormwater Handbook	Review and update regulatory mechanisms to meet permit requirements	DPW	Complete 2 years after effective date of permit	2020

Notice of Intent (NOI) for coverage under Small MS4 General Permit

Part III: Stormwater Management Program Summary (continued)

MCM 6: Municipal Good Housekeeping and Pollution Prevention

BMP Categorization (enter your own text to override the drop down menu or entered text)	**BMP Description**	**Responsible Department/Parties** (enter your own text to override the drop down menu)	**Measurable Goal** (all text can be overwritten)	**Beginning Year of BMP Imple-mentation**
O&M procedures	Create written O&M procedures including all requirements contained in 2.3.7.a.ii for parks and open spaces, buildings and facilities, and vehicles and equipment	DPW to manage, will involve a number of City Departments	Complete and implement 2 years after effective date of permit	2020
Inventory all permittee-owned parks and open spaces, buildings and facilities, and vehicles and equipment	Create inventory	DPW to manage, will involve a number of City Departments	Complete 2 years after effective date of permit and implement annually	2020
Infrastructure O&M	Establish and implement program for repair and rehabilitation of MS4 infrastructure	DPW	Complete 2 years after effective date of permit	2020
Stormwater Pollution Prevention Plan (SWPPP)	Create SWPPPs for maintenance garages, transfer stations, and other waste-handling facilities	DPW to manage, will involve a number of City Departments	Complete and implement 2 years after effective date of permit	2020
Catch basin cleaning	Establish schedule for catch basin cleaning such that each catch basin is no more than 50% full and clean catch basins on that schedule	SUEZ	Inventory catch basins depths to established schedule and report number of catch basins cleaned and volume of material moved annually	2020
Street sweeping program	Sweep all streets and permitee-owned parking lots in accordance with permit conditions	SUEZ	Sweep all streets and permitee-owned parking lots once per year in the spring	2020
Road salt use optimization program	Establish and implement a program to minimize the use of road salt	DPW	Implement salt use optimization during deicing season	2021

Inspections and maintenance of stormwater treatment structures	Establish and implement inspection and maintenance procedures and frequencies	DPW	Inspect and maintain treatment structures at least annually	2021

Notice of Intent (NOI) for coverage under Small MS4 General Permit

Part III: Stormwater Management Program Summary (continued)

Actions for Meeting Total Maximum Daily Load (TMDL) Requirements

Use the drop-down menus to select the applicable TMDL, action description to meet the TMDL requirements, and the responsible department/parties. If no options are applicable, or more than one, **enter your own text to override drop-down menus.**

Applicable TMDL	Action Description	Responsible Department/Parties (enter your own text to override the drop down menu)
Long Island Sound TMDL (Nitrogen)	Adhere to requirements in part B.I of Appendix F	DPW and SUEZ

Notice of Intent (NOI) for coverage under Small MS4 General Permit

Part III: Stormwater Management Program Summary (continued)

Actions for Meeting Requirements Related to Water Quality Limited Waters

Use the drop-down menus to select the pollutant causing the water quality limitation and enter the waterbody ID(s) experiencing excursions above water quality standards for that pollutant. In addition, if you are subject to additional requirements due to a downstream nutrient impairment (see Part 2.2.2 of the permit) select the pollutant of concern and indicate applicable waterbody IDs or write "all waterbodies" if applicable. Choose the action description from the dropdown menu and indicate the responsible party. If no options are applicable, or more than one, **enter your own text to override drop-down menus.**

Pollutant	Waterbody ID(s)	Action Description	Responsible Department/Parties (enter your own text to override the drop down menu)
Nitrogen	Connecticut River (MA 35-05)	Adhere to requirements in part I of Appendix H	Department of Public Works
E. Coli	Connecticut River (MA 35-05)	Adhere to requirements in part III of Appendix H	
TSS	Connecticut River (MA 35-05)	Adhere to requirements in part V of Appendix H	

Part IV: Notes and additional information

Use the space below to indicate the part(s) of 2.2.1and 2.2.2 that you have identified as not applicable to your MS4 because you do not discharge to the impaired water body or a tributary to an impaired water body due to nitrogen or phosphorus. Provide all supporting documentation below or attach additional documents if necessary.
Also, provide any additional information about your MS4 program below.

Click to add text

Notice of Intent (NOI) for coverage under Small MS4 General Permit

Part V: Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: Alex B Morse

Title: Mayor

Signature: Alex Morse

Date: 09-27-18

[To be signed according to Appendix B, Subparagraph B.11, Standard Conditions]

Note: When prompted during signing, save the document under a new file name

APPENDIX C

THE JOINT AUTHORIZATION LETTER FROM USEPA AND MASSDEP

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MA 02109-3912

VIA EMAIL

March 5, 2019

Alex B. Morse
Mayor

And;

Robert Pierent
City Engineer
63 Canal Street
Holyoke, MA. 01040
peirentr@holyoke.org

Re: National Pollutant Discharge Elimination System Permit ID #: MAR041011, City of Holyoke

Dear Robert Pierent:

The 2016 NPDES General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts (MS4 General Permit) is a jointly issued EPA-MassDEP permit. Your Notice of Intent (NOI) for coverage under this MS4 General Permit has been reviewed by EPA and appears to be complete. You are hereby granted authorization by EPA and MassDEP to discharge stormwater from your MS4 in accordance with the applicable terms and conditions of the MS4 General Permit, including all relevant and applicable Appendices. This authorization to discharge expires at midnight on **June 30, 2022.**

For those permittees that certified Endangered Species Act eligibility under Criterion C in their NOI, this authorization letter also serves as EPA's concurrence with your determination that your discharges will have no effect on the listed species present in your action area, based on the information provided in your NOI.

As a reminder, your first annual report is due by **September 30, 2019** for the reporting period from May 1, 2018 through June 30, 2019.

Information about the permit and available resources can be found on our website: https://www.epa.gov/npdes-permits/massachusetts-small-ms4-general-permit. Should you have any questions regarding this permit please contact Newton Tedder at tedder.newton@epa.gov or (617) 918-1038.

Sincerely,

Thelma Murphy, Chief
Stormwater and Construction Permits Section
Office of Ecosystem Protection
United States Environmental Protection Agency, Region 1

and;

Lealdon Langley, Director
Wetlands and Wastewater Program
Bureau of Water Resources
Massachusetts Department of Environmental Protection

APPENDIX D

IDDE PLAN

ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) PLAN

CITY OF HOLYOKE, MASSACHUSETTS

PROJECT NO.: 25000684.001A

JUNE 2024

.

A Report Prepared for:

Carl Rossi
Director of Public Works
City Of Holyoke, Massachusetts
536 Dwight Street
Holyoke, Massachusetts 01040

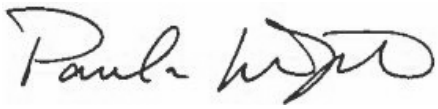
ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) PROGRAM REPORT

Prepared by:

_____

Portia Freeman
Professional

Reviewed by:



_____

Pamela Westgate
Principal Professional

KLEINFELDER
1500 Main Street, Suite 1510
Springfield, MA 01115
Phone: 617.497.7800

June 2024
Kleinfelder Project No: 25000684.001A

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APPENDICES

DEFINITIONS

Best Management Practice (BMP): An activity, procedure, restraint, or structural improvement that helps to reduce the quantity or improve the quality of stormwater runoff.

Catch basin: A chamber or well, usually built to the curb line of a street that allows surface water to discharge into a storm water drain.

Clean Water Act: The Federal Water Pollution Control Act (33 U.S.C. § 1251 *et seq*.) as hereafter amended.

Discharge of Pollutants: The addition of any pollutant or combination of pollutants into the municipal storm drain system or into the waters of the United States or Commonwealth from any source.

Groundwater: Water beneath the surface of the ground including water in soil and bedrock beneath water bodies

Illicit Connection: A surface or subsurface drain or conveyance, which allows an illicit discharge into the municipal storm drain system, including without limitation sewage, process wastewater, or wash water and any connections from indoor drains, sinks, or toilets, regardless of whether said connection was previously allowed, permitted, or approved before the effective date of bylaws enacted to prohibit such discharges.

Illicit Discharge: Direct or indirect discharge to the municipal storm drain system that is not composed entirely of stormwater, except as exempted by the EPA's Phase II regulations.

Interconnection: The point (excluding sheet flow over impervious surfaces) where the permittee's MS4 discharges to another MS4 or other storm sewer system, through which the discharge is conveyed to waters of the United States or to another storm sewer system and eventually to a water of the United States.

Manhole: Sewer system structure typically made from brick, concrete block, or monolithic concrete sections. Manholes have solid covers that do not accept runoff like a catch basin. Manholes within a storm sewer system are installed typically at bends in pipe runs, every 300 feet to 400 feet within a storm sewer pipe run, intersections of two or more pipe runs, and at the ends of pipe runs. Manholes allow for the cleaning and inspection of storm sewer systems. Manholes are typically 'fed' stormwater by catch basins and upstream storm sewer pipes.

Junction Manhole: Per the MS4 Permit, a junction manhole is a manhole or structure with two or more inlets accepting flow from two or more MS4 alignments. Manholes with inlets solely from private storm drains, individual catch basins, or both, are not considered junction manholes.

Municipal Separate Storm Sewer System (MS4): The system of conveyances designed or used for collecting or conveying stormwater, including any road with a drainage system, street, gutter, curb, inlet, piped storm drain, pumping facility, retention or detention basin, natural or man-made or altered drainage channel, reservoir, and other drainage structure that together

comprise the storm drainage system owned or operated by the Town of Wayland.

National Pollutant Discharge Elimination System (NPDES) Stormwater Discharge Permit: A permit issued by United States Environmental Protection Agency or jointly with the Commonwealth of Massachusetts that authorizes the discharge of pollutants to waters of the United States.

Non-Stormwater Discharge: Discharge to the municipal storm drain system not composed entirely of stormwater.

Outfall: A point source where a municipal separate storm sewer discharges to waters of the United States**.**

Point-source means a discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, (also bridge drains); this term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant: Any element or property of sewage, agricultural, industrial or commercial waste, runoff, leachate, heated effluent, or other matter whether originating at a point or nonpoint source, that is or may be introduced into any sewage treatment works or waters of the Commonwealth. Pollutants shall include without limitation:

(1) paints, varnishes, and solvents;
(2) oil and other automotive fluids;
(3) non-hazardous liquid and solid wastes and yard wastes;
(4) refuse, rubbish, garbage, litter, or other discarded or abandoned objects, accumulations and floatables;
(5) pesticides, herbicides, and fertilizers;
(6) hazardous materials and wastes; sewage, fecal coliform and pathogens;
(7) dissolved and particulate metals;
(8) animal wastes;
(9) rock; sand; salt, soils;
(10) construction wastes and residues;
(11) and noxious or offensive matter of any kind.

Stormwater: Runoff from precipitation or snow melt.

Wastewater: Any sanitary waste, sludge, or septic tank or cesspool overflow, and water that during manufacturing, cleaning or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct or waste product.

Storm sewer: A sewer that carries only surface runoff, street wash, and snow melt from the land. In a separate sewer system, storm sewers are separate from those that carry domestic and commercial wastewater (sanitary sewers).

LIST OF ACRONYMS

BMP – Best Management Practice

USEPA – United States Environmental Protection Agency

GIS – Geographic Information System

GPS – Global Positioning System

IDDE – Illicit Discharge Detection and Elimination

MassDEP – Massachusetts Department of Environmental Protection

MassDOT – Massachusetts Department of Transportation

MS4 – Municipal Separate Storm Sewer System

NOI – Notice of Intent

NPDES – National Pollutant Discharge Elimination System

SWMP – Storm Water Management Plan

1 ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) PROGRAM

1.1 INTRODUCTION

1.1.1 MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PROGRAM

This document serves as a written plan for Illicit Discharge Detection and Elimination (IDDE) for the City of Holyoke, hereafter referred to as "the City" or "Holyoke" to address the requirements of the United States Environmental Protection Agency's (U.S. EPA) and the Massachusetts Department of Environmental Protection's (MassDEP) *General Permits for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts*, effective July 1st, 2018, hereinafter referred to as the "2016 MS4 Permit" or "MS4 Permit", and the 2023 MS4 Consent Decree, hereinafter referred to as the "Consent Decree".

The MS4 Permit requires regulated communities to address six Minimum Control Measures (MCM) including:

1. Public Education and Outreach;
2. Public Involvement and Participation;
3. Illicit Discharge Detection and Elimination Program (IDDE);
4. Construction Site Stormwater Runoff Control;
5. Post-construction Stormwater Management in New Development and Redevelopment; and
6. Good Housekeeping and Pollution Prevention for Permittee Owned Operations.

Under MCM 3, the City is required to implement an IDDE program to systematically find and eliminate sources of non-stormwater discharges to its MS4 and implement procedures to prevent such discharges. The IDDE program must be recorded in a written (hardcopy or electronic) document. This IDDE Program has been prepared to address this requirement.

The City of Holyoke negotiated a Consent Decree, which was finalized in 2023 and defined the terms that the City shall take to reach compliance with the MS4 program. **Table 1-1** links sections of this IDDE Program to requirements outlined in the Consent Decree.

Table 1-1: Consent Decree Requirements included in the IDDE Plan

Consent Decree Section	Description of Requirement	IDDE Section
11-11e	Apply new IDDE screening thresholds to all MS4 outfalls and any MS4 discharges to other municipal MS4s or non-City owned outfalls	Table 6-4: Sampling Parameters and Analysis Methods
12a	Current MS4 Catchment area map with boundaries of each catchment area and all associated outfalls or interconnections	**Appendix C** Stormwater System Cover Map
12b	Identification of all combined manholes within MS4 catchment areas	Appendix A MS4 Outfall and Interconnection Prioritization and Table 8-1: Investigation and Screening
12c	Schedule to inspect all identified combined manholes	**Appendix A** Investigation Timeline and Procedure and
12d	Schedule to repair or eliminate the identified combined manholes	**Appendix A** Investigation Timeline and Procedure
12e	A prioritization of all Catchment areas based on EPA monitoring results, City monitoring results, applicable TMDLs for impaired waterbodies, and a schedule for completion of catchment investigations	Section 7.5 Screening Timeline and **Appendix E** Reprioritized Outfall Ranking
13	Dry-Weather Sampling	Section 5.3 Dry Weather Outfall Interconnection Screening and Sampling; Section 7.1 Dry Weather Manhole Inspections Section 6.4 Status of Outfall Screenings and Results **APPENDIX E** Field Investigation Records
14	Wet-Weather Sampling	Section 7.2 Wet Weather Outfall Sampling
15a-15c	Identification and Elimination of Illicit Discharges to MS4 area with schedule for actions	Section 6.2.2 Identification of Illicit Discharge
17	Semi-annual Consent Decree compliance report relating to implementation of IDDE Plan (Due 7/31/2024)	To be provided at a later date as required

1.1.2 GEOGRAPHICAL SCOPE OF IDDE PROGRAM

The MS4 Permit requires municipalities to implement the IDDE program for those portions of the MS4 that are located either fully or partially within the Urbanized Area (based on 2010 U.S. Census) or located in a geographical area designated by U.S.EPA as requiring a permit. The urbanized areas for Holyoke are shown in **Figure 1-1**.

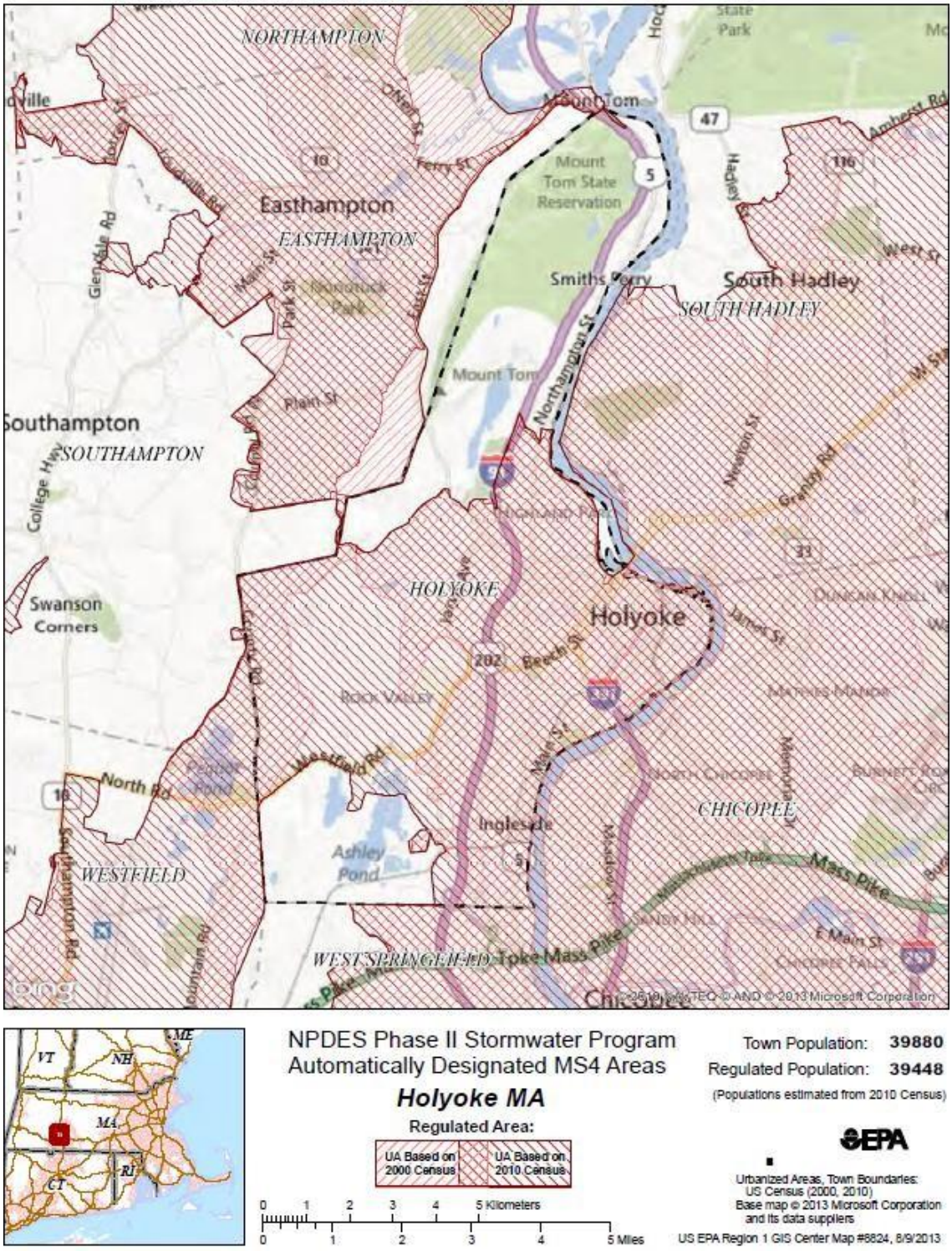


Figure 1-2: Holyoke MS4 Urbanized Area

1.1.3 ALLOWABLE NON-STORMWATER DISCHARGES

An illicit discharge is any discharge to an MS4 that is not composed entirely of stormwater, except for site-specific NPDES permitted discharges and discharges resulting from firefighting activities and allowable non-stormwater discharges.

Illicit discharges may enter the drainage system through direct or indirect connections and may be intentional or unintentional. Direct connections include cross-connections of sewer services to the storm drain system. Indirect illicit discharges may be more difficult to detect and may include failing septic systems that discharge untreated sewage to a storm ditch or swale that is part of an MS4, or a sump pump that discharges contaminated water to storm drains intermittently.

Some illicit discharges are intentional, such as dumping used oil into catch basins, seasonal dumping of swimming pool water, or illegally connecting a new sewer lateral into a storm drainpipe. Unintentional illicit discharges include breakouts from failing septic systems that enter the MS4, or disposal of floor wash water to a floor drain in an old building where the drain is thought to connect to a sewer line but connects to a storm drain instead.

When not addressed, illicit discharges can contribute high levels of pollutants such as metals, toxics, oil, grease, solvents, nutrients, and bacteria to surface waters.

The following non-stormwater discharges are allowed under the MS4 Permit unless the permittee, U.S.EPA, or MassDEP finds the discharge to be a significant contributor of pollutants to the MS4:

- Water line flushing
- Landscape irrigation
- Diverted stream flows
- Rising ground water
- Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20))
- Uncontaminated pumped groundwater
- Discharge from potable water sources
- Foundation drains
- Air conditioning condensation

- Irrigation water, springs
- Water from crawl space pumps
- Footing drains
- Lawn watering
- Individual resident car washing
- De-chlorinated swimming pool discharges
- Street wash waters
- Residential building wash waters without detergents

If any of the above discharges are identified as significant contributors of pollution to the MS4, they will be considered “illicit discharges” and addressed in the IDDE program.

1.1.4 RECEIVING WATERS AND IMPAIRMENTS

Impaired waters are water bodies that do not meet water quality standards for one or more designated use(s) such as recreation or aquatic habitat. The impaired waters that are within the boundaries of Holyoke’s regulated area based on the Final 2022 Massachusetts Integrated List of Waters are listed in **Table 1-2**.

Because Holyoke is in the watershed of Long Island Sound (LIS), which has an approved total maximum daily load (TMDL) for nitrogen, the City is required to meet additional requirements in the MS4 Permit with respect for nitrogen discharges (MAR041000, Appendix B part B1 of the Permit).

Table 1-2: Receiving Waters in Holyoke

Water Body Name	Segment ID	Category[1]	Impairment	Comments
Connecticut River	MA34-04	5	*Escherichia coli*, PCB in fish tissue, Non-Native aquatic plants (Water Chestnut)	Confluence with Deerfield River, Greenfield/Deerfield to Holyoke Dam (NATID: MA00973), Holyoke/South Hadley.
Connecticut River	MA34-05	5	*Escherichia coli*, PCB in fish tissue	Holyoke Dam (NATID: MA00973), Holyoke/South Hadley to Massachusetts/Connecticut border, Longmeadow.
Log Pond Cove	MA34124	5	Non-Native aquatic plants (Water Chestnut), PCB in fish tissue	Part of Connecticut River
Pequot Pond	MA32055	5	Eurasian milfoil, chlorophyll-a, Non- Native aquatic plants, *Enterococcus*, dissolved oxygen, Total Phosphorus	Located in Southampton Urban Area. Outfalls from Holyoke drain to a tributary of the Pond
Ashley Pond	MA32002	4C	Non-Native aquatic plants (Water Chestnut)	Holyoke
Lake Bray	MA34013	4C	Non-Native aquatic plants (Water Chestnut, Curly-leaf Pondweed)	Holyoke
Whiting Street Reservoir	MA34101	4C	Non-Native aquatic plants (Water Chestnut, Eurasian Water Milfoil, Myriophyllum Spicatum)	Holyoke
Mclean Reservoir	MA32050	3	N/A	Holyoke
Clear Pond	MA32077	3	N/A	Holyoke
Wright Pond	MA32078	3	N/A	Holyoke
Ashley Cutoff	MA32001	3	N/A	Holyoke
Connor Reservoir	MA32024	3	N/A	Holyoke
North Railroad Pond	MA32053	3	N/A	Holyoke
Barry Brook	MA32-57	3	N/A	Headwaters, outlet Snake Pond, Holyoke to mouth at confluence with Trask Brook (forming headwaters Bush Brook), Westfield.
Schoolhouse Brook	MA34-43	3	N/A	Headwaters, southeast of Connor Reservoir, Holyoke to mouth at confluence with Goldine Brook, West Springfield.

Table 1-2: Receiving Waters in Holyoke (Continued)

Water Body Name	Segment ID	Category[1]	Impairment	Comments
Broad Brook*	MA34-18	2	N/A	Headwaters, Holyoke to mouth at inlet Nashawannuck Pond, Easthampton. Uses attained – fish, other aquatic life and wildlife
Paucatuck Brook	MA32-29	2	N/A	From outlet of Bearhole Reservoir, West Springfield to mouth at confluence with Westfield River, West Springfield. Uses attained – fish, other aquatic life and wildlife

[1] Category 5: Impaired or threatened for one or more uses and requiring a TMDL.
Category 4C: Impaired waters not caused by a pollutant – TMDL not required.
Category 3: No uses assessed.
Category 2: Attaining some uses; other uses not assessed.
*Uses attained: Fish, other Aquatic Life and Wildlife

1.1.5 IDDE PROGRAM OBJECTIVES, REQUIREMENTS, AND TIMELINE

The goals of the IDDE program are to find and eliminate illicit discharges to the municipal separate storm sewer system and to prevent illicit discharges from happening in the future. The program consists of the following major components as outlined in the MS4 Permit:

- Legal authority and regulatory mechanism to prohibit illicit discharges and enforce this prohibition,
- Storm system mapping,
- Inventory and ranking of outfalls,
- Dry weather outfall screening,
- Catchment investigations,
- Identification/confirmation of illicit sources,
- Illicit discharge removal,
- Follow-up screening, and
- Employee training.

Investigation procedures and the required timeline for implementing the IDDE program are included in **Appendix A**.

2 OBJECTIVE, AUTHORITY AND IDDE RESPONSIBILITIES

The objective of the IDDE program is to systematically find and eliminate illicit discharges to Holyoke's MS4 and prevent them from happening in the future.

2.1 LEGAL AUTHORITY

Holyoke's Stormwater Ordinance was adopted by City Council on May 17th, 2010, and revised on September 1st, 2021. Specifically, Holyoke's Stormwater Ordinance grants the City the authority to:

- Prohibit illicit discharges.

The City plans to update regulations or ordinances to grant the City authority to:

- Investigate suspected illicit discharges;
- Eliminate illicit discharges, including discharges from properties not owned by or controlled by the City that discharge into the MS4; and
- Implement appropriate enforcement procedures and actions.

A copy of Holyoke's Stormwater Bylaw and additional relevant ordinance sections are included in **Appendix B**. The draft ordinance language, proposed by the Pioneer Valley Planning Commission (PVPC), is also included in **Appendix B.**

2.2 IDDE PROGRAM RESPONSIBILITIES

As owner and operator of the MS4 the City and Veolia, respectively, hold joint responsibility for implementing the IDDE program. The City Department of Public Works (DPW) is the lead municipal agency that works with Veolia and other departments to administer various aspects of the program. Specific IDDE Program responsibilities and responsible parties are listed in **Table 2-1**. The organizational structure of the responsible parties is shown in **Figure 2-1**.

Table 2-1: IDDE Responsibilities

Responsible Party	IDDE Responsibilities
City Engineer	• Enforcement of illicit discharge (ID) procedures and actions
VEOLIA Project Manager; City Engineer	• Catchment Investigations; identifying system vulnerability factors (SVF), manhole inspections and isolation to confirm sources of illicit discharges (ID) • Catchment prioritization • Dry weather outfall screens/inspections and outfall sample collection • Rank/Prioritize and reprioritize outfalls and interconnections • Wet and dry weather data review, tracking, collection, and annual reporting • IDDE Program Progress Annual Report (SSOs, IDs identified and removed; # and % total outfall catchments evaluated; dry and wet weather screening results; volume of sewage removed
VEOLIA Project Manager	• Illicit Discharge (ID) Investigations; removal, and removal confirmations • SSOs Investigations and Maintenance of SSO Inventory • Field checks and documentation of new / updated MS4 infrastructure; outfalls and interconnections; update MS4 maps • Wet weather outfall screens/inspections and outfall sample collection • Track and provide annual report of Illicit discharge removal • Confirmatory outfall and interconnection screening after ID has been removed • IDDE training frequency and type in annual report

Veolia Project Manager	**Holyoke Stormwater Coordinator**	**Holyoke Department of Public Works Director**	**Holyoke City Engineer**
Michael Williams Veolia (413) 534-2222	Miira Gates Public Works (DPW) (413) 322-5645	Carl Rossi Public Works (DPW) (413) 322-5645	Victoria Houle Public Works (DPW) (413) 322-5645

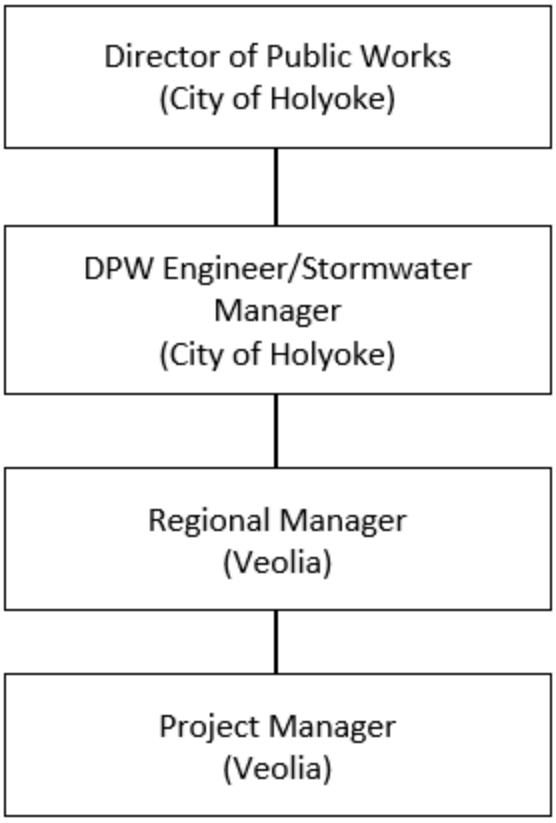


Figure 2-1: Organizational Structure

3 STORMWATER SYSTEM MAPPING

Holyoke's MS4 system maps are used to identify key stormwater infrastructure, factors influencing proper system operation, and the potential for illicit sanitary discharges. The City of Holyoke developed an updated stormwater map to begin addressing mapping requirements of the 2016 MS4 Permit and the Consent Decree Term 21. A copy of the Stormwater System Map is included in **Appendix C.** The Stormwater System Map includes outfalls categorized by priority, receiving water bodies, and preliminary catchment delineations.

The City is working with Veolia on the stormwater system mapping. Veolia is using both desktop analysis and field verification to further improve the accuracy of the existing GIS mapping data. There were about 15 outfalls added to the inventory as a result of mapping and field investigation efforts in West Holyoke. The rest of the increase is due to field investigation efforts that uncovered several previously unidentified outfalls. The inventory and ranking will be updated as additional information from the outfall screening and catchment investigations become available. The screening and catchment investigations are discussed in **Section 6** and **Section 7**, respectively.

Updated maps reflecting newly developed and/or discovered information, corrections, and modifications are submitted in conjunction with compliance reports semi-annually. In compliance with the MS4 Permit and Consent Decree Term 21, the following information and features are included on the MS4 map, and updated after new data becomes available:

- Base Map containing municipal property information.
- Water Resources and Topographic Features.
- Stormwater Infrastructure.
- Collection System (outside MS4)
- Investigations, remediation, and capital prxojects completed for the City's MS4 and collection system.

3.1 MAPPING NEXT STEPS

Gaps in Holyoke's GIS data are addressed in this IDDE Plan. Updates to the mapping will occur as field information from ongoing investigations is added to the database. In addition, the City is developing procedures to formalize the following updates to its map:

- Refine spatial location of outfalls and storm drain collection system as a whole
- Identify stormwater treatment structures and refine spatial location
- Refine catchment delineations
- Refine mapping of sanitary sewer collection and treatment system, including septic systems

4 SANITARY SEWER OVERFLOWS (SSOS)

The MS4 permit requires municipalities to prohibit illicit discharges, including sanitary sewer overflows (SSOs) to the MS4. An SSO is a discharge of untreated sanitary wastewater from a municipal sanitary sewer that can contaminate surface waters, cause serious water quality problems and property damage, and threaten public health. SSOs can be caused by blockages, line breaks, sewer system bypasses that allow stormwater and groundwater to overload the system, power failures, and human error.

4.1 SSO INVENTORY

As part of its Stormwater Management Plan (SWMP), the City maintains an SSO inventory that includes the following information:

- Location (approximate street crossing/address and receiving water, if any).
- A clear statement of whether the discharge entered a surface water directly or entered the MS4.
- Date(s) and time(s) of each known SSO occurrence.
- Estimated volume(s) of the occurrence.
- Description of the occurrence including known or suspected cause(s).
- Mitigation and corrective actions and completion dates as well as planned corrective measures and their implementation schedule.

The SSO inventory is updated annually and is included in the Annual Report. The SSO inventory is summarized in **Table 4-1**.

4.2 REMOVAL AND NOTIFICATION

Upon detecting or receiving notice of an SSO, the City shall eliminate it as soon as possible and take interim mitigation steps to minimize the discharge of pollutants to the MS4 until the SSO is eliminated. Holyoke must provide oral notification to the U.S.EPA within 24 hours of becoming aware of an SSO, as well as written notification within 5 days of becoming aware of an SSO.

The City is required to issue public advisory notifications within 2 hours of discovery of the SSO, posting public advisory notifications to the City's website and reporting into the MassDEP's online data system.

MassDEP Contact
Western Region (413) 784-1100
436 Dwight Street
Springfield, MA 01103
24-hour Emergency Line 1-888-304-1133

U.S. EPA Contact
New England (888) 372-7341
5 Post Office Square
Boston, MA 02109

Table 4-1: **MS4 SSO Inventory**

SSO Location[1]	Discharge Statement[2]	Date	Duration	Volume (gals)[3]	Description[4]	Mitigation Steps[5]	Date Completed[6]
50 Holy Family Rd.	Tannery Brook	1/24/2019	1.5 hrs.	2,250	Grease & Rags	Removed blockage. Jet cleaned sewer main.	12/08/2019
75 Reservation Rd. 200 Whiting Farms Rd.	Ground Tannery brook	4/24/2019 7/23/2019	2 hrs. 1.5hrs.	30 >10,000	Debris & Rocks Grease & Rags	Removed blockage. Sewer main will be jet cleaned Removed blockage Main was put on Bi-monthly cleaning list.	summer 2019 7/23/2019
20 Easthampton Rd.	Green Brook	1/13/2020	1hr	300	Grease	Removed blockage. De greased sewer main.	1/13/2020
63 Canal St.	Ct. River	4/26/2022	36 mins.	225	Debris	Removed blockage. Jet cleaned main.	4/26/2022
Whiting Reservoir	CT. River	06/07/2022	3.15 hrs.	900	Grease & debris	Removed blockage. Jet cleaned main.	06/07/2022
Yale St.	Ground	8/23/2022	Unknown	300-500	Unbolted man hole	Replaced missing bolts on manhole.	8/26/2022
50 Holy Family Rd.	Tannery Brook	12/08/2022	1.25 hrs.	1,500	Grease & Rags	Removed blockage. Jet cleaned sewer main.	12/08/2022
Highland Park Pump Station	Ct. River	3/17/2023	3.25hrs.	600	Force main failure	Setup bypass and shut station down. Replaced failed section of main.	3/27/2023
58 Canal St	No release to surface water	11/9/2023	1.5 hrs	<100	Sewer system blockage	Jetted main and removed blockage, vac cleaned the entire area.	11/9/2023
105 Old Easthampton Rd	No release to surface water	10/25/2023	1.25 hrs	25-50	Sewer system blockage	Jetted main and removed blockage, vac cleaned the entire area.	10/25/2023
145 Westfield Rd and Woodland Street	No release to surface water	4/6/2024	1 hr	1000	Sewer system blockage	Jetted main and removed blockage, vac cleaned the entire area.	4/6/2024

Notes:

1 Location (approximate street crossing/address and receiving water, if any)

2 A clear statement of whether the discharge entered a surface water directly or entered the MS4

3 Estimated volume(s) of the occurrence

4 Description of the occurrence indicating known or suspected cause(s)

5 Mitigation and corrective measures taken or planned

6 Date mitigation and corrective measures completed

5 ASSESSMENT OF CATCHMENTS AND OUTFALLS

The MS4 permit requires Holyoke to assess and rank outfalls and interconnections based on their illicit discharge potential and the significance of the potential public health issues associated with such discharges. The rankings are used to prioritize the order of screening outfalls and interconnections and the order of conducting catchment investigations for evidence of illicit discharges and SSOs. The rankings are also used to track progress towards meeting permit milestones.

5.1 OUTFALL/INTERCONNECTION INVENTORY

The City maintains an inventory of each outfall and interconnection that discharges from the MS4. Currently, 103 public outfalls within the Holyoke MS4 area have been identified. The inventory includes the outfall and interconnection locations as well as a means of tracking all inspections, screenings, samplings, and other activities covered by the IDDE program.

5.2 OUTFALL CATCHMENT DELINEATIONS

A catchment is the area that drains to an outfall or interconnection. Catchment delineations define the contributing areas for investigations of potential sources of illicit discharges. Delineations are based on topographic maps (USGS Springfield North Quadrangle, Massachusetts, 7.5 minute, 2018 and Mount Tom Quadrangle, Massachusetts, 7.5 minute, 2018) and mapped drainage infrastructure. Initial catchment delineations are complete and can be found in **Appendix C**. Further refined delineations will be completed as catchment investigations continue.

5.3 PRELIMINARY RANKING OF OUTFALLS AND INTERCONNECTIONS

Last year's inventory of 67 outfalls was given a preliminary ranking based on receiving water body and whether they had been previously sampled by EPA (in May and July 2019). Outfalls were ranked and prioritized using a point system: one (1) point was assigned to each outfall that drains directly into an impaired water body, and one (1) point was given to each outfall that had been previously sampled by the EPA. The outfalls that the EPA sampled all yielded testing results above at least one analyte threshold, including ammonia, chlorine, surfactants, E. coli, and Enterococcus. Any outfall with one or more points is considered high priority. The Preliminary Prioritized Outfall list is included as **Appendix D**.

5.4 REPRIORITIZATION OF OUTFALLS AND INTERCONNECTIONS

Upon completion of all dry weather outfall screenings, the City updated the outfall priority rankings (see **Appendix E**) based on the dry weather screening data. The reprioritization was completed by adapting the Neponset Stormwater Partnership Outfall Inventory and Prioritization Tool to Holyoke's specific case.

There are a number of MS4 outfalls located in West Holyoke that were not included in the previous year's inventory. Field investigations and mapping efforts uncovered approximately 15 outfalls in the West Holyoke area between May 2023 and June 2024. The West Holyoke outfalls, in addition to the 21 other outfalls identified during field investigation and mapping efforts in Permit Year 2023-2024, were incorporated into the reprioritization, bringing the total MS4 outfall count from 67 outfalls previously to 103 outfalls currently.

As seen in **Table 5-1**, outfalls were differentiated between Problem, High, and Low priority to establish a priority ranking for catchment investigations. Ranking was based on a point system for the following factors:

- Impaired Receiving Water Bodies and Streams,
- Discharges to Water Bodies designated for recreational activities,
- Discharges to Zone 1 or Zone 2 Wellhead Protection Areas,
- Sewage indicators found during wet weather outfall screening (automatically prioritized as Problem),
- Seage indicators found during dry weather outfall screening (automatically prioritized as Problem),
- Recent CSO Separation,
- Land Use Data, and
- Stormwater Related Impairments.

Table 5-1: EPA Priority Categorization of Outfalls

EPA Priority Category	Description	No. of Outfalls in Holyoke
Problem	**Problem outfalls** have known or suspected contributions of illicit discharges and include outfalls/interconnections where previous screening indicates likely sewer input. Likely sewer input is indicated by bacteria levels above 410 MPN/100mL during dry or wet weather outfall screening.	19
High	**High Priority** outfalls discharge to any one of the following: • areas concerning public health due to their proximity to public beaches, recreational areas, or drinking water supplies; • bacteria/pathogen impaired water bodies; or • Zone 1 and Zone 2 Wellhead Protection areas designated by MassDEP	52
Low	**Low Priority** outfalls are considered to be low priority based on land use data and the absence of aforementioned environmental factors that would cause an outfall to be ranked as Problem or High Priority.	32
Excluded	**Excluded** outfalls have no potential for illicit discharges and are excluded from the IDDE program. This category is limited to roadway drainage in undeveloped areas with no dwellings and no sanitary sewers; drainage for athletic fields, parks or undeveloped green space and associated parking without services; cross-country drainage alignments that neither cross nor are in proximity to sanitary sewer alignments through undeveloped land.	0
Total Outfalls		103

The reprioritization was based on a two-tier ranking and categorization system, adapted from the Neponset Stormwater Partnership Reprioritization Tool. If an outfall was automatically triggered to be a Problem outfall based on likely sewer input/potential illicit discharges, it did not receive an outfall score because the investigation of catchments associated with any Problem outfall must be prioritized and investigated as soon as possible. As such, the 19 identified Problem outfalls and their associated catchments will be investigated during the next Permit year (2024-2025) before any High or Low ranked Priority outfalls.

If an outfall discharged to a public beach or water body designated for recreational or fishing use; a bacteria-impaired water body; or a Zone 1 or 2 Wellhead Protection area (designated by MassDEP), it is automatically ranked as High Priority. The outfalls that don't satisfy the aforementioned triggers to become Problem or High Priority are designated as Low Priority. The outfall score for Low Priority outfalls may increase based on land use data (open space = 1, residential = 2, commercial/industrial/institutional = 3) or stormwater related impairments (PCBs, debris, oil, etc.) to the receiving waterbody. Once outfalls are categorized into Problem, High, and Low priority, they are then ranked based on outfall score within the High and Low Priority categories. Rankings will be updated and presented in future reports as catchment investigations and wet weather outfall screenings continue.

The order of catchment investigations should go as follows whenever it is possible:

1. **Problem** outfalls and their associated catchments
2. **High Priority** outfalls and their associated catchments in order of highest to lowest outfall score
3. **Low Priority** outfalls and their associated catchments in order of highest to lowest outfall score

Out of a total of 103 outfalls in the MS4 urbanized areas of Holyoke, 19 were ranked as **Problem** outfalls, 52 were **High Priority** outfalls, and 32 were **Low Priority** outfalls. Both the MS4 map (**Appendix C**) and the Reprioritized Outfall Inventory Ranking Table (**Appendix E**) were updated according to recent data.

6 DRY WEATHER OUTFALL AND INTERCONNECTION SCREENING AND SAMPLING

(Consent Decree Term #13)

Outfalls can be in the form of pipes or ditches and are the final point of discharge into a body of water for an engineered storm drain system. Current and pending regulations require that all outfalls in the storm drain system be inspected and that their water quality be analyzed under dry and wet weather conditions. This section is a description of the objectives of dry weather outfall inspections. **Section 7.2** covers the objectives for wet weather outfall inspections.

Dry weather flow is a common indicator of potential illicit connections. Veolia inspects and screens outfalls and interconnections in accordance with their priority ranking and the IDDE Program Timeline (**Appendix A**). The proper identification of any potential source(s) of an illicit discharge is further described in **Section 7.4**.

6.1 WEATHER CONDITIONS

To ensure that sampling occurs during dry weather conditions, screening and sampling takes place when no more than 0.1 inches of rainfall has occurred in the previous 24-hour period, or 48-hour period when possible, and during times when there is no significant snow melt.

6.2 SCREENING REQUIREMENTS

Screening data is included in the outfall/ interconnection inventory and is used to set and update priority rankings for future screenings. For every outfall and interconnection, the following data is collected and entered into the digital inventory:

- Unique identifier.
- Receiving water.
- Date of most recent inspection.
- Dimensions and shape.
- Material (concrete, PVC).
- Spatial location (latitude and longitude within +/- 30 feet).
- Physical condition (vegetation and damage to outfall structures).
- Visual/olfactory evidence of non-stormwater discharge (evidence of flow, odor, color, turbidity, floatables (suds, toilet paper, or sanitary products), deposits, oil sheen.

6.2.1 ACCESS

As per the 2016 Massachusetts Small MS4 General Permit, if an outfall/interconnection is inaccessible or submerged, the permittee shall proceed to the first accessible upstream manhole or structure for the observation and sampling and report the location with the screening results.

6.2.2 IDENTIFICATION OF ILLICIT DISCHARGE

Any flow observed during dry weather conditions at a stormwater outfall or manhole is a strong indicator of illicit discharges, though it is important to inspect within and around the outfall or manhole for other indicators of the type of discharge. If no flow is observed, there may be other visual or olfactory indicators that past flow existed, which are shown in **Table 6-1**.

Table 6-1: Visual Condition Assessment

Indicator	Possible Source
Foam	upstream vehicle washing activities or illicit discharge
Oil Sheen	leak or spill
Cloudiness	suspended solids (i.e. dust, ash, powdered chemicals, ground up materials, etc.)
Color or Odor	raw materials, chemicals, or sewage
Excessive Sediment	disturbed earth of unpaved areas lacking adequate erosion control measures
Sanitary Waste/ Optical Enhancers*	illicit discharge
Orange Staining	high mineral concentrations

* Fluorescent dyes added to laundry detergent and some toilet paper

While many of the indicators listed in **Table 6-1** would indicate an illicit discharge, some indicators may occur naturally. For example, orange staining could be the result of naturally occurring iron. Foam can also be naturally occurring or caused by a pollutant; however, it may be difficult to determine the difference between natural foam and foam caused by pollution. Natural foam can typically be found in water with high organic content such as bog lakes, streams that originate from bog lakes, productive lakes, wetlands, or woody areas. As per the Central Massachusetts Regional Stormwater Coalition, it is important to consider the factors listed in **Table 6-2** when determining if the source of foam present at a stormwater outfall is natural or not.

Table 6-2: Conditional and Qualitative Considerations of Foam

Factors	Explanation
Wind Direction or Turbulence	Natural foam occurrences of the beach coincide with onshore winds. Often, foam can be found along a shoreline and/or on open waters during windy days. Natural occurrences in rivers can be found downstream of a turbulent site.
Proximity to Potential Pollution Source	Some entities including the textile industry, paper production facilities, oil industries, and firefighting activities work with materials that cause foaming in water. If these materials are released to a water body in large quantities, they can cause foaming. The presence of silt in water, such as from a construction site can cause foam.
Physical Feeling	Natural foam is typically persistent, light, not slimy to the touch.
Visual Observation	Prescence of decomposing plants or organic material in the water.

In addition to foam, both bacteria and petroleum can create a sheen on the water surface. Differentiating the two can be as simple as disturbing the “sheen” with a pole, stick, or similar object. A sheen caused by oil will remain intact and move in a swirl pattern while a sheen caused by bacteria will separate into several smaller patches and appear “blocky.” In addition, bacteria or naturally occurring sheens are usually silver or dull in color. While bacterial sheen is not a pollutant, it should be noted when describing the discharge.

Optical enhancers, however, can be visible to the naked eye when found in high enough concentrations and will appear as a bluish-purple haze. If a visual observation is unable to confirm the presence of this pollutant, a quantitative test can be used. To perform this test, a clean, white, cotton pad should be placed, either directly in, or within a sample of, the discharge for several days. After soaking, the cotton pad should be dried and then viewed under a fluorometer. If the cotton pad fluoresces, optical enhancers are assumed to be the pollutant. The magnitude of the fluorescence, as measured in fluorescent units, can be used to determine the concentration of optical enhancers within the sample. Often a visual observation is enough. It is not typical that this analysis is required. If evidence of illicit flow exists, a sample should be taken and observations should be recorded.

6.2.3 SAMPLE COLLECTION AND TESTING

At least one (1) sample from each catchment during dry weather flow conditions is collected and analyzed for: ammonia, chlorine, conductivity, salinity, surfactants (such as MBAS), and temperature. E. Coli bacteria samples should be taken only if:

a. outfalls identified by EPA in sampling results previously supplied to the City on May 7-8, 2019 and July 7, 2019 based on field test kit screening;

b. olfactory or visual evidence of sewage;

c. an exceedance of a bacterial threshold concurrent with meeting or exceeding of both the surfactant and ammonia thresholds;

d. an exceedance of both the surfactant and ammonia thresholds concurrent with any detectable level of chlorine; and

e. an exceedance of a bacterial threshold concurrent with any detectable level of ammonia below its threshold.

A discrete manual or grab sample will be collected for dry weather outfall inspections due to the time-sensitive nature of the process. Grab samples classify water at a distinct point in time and are used primarily when the water quality of the discharge is expected to be homogenous, or unchanging, in nature. A flow-weighted composite sample captures water quality over a measured period of time and is used when the water quality of discharge is expected to be heterogenous, or fluctuating, in nature.

Protocols for collecting a grab sample, as per the Central Massachusetts Regional Stormwater Coalition, are as follows:

1. Fill out sample information on sample bottles and field sheets (see Attachment 4 for example field sheets).
7. Do not eat, drink, or smoke during sample collection and processing.
8. Do not collect or process samples near a running vehicle.
9. Do not park vehicles in the immediate sample collection area, including both running and non-running vehicles.
10. Always wear clean, powder-free nitrile gloves when handling sample containers and lids.
11. Never touch the inside surface of a sample container or lid, even with gloved hands.
12. Never allow the inner surface of a sample container or lid to be contacted by any material other than the sample water.
13. Collect samples with a dipper or directly into sample containers. If possible, collect water while facing upstream of the flow into the sample bottles to not disturb water or sediments in the outfall pipe or ditch.

14. Do not overfill sample containers, and do not dump any liquid in them. Liquids are often added to sample containers intentionally by the analytical laboratory as a preservative or for pH adjustment.
15. Slowly lower the bottle into the water to avoid bottom disturbance and stirring up sediment.
16. Do not allow any object or material to fall into or contact the collected water sample.
17. Replace and tighten sample container lids immediately after sample collection.
18. Place laboratory samples on ice for analysis of bacteria and pollutants of concern.
19. Accurately label the sample with the time and location.
20. Document on the Dry Weather Outfall Inspection Survey that analytical samples were collected, specify parameters, and note the sample time on an Inspection Survey (See **Appendix F** for field inspection forms). This creates a reference point for samples.
21. Fill out chain-of-custody form for laboratory samples.
22. If using a dipper or other device, triple rinse the device with distilled water and then in water to be sampled, except for bacteria sampling.
23. Store used test strips and test kit waste/ampules properly in a 5-gallon bucket with a cover. Storage and disposal shall be coordinated with the City.
24. Decontaminate all testing personnel and equipment.

Samples that are unable to be analyzed for parameters using field instrumentation require laboratory analysis. Coordination with the laboratory, including the pick-up and/or dropping off of samples, is the responsibility of the City. The laboratory requires that a chain-of-custody form be filled out and accompany any samples that require analysis. The laboratory will also provide additional details regarding how samples should be collected based on the sample containers and/or specific analytes.

Table 6-3 includes field equipment commonly used for outfall screening and sampling. **Table 6-4** summarizes tests performed for each analyte and indicates whether they are done in the field or sent to an outside laboratory.

Table 6-3: Field Equipment

Equipment	Purpose
Covered Metal Clipboard	For organization/ protection of field sheets and writing surface
Field Sheets or Tablet for Electronic Forms	Field sheets for both dry weather inspection and Dry weather sampling should be available with extra copies
Chain of Custody Forms	To ensure proper handling of all samples
Pens/Pencils/Permanent Markers	For proper labeling
Nitrile Gloves	To protect the sampler and prevent contamination of samples
Flashlight/headlamp w/batteries	For inspecting outfalls or manholes
Cooler with Ice	For transporting samples to the laboratory (see sample holding requirements)
Digital Camera	For documenting field conditions at time of inspection
Personal Protective Equipment (PPE)	Reflective vest, safety glasses, nitrile gloves and boots, steel toed shoes
Insect/Plant Repellant and Sunscreen	Protection from environmental conditions
GPS Receiver	For recording spatial location data
Distilled Water/Calibration Standards	For use with test kits and water quality meters; cleaning equipment and calibration
Water Quality Meter(s)	Handheld meters for testing various water quality parameters such as ammonia, surfactants, and chlorine
Test Kits	Have extra kits on hand to sample more outfalls than are anticipated to be screened in a single day
Label Tape	For labeling sample containers
Sample Containers	Make sure all sample containers are clean and keep extra sample containers on hand at all times. Confirm sample containers are appropriate for what is being sampled for (i.e., sterile containers for bacteria).
Pry Bar. Shovel, or Pick	For opening catch basins and manholes
Sandbags	For damming low flows to collect water for sampling
Small Mallet or Hammer	To free stuck manhole and catch basin covers
Utility Knife	Multiple uses
Measuring Tape	Measuring distances and depth of flow
Safety Cones	To clearly mark areas where samplers are present
Hand Sanitizer	To disinfect hands and nitrile gloves especially prior to collecting samples for bacterial analysis
Zip Ties/Duct Tape	For making field repairs
Rubber Boots/Waders	For accessing shallow streams/areas
Sampling Pole/Dipper/Sampling Cage	For accessing hard to reach outfalls and manholes
5-Gallon Bucket w/ Cover	Disposal of chemical waste
Confined Space Entry Equipment (if needed)	DBI Sali Tripod and retrieval winch; MSA Tripod, rescue wench and material/personal wench; full body harness; 10’ ladder; waders; hard hat; air monitoring equipment (Ventis 4 gas meter)

Table 6-4: Sampling Parameters and Analysis Methods

Analyte/Indicator	Threshold Limits in a Single Field Sample	Instrumentation	Max. Hold Time	Preservatives
E. Coli	≥ 410 cfu/100 ml	Laboratory via approved method	8 hours	Cool ≤10°C, 0.0008% Na2S2O3
Enterococci	≥ 130 cfu/100 ml	Laboratory via approved method		
Surfactants	≥ 0.25 mg/l	MBAS Field Test Kit (e.g. CHEMetrics K-9400)	48 hours	Cool ≤6°C
	≥ 0.1 mg/l	Laboratory via approved method		
Ammonia (NH_3)	≥ 0.5 mg/l	Ammonia Field Test Strips (e.g. Hach Brand)	28 days	Cool ≤6°C, H2SO4 to pH <2, No preservative required if analyzed immediately
	≥ 0.1 mg/l	Laboratory via approved method		
Chlorine	≥ 0.02 mg/l	Field Meter (e.g. Hach Pocket Colorimeter II)	Analyze within 15 minutes	None Required
Temperature	N/A	Field Meter (e.g. YSI Model 30)	Immediate	None Required
Conductivity	N/A	Field Meter (e.g. YSI Model 30)	28 days	Cool ≤6°C
Salinity	N/A	Field Meter (e.g. YSI Model 30)	28 days	Cool ≤6°C

Notes:
Where water is being discharged directly into an impaired water body subject to an approved TMDL, the sample must be analyzed for the pollutant(s) of concern identified as the cause of the water quality impairment.

According to the 2016 MS4 Permit and Consent Decree, all analyses, except for indicator bacteria and pollutants of concern, can be performed with field tests or field instrumentation and are not subject to 40 CFR part 136 requirements. Sampling for bacteria and pollutants of concern shall be conducted using the analytical methods found in 40 CFR § 136, or alternative methods approved by EPA in accordance with the procedures in 40 CFR § 136.

The City, facilitated by Kleinfelder, is responsible for selecting a laboratory or field kits intended for measuring each analyte. When selecting field kits, Kleinfelder will review the detection range for each field kit and ensure it corresponds to the threshold limits for each analyte of interest. These limits will be communicated to the laboratory so that the laboratory's instrumentation can be properly calibrated to account for the threshold concentrations. In addition, each analyte has a corresponding analytical method, as per Appendix G of the 2016 MS4 General Permit, that each field kit and laboratory analysis shall utilize to ensure compliance. Lastly, as per 40 CFR § 136, maximum holding times and preservation requirements should be communicated to the laboratory. This is not applicable for field kits since

samples are analyzed instantaneously after sample collection. **Table 6-4** summarizes this information, which should be shared with the selected laboratory to ensure compliance with the Permit.

Testing for indicator bacteria and any pollutants of concern must be conducted using analytical methods and procedures found in 40 CFR §136. Samples for laboratory analysis must be stored and preserved in accordance with procedures found in 40 CFR §136. **Table 6-4** is a list of analytical methods, detection limits, hold times, and preservatives for laboratory analysis of dry weather sampling parameters.

6.3 INTERPRETING OUTFALL SAMPLING RESULTS

Outfall analytical data from dry weather sampling can be used to help identify the major type or source of discharge. Screening values that exceed these benchmarks indicate the presence of pollution and/or illicit discharges.

Evaluation of sample data can show positive results due to sources other than human wastewater and false negative results due to chemical reactions or interferences. For example, elevated ammonia readings are common in the New England region due to sampling near historically filled tidal wetlands where the breakdown of biological organic material can skew sample results. The same elevated ammonia readings can also be triggered by discharge from a nearby landfill. In addition, elevated surfactant readings caused by salinity levels greater than one (1) part per thousand can be triggered by the presence of oil. Inconclusive surfactant readings, where the indicator ampule turns green instead of a shade of blue, can often be caused by fine suspended particulate matter being present in the sample being tested. Finally, very low bacteria concentrations can often be the result of elevated chlorine from leaking drinking water infrastructure inhibiting bacterial growth. As such, any detection of chlorine above the instrument Reporting Limit should be noted.

6.4 STATUS OF OUTFALL SCREENINGS AND RESULTS

Veolia has completed dry weather outfall screenings for the City of Holyoke and has begun the wet weather outfall screenings and catchment investigations as of June 2024.

Of the 103 outfalls that were screened during dry weather, 47 outfalls were flowing and were thus sampled. Of the 47 outfalls that were sampled, eight (8) outfalls have potential illicit discharges, indicated by an E. coli result equal to or greater than 410 MPN/100ml. These eight (8) outfalls are included in the nineteen (19) Problem outfalls and will be investigated during catchment investigations in the next Permit year (2024-2025). The IDs for these specific outfalls can be found in the Reprioritization table in **APPENDIX E**.

As wet weather outfall screening and catchment investigations continue, the City will update outfall priorities. Records of field investigations can be found in **Appendix H**.

7 CATCHMENT INVESTIGATIONS

This section of the IDDE describes the catchment investigation procedure to investigate outfall catchments to trace the source of potential illicit discharges. The MS4 Permit requires catchment investigations for outfalls and/or interconnections to begin no later than June 30, 2020, and that all catchments affiliated with problem outfalls be investigated by June 30, 2025. Catchment investigations affiliated with all the other high and low priority outfalls must be completed by June 30, 2028. Catchment investigation techniques include, but are not limited to, reviewing maps, historic plans, and records. Data collected during catchment investigations will be recorded and reported in each annual report. Infrastructure information gathered during catchment investigations will be incorporated into the MS4 maps.

7.1 DRY WEATHER MANHOLE INSPECTIONS (Consent Decree Term #13)

A key step in catchment investigations is dry weather investigations of the manholes in the storm drain network. Investigations involve systematically and progressively observing, sampling, and evaluating key junction manholes, defined as follows:

- **Junction Manhole** is a manhole or structure with two or more inlets accepting flow from two or more MS4 alignments. Manholes with inlets that are only from private storm drains, individual catch basins, or both are not considered junction manholes for these purposes.
- **Key Junction Manholes** can represent one or more junction manhole. Adequate implementation of the IDDE program would not be compromised if the exclusion of a particular junction manhole as a key junction manhole would not affect the permittee's ability to determine the possible presence of an upstream illicit discharge. Veolia may exclude a junction manhole located upstream and in the immediate vicinity from another manhole, or one that serves a drainage alignment that has no potential for illicit connections.

For all catchments requiring investigation during dry weather, Veolia systematically inspects key junction manholes for evidence of illicit discharges. The program requires progressive inspection and sampling at manholes to find evidence of illicit discharges and to isolate and eliminate them.

Prior to manhole inspections property owners will be notified and the storm drain system will be cleaned, catchment investigations can begin. Veolia's inspections are conducted in one of two ways (or a combination of both):

- Working progressively up from an outfall and inspecting key junction manholes along the way ("Bottom Up"), and/or
- Working progressively down from the upper parts of the catchment towards the outfall ("Top Down").

The decision to work bottom up or top down depends on the nature of the drainage system, the land use, and the availability of information on the catchment and drainage system. A bottom-up approach can begin immediately when an illicit discharge is detected at an outfall, and only a map of the storm drain system is required. A top-down approach requires more advance preparation and reliable drainage system information on the upstream segments of the storm drain system but may be more efficient if the sources of illicit discharged are believed to be located in the upstream portions of the catchment area.

Once an inspection direction has been chosen, the investigation can then begin with key junction manholes and mainline manholes. From there, the inspection can continue towards junction manholes and other manholes, if needed, with the purpose to isolate any illicit discharges. The specific steps are as follows:

1. Manholes are opened and inspected for visual and olfactory evidence of illicit connections during dry weather. Visual evidence may include toilet paper, gray filamentous bacterial growth, sanitary products, sewage, soap, food, or other indications of anything other than stormwater. Olfactory evidence may include sewage, soap, laundry, bleach, or other odors not typical of stormwater. Sample outfall and manhole inspection forms are in Appendix E.

25. When possible, condition information and measured elevation of the manhole rim as well as the invert depth should be recorded.

26. If flows are observed, the inlet and outlet direction of the flow should be recorded.

27. If no flow is observed, record whether the manhole is dry or has standing water and move on to the next manhole upstream or downstream.

28. As the investigation follows the catchment upstream or downstream, only the most upstream manhole with flow should be sampled. For example, if flow is observed at an outfall, as well as

at the next three (3) manholes upstream, then only sample and test at the third manhole upstream. Testing should include chlorine, ammonia, surfactants, conductivity, salinity, and temperature. Refer to **Section 6.2.3** for information on when to take E. Coli bacteria samples. Refer to **Table 6-4** for threshold limits for each analyte.

29. If sampling results or visual or olfactory observations indicate potential illicit discharges or SSOs, Veolia flags the area draining to the junction manhole for further upstream investigation and/or isolation and confirmation of sources.
30. Additional key junction manhole inspections will proceed until the location of the suspected illicit discharge(s) or SSO(s) are located and isolated to a pipe segment between two manholes.
31. If no evidence of an illicit discharge is found, the catchment investigation is complete upon completion of key junction manhole sampling.

7.2 WET WEATHER OUTFALL SAMPLING (Consent Decree Term #14)

Catchments that have a minimum of one (1) system vulnerability factor (SVF) are screened during wet weather conditions. These catchments are sampled and inspected to the extent necessary to determine whether wet weather-induced high flows in sanitary sewers or high groundwater in areas served by septic systems-results in discharges of sanitary flows to the MS4. Catchment investigations are not considered complete until wet weather inspections are done.

Wet weather sampling events are scheduled to occur during the spring (March to June) when groundwater levels are high and timed to avoid sampling during the first flush of a wet weather event.

At least one (1) wet weather sample is collected and analyzed for: ammonia, chlorine, conductivity, salinity, E. coli, surfactants (such as MBAS), and pollutants of concern (nitrogen, if discharge directly flows to the Connecticut River).

In May 2024, 23 outfalls were screened during wet weather. Thirteen (13) of the 23 outfalls yielded data that indicated a potential illicit discharge due to their E. coli results exceeding the EPA threshold of 410 MPN/100mL. These thirteen (13) outfalls represent a portion of the nineteen (19) Problem outfalls and will be investigated in the next Permit year (2024-2025). Two (2) outfalls tested above the EPA bacteria threshold during both dry and wet weather screenings. The IDs for these specific outfalls can be found in the Reprioritization table in **APPENDIX E**. Veolia will continue to perform wet weather outfall screenings on the remaining outfalls throughout the Permit term. Screening records are in **APPENDIX H**.

7.3 ILLICIT DISCHARGE IDENTIFICATION, SOURCE ISOLATION, AND CONFIRMATION

Once the source of an illicit discharge is approximated between two manholes, a range of techniques can be used to isolate and confirm the source of the discharge that may include:

- Sandbagging
- Smoke Testing
- Dye Testing
- Video Inspections
- Optical Brightener Monitoring

These methods are described in further detail below.

7.3.1 SANDBAGGING

This technique is used to identify and isolate intermittent sources of illicit discharge or sources having little perceptible flow. Sandbagging involves placing sandbags or other temporary barriers (caulking, weirs/plates, etc.) within outlets to manholes to form a temporary dam that collects any intermittent flows that may occur. The bags and barriers are only deployed during dry weather conditions and typically left in place for 48 hours. If water collects behind the barrier after 48 hours, it can be assessed using visual observations or by sampling. If no flow collects behind the sandbag, the upstream pipe network can be ruled out as a source of intermittent discharge.

7.3.2 SMOKE TESTING

Smoke testing is used on short sections of pipes or pipes with small diameters. It is used to trace illegal connections from buildings to the sewer. Smoke testing involves injecting non-toxic smoke into drain lines and the emergence of smoke from sanitary sewer vents in or from cracks and leaks in the system. Typically, a smoke bomb or smoke generator is used to inject smoke into a catch basin or manhole.

Before conducting any smoke testing, area residents, business owners, and local police and fire departments are notified. Smoke can cause minor irritation of respiratory passages. Residents with respiratory conditions may need to be monitored or evacuated from the testing area to ensure safety.

7.3.3 DYE TESTING

Dye testing involves flushing non-toxic dye into plumbing fixtures (toilets, showers, sinks) and observers standby at nearby storm drains, sewer manholes, and outfalls. Dye testing is done by a team of two or more with one person stationed inside the building, while others are stationed at the appropriate storm sewer and sanitary sewer manhole and/or outfall. The person inside the building adds dye into a plumbing fixture (sink or toilet) and runs water to move the dye through the system. Employees stationed outside are notified that the dye has been dropped and watch for the dye in the storm sewer and sanitary sewer.

Dye testing is best used when the likely source of an illicit discharge has been narrowed down to a few specific houses or businesses. Before dye testing is done, affected residents, business owners, the local police and fire departments, and public health staff are notified.

7.3.4 VIDEO INSPECTIONS

Video inspections use mobile video cameras that are guided remotely through the stormwater drain lines to observe possible illicit discharges.

7.3.5 OPTICAL BRIGHTENER MONITORING

Optical brighteners are fluorescent dyes that are used in detergents and paper products. The presence of optical brighteners in surface waters or dry weather discharges indicates a possible illicit discharge or insufficient wastewater treatment at nearby septic systems or wastewater treatment plants. Optical brightener monitoring involves placing a cotton pad in a wire cage and securing the cage in a pipe, manhole, catch basin, or inlet to capture intermittent dry weather flows. The pad is collected and viewed with a UV light or with a fluorometer to determine the presence or absence of brighteners. Additional instructions and Standard Operating Procedures (SOPs) for these methods are in Appendix F.

7.4 ILLICIT DISCHARGE REMOVAL

Once an illicit source is identified, the Veolia Project Manager contacts the Stormwater Manager and the City Engineer . The City Engineer, in accordance with legal authorities, notifies all responsible parties and requires immediate cessation of improper disposal practices. The City and Veolia take appropriate steps to eliminate the illicit discharge as expeditiously as possible. While the illicit discharge is being eliminated, all reasonable and prudent steps to minimize the discharge of pollutants to the MS4 are taken.

When an illicit discharge cannot be removed within 60 days of being identified, the City creates a schedule for elimination and reports dates and schedules for removal in the annual report.

For each confirmed source, Holyoke documents the following information in its Annual Report:

- Location of ID and its source(s);
- A description of the discharge;
- The method of discovery;
- The date of discovery;
- The date of elimination, mitigation or enforcement action or planned corrective measure and a schedule for completing the ID removal; and
- The estimate of the volume of flow removed.

7.4.1 CONFIRMATORY OUTFALL OR INTERCONNECTION SCREENING

Within one (1) year of removal of all identified illicit discharges within a catchment area, confirmatory outfall or interconnection screening shall be conducted. If confirmatory screening indicates evidence of additional illicit discharges, the catchment shall be scheduled for additional investigation. Catchments investigations are considered complete upon confirmation of all illicit sources.

7.5 STATUS OF CATCHMENT INVESTIGATIONS AND RESULTS

Veolia has begun catchment investigations upon the completion of all dry weather outfall screenings. Veolia has reported the completion of 23 catchment investigations as of June 2024. The results and findings of these investigations are currently being reviewed and will be reported in the next compliance report due in July 2024.

8 INVESTIGATION AND SCREENING TIMELINE

The goal of the MS4 program is to conduct continual screening of each outfall and catchment area. After the initial screening of outfalls and catchment investigations are completed, and the illicit discharges identified, eliminated, and confirmed, the inspection and screening cycle continues. Ongoing screening consists of both dry weather and wet weather screening and sampling of all outfalls. Each outfall or interconnection will be reprioritized for screening once every five years based on previous screening results. The dry weather screenings are conducted once every five years for each outfall upon completion of all catchment investigations, and based on the 2023 Consent Decree, the wet weather screenings are conducted on a 3-year cycle.

Table 8-1 details a recommended timeline to complete the remaining fieldwork tasks by the end of the Permit.

Table 8-1: Investigation and Screening Schedule

5-Year Schedule							
Task	**Years to Complete**	**Total Number of Outfalls/ Catchments**	**Completed 2023-2024**	**2024-2025**	**2025-2026**	**2026-2027**	**2027-2028**
Catchment Investigations	5	103	23	20-25[1]	25-30	15-20	15-20
Dry Weather Screening	1	103	103	0	0	0	0
Wet Weather Screening[2]	3	103	24	40	39	35	35

1. Ranges are provided to account for variability in the size of individual catchments.
2. The 2023 Consent Decree requires the City to perform wet weather screenings on all outfalls once every three (3) years. The first 3-year wet weather screening cycle ends in June 2026; the subsequent cycle will range from July 2026 to June 2029 (the first two years of the cycle shown in this table).

Each task type will be performed on separate field days because catchment investigations must be completed during dry weather and wet weather outfall screenings must be completed during wet weather. The City may choose to follow their own timeline to complete fieldwork, but **Table 8-1** serves as a guide.

Additional instructions and Standard Operating Procedures (SOPs) for outfall screenings and catchment investigations are in **Appendix G**.

9 TRAINING

Veolia provides annual IDDE training to all employees involved in the IDDE program. At a minimum, training includes how to identify illicit discharges and SSOs. Training records, including the frequency and type, are recorded on a form included in **Appendix I** and included in the annual report.

10 ANNUAL REPORT

Holyoke and Veolia evaluate the progress of their IDDE Program annually. This evaluation is documented in the annual report and includes:

- Number of SSOs and Illicit discharges identified and removed;
- Number and percent of total outfall catchments served by the MS4 that have been evaluated using the catchment investigation procedure;
- Number of dry weather outfall inspections/screenings;
- Number of wet weather outfall inspections/sampling events;
- Number of enforcement notices issued;
- All dry weather and wet weather screening and sampling results;
- Estimates of the volume of stormwater removed; and
- Number of employees trained annually.

11 REFERENCES

1. United States Environmental Protection Agency (EPA). (n.d.). General Permits for stormwater discharges from small municipal .–US EPA. Massachusetts Small MS4 General Permit. Retrieved January 16, 2023, from https://www3.epa.gov/region1/npdes/stormwater/ma/2016fpd/final-2016-ma-sms4-gp-mod.pdf

2. Standard Operating Procedures. Central Massachusetts Regional Stormwater Coalition. (n.d.). Retrieved January 16, 2023, from https://www.centralmastormwater.org/toolbox/pages/standard-operating-procedures

3. United States Environmental Protection Agency (EPA). March 22, 2023. *United States and Massachusetts v. City of Holyoke* Consent Decree.

APPENDIX A

IDDE Implementation Timeline

IDDE Program Implementation Timeline

(Consent Decree Term #12c and #12d)

IDDE Program Requirement	Target Completion Date						Status
	Completed in 2019		5/31/23 (PY5)	6/30/24 (PY6)	6/30/25 (PY7)	6/30/27 (PY9)	
Written IDDE Program Plan			X				Completed (2024)
SSO Inventory	X						Completed (2024)
Preliminary Ranking of Outfalls and interconnections	X						Completed
Written Catchment Investigation Procedure		X					Completed
IDDE Regulatory Mechanism or By-law (if not already in place)			X				Completed
Dry Weather Outfall Screening				X			Completed
Follow-up Ranking of Outfalls and Interconnections				X			Completed
Catchment Investigations – Problem Outfalls			**Start**		**Finish**		Ongoing
Catchment Investigations – of High and Low Priority Outfalls			**Start**			**Finish**	Ongoing

APPENDIX B

Legal Authority (Stormwater Bylaw)

MODEL

ILLICIT CONNECTIONS AND DISCHARGES ORDINANCE

Pioneer Valley Planning Commission

City of Holyoke

Illicit Connections and Discharges To
The Municipal Storm Drain System Ordinance

SECTION _1. PURPOSE

The purpose of this ordinance is to regulate illicit connections and discharges to the storm drain system, which is necessary for the protection of the City of Holyoke's water bodies, wetlands, and groundwater, and to safeguard the public health, safety, welfare and the environment.

The objectives of this ordinance are:

(1) To prevent pollutants from entering the municipal separate storm sewer system;
(2) To prohibit illicit connections and unauthorized discharges to the stormwater system;
(3) To require the removal of all such illicit connections;
(4) To comply with state and federal statutes and regulations relating to stormwater discharges;
(5) To establish the legal authority to ensure compliance with the provisions of this ordinance through inspection, monitoring, and enforcement.

Increased and contaminated stormwater runoff are major causes of:

(1) Impairment of water quality and flow in lakes, ponds, streams, rivers, wetlands and groundwater;
(2) Contamination of drinking water supplies;
(3) Alteration or destruction of aquatic and wildlife habitat; and
(4) Local flooding.

SECTION _2. DEFINITIONS

For the purposes of this ordinance, the following shall mean:

Active Groundwater Dewatering (AGD) Device: Any active device used to transport groundwater, i.e. a sump pump.

Authorized Enforcement Agency: The Director of the Department of Public Works or designated representative**,** its employees or agents designated to enforce this ordinance.

Best Management Practice (BMP): An activity, procedure, restraint, or structural improvement that helps to reduce the quantity or improve the quality of stormwater runoff. BMPs also include treatment practices, operating procedures, and practices to control site runoff, spillage or leaks, sludge or water disposal, or drainage from raw materials storage.

Clean Water Act: The Federal Water Pollution Control Act (33 U.S.C. § 1251 *et seq*.) as hereafter amended.

Discharge of Pollutants: The addition from any source of any pollutant or combination of pollutants into the municipal storm drain system or into the waters of the United States or Commonwealth from any source.

Grandfathered: Exempt from new legislation, restrictions, or requirements.

Groundwater: All water beneath the surface of the ground.

Illegal Discharge: Any direct or indirect non-stormwater discharge to the municipal storm drain system, except as specifically exempted in Section 7 of this ordinance. The term does not include a discharge in compliance with an NPDES Storm Water Discharge Permit or resulting from fire fighting activities exempted pursuant to Section 7 of this ordinance.

Illicit Connection: Any surface or subsurface drain or conveyance, which allows an illegal discharge into the municipal storm drain system. Illicit connections include conveyances which allow a non-stormwater discharge to the municipal storm drain system, including: sewage, process wastewater or wash water and any connections from indoor drainages sinks, or toilets, regardless of whether said connection was previously allowed, permitted, or approved before the effective date of this ordinance.

Impervious Surface: Any material or structure on or above the ground that prevents water from infiltrating the underlying soil. Impervious surface includes, without limitation, roads, paved parking lots, sidewalks, and roof tops.

Municipal separate storm sewer system (MS4) or municipal storm drain system: The system of conveyances designed or used for collecting or conveying stormwater, including any road with a drainage system, street, gutter, curb, inlet, piped storm drain, pumping facility, retention or detention basin, natural or man-made or altered drainage channel, reservoir, and other drainage structure that together comprise the storm drain system owned or operated by the City of Holyoke.

National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Permit: A permit issued by United States Environmental Protection Agency or jointly with the State that authorizes the discharge of pollutants to waters of the United States.

Non-Stormwater Discharge: Any discharge to the municipal storm drain system not composed entirely of stormwater.

Person: Any individual, partnership, association, firm, company, trust, corporation, and, any agency, authority, department or political subdivision of the Commonwealth or the federal government, to the extent permitted by-law, and any officer, employee, or agent of such person.

Pollutant: Any element or property of sewage, agricultural, industrial or commercial waste, runoff, leachate, heated effluent, or other matter whether originating at a point or nonpoint source, that is or may be introduced into any sewage treatment works or waters of the Commonwealth. Pollutants shall include**:**

(1) paints, varnishes, and solvents;

(2) oil and other automotive fluids;

(3) liquid and solid wastes and yard wastes;

(4) refuse, rubbish, garbage, litter, or other discarded or abandoned objects, ordnances, accumulations and floatables;

(5) pesticides, herbicides, and fertilizers;

(6) hazardous materials and wastes; sewage, fecal coliform and pathogens;

(7) dissolved and particulate metals;

(8) animal wastes;

(9) rock; sand; salt, soils;

(10) construction wastes and residues;

(11) and noxious or offensive matter of any kind.

Process wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any material, intermediate product, finished product, or waste product.

Recharge: The process by which groundwater is replenished by precipitation through the percolation of runoff and surface water through the soil.

Storm Drain System: The system of conveyance designed or used for collecting or conveying stormwater, including any road with a drainage system, street, gutter, curb, inlet, piped storm drain, pumping facility, retention, or detention basin, natural or man-made or altered drainage channel, reservoir, and other drainage structure that together comprise the storm drain system on public or private ways within the City of Holyoke.

Stormwater: Runoff from precipitation or snow melt.

Toxic or Hazardous Material or Waste: Any material, which because of its quantity, concentration, chemical, corrosive, flammable, reactive, toxic, infectious or radioactive characteristics, either separately or in combination with any substance or substances, constitutes a present or potential threat to human health, safety, welfare, or to the environment. Toxic or hazardous materials include any synthetic organic chemical, petroleum product, heavy metal, radioactive or infectious waste, acid and alkali, and any substance defined as Toxic or Hazardous under M.G.L. Ch.21C and Ch.21E, and the regulations at 310 CMR 30.000 and 310 CMR 40.0000.

Wastewater: any sanitary waste, sludge, or septic tank or cesspool overflow, and water that during manufacturing, cleaning or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct or waste product.

Watercourses: A natural or man-made channel through which water flows or a stream of water, including a river, brook or underground stream.

Waters of the Commonwealth: all waters within the jurisdiction of the Commonwealth, including, without limitation, rivers, streams, lakes, ponds, springs, impoundments, estuaries, wetlands, costal waters, and groundwater.

SECTION _3. APPLICABILITY

This ordinance shall apply to all flows entering the storm drain system owned and operated by the City of Holyoke.

SECTION _4. AUTHORITY

This bylaw/ordinance is adopted under the authority granted by the Home Rule Amendment of the Massachusetts Constitution and the Home Rule Procedures Act, and pursuant to the regulations of the federal Clean Water Act found at 40 CFR 122:34.

SECTION _5. RESPONSIBILITY FOR ADMINISTRATION

The Director of the Department of Public Works or designated representative shall administer, implement and enforce this ordinance. Any powers granted to or duties imposed upon the Director of the Department of Public Works may be delegated in writing by the Director of the Department of Public Works to employees or agents of the Department of Public Works.

SECTION _6. REGULATIONS

The Director of the Department of Public Works may promulgate rules and regulations to effectuate the purposes of this ordinance. Failure by the Director of the Department of Public Works to promulgate such rules and regulations shall not have the effect of suspending or invalidating this ordinance.

SECTION _7. PROHIBITED ACTIVITIES

1. Illegal Discharges

   No person shall dump, discharge, cause or allow to be discharged any pollutant or non-stormwater discharge into any storm drain system, watercourse, or into the waters of the Commonwealth. Emergency pumping performed by the Fire Department must utilize appropriate best management practices (BMPs) and follow hazardous materials disposal guidelines to prevent contamination of the municipal storm drain system with hazardous materials. If hazardous materials are observed within the flooded area from the activities noted above, or are suspected to be contained therein, a qualified hazmat technician and applicable state and local agencies must be consulted. These agencies will be responsible for implementing the BMPs to the contamination of nearby water ways and the municipal storm drain system.

2. Illicit Connections

   No person shall construct, use, allow, maintain or continue any illicit connection to the municipal storm drain system, regardless of whether the connection was permissible under applicable law, regulation or custom at the time of connection. No grandfathering is permitted.

3. Obstruction of the Municipal Storm Drain System

No person shall obstruct or interfere with the normal flow of stormwater into or out of the storm drain system without prior approval from the Director of the Department of Public Works or designated representative. No person shall dump or dispose of yard waste (leaves, grass clippings, etc.) into the MS4, or into open watercourses (swales, brooks and streams).

Could add the following to elaborate if desired:

a. Drains – No one shall tie any pump, cellar, yard, roof or area drain directly into the storm drain system without approval from the Applicable Authority.

b. Catch Basins – No Person shall directly or indirectly dump, discharge or cause or allow to be discharged into any catch basin, any solid waste, construction debris, paint or paint product, antifreeze, hazardous waste, oil, gasoline, grease and all other automotive and petroleum products, solvents and degreasers, drain cleaners, commercial or household cleaners, soap, detergent, ammonia, food and food waste, grease or yard waste, animal feces, dirt, sand gravel or other pollutant. Any person determined by the applicable authority to be responsible for the discharge of any of the above substances to a catch basin may be held responsible for cleaning the catch basin and any other portions of the storm water system impacted according to City/Town standards and requirements or paying the cost for such cleaning. In addition, the Person shall be responsible for paying any penalties assessed by the City/Town.

c. Septage – No person shall discharge or cause or allow to be discharged any septage, or septage tank or cesspool overflow into the City/Town's storm drain system.

d. Storage & Disposal of Hazardous Material – No one shall dispose of anything other than clear water into the City/Town's storm drain system. The disposal of waste, gasoline or any other hazardous material into the storm drain system is strictly prohibited and is in violation of state and federal pollution laws.

e. Private drainage systems – It is prohibited for anyone with a private drainage system from tying into the public storm drain system without written approval from the Applicable Authority. The maintenance of any and all private drainage systems shall be the responsibility of the owners.

4. Exemptions

This section shall not apply to any of the following non-stormwater discharges or flows provided that the source is not a significant contributor of a pollutant to the storm drain system.

(a.) Discharges or flows resulting from fire fighting activities;

(b) Municipal waterline flushing

(c) Discharges from landscape irrigation or lawn watering

(d) Diverted stream flows

(e) Rising groundwater

(f) Uncontaminated groundwater infiltration as defined in 40 CFR 35.2005(20), or uncontaminated pumped groundwater

(g) Flows from potable water sources

(h) Water from exterior foundation drains, footing drains (not including active groundwater dewatering systems)

(i) Irrigation water, springs

(j) Water from crawl space pumps

(k) Water from individual residential car washing

(l) Natural flows from riparian habitats and wetlands

(m) Discharges from de-chlorinated swimming pool water provided it is allowed to stand for one week prior to draining, or tested for chlorine levels with a pool test kit prior to draining (less than one parts per million chlorine), and the pool is drained in such a way as not to cause a nuisance;

(n) Discharges from street sweepers of minor amounts of water during operation and other storm drain system maintenance;

(o) Dye testing, provided notification is given to the Director of the Department of Public Works or designated representative prior to the time of the test;

(p) Non-stormwater discharges permitted under an NPDES permit, waiver, or waste discharge order administered under the authority of the United States Environmental Protection Agency, provided that the discharge is in full compliance with the requirements of the permit, waiver, or order and applicable laws and regulations;

(q) Discharges for which advanced written approval is received from the Director of the Department of Public Works or designated representative if necessary to protect public health, safety, welfare or the environment.

(r) Emergency repairs to either the municipal storm drain system, or any stormwater management structure or practice that poses a threat to public health or safety, or as deemed necessary by the Town.

SECTION 8. EMERGENCY SUSPENSION OF STORM DRAIN SYSTEM ACCESS

The Director of the Department of Public Works or designated representative may suspend storm drain system access to any person or property without prior written notice when such suspension is necessary to stop an actual or threatened illegal discharge that presents or may present imminent risk of harm to the public health, safety, welfare or the environment. In the event any person fails to comply with an emergency suspension order, the Director of the

Department of Public Works or designated representative may take all reasonable steps to prevent or minimize harm to the public health, safety, welfare or the environment.

Not required by MS4 permit, but may be useful addition in some municipalities:

SECTION ___. WATERCOURSE PROTECTION

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

Failure by the property owner to maintain the watercourse does not constitute an obligation on the part of the Town to assume this responsibility.

SECTION 9. NOTIFICATION OF SPILLS

Notwithstanding any other requirements of local, state or federal law, as soon as any person responsible for a facility or operation, or responsible for emergency response for a facility or operation has information of any known or suspected release of materials at that facility operation which is resulting or may result in illegal discharge of pollutants that person shall take all necessary steps to ensure containment, and cleanup of the release. In the event of a release of oil or hazardous materials, the person shall immediately notify the municipal fire and police departments, the Director of the Department of Public Works or designated representative, and the Massachusetts Department of Environmental Protection (if release is reportable as defined by 310 CMR 40.00). In the event of a release of non-hazardous material, said person shall notify the Director of the Department of Public Works or designated representative no later than the next business day. Written confirmation of all telephone, facsimile or in person notifications shall be provided to the Director of the Department of Public Works or designated representative within three business days thereafter. If the discharge of prohibited materials is from a commercial or industrial facility, the facility owner or operator of the facility shall retain on-site a written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least three years.

SECTION 10. ENFORCEMENT

1. The Director of the Department of Public Works or an authorized agent of the Department of Public Works shall enforce this ordinance, and the regulations promulgated thereunder, as well as the terms and conditions of all permits, notices, and orders, and may pursue all civil and criminal remedies for such violations.

2. <u>Orders</u>

   The Director of the Department of Public Works or designated representative may issue a written order to enforce the provisions of this ordinance or the regulations thereunder, which include, but are not limited to:

   (a) Elimination of illicit connections or discharges to the storm drain system;
   (b) Termination of access to the storm drain system;

(c) Performance of monitoring, analyses, and reporting;
(d) Cessation of unlawful discharges, practices, or operations;
(e) Remediation of contamination in connection therewith.
(f) Implementation of source control or treatment BMPs

If the Director of the Department of Public Works or designated representative determines that abatement or remediation of contamination is required, the order shall set forth a deadline for completion of the abatement or remediation. Said order shall further advise that, should the violator or property owner fail to abate or perform remediation within the specified deadline, the City of Holyoke may, at its option, undertake such work and expenses thereof shall be charged to the violator or property owner.

Within thirty (30) days after completing all measures necessary to abate the violation or to perform remediation, the violator and the property owner will be notified of the costs incurred by the City of Holyoke, including administrative costs for which payment is due to the City of Holyoke. The violator or property owner may file a written protest or appeal objecting to the amount or basis of costs with the City Council within thirty (30) days of receipt of the notification of the costs incurred. If the amount due is not received by the expiration of the time in which to file a protest or within thirty (30) days following a decision of the City Council or designated representative affirming or reducing the costs, or from a final decision of a court of competent jurisdiction, the costs shall become a special assessment against the property owner and shall constitute a lien on the owner's property for the amount of said costs pursuant to MGL Ch. 40, §58. Interest shall begin to accrue on any unpaid costs at the statutory rate provided in M.G.L. Ch. 59, §57 after the thirty-first day at which the costs first become due.

3. Equitable Remedy

If anyone violates the provisions of this ordinance, regulations, permit, notice, or order issued thereunder, the Director of the Department of Public Works or designated representative may seek injunctive relief in a court of competent jurisdiction to restrain the person from activities which would create further violations or compelling the person to abate or remediate the violation.

4. Criminal penalty

Any person who violates any provision of this Bylaw/Ordinance, regulation, order or written approval issued thereunder, shall be punished by a fine not to exceed $300 per violation. Each day or part thereof that such violation occurs or continues shall constitute a separate offense.

5. Non-Criminal Disposition

As an alternative to criminal prosecution or civil action, the City of Holyoke may elect to utilize the non-criminal disposition procedure set forth in M.G.L. Chapter 40, §21D. The Director of the Department of Public Works or designated representative shall be the enforcing person. The penalty for the 1st violation shall be up to $100. The penalty for the 2nd violation shall be $200. The penalty for the 3rd and subsequent violations shall be $300.00. Each day or part thereof that such violation occurs or continues shall constitute a separate offense.

6. Right-of-Entry

To the extent permitted by state law, or if authorized by the owner or other party in control of the property, the Director of the Department of Public Works or designated representative, its agents, officers, and employees may enter upon privately owned property for the purpose of performing their duties under this ordinance and regulations and may make or cause to be made such examinations, surveys or sampling as the Director of the Department of Public Works or designated representative deems reasonably necessary

Be advised that any entry without express permission of the owner should be by warrant. Generally, the 4th Amendment to the U.S. Constitution prohibits entry onto private property without the express consent of the owner or person in charge, a warrant or exigent circumstances. Although there are similar provisions in regulations concerning commercial uses, residential property is generally afforded greater protections. Because private property rights are generally afforded rigid protections by Massachusetts courts, use of this provision may expose the Town to liability. Therefore, if you are going to include this provision, I recommend that it be used sparingly.

Recommendation to Town of Belchertown by Koppleman & Paige

7. Appeals

The decisions or orders of the Director of the Department of Public Works shall be final. Further relief shall be to a court of competent jurisdiction.

8. Remedies Not Exclusive

The remedies listed in this ordinance are not exclusive of any other remedies available under any applicable federal, state or local law.

SECTION _11. SEVERABILITY

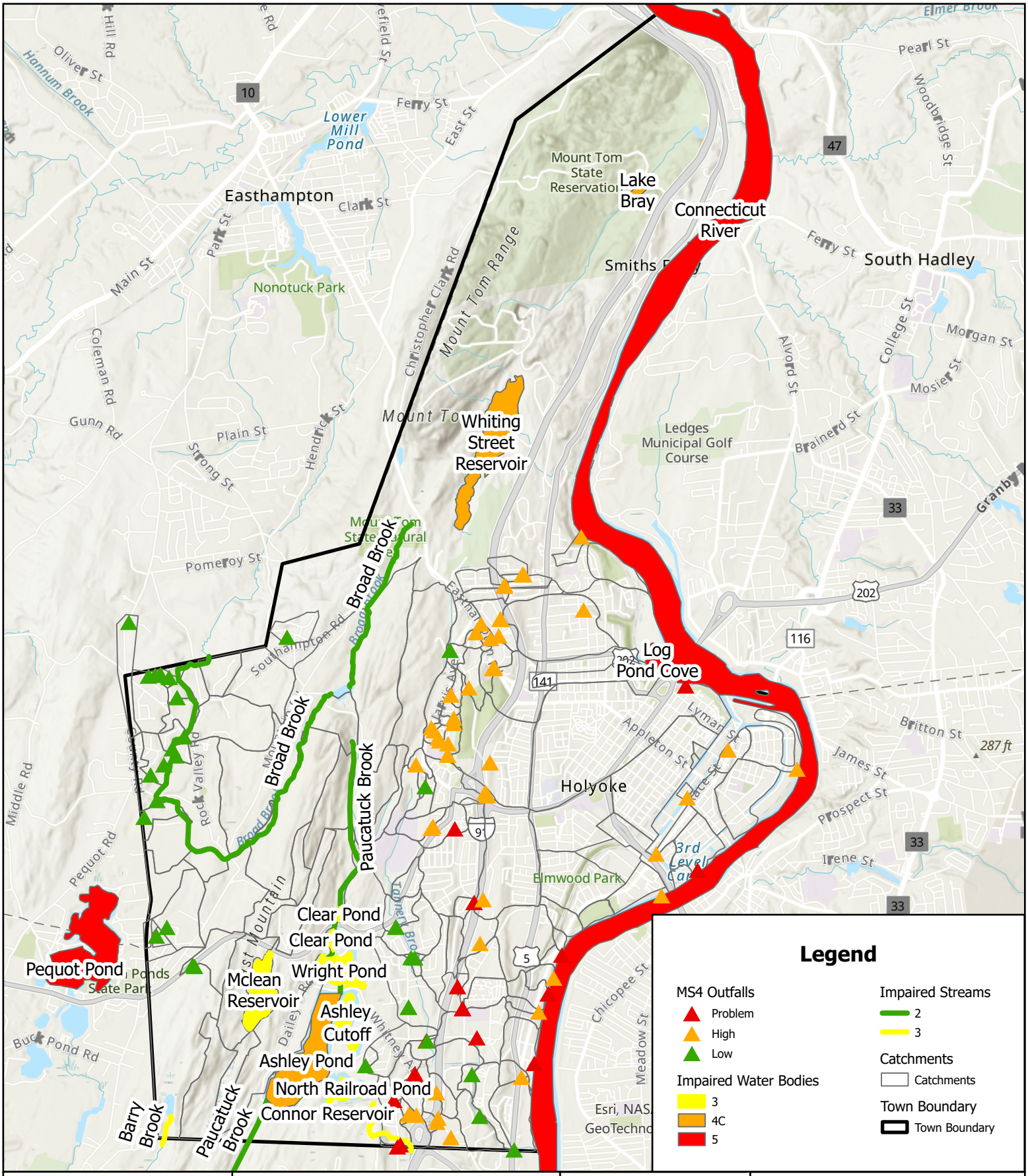
If any provision, paragraph, sentence, or clause, of this Bylaw/Ordinance or the application thereof to any person, establishment, or circumstances, shall be held invalid for any reason, such invalidity shall not affect any other provisions or applications of this Bylaw, and shall continue in full force and effect.

SECTION _12. TRANSITIONAL PROVISIONS

Property owners shall have _____ days from the effective date of the ordinance to comply with its provisions provided good cause is shown for the failure to comply with the ordinance during that period unless local, state, or federal agencies deem that immediate actions are warranted

APPENDIX C

Stormwater System Map



PROJECT NO.	25000684.001A
CREATED:	6/21/2024
CREATED BY:	SStMarie
FILE NAME:	Holyoke_Maps_V2.aprx

Storm System Map

City of Holyoke
122 Middle Water Street
Holyoke, MA 01040

APPENDIX D

Preliminary Prioritized Outfall Ranking

MS4 OUTFALL AND INTERCONNECTION PRIORITIZATION TABLE

Outfall ID	Location	Receiving Water Body	EPA Sample Site	Dry Weather Ammonia	Dry Weather Surfactant	Dry Weather Chlorine	Dry Weather Enterococci	Wet Weather Ammonia	Wet Weather Surfactant	Wet Weather Chlorine	Wet Weather Enterococci	Ranking	Priority
		Water Body = 1; None = 0	*Yes = 1; No = 0*	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1		
OUTFALL-00001	TBD*	Connecticut River	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00002	TBD*	Broad Brook	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00003	TBD*	Broad Brook	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00004	TBD*	Broad Brook	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00005	TBD*	Broad Brook	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00006	TBD*	Pequot Pond	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00007	TBD*	Pequot Pond	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00008	TBD*	Broad Brook	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00009	TBD*	Broad Brook	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00010	TBD*	Broad Brook	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00011	Whiting Reservoir area	Broad Brook	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00012	Whiting Reservoir area	Broad Brook	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00013	SUMMIT AVE	Connecticut River	1	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	2	HIGH
OUTFALL-00014	Whiting Reservoir area	Broad Brook	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00015	TBD*	Broad Brook	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00016	TBD*	Broad Brook	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH

Outfall ID	Location	Receiving Water Body	EPA Sample Site	Dry Weather Ammonia	Dry Weather Surfactant	Dry Weather Chlorine	Dry Weather Enterococci	Wet Weather Ammonia	Wet Weather Surfactant	Wet Weather Chlorine	Wet Weather Enterococci	Ranking	Priority
		Water Body = 1; None = 0	*Yes = 1; No = 0*	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1		
OUTFALL-00017	TBD*	Ashley Cutoff	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00018	16 HOLLY MEADOW RD	Pequot Pond	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00019	22 HOLLY MEADOW RD	Pequot Pond	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00020	BOBALA RD	Schoolhouse Brook	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00021	HOMESTEAV AVE	Wright Pond	1	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	2	HIGH
OUTFALL-00022	MAIN ST	Connecticut River	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00023	MAIN ST	Connecticut River	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00024	WHITNEY AVE	North RailRoad Pond	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00025	BOBALA RD	North RailRoad Pond	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00026	WHITNEY AVENUE	North RailRoad Pond	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00027	LOWER WESTFIELD RD	Connecticut River	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00028	EASTHAMPTON RD	Broad Brook	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00029	JARVIS AVE	Broad Brook	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00030	EASTHAMPTON RD	Broad Brook	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00031	EASTHAMPTON RD	Broad Brook	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00032	LINDOR ST	Broad Brook	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH

Outfall ID	Location	Receiving Water Body	EPA Sample Site	Dry Weather Ammonia	Dry Weather Surfactant	Dry Weather Chlorine	Dry Weather Enterococci	Wet Weather Ammonia	Wet Weather Surfactant	Wet Weather Chlorine	Wet Weather Enterococci	Ranking	Priority
		Water Body = 1; None = 0	*Yes = 1; No = 0*	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1		
OUTFALL-00033	2ND LEVEL CANAL CABOT ST	Connecticut River	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00034	MAIN ST 3RD LEVEL CANAL	Connecticut River	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00035	2ND LEVEL CANAL RACE ST	Connecticut River	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00036	LONGFELLOW RD	Broad Brook	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00037	BOBALA RD	Schoolhouse Brook	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00038	LOWER WESTFIELD RD	Ashley Cutoff	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00039	LOWER WESTFIELD RD	Ashley Cutoff	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00040	WHITING FARMS RD	Connecticut River	1	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	2	HIGH
OUTFALL-00041	WHITING FARMS RD	Connecticut River	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00042	MAIN ST	Connecticut River	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00043	MAIN ST	Connecticut River	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00044	MAIN ST	Connecticut River	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00045	BOBALA ROAD	Schoolhouse Brook	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00046	KNOLLWOOD CIRCLE	Wright Pond	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00047	EASTHAMPTON RD	Broad Brook	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00048	MOSHER ST	Connecticut River	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00049	Jones Ferry Pump Station	Connecticut River	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH

Outfall ID	Location	Receiving Water Body	EPA Sample Site	Dry Weather Ammonia	Dry Weather Surfactant	Dry Weather Chlorine	Dry Weather Enterococci	Wet Weather Ammonia	Wet Weather Surfactant	Wet Weather Chlorine	Wet Weather Enterococci	Ranking	Priority
		Water Body = 1; None = 0	*Yes = 1; No = 0*	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1		
OUTFALL-00050	TBD*	Connecticut River	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00051	TBD*	Connecticut River	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00052	TBD*	Connecticut River	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00053	TBD*	Connecticut River	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	1	HIGH
OUTFALL-00054	TBD*	TBD*	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	0	LOW
OUTFALL-00055	TBD*	TBD*	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	0	LOW
OUTFALL-00056	TBD*	TBD*	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	0	LOW
OUTFALL-00057	TBD*	TBD*	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	0	LOW
OUTFALL-00058	TBD*	TBD*	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	0	LOW
OUTFALL-00059	TBD*	TBD*	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	0	LOW
OUTFALL-00060	TBD*	TBD*	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	0	LOW
OUTFALL-00061	TBD*	TBD*	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	0	LOW
OUTFALL-00062	TBD*	TBD*	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	0	LOW
OUTFALL-00063	TBD*	TBD*	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	0	LOW
OUTFALL-00064	TBD*	TBD*	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	0	LOW
OUTFALL-00065	TBD*	TBD*	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	0	LOW
OUTFALL-00066	TBD*	TBD*	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	0	LOW
OUTFALL-00067	TBD*	TBD*	0	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	0	LOW

Outfall ID	Location	Receiving Water Body	EPA Sample Site	Dry Weather Ammonia	Dry Weather Surfactant	Dry Weather Chlorine	Dry Weather Enterococci	Wet Weather Ammonia	Wet Weather Surfactant	Wet Weather Chlorine	Wet Weather Enterococci	Ranking	Priority
		Water Body = 1; None = 0	*Yes = 1; No = 0*	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1	Max: 0.1		
OUTFALL-00068 – OUTFALL-000XX	West Holyoke	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*	TBD*

Notes:

1. TBD* - Will be updated with information gathered from future outfall investigation and mapping efforts
2. Previous screening results indicate likely sewer input if any of the following are true:
   - Outfalls identified by the EPA in sampling results previously supplied to the City on May 7-8, 2019 and July 7, 2019 based on field test kit screening,
   - Olfactory or visual evidence of sewage,
   - Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water,
   - Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and detectable levels of chlorine, or
   - Any exceedance of a bacteria threshold and any detectable level of ammonia below its threshold
3. Outfalls and interconnections discharging to or in the vicinity of any of the following: public beaches, recreational areas, or drinking water supplies.
4. Receiving water quality based on latest version of MassDEP Integrated List of Waters;
   - Poor = Waters with approved TMDLs (Category 4a Waters) where illicit discharges have the potential to contain the pollutant identified as the cause of the impairment; also, waters exceeding the water quality standards for bacteria; ammonia >0.5 mg/L; surfactants ≥0.25 mg/L
   - Fair = Water quality limited waterbodies that receive a discharge from the MS4 (Category 5 Waters)
   - Good = No water quality impairments
5. Generating sites are institutional, municipal, commercial, or industrial sites with a potential to generate pollutants that could contribute to illicit discharges (e.g., car dealers, car washes, gas stations, garden centers, and industrial manufacturing areas).
6. Age of development and infrastructure: High = developments with stormwater and sewer infrastructure > 40 years old; medium = developments with infrastructure 20-40 years old; Low = developments with infrastructure <20 years old.
7. Historic Combined Sewers or Septic: Yes = Areas once served by combined sewers that have been separated, or areas once served by septic that have converted to sanitary sewers.
8. Aging septic systems: Yes = septic systems 30 years or older in residential areas.
9. Local Priority due to Environmental Qualities of the area and land use development.
10. Any river or stream that is culverted for distance greater than a simple roadway crossing.

APPENDIX E

Reprioritized Outfall Ranking

Reprioritized Outfall Ranking and Inventory
Illicit Discharge Detection and Elimination Program
City of Holyoke, MA
Reprioritized: June 2024

Owner	EPA Priority Category	Outfall ID	Address	MassDEP Stream Segment (AU ID)	Waterbody Name	Sewage Indicators Found During DRY Screening	Septic to Sewer Conversion or CSO Separation?	Sewage Indicators Found During WET Screening	Infra-structure Score	Land Use Data	Density/Land Use of Generating Sites	Catchment Score	Discharge to Pub Beach, Shellfish or Rec	Discharge to Bacteria/ Pathogen Impaired Waterbody	Discharge to Zone I and Zone II	Stormwater Related Impairments	Receiving Water Score	Final Outfall Score
						1 or 0 (1=auto problem)	1 or 0	1 or 0 (1=auto problem)					1 or 0 (1=auto high)	1 or 0 (1=auto high)	1 or 0 (1=auto high)			
Holyoke	Problem	CA086	Jackson Street Flood Station	MA34-05	CONNECTICUT RIVER	1	1	0	0.500	industrial	3.000	1.000	0	1	0	1	0.333	n/a
Holyoke	Problem	CA158-A	6 Appleton St	MA34-05	CONNECTICUT RIVER	1	1	0	0.500	commercial	3.000	1.000	0	1	0	1	0.333	n/a
Holyoke	Problem	CA046	14 Bobala Rd	MA34-05	CONNECTICUT RIVER	0	0	1	0.250	commercial	3.000	1.000	0	1	0	1	0.333	n/a
Holyoke	Problem	CA047-A	361 Whitney Ave	MA34-05	CONNECTICUT RIVER	0	0	1	0.250	industrial	3.000	1.000	0	1	0	1	0.333	n/a
Holyoke	Problem	CA047-B	361 Whitney	MA34-05	CONNECTICUT RIVER	0	0	1	0.250	industrial	3.000	1.000	0	1	0	1	0.333	n/a
Holyoke	Problem	CA049	59 Bobala	MA34-05	CONNECTICUT RIVER	0	0	1	0.250	commercial	3.000	1.000	0	1	0	1	0.333	n/a
Holyoke	Problem	CA073	938 Main St	MA34-05	CONNECTICUT RIVER	1	0	0	0.250	commercial	3.000	1.000	0	1	0	1	0.333	n/a
Holyoke	Problem	CA068	Jones Ferry PS	MA34-05	CONNECTICUT RIVER	1	0	1	0.500	suburban_residential	2.000	0.667	0	1	0	1	0.333	n/a
Holyoke	Problem	CA143	14 Nicholls Drive	MA34-05	CONNECTICUT RIVER	1	0	1	0.500	suburban_residential	2.000	0.667	0	1	0	1	0.333	n/a
Holyoke	Problem	CA045	150 lower Westfield rd		TANNERY BROOK	0	0	1	0.250	commercial	3.000	1.000	0	0	0	0	0.000	n/a
Holyoke	Problem	CA052	100 Bobala	MA34-43	SCHOOLHOUSE BROOK	0	0	1	0.250	industrial	3.000	1.000	0	0	0	0	0.000	n/a
Holyoke	Problem	CA053	100 Bobala	MA34-43	SCHOOLHOUSE BROOK	0	0	1	0.250	industrial	3.000	1.000	0	0	0	0	0.000	n/a
Holyoke	Problem	CA064	86 Lower Westfield Rd		TANNERY BROOK	0	0	1	0.250	commercial	3.000	1.000	0	0	0	0	0.000	n/a
Holyoke	Problem	CA065	200 Whiting Farms Rd	MA34-05	CONNECTICUT RIVER	0	0	1	0.250	suburban_residential	2.000	0.667	0	1	0	1	0.333	n/a
Holyoke	Problem	CA066	6 jeane Dr	MA34-05	CONNECTICUT RIVER	0	0	1	0.250	urban_residential	2.000	0.667	0	1	0	1	0.333	n/a
Holyoke	Problem	CA071	1030 Main St	MA34-05	CONNECTICUT RIVER	1	0	0	0.250	suburban_residential	2.000	0.667	0	1	0	1	0.333	n/a
Holyoke	Problem	CA132	200 Whiting Farms Rd	MA34-05	CONNECTICUT RIVER	0	0	1	0.250	suburban_residential	2.000	0.667	0	1	0	1	0.333	n/a
Holyoke	Problem	CA142	50 Bray Park Dt	MA34-05	CONNECTICUT RIVER	1	0	0	0.250	suburban_residential	2.000	0.667	0	1	0	1	0.333	n/a
Holyoke	Problem	CA039	Highland Park PS	MA34-04	CONNECTICUT RIVER	1	0	0	0.250	open_space	1.000	0.333	1	1	0	1	0.500	n/a
Holyoke	High	CA158-B	138 Appleton St	MA34-05	CONNECTICUT RIVER	0	1	0	0.250	commercial	3.000	1.000	0	1	0	1	0.333	0.52778
Holyoke	High	CA012	Sullivan school	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	institutional	3.000	1.000	0	1	0	1	0.333	0.44444
Holyoke	High	CA016	Sullivan school	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	institutional	3.000	1.000	0	1	0	1	0.333	0.44444
Holyoke	High	CA037	1 Berkshire St	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	commercial	3.000	1.000	0	1	0	1	0.333	0.44444
Holyoke	High	CA042	1 Bigelow St	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	commercial	3.000	1.000	0	1	0	1	0.333	0.44444
Holyoke	High	CA048	36 Bobala	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	industrial	3.000	1.000	0	1	0	1	0.333	0.44444
Holyoke	High	CA050	36 Bobala	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	industrial	3.000	1.000	0	1	0	1	0.333	0.44444
Holyoke	High	CA051	36 Bobala	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	industrial	3.000	1.000	0	1	0	1	0.333	0.44444
Holyoke	High	CA054	400 Whitney	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	commercial	3.000	1.000	0	1	0	1	0.333	0.44444
Holyoke	High	CA055	400 Whitney	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	commercial	3.000	1.000	0	1	0	1	0.333	0.44444
Holyoke	High	CA057-B	Holyoke mall	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	commercial	3.000	1.000	0	1	0	1	0.333	0.44444
Holyoke	High	CA067	1 Sullivan Rd	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	commercial	3.000	1.000	0	1	0	1	0.333	0.44444
Holyoke	High	CA072	990 Main St Paper city car wash	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	commercial	3.000	1.000	0	1	0	1	0.333	0.44444
Holyoke	High	CA084	1 Main St	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	commercial	3.000	1.000	0	1	0	1	0.333	0.44444
Holyoke	High	CA085	Mosher St Pump Station	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	commercial	3.000	1.000	0	1	0	1	0.333	0.44444
Holyoke	High	CA087	636 Main St	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	commercial	3.000	1.000	0	1	0	1	0.333	0.44444

Reprioritized Outfall Ranking and Inventory
Illicit Discharge Detection and Elimination Program
City of Holyoke, MA
Reprioritized: June 2024

Owner	EPA Priority Category	Outfall ID	Address	MassDEP Stream Segment (AU ID)	Waterbody Name	Sewage Indicators Found During DRY Screening	Septic to Sewer Conversion or CSO Separation?	Sewage Indicators Found During WET Screening	Infra-structure Score	Land Use Data	Density/Land Use of Generating Sites	Catchment Score	Discharge to Pub Beach, Shellfish or Rec	Discharge to Bacteria/ Pathogen Impaired Waterbody	Discharge to Zone I and Zone II	Stormwater Related Impairments	Receiving Water Score	Final Outfall Score
						1 or 0 (1=auto problem)	1 or 0	1 or 0 (1=auto problem)					1 or 0 (1=auto high)	1 or 0 (1=auto high)	1 or 0 (1=auto high)			
Holyoke	High	CA003	T1 university park	MA34-04	CONNECTICUT RIVER	0	0	0	0.000	urban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA004	6 Hawthorne Ln	MA34-04	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA005-A	29 Longfellow Rd	MA34-04	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA005-B	29 Longfellow Rd	MA34-04	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA005-C	29 Longfellow Rd	MA34-04	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA005-E	36 Longfellow Rd	MA34-04	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA006-A	10 Lindor Heights	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA006-B	10 Lindor Heights	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA006-C	10 Lindor Heights	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA006-D	10 Beaudoin Ter	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA007	14 Scott hollow rd	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	urban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA009	330 Jarvis ave	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	urban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA010	27 Scotthollow	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA011	20 Wayne Court	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA013	26 Jarvis way	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	urban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA014	30 Jarvis Heights	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA015	338 Jarvis ave	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	urban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA017	Sullivan school	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	urban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA018	393 cherry st	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	urban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA023-B	105 Cherry Street	MA34-04	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA023-C	105 Cherry St	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA027	14 Philip dr	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	urban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA035-A	85 Woodland St	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA070	1030 Main St	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA078-A	124 Ridgewood Ave	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA078-B	124 Ridgewood Ave	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA079	73 Madison Ave	MA34-04	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA133-A	115 Bemis Rd	MA34-04	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA133-B	115 Bemis Rd	MA34-04	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA134	29 Claren Dr	MA34-04	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA135	30 Claren Dr	MA34-04	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA144	College way	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	urban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA147	105 Cherry street	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA002	2 Burns Way	MA34-04	CONNECTICUT RIVER	0	0	0	0.000	suburban_residential	2.000	0.667	0	1	0	1	0.333	0.33333
Holyoke	High	CA056	91 South, mile 12 before exit 11	MA34-04	CONNECTICUT RIVER	0	0	0	0.000	open_space	1.000	0.333	0	1	0	1	0.333	0.22222

Reprioritized Outfall Ranking and Inventory
Illicit Discharge Detection and Elimination Program
City of Holyoke, MA
Reprioritized: June 2024

Owner	EPA Priority Category	Outfall ID	Address	MassDEP Stream Segment (AU ID)	Waterbody Name	Sewage Indicators Found During DRY Screening	Septic to Sewer Conversion or CSO Separation?	Sewage Indicators Found During WET Screening	Infra-structure Score	Land Use Data	Density/Land Use of Generating Sites	Catchment Score	Discharge to Pub Beach, Shellfish or Rec	Discharge to Bacteria/ Pathogen Impaired Waterbody	Discharge to Zone I and Zone II	Stormwater Related Impairments	Receiving Water Score	Final Outfall Score
						1 or 0 (1=auto problem)	1 or 0	1 or 0 (1=auto problem)					1 or 0 (1=auto high)	1 or 0 (1=auto high)	1 or 0 (1=auto high)			
Holyoke	High	CA060	1152 Main St	MA34-05	CONNECTICUT RIVER	0	0	0	0.000	open_space	1.000	0.333	0	1	0	1	0.333	0.22222
Holyoke	High	CA082	River Terrace CSO	MA34-04	CONNECTICUT RIVER	0	0	0	0.000	open_space	1.000	0.333	0	1	0	1	0.333	0.22222
Holyoke	Low	CA026	518 Wesrfield Rd		TANNERY BROOK	0	0	0	0.000	commercial	3.000	1.000	0	0	0	0	0.000	0.33333
Holyoke	Low	CA058	Holyoke mall		TANNERY BROOK	0	0	0	0.000	commercial	3.000	1.000	0	0	0	0	0.000	0.33333
Holyoke	Low	CA062	Mount Marie Rd		TANNERY BROOK	0	0	0	0.000	commercial	3.000	1.000	0	0	0	0	0.000	0.33333
Holyoke	Low	CA138	150 lower Westfield rd		TANNERY BROOK	0	0	0	0.000	commercial	3.000	1.000	0	0	0	0	0.000	0.33333
Holyoke	Low	CA145	518 Homestead Ave		TANNERY BROOK	0	0	0	0.000	commercial	3.000	1.000	0	0	0	0	0.000	0.33333
Holyoke	Low	CA088	24 Holly Meadow	MA32055	PEQUOT POND	0	0	0	0.000	suburban_residential	2.000	0.667	0	0	0	1	0.167	0.27778
Holyoke	Low	CA089	16 Holly Meadow Rd	MA32055	PEQUOT POND	0	0	0	0.000	suburban_residential	2.000	0.667	0	0	0	1	0.167	0.27778
Holyoke	Low	CA091-A	700 Westfield Rd	MA32055	PEQUOT POND	0	0	0	0.000	suburban_residential	2.000	0.667	0	0	0	1	0.167	0.27778
Holyoke	Low	CA091-B	700 Westfield Rd	MA32055	PEQUOT POND	0	0	0	0.000	suburban_residential	2.000	0.667	0	0	0	1	0.167	0.27778
Holyoke	Low	CA019	2 hickory st		TANNERY BROOK	0	0	0	0.000	urban_residential	2.000	0.667	0	0	0	0	0.000	0.22222
Holyoke	Low	CA034	957 Homestead Ave		TANNERY BROOK	0	0	0	0.000	urban_residential	2.000	0.667	0	0	0	0	0.000	0.22222
Holyoke	Low	CA059	1256 Main St		TANNERY BROOK	0	0	0	0.000	urban_residential	2.000	0.667	0	0	0	0	0.000	0.22222
Holyoke	Low	CA096-A	6 hollygrape dr	MA34-18	BROAD BROOK	0	0	0	0.000	suburban_residential	2.000	0.667	0	0	0	0	0.000	0.22222
Holyoke	Low	CA096-B	6 Holly Grape Cir	MA34-18	BROAD BROOK	0	0	0	0.000	urban_residential	2.000	0.667	0	0	0	0	0.000	0.22222
Holyoke	Low	CA098	9 winterberry cir	MA34-18	BROAD BROOK	0	0	0	0.000	suburban_residential	2.000	0.667	0	0	0	0	0.000	0.22222
Holyoke	Low	CA099	113 County Rd Southampton	MA34-18	BROAD BROOK	0	0	0	0.000	suburban_residential	2.000	0.667	0	0	0	0	0.000	0.22222
Holyoke	Low	CA100	3 hemlock Dr	MA34-18	BROAD BROOK	0	0	0	0.000	suburban_residential	2.000	0.667	0	0	0	0	0.000	0.22222
Holyoke	Low	CA101-A	9 deer run	MA34-18	BROAD BROOK	0	0	0	0.000	suburban_residential	2.000	0.667	0	0	0	0	0.000	0.22222
Holyoke	Low	CA101-B	9 deer run	MA34-18	BROAD BROOK	0	0	0	0.000	suburban_residential	2.000	0.667	0	0	0	0	0.000	0.22222
Holyoke	Low	CA102	10 deer run	MA34-18	BROAD BROOK	0	0	0	0.000	suburban_residential	2.000	0.667	0	0	0	0	0.000	0.22222
Holyoke	Low	CA103	2 deer run	MA34-18	BROAD BROOK	0	0	0	0.000	suburban_residential	2.000	0.667	0	0	0	0	0.000	0.22222
Holyoke	Low	CA105	15 Lemay Dr	MA34-18	BROAD BROOK	0	0	0	0.000	suburban_residential	2.000	0.667	0	0	0	0	0.000	0.22222
Holyoke	Low	CA122	45 Keyes Rd	MA34-18	BROAD BROOK	0	0	0	0.000	suburban_residential	2.000	0.667	0	0	0	0	0.000	0.22222
Holyoke	Low	CA128	95 Knollwood Circle		TANNERY BROOK	0	0	0	0.000	suburban_residential	2.000	0.667	0	0	0	0	0.000	0.22222
Holyoke	Low	CA137	71 richard eger dr	MA32002	ASHLEY POND	0	0	0	0.000	urban_residential	2.000	0.667	0	0	0	0	0.000	0.22222
Holyoke	Low	CA139	18 bray berry Dr	MA34-18	BROAD BROOK	0	0	0	0.000	suburban_residential	2.000	0.667	0	0	0	0	0.000	0.22222
Holyoke	Low	CA140	26 Ross rd	MA34-18	BROAD BROOK	0	0	0	0.000	suburban_residential	2.000	0.667	0	0	0	0	0.000	0.22222
Holyoke	Low	CA141	95 Knollwood Dr		TANNERY BROOK	0	0	0	0.000	suburban_residential	2.000	0.667	0	0	0	0	0.000	0.22222
Holyoke	Low	CA146	967 Homestead Ave		TANNERY BROOK	0	0	0	0.000	urban_residential	2.000	0.667	0	0	0	0	0.000	0.22222
Holyoke	Low	CA008	100 Jarvis ave	MA34101	WHITING STREET RESERVOIR	0	0	0	0.000	open_space	1.000	0.333	0	0	0	0	0.000	0.11111
Holyoke	Low	CA094	Pilsudski Park 200 County Rd	MA34-18	BROAD BROOK	0	0	0	0.000	open_space	1.000	0.333	0	0	0	0	0.000	0.11111

APPENDIX F

Field Inspection Forms and Sampling Procedures

OUTFALL INVENTORY FIELD SHEET

Section 1: Background Data

City/Town:	Street:	Tax Map #:	Outfall ID: OF-
Owner: ☐ City ☐ State ☐ Private ☐ Other: _____		Nearest House/Utility Pole #:	
Today's date:		Time (Military):	
Investigators:		Form completed by:	
Temperature (°F):	Rainfall (in.): Last 24 hours:	Last 48 hours:	
Northing:	Easting:	GPS Unit:	GPS LMK #:
Rim Elevation:		Invert Elevation:	
Elevation Datum:		Receiving Water:	
Camera:		Photo #s: -- Take 1 Upstream (head on) and 1 Downstream view	

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

☐ Industrial ☐ Open Space

☐ Urban Residential ☐ Institutional

☐ Suburban Residential Other: _____

☐ Commercial Known Industries: _____

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

Section 2: Outfall Description

TYPE	MATERIAL	SHAPE		DIMENSIONS (IN.)	SUBMERGED
☐ Closed Pipe	☐ RCP ☐ CMP ☐ PVC ☐ HDPE ☐ Steel ☐ Other: _____	☐ Circular ☐ Elliptical ☐ Box ☐ Other: _____	☐ Single ☐ Double ☐ Triple ☐ Other: _____	Diameter/Dimensions: _____	In Water: ☐ No ☐ Partially ☐ Fully With Sediment: ☐ No ☐ Partially ☐ Fully
☐ Open drainage	☐ Concrete ☐ Pavement/Scupper ☐ Earthen ☐ rip-rap ☐ Other: _____	☐ Trapezoid ☐ Parabolic ☐ Other: _____		Depth: _____ Top Width: _____ Bottom Width: _____	
Flow Present?	☐ Yes ☐ No	***If No, Skip to Section 3. If Yes, Notify Town and continue field reconnaissance.***			
Flow Description (If present)	☐ Trickle ☐ Moderate ☐ Substantial			Flow Direction (If Present):	

Section 3: Sketch

Outfall Inventory Field Sheet

Section 4: Physical Indicators for Flowing Outfalls Only

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

INDICATOR	CHECK if Present	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)		
Odor	☐	☐ Sewage ☐ Rancid/sour ☐ Petroleum/gas ☐ Sulfide ☐ Other:	☐ 1 – Faint	☐ 2 – Easily detected	☐ 3 – Noticeable from a distance
Color	☐	☐ Clear ☐ Brown ☐ Gray ☐ Yellow ☐ Green ☐ Orange ☐ Red ☐ Other:	☐ 1 – Faint colors in outfall flow	☐ 2 – Clearly visible in outfall flow	☐ 3 – Clearly visible in outfall flow
Turbidity	☐	See severity	☐ 1 – Slight cloudiness	☐ 2 – Cloudy	☐ 3 – Opaque
Floatables -Does Not Include Trash!!	☐	☐ Sewage (Toilet Paper, etc.) ☐ Suds ☐ Petroleum (oil sheen) ☐ Other:	☐ 1 – Few/slight; origin not obvious	☐ 2 – Some; indications of origin (e.g., possible suds or oil sheen)	☐ 3 - Some; origin clear (e.g., obvious oil sheen, suds, or floating sanitary materials)

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

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

INDICATOR	CHECK if Present	DESCRIPTION	COMMENTS
Outfall Damage	☐	☐ Spalling, Cracking or Chipping ☐ Peeling Paint ☐ Corrosion	
Deposits/Stains	☐	☐ Oily ☐ Flow Line ☐ Paint ☐ Other:	
Abnormal Vegetation	☐	☐ Excessive ☐ Inhibited	
Poor pool quality	☐	☐ Odors ☐ Colors ☐ Floatables ☐ Oil Sheen ☐ Suds ☐ Excessive Algae ☐ Other:	
Pipe benthic growth	☐	☐ Brown ☐ Orange ☐ Green ☐ Other:	

Section 6: Potential for Illicit Discharge

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

Section 7: Any Non-Illicit Discharge Concerns (e.g., trash or needed infrastructure repairs)?

Manhole Inspection Report

MH#

Catchment Area: _____

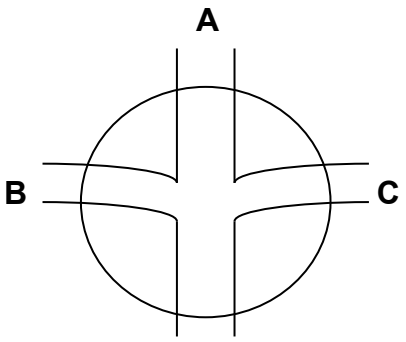
Inspector: _____

Date/Time: _____

Weather: _____

Street/Location: _____

General Comments: _____



(Hold "D" as outlet)

Structural Information:

Cover Size: 24" 30" Other: _____

MH Size: 4' 5' Other: _____

MH Sump: Y / N Sump Depth: _____

MH Channel: Y / N

Weir: Y / N Rim to Top of Weir: _____

Internal Drop: Y / N

Depth to Wet Ring from Rim: _____

General Information:

Manhole Type:	Sanitary ☐	Storm ☐	Combined ☐	Common ☐							
Location of MH:	Roadway ☐	Sidewalk ☐	Roadside ☐	Alley ☐	Easement ☐	Other ☐					
Manhole Material:	Brick ☐	Clay Block ☐	Poured Concrete ☐		Manhole Block ☐	Precast Concrete ☐	Other ☐				
Paved Area Around MH:	Satisfactory ☐		Cracked ☐	☐	Missing Pavement ☐	Vegetation Growth					
Unpaved Area Around MH:	Satisfactory ☐		Eroded ☐								
Odors:											
Recommendations:	No Action ☐	Rebuild ☐	Line Manhole Wall ☐		Reset Frame ☐	Clean / Remove debris from Invert ☐					

Field Test Kit Results:

Pipe (A-F):						
Ammonia, mg/L (Compliant ≤ 0.5 mg/L)						
Surfactants, mg/L (Compliant ≤ 0.25 mg/L)						
Chlorine, mg/L (Compliant < 0.02 mg/L)						

Pipe Information:

	Pipe Size	Material	From / To MH#	Invert Depth (from Rim)	Flow Depth (from Invert)	Debris Depth (from Invert)	Condition	Flow	Clarity of Flow
A.									
B.									
C.									
D.									
E.									
F.									

Ammonia Nitrogen Test Kit

NI-SA (2428700)

DOC326.98.00007

Test preparation

CAUTION: ⚠ Review the Safety Data Sheets (MSDS/SDS) for the chemicals that are used. Use the recommended personal protective equipment.

- Put the color disc on the center pin in the color comparator box (numbers to the front).
- Use sunlight or a lamp as a light source to find the color match with the color comparator box.
- Rinse the tubes with sample before the test. Rinse the tubes with deionized water after the test.
- If the color match is between two segments, use the value that is in the middle of the two segments.
- If the color disc becomes wet internally, pull apart the flat plastic sides to open the color disc. Remove the thin inner disc. Dry all parts with a soft cloth. Assemble when fully dry.
- To verify the test accuracy, use a standard solution as the sample.
- This test kit is for seawater. If used for brackish or fresh water, the test kit gives a higher than actual value. The error in brackish water is usually less than 10%. The error in low salinity or fresh water is a maximum 16%.
- This test is very sensitive to contamination. Try to get the same result on a second test. Fully rinse the tubes with fresh sample before the second test. The reagents clean the tubes during the first test.
- To increase the range of this test to 4 mg/L NH_3–N, dilute the sample as follows. Use a 3-mL syringe to add 2.5 mL of sample to each tube. Dilute the sample to the 5-mL mark with deionized water. Use the diluted sample in the test procedure and multiply the result by 2.

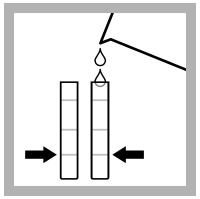
Replacement items

Description	Unit	Item no.
Ammonia Salicylate Reagent Powder Pillows, 5 mL	50/pkg	2395266
Ammonia Cyanurate Reagent Powder Pillows, 5 mL	50/pkg	2395466
Color disc, ammonia nitrogen, salicylate, 0–2.0 mg/L	each	9261300
Color comparator box	each	173200
Glass viewing tubes, glass, 18 mm	6/pkg	173006
Stoppers for 18-mm glass tubes and AccuVac Ampuls	6/pkg	173106

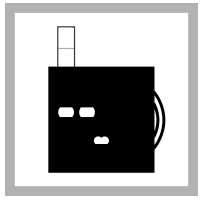
Optional items

Description	Unit	Item no.
Nitrogen ammonia standard solution, 1.0 mg/L NH_3–N	500 mL	189149
Water, deionized	500 mL	27249
Syringe, Luer-Lok® Tip, 3 mL	each	4321300

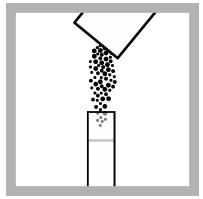
Test procedure—Ammonia-nitrogen (0–2.0 mg/L NH_3–N)



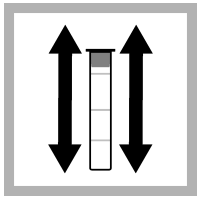
1. Fill two tubes to the first line (5 mL) with sample.



2. Put one tube into the left opening of the color comparator box.

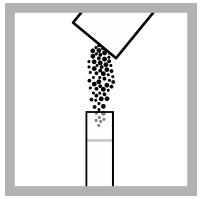


3. Add one Ammonia Salicylate Reagent Powder Pillow to the second tube.

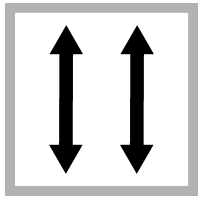


4. Put a stopper on the tube. Shake until the powder fully dissolves.

5. Wait 3 minutes.

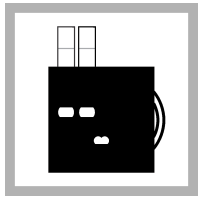


6. Add one Ammonia Cyanurate Reagent Powder Pillow to the same tube. Put a stopper on the tube.

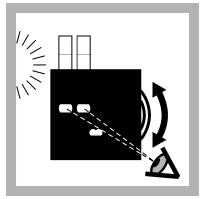


7. Shake until the powder fully dissolves.

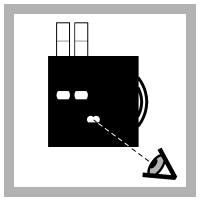
8. Wait 15 minutes. A green color develops.



9. Put the second tube into the color comparator box.



10. Hold the color comparator box in front of a light source. Turn the color disc to find the color match.



11. Read the result in mg/L in the scale window.

Calculate the mg/L NH_3 and mg/L NH_4^+

Ammonia in water is in the form of the ammonium ion (NH_4^+) and un-ionized ammonia (NH_3). NH_3 is toxic to fish. Table 1 shows that the percent of NH_3 increases as the pH and temperature increase. This test kit measures both NH_4^+ and NH_3 as ammonia nitrogen (NH_3–N).

To calculate the mg/L NH_3 in the sample, refer to Table 1 and the equation that follows.

mg/L NH_3 = ((mg/L NH_3–N x percent NH_3 from Table 1) ÷ 100) × 1.2

Example: *The test result was 1.6 mg/L NH_3–N. The sample pH was 7.6 and the sample temperature was 16 °C. The mg/L NH_3 is ((1.6 x 1.16) ÷ 100) × 1.2 = 0.02 mg/L NH_3.*

To calculate the mg/L NH_4^+ in the sample, refer to Table 1 and the equation that follows.

mg/L NH_4^+ = ((mg/L NH_3–N x (100 – percent NH_3 from Table 1)) ÷ 100) × 1.3

Example: *The test result was 1.6 mg/L NH_3–N. The sample pH was 7.6 and the sample temperature was 16 °C. The mg/L NH_4^+ is ((1.6 x (100 – 1.16)) ÷ 100) × 1.3 = 2.056 mg/L NH_4^+.*

Table 1 Percent of NH_3 in water

pH	16 °C	18 °C	20 °C	22 °C	24 °C	26 °C	28 °C	30 °C	32 °C
7.0	0.29	0.34	0.39	0.46	0.52	0.60	0.69	0.80	0.91
7.2	0.46	0.54	0.62	0.82	0.83	0.96	1.10	1.26	1.44
7.4	0.73	0.85	0.98	1.14	1.31	1.50	1.73	1.98	2.26
7.6	1.16	1.34	1.55	1.79	2.06	2.36	2.71	3.10	3.53
7.8	1.82	2.11	2.44	2.81	3.22	3.70	4.23	4.82	5.48
8.0	2.86	3.30	3.81	4.38	5.02	5.74	6.54	7.43	8.42
8.2	4.45	5.14	5.90	6.76	7.72	8.80	9.98	11.29	12.72
8.4	6.88	7.90	9.04	10.31	11.71	13.26	14.95	16.78	18.77
8.6	10.48	11.97	13.61	15.41	17.37	19.50	21.78	24.22	26.80
8.8	15.66	17.73	19.98	22.41	25.00	27.74	30.62	33.62	36.72
9.0	22.73	25.46	28.36	31.40	34.56	37.83	41.16	44.53	47.91
9.2	31.80	35.12	38.55	42.04	45.57	49.09	52.58	55.99	59.31
9.4	42.49	46.18	49.85	53.48	57.02	60.45	63.73	66.85	69.79
9.6	53.94	57.62	61.17	64.56	67.77	70.78	73.58	76.17	78.55
9.8	64.99	68.31	71.40	74.28	76.92	79.33	81.53	83.51	85.30
10.0	74.63	77.35	79.83	82.07	84.08	85.88	87.49	88.92	90.19
10.2	82.34	84.41	86.25	87.88	89.33	90.60	91.73	92.71	93.58

Detergents CHEMets Kit

K-9400/R-9400: 0 - 3 ppm

Test Procedure

1. Rinse the reaction tube with the sample to be tested, and then fill it to the 5 mL mark with the sample.
2. While holding the double-tipped ampoule in a vertical position, snap the upper tip using the tip breaking tool (fig. 1).
3. Invert the ampoule and position the open end over the reaction tube. Snap the upper tip and allow the contents to drain into the reaction tube (fig. 1).
4. Cap the reaction tube and shake it vigorously for **30 seconds**. Allow the tube to stand undisturbed for **1 minute**.
5. Make sure that the flexible tubing is firmly attached to the CHEMet ampoule tip.
6. Insert the CHEMet assembly (tubing first) into the reaction tube making sure that the end of the flexible tubing is at the bottom of the tube. Break the tip of the CHEMet ampoule by gently pressing it against the side of the reaction tube (fig. 2). The ampoule should draw in fluid only from the organic phase (bottom layer).
7. When filling is complete, remove the CHEMet assembly from the reaction tube.

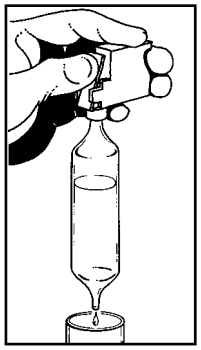


Figure 1

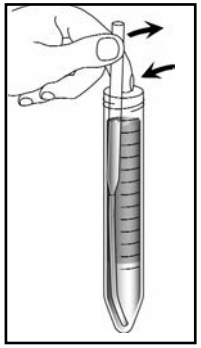


Figure 2

8. Remove the flexible tubing from the CHEMet ampoule and wipe all liquid from the exterior of the ampoule. Place an ampoule cap firmly onto the tip of the CHEMet ampoule. Invert the ampoule several times, allowing the bubble to travel from end to end.
9. Obtain a test result by placing the ampoule, flat end first, into the comparator. Hold the comparator up toward a source of light and view from the bottom. Rotate the comparator until the best color match is found (fig. 3).

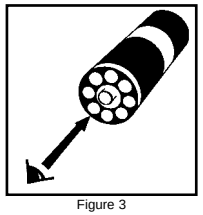


Figure 3

Tip Breaker

The tip breaker opens for easy disposal of the glass tips (pull lever away from body of tip breaker or pull open the side wall). The tip breaker will work most effectively if the tips are emptied out frequently.

Test Method

The Detergents CHEMets®[1] test kit employs the methylene blue extraction method[2,3,4]. Anionic detergents react with methylene blue to form a blue complex that is extracted into an immiscible organic solvent. The intensity of the blue color is directly related to the concentration of "methylene blue active substances (MBAS)" in the sample. Anionic detergents are one of the most prominent methylene blue active substances. Test results are expressed in ppm (mg/Liter) linear alkylbenzene sulfonate (equivalent weight 325).

1. CHEMets is a registered trademark of CHEMetrics, Inc. U.S. Patent No. 3,634,038
2. APHA Standard Methods, 22nd ed., Method 5540 C - 2000
3. EPA Methods for Chemical Analysis of Water and Wastes, Method 425.1 (1983)
4. ASTM D 2330-02, Methylene Blue Active Substances

Safety Information

Read SDS (available at www.chemetrics.com) before performing this test procedure. Wear safety glasses and protective gloves.

CHEMetrics

Simplicity in Water Analysis

www.chemetrics.com
4295 Catlett Road, Midland, VA 22728 U.S.A.
Phone: (800) 356-3072; Fax: (540) 788-4856
E-Mail: orders@chemetrics.com

Feb. 18, Rev. 10

CHLORINE, TOTAL, Low Range (0 to 2.00 mg/L Cl_2)

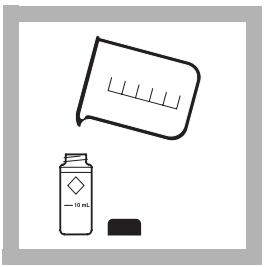
For water, wastewater and seawater

DPD Method* USEPA accepted (powder pillows only)**

Measuring Hints

If the sample temporarily turns yellow after reagent addition or the display shows overrange (flashing **2.20** in display), dilute a fresh sample and repeat the test. A slight loss of chlorine may occur because of the dilution. Multiply the result by the appropriate dilution factor.

* Adapted from *Standard Methods for the Examination of Water and Wastewater.*
** Procedure is equivalent to USEPA method 330.5 for wastewater and Standard Method 4500-Cl G for drinking water.



1. Fill a 10-mL cell to the 10-mL line with sample. Cap.

Note: *Samples must be analyzed immediately and cannot be preserved for later analysis.*

Note: *Be sure the instrument is in the low range mode. See page 37.*

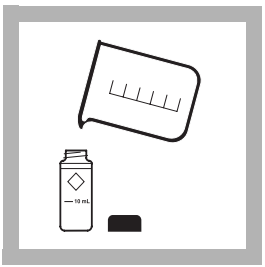
2. Add the contents of one DPD Total Chlorine Powder Pillow to the sample cell (the prepared sample). Cap and gently shake for 20 seconds.

Note: *Gently shaking dissipates bubbles which may form in samples containing dissolved gases.*

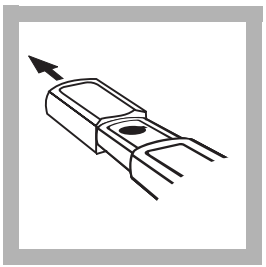
3. Wait 3 minutes. During this period, proceed with *steps 4–8*.

Note: *A pink color will form if chlorine is present.*

Note: *Accuracy is not affected by undissolved powder.*

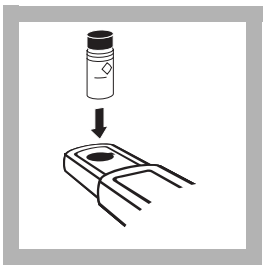


4. Fill a 10-mL sample cell to the 10-mL line with sample (the blank). Cap.



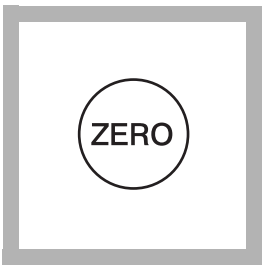
5. Remove the instrument cap.

Note: *For best results, zero the instrument and read the sample under the same lighting conditions.*



6. Place the blank in the cell holder, with the diamond mark facing you. Tightly cover the cell with the instrument cap (flat side should face the back of the instrument).

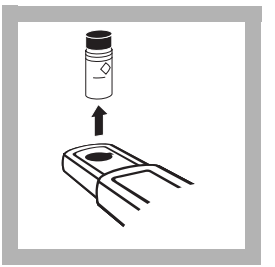
Note: *Wipe liquid off sample cells.*



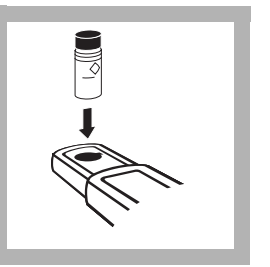
7. Press: **ZERO**

The instrument will turn on and the display will show **- - -** followed by **0.00**.

Note: *The instrument automatically shuts off after 1 minute and stores the last zero in memory. Press* **READ** *to complete the analysis.*

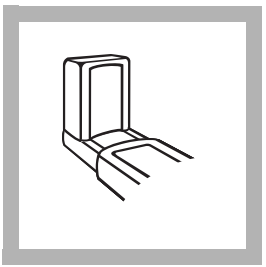


8. Remove the cell from the cell holder.

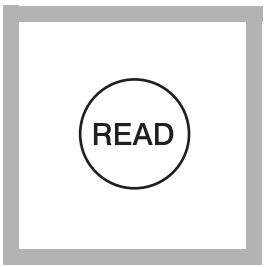


9. Within 3 minutes after the 3-minute reaction period, place the prepared sample in the cell holder.

Note: *Wipe liquid off sample cells.*



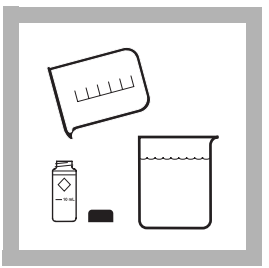
10. Cover the cell with instrument cap.



11. Press: **READ**
The instrument will show **- - -** followed by the result in mg/L total chlorine.

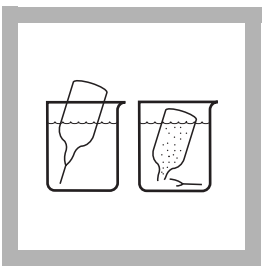
Note: *If the sample temporarily turns yellow after reagent addition or shows overrange (flashing* **2.20***), dilute a fresh sample and repeat the test. Some loss of chlorine may occur. Multiply the result by the dilution factor.*

Using AccuVac® Ampuls



1. Fill a 10-mL sample cell to the 10-mL line with sample (the blank). Cap. Collect at least 40 mL of sample in a 50-mL beaker.

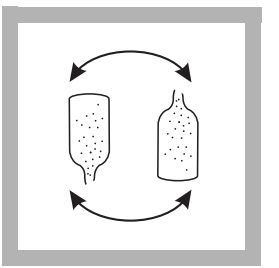
Note: *Samples must be analyzed immediately and cannot be preserved for later analysis.*



2. Fill a DPD Total Chlorine Reagent AccuVac Ampul with sample (the prepared sample).

Note: *Keep the tip immersed until the ampule fills completely.*

Note: *Be sure the instrument is in low range. See page 37.*

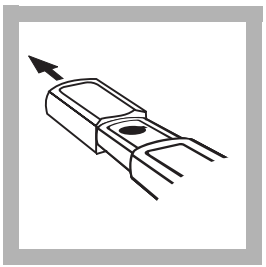


3. Quickly invert the ampule several times to mix. Wipe off any liquid or fingerprints.

Note: *A pink color will develop if chlorine is present.*

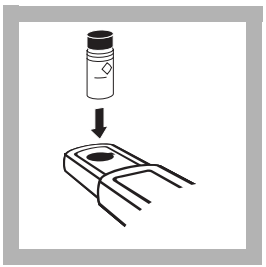
Note: *Accuracy is not affected by undissolved powder.*

4. Wait 3 minutes. During this period, proceed with *steps 5–8*.



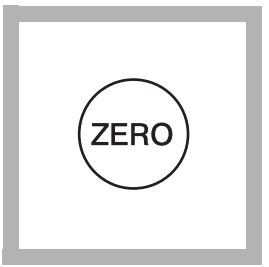
5. Remove the instrument cap.

Note: *For best results, zero and read the sample measurements under the same lighting conditions.*



6. Place the blank in the cell holder with the diamond mark facing you. Tightly cover the cell with the instrument cap (flat side should face the back of the instrument).

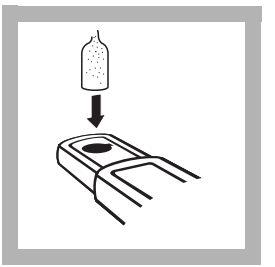
Note: *Wipe liquid off sample cells.*



7. Press: **ZERO**

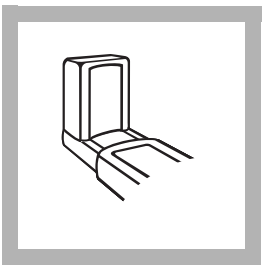
The instrument will turn on and the display will show **- - -** then **0.00**.

Note: *The instrument automatically shuts off after 1 minute and stores the last zero in memory. Press* **READ** *to complete the analysis.*

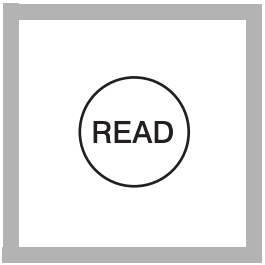


8. Within 3 minutes after the 3-minute reaction period, place the prepared sample in the cell holder.

Note: *Wipe liquid off sample cells.*



9. Cover the ampule with the instrument cap.



10. Press: **READ**

The instrument will show **- - -** followed by the result in mg/L total chlorine.

Note: *If the sample temporarily turns yellow after reagent addition or shows overrange (flashing* **2.20***), dilute a fresh sample and repeat the test. Some loss of chlorine may occur. Multiply the result by the dilution factor.*

Accuracy Check

Standard Additions Method

a. Snap the neck off a Chlorine Standard Solution Voluette® Ampule.

b. Use a TenSette® pipet to add 0.1, 0.2, and 0.3 mL of standard to three 25-mL samples. Swirl gently to mix. (For AccuVac Ampuls, use 50-mL beakers.)

c. Analyze a 10-mL aliquot of each sample as described in the procedure. Each 0.1 mL of standard will cause an incremental increase in chlorine, the exact value depends on the concentration of the Voluette ampule standard. Check the certificate enclosed with the Voluette ampules for this value.

d. If these increases do not occur, call Hach at 800-227-4224. Outside the United States, contact the Hach office or distributor serving you.

Interferences

Samples containing more than the 250 mg/L alkalinity or 150 mg/L acidity as $CaCO_3$ may inhibit full color development, or the color may fade instantly. Neutralize these samples to pH 6–7 with 1 N Sulfuric Acid or 1 N Sodium Hydroxide. Determine the

amount required on a separate 10-mL sample. Add the same amount to the sample to be tested. Correct for the additional volume.

Bromine, iodine, ozone and oxidized forms of manganese and chromium may also react and read as chlorine.

To compensate for the effects of manganese (Mn^{4+}) or chromium (Cr^{6+}), adjust the pH to 6–7 as described above. To a 25-mL sample, add 3 drops of 30 g/L Potassium Iodide Solution, mix, and wait one minute. Add 3 drops of 5 g/L Sodium Arsenite and mix. If chromium is present, allow exactly the same reaction period with DPD for both analyses. Subtract the result of this test from the original analysis to obtain the accurate chlorine concentration.

DPD Total Chlorine Reagent Powder Pillows and AccuVac Ampuls contain a buffer formulation that withstands high levels (at least 1000 mg/L) of hardness without interference.

REQUIRED REAGENTS

Description	Unit	Cat. No.
DPD Total Chlorine Reagent Powder Pillows	100/pkg	21056-69
or		
DPD Total Chlorine Reagent AccuVac® Ampuls	25/pkg	25030-25

REQUIRED APPARATUS (AccuVac® Ampuls)

Beaker, 50 mL	each	500-41

OPTIONAL REAGENTS

Chlorine Standard Solution Voluette® Ampules, 50-75 mg/L, 10 mL	16/pkg	14268-10
Chlorine Standards, secondary, Specv™, 0.0, 0.2, 0.8, and 1.5 mg/L	4/set	26353-00
DPD Total Chlorine Reagent w/dispensing cap	250 tests	21056-29
Potassium Iodide Solution, 30 g/L	100 mL MDB*	343-32
Sodium Arsenite Solution, 5 g/L	100 mL MDB	1047-32
Sodium Hydroxide Standard Solution, 1 N	100 mL MDB	1045-32
Sulfuric Acid Standard Solution, 1 N	100 mL MDB	1270-32
Water, deionized	4 L	272-56

* Marked Dropper Bottle

OPTIONAL APPARATUS

Description	Unit	Cat. No.
AccuVac® Snapper Kit	each	24052-00
Batteries, AAA, alkaline	4/pkg	46743-00
Caps for 10-mL sample cells	12/pkg	24018-12
Cylinder, graduated, 25 mL, poly	each	1081-40
Cylinder, graduated, 100 mL, PMP	each	2172-42
sens*ion*™*1* Basic Portable pH Meter, with electrode	each	51700-10
Pipet, TenSette®, 0.1 to 1.0 mL	each	19700-01
Pipet Tips, For 19700-01 TenSette®	50/pkg	21856-96
Sample Cells, 10-mL with screw caps	6/pkg	24276-06

REPLACEMENT PARTS

Instrument Cap/light shield	each	46704-00
Instrument Manual	each	46760-88

Pro30

USER MANUAL

English

Item #606082
Rev A
Drawing # A606082
July 2011

CONTENTS

WARRANTY

The YSI Professional 30 instrument (Pro30) is warranted for three (3) years from date of purchase by the end user against defects in materials and workmanship, exclusive of batteries and any damage caused by defective batteries. Pro30 cable/probe assemblies are warranted for two (2) years from date of purchase by the end user against defects in material and workmanship. Pro30 instruments & cables are warranted for 90 days from date of purchase by the end user against defects in material and workmanship when purchased by rental agencies for rental purposes. Within the warranty period, YSI will repair or replace, at its sole discretion, free of charge, any product that YSI determines to be covered by this warranty.

To exercise this warranty, call your local YSI representative, or contact YSI Customer Service in Yellow Springs, Ohio at +1 937 767-7241, 800-897-4151 or visit www.YSI.com for a Product Return Form. Send the product and proof of purchase, transportation prepaid, to the Authorized Service Center selected by YSI. Repair or replacement will be made and the product returned, transportation prepaid. Repaired or replaced products are warranted for the balance of the original warranty period, or at least 90 days from date of repair or replacement.

LIMITATION OF WARRANTY

This Warranty does not apply to any YSI product damage or failure caused by:

1. Failure to install, operate or use the product in accordance with YSI's written instructions;
2. Abuse or misuse of the product;
3. Failure to maintain the product in accordance with YSI's written instructions or standard industry procedure;
4. Any improper repairs to the product;
5. Use by you of defective or improper components or parts in servicing or repairing the product;
6. Modification of the product in any way not expressly authorized by YSI.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. YSI'S LIABILITY UNDER THIS WARRANTY IS LIMITED TO REPAIR OR REPLACEMENT OF THE PRODUCT, AND THIS SHALL BE YOUR SOLE AND EXCLUSIVE REMEDY FOR ANY DEFECTIVE PRODUCT COVERED BY THIS WARRANTY. IN NO EVENT SHALL YSI BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY DEFECTIVE PRODUCT COVERED BY THIS WARRANTY.

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INTRODUCTION

Thank you for purchasing the YSI Pro30, an instrument from the YSI *Professional Series* product family. The Pro30 measures conductivity and temperature in water. The Pro30 features an impact resistant and waterproof (IP-67) case, a rugged MS-8 (military-spec) cable connector, backlit display, user-selectable sensor options, 50 data set memory, internal barometer and a rubber over-mold case.

The Pro30 provides valuable instructions and prompts near the bottom of the display that will guide you through operation and use. However, reading the entire manual is recommended for a better understanding of the instrument's features.

> ⓘ *The Pro30 cannot communicate to a PC via a Pro Series communications saddle. Connecting the Pro30 to a communication saddle may cause erratic instrument behavior.*

GETTING STARTED

INITIAL INSPECTION

Carefully unpack the instrument and accessories and inspect for damage. Compare received parts with items on the packing list. If any parts or materials are damaged or missing, contact YSI Customer Service at 800-897-4151 (+1 937 767-7241) or the authorized YSI distributor from whom the instrument was purchased.

BATTERY INSTALLATION

The instrument requires 2 alkaline C-cell batteries. Under normal conditions, the average battery life is 425 hours at room temperature without using the back light. A battery symbol  will blink in the lower, left corner of the display to indicate low batteries when approximately 1 hour of battery life remains.

To install or replace the batteries:

1. Turn the instrument off and flip over to view the battery cover on the back.
2. Unscrew the four captive battery cover screws.
3. Remove the battery cover and remove the old batteries if necessary.
4. Install the new batteries, ensuring correct polarity alignment (figure 1).

5. Place the battery cover on the back of the instrument and tighten the four screws. Do not over-tighten.

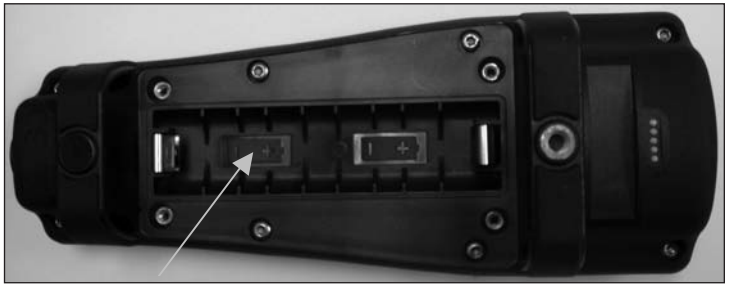


Figure 1. Pro30 with battery cover removed. Notice battery symbols indicating polarities.

> *The waterproof instrument case is sealed at the factory and is not to be opened, except by authorized service technicians. Do not attempt to separate the two halves of the instrument case as this may damage the instrument, break the waterproof seal, and will void the warranty.*

KEY PAD

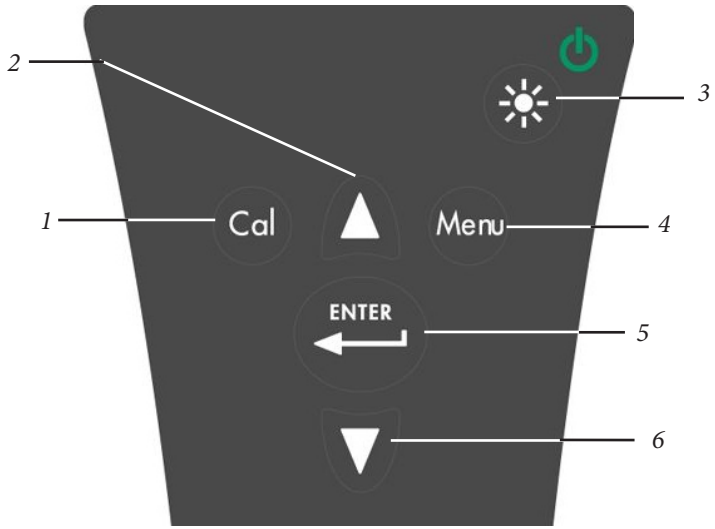


Figure 2, Keypad

Number	*Key*	*Description*
1	Cal	**Calibrate** Press and hold for 3 seconds to calibrate. Opens Calibrate menu from the Run screen.
2	▲	**Up Arrow** Use to navigate through menus, to navigate through box options along the bottom of the Run screen and to increase numerical inputs.
3	⏻ ☀	**Power and Backlight** Press once to turn instrument on. Press a second time to turn backlight on. Press a third time to turn backlight off. Press and hold for 3 seconds to turn instrument off.
4	Menu	**Menu** Use to enter the System Setup menu from the Run screen.
5	ENTER	**Enter** Press to confirm entries and selections.
6	▼	**Down Arrow** Use to navigate through menus, to navigate through box options at the bottom of the Run screen and to decrease numerical inputs.

CONNECTING THE PROBE/CABLE ASSEMBLY TO THE INSTRUMENT

The conductivity and temperature sensors are integral to the cable assembly; therefore, they cannot be removed from the cable.

To connect the cable, align the keys on the cable connector to the slots on the instrument connector. Push together firmly and then twist the outer ring until it locks into place (figure 3). This connection is water-proof.

Figure 3, Note the keyed connector.

RUN SCREEN

Press the power/backlight key to turn the instrument on. The instrument will run through a self test and briefly display a splash screen with system information before displaying the main Run screen (figure 4). The first time the Pro30 is turned on, it will prompt you to select a language; see the First Power On section of this manual for more information.

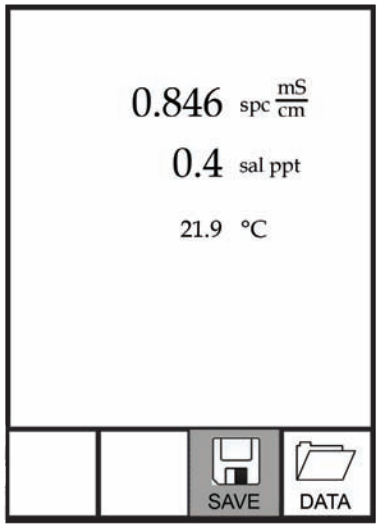


Figure 4, Run screen.

BACKLIGHT

Once the instrument is powered on, pressing the power/backlight key will turn on the display backlight. The backlight will remain on until the key is pressed again or after two minutes of not pressing any key on the keypad.

POWERING OFF

To turn the instrument off, press and hold the power/backlight key for three seconds.

NAVIGATION

The up and down arrow keys allow you to navigate through the functions of the Pro30.

NAVIGATING THE RUN SCREEN

When in the Run screen, the up and down arrow keys will move the highlighted box along the bottom options. Once a box is highlighted, press enter to access the highlighted option.

Description of Run screen box functions from left to right:

Option	*Description*
SAVE	Highlight and press enter to save displayed data to memory.
DATA	Highlight and press enter to view and/or erase saved data.

NAVIGATING THE SYSTEM SETUP MENU

When in the System Setup menu, the up and down arrow keys will move the highlighted bar up and down the system setup options. See the System Setup menu section of this manual for more information about these options.

FIRST POWER ON

The instrument will step through an initial language configuration when powered on for the first time. Use the up or down arrow keys to highlight the

appropriate language then press enter to confirm (figure 5). If an incorrect language is selected, it may be changed in the System Setup menu.

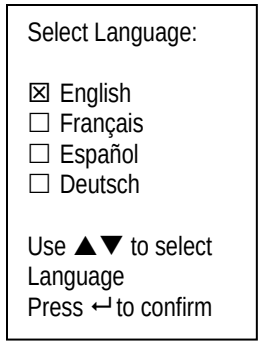


Figure 5, Select language.

After selecting a language, the Run screen will be displayed. The next time the instrument is powered up, the Run screen will display immediately after the splash screen.

SYSTEM SETUP MENU

Press the menu Menu key to access the System Setup menu. The System Setup menu contains multiple screens that are notated as 'pages'. The current page is indicated near the bottom of the display (figure 6).

Use the up and down arrow keys to scroll through menu options and menu pages.

EXITING THE SYSTEM SETUP MENU

To exit the System Setup menu, press the down arrow key until the ESC - Exit box is highlighted, then press enter to return to the Run screen.

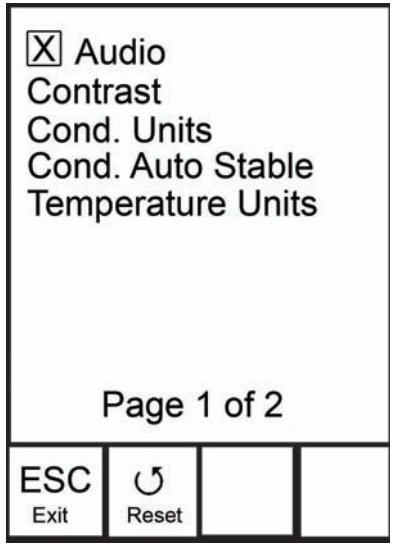


Figure 6, page 1 of System Setup menu. Audio is enabled.

AUDIO

Audio can be enabled or disabled by using the up or down arrow keys to highlight Audio and pressing enter. When enabled, there will be an 'X' in the box next to Audio.

When Audio is enabled, the Pro30 will beep twice to indicate stability when Auto Stable is enabled. The instrument will also beep when a key is pressed. When Audio is disabled, the Pro30 will not beep.

CONTRAST

To adjust the display Contrast, use the up or down arrow keys to highlight Contrast, then press enter. Next, use the up or down arrow keys to adjust the contrast. The up arrow key will darken the contrast and the down arrow key will lighten the contrast. After adjusting the contrast, press enter to save and exit the Contrast adjustment option.

EMERGENCY CONTRAST ADJUSTMENT

If necessary, there is an alternate method of adjusting the contrast. To adjust the contrast, press and hold the menu key, then press the up arrow key to darken the contrast or press the down arrow key to lighten the contrast.

CONDUCTIVITY UNITS (COND. UNITS)

Highlight Cond. Units (Conductivity Units) and press enter to open a submenu that allows you to select the conductivity units to be displayed on the Run screen. Highlight a unit and press enter to enable or disable it. An enabled conductivity unit will have an 'X' in the box next to it. Highlight the ESC-Exit box along the bottom of the display and press enter to save any changes and to close the conductivity units submenu.

There are seven options for displaying conductivity. Only four units can be enabled at the same time:

- COND-mS/cm displays conductivity in milliSiemens per centimeter.
- COND-uS/cm displays conductivity in microSiemens per centimeter.
- SPC-mS/cm displays Specific Conductance in milliSiemens per centimeter. Specific Conductance is temperature compensated conductivity.
- SPC-uS/cm displays Specific Conductance in microSiemens per centimeter. Specific Conductance is temperature compensated conductivity.
- Sal ppt displays salinity in parts per thousand. The salinity reading is calculated from the instrument's conductivity and temperature values using algorithms found in *Standard Methods for the Examination of Water and Wastewater*.
- TDS g/L displays Total Dissolved Solids in grams per liter. TDS is calculated from conductivity and temperature using a user-selectable TDS constant.
- TDS mg/L displays Total Dissolved Solids in milligrams per liter. TDS is calculated from conductivity and temperature using a user-selectable TDS constant.

Note: 1 milliSiemen = 1,000 microSiemens.

SPECIFIC CONDUCTANCE

The conductivity of a sample is highly dependent on temperature, varying as much as 3% for each change of one degree Celsius (temperature coefficient = 3%/°C). In addition, the temperature coefficient itself varies with the nature of the ionic species present in the sample. Therefore, it is useful to compensate for this temperature dependence in order to quickly compare conductivity readings taken at different temperatures.

The Pro30 can display non-temperature compensated conductivity as well as temperature compensated Specific Conductance. If Specific Conductance is selected, the Pro30 uses the temperature and conductivity values associated with

each measurement to calculate a specific conductance value compensated to a user selected reference temperature, see below. Additionally, the user can select the temperature coefficient from 0% to 4%.

Using the Pro30's default reference temperature and temperature coefficient (25 °C and 1.91%), the calculation is carried out as follows:

$$\text{Specific Conductance (25°C)} = \frac{\text{Conductivity of sample}}{1 + 0.0191 * (T - 25)}$$

T = Temperature of the sample in °C

CONDUCTIVITY AUTO STABLE (COND. AUTO STABLE)

Auto Stable utilizes preset values to indicate when a reading is stable. The preset values are adjustable in the System Setup menu. The user can input a % change in readings (0.0 to 1.9) over 'x' amount of time in seconds (3-19).

Highlight Cond. Auto Stable, then press enter to open the submenu.

Use the up or down arrow keys to highlight the % change or seconds (secs) input field, then press enter to make the highlighted field adjustable. Use the up or down arrow keys to adjust the selected value, then press enter to confirm changes. Once you have confirmed any changes, highlight the ESC-Exit box along the bottom of the display and press enter to close the Auto Stable submenu.

To disable Auto Stable, set the % Change input to 0.0.

When Auto Stable is enabled, an (AS) symbol will display next to the reading on the Run screen and blink during stabilization. When the dissolved oxygen and/or conductivity reading stabilizes based on the Auto Stable settings, the (AS) symbol will display steadily and the instrument will beep twice if Audio is turned on.

TEMPERATURE UNITS

Highlight Temperature Units and press enter to open a submenu that allows you to change the temperature units displayed on the Run screen. Highlight the desired unit (Celsius or Fahrenheit) and press enter to enable. The enabled temperature unit will have an 'X' in the box next to it. Only one unit may be enabled at a time. Highlight the ESC-Exit box and press enter to save any changes and to close the Temperature Units submenu.

SPECIFIC CONDUCTANCE REFERENCE TEMPERATURE (SPC REF. TEMP.)

SPC Ref. Temp. (Specific Conductance Reference Temperature) is the reference temperature used to calculate Specific Conductance. The reference temperature range is 15 and 25 °C. The default value is 25 °C.

To change the reference temperature, highlight SPC Ref. Temp. and press enter to open the submenu. With the reference temperature highlighted, press enter to make the field adjustable. Next, use the up or down arrow key to increase or decrease the value. Press enter to save the new reference temperature. Next, highlight the ESC-Exit box and press enter to close the submenu.

SPECIFIC CONDUCTANCE TEMPERATURE COEFFICIENT (SPC %/°C)

SPC %/°C (Specific Conductance Temperature Coefficient) is the temperature coefficient used to calculate Specific Conductance. The coefficient range is 0.00 to 4.00. The default value is 1.91% which is based on KCl standards.

To change the temperature coefficient, highlight SPC %/°C and press enter to open the submenu. With the temperature coefficient highlighted, press enter to make the field adjustable. Next, use the up or down arrow key to increase or decrease the value. Press enter to save the new coefficient. Next, highlight the ESC-Exit box and press enter to close the submenu.

TDS CONSTANT

TDS Constant is a multiplier used to calculate an estimated TDS (Total Dissolved Solids) value from conductivity. The multiplier is used to convert Specific Conductance in mS/cm to TDS in g/L. The Pro30's default value is 0.65. This multiplier is highly dependent on the nature of the ionic species present in the water sample. To be assured of moderate accuracy for the conversion, you must determine a multiplier for the water at your sampling site. Use the following procedure to determine the multiplier for a specific sample:

1. Determine the specific conductance of a water sample from the site;
2. Filter a sample of water from the site;
3. Completely evaporate the water from a carefully measured volume of the filtered sample to yield a dry solid;
4. Accurately weigh the remaining solid;
5. Divide the weight of the solid (in grams) by the volume of water used (in liters) to yield the TDS value in g/L for this site;
6. Divide the TDS value in g/L by the specific conductance of the water in mS/cm to yield the conversion multiplier. Be certain to use the correct units.

If the nature of the ionic species at the site changes between sampling studies, the TDS values will be in error. TDS cannot be calculated accurately from specific conductance unless the make-up of the chemical species in the water remains constant.

To change the TDS Constant in the Pro30, highlight TDS Constant and press enter to open the submenu. With the TDS Constant highlighted, press enter to make the field adjustable. Next, use the up or down arrow key to increase or decrease the value. The input range is 0.30 to 1.00. Press enter to save the new TDS Constant. Next, highlight the ESC-Exit box and press enter to close the submenu.

LANGUAGE

Highlight Language and press enter to open a submenu that allows you to change the language. Highlight the desired language (English, Spanish, German, or French) and press enter to enable. The enabled language will have an 'X' in the box next to it. Highlight ESC-Exit box and press enter to save any changes and to close the Language submenu.

The text in the boxes along the bottom of the Run screen will always be displayed in English regardless of the language enabled in the System Setup menu.

AUTO SHUTOFF

Auto Shutoff allows you to set the instrument to turn off automatically after a period of time. Use the up or down arrow keys to highlight Auto Shutoff, then press enter to open the submenu. Press enter while the minute field is highlighted to make it adjustable. Next, use the up or down arrow keys to adjust the shut off time from 0 to 60 minutes. Press enter to save the new shutoff time. Next, highlight the ESC-Exit box and press enter to close the submenu.

To disable Auto Shutoff, set the Time in Minutes to 0 (zero).

CELL CONSTANT

The Cell Constant displays the cell constant of the conductivity cell. The cell constant is calculated and updated each time a conductivity calibration is performed. The cell constant range is 4.0 to 6.0. Resetting the System Menu resets the cell constant to 5.0.

RESETTING THE SYSTEM SETUP MENU TO FACTORY DEFAULT

To reset the Pro30 settings to factory default, press the down arrow key while in the System Setup menu until the Reset - ↺ box is highlighted, then press enter. The instrument will ask you to confirm the reset. Highlight Yes and press enter to continue with the reset or highlight No and press enter to cancel the reset. A Factory Reset will not affect data saved in the instrument's memory.

The following will be set in the Pro30 after performing a reset:

Parameter	*Reset Defaults*
Audio	On
Contrast	Set to mid range
Conductivity Units	cond uS/cm, spc mS/cm, spc uS/cm and sal ppt
Conductivity Auto Stable	Off (0.0 % Change and 10 seconds)
SPC Reference Temperature	25°C
SPC Temperature Coefficient	1.91%/°C
TDS Constant	0.65
Temperature Units	°C
Language	English
Auto Shutoff	30 minutes
Conductivity Cell Constant	Cell constant reset to 5.0*

*It is recommended to perform a Conductivity calibration after performing a reset.

CALIBRATION

TEMPERATURE

All Pro30 cables have built-in temperature sensors. Temperature calibration is not required nor is it available.

CONDUCTIVITY CALIBRATION

Ensure the conductivity sensor is clean and dry before performing a conductivity, specific conductance or salinity calibration.

> ⓘ *It is not necessary to calibrate conductivity, specific conductance and salinity. Calibrating one of these parameters will simultaneously calibrate the others. YSI recommends calibrating specific conductance for greatest ease.*

CALIBRATING SPECIFIC (SP.) CONDUCTANCE OR CONDUCTIVITY

Note: When calibrating Specific Conductance, the Pro30 uses the factory default values for the Specific Conductance Reference Temperature and the Specific Conductance Temperature Coefficient regardless of what is configured in the System Setup Menu. The default value for the Reference Temperature is 25°C and the default value for the Temperature Coefficient is 1.91%/°C. It is important to note that the Temperature Coefficient of a calibration solution is dependent on the contents of the solution. Therefore, YSI recommends using a traceable calibration solution made of KCl (potassium chloride) when calibrating Specific Conductance since these solutions typically have a Temperature Coefficient of 1.91%/°C. Additionally, be sure to enter the value of the solution as it is listed for 25°C when calibrating Specific Conductance.

1. Fill a clean container (i.e. plastic cup or glass beaker) with fresh, traceable conductivity calibration solution and place the sensor into the solution. The solution must cover the holes of the conductivity sensor that are closest to the cable (figure 7). Ensure the entire conductivity sensor is submerged in the solution or the instrument will read approximately half the expected value. Gently move the probe up and down to remove any air bubbles from the conductivity sensor.

Figure 7, solution above two holes near cable.

2. Turn the instrument on and allow the conductivity and temperature readings to stabilize. Press and hold the Cal key for 3 seconds. Highlight Conductivity and press enter. Next, highlight the desired calibration method, Sp. Conductance or Conductivity, and press enter.
3. Highlight the units you wish to calibrate, either uS/cm or mS/cm, and press enter. 1 mS = 1,000 uS. Next, use the up or down arrow key to adjust the value on the display to match the value of the conductivity calibration solution. If calibrating conductivity, it is necessary to look up the value of the solution at the current temperature and enter that value into the Pro30. Most conductivity solutions are labeled with a value at 25°C. If calibrating specific conductance, enter the value listed for 25°C. Depressing either the up or down arrow key for 5 seconds will move the changing digit one place to the left. The Pro30 will remember the entered calibration value and display it the next time a conductivity calibration is performed.
4. Press enter to complete the calibration. Or, press Cal to cancel the calibration and return to the Run screen.
5. 'Calibration Successful' will display for a few seconds to indicate a successful calibration and then the instrument will return to the Run screen.
6. If the calibration is unsuccessful, an error message will display on the screen. Press the Cal key to exit the calibration error message and return to the Run screen. See the Troubleshooting guide for possible solutions.

CALIBRATING IN SALINITY

1. Fill a clean container (i.e. plastic cup or glass beaker) with fresh, traceable salinity calibration solution and place the sensor into the solution. The solution must cover the holes of the conductivity sensor that are closest to the cable (figure 7). Ensure the entire conductivity sensor is submerged in the solution or the instrument will read approximately half the expected value. Gently move the probe up and down to remove any air bubbles from the conductivity sensor.
2. Turn the instrument on and allow the conductivity and temperature readings to stabilize. Press and hold the Cal key for 3 seconds. Highlight Conductivity and press enter. Next, highlight Salinity and press enter.
3. Use the up or down arrow key to adjust the value on the display to match the value of the salinity solution. Depressing either the up or down arrow key for 5 seconds will move the changing digit one place to the left. The Pro30 will remember the entered calibration value and display it the next time a salinity calibration is performed.
4. Press enter to complete the calibration. Or, press Cal to cancel the calibration and return to the Run screen.
5. 'Calibration Successful' will display for a few seconds to indicate a successful calibration and then the instrument will return to the Run screen.
6. If the calibration is unsuccessful, an error message will display on the screen. Press the Cal key to exit the calibration error message and return to the Run screen. See the Troubleshooting guide for possible solutions.

TAKING MEASUREMENTS

Before taking measurements, be sure the instrument has been calibrated to ensure the most accurate readings. Place the probe in the sample to be measured and give the probe a quick shake to release any air bubbles. Be sure the conductivity sensor is completely submerged in the sample. The two holes near the cable should be covered by the sample for accurate conductivity readings (figure 7). Allow the temperature readings to stabilize.

SAVING AND VIEWING DATA

The Pro30 can store 50 data sets in non-volatile memory for later viewing. A data set includes the values currently on the display, i.e. temperature, dissolved oxygen and two conductivity parameters. Each data point is referenced with a data set number, 01 through 50.

SAVING DATA

> *The Pro30 can not communicate to a PC via a Pro Series communications saddle. Connecting the Pro30 to a communication saddle may cause erratic instrument behavior.*

From the Run screen, use the up or down arrow keys to highlight the Save box and press enter to save the current readings. The instrument will indicate the data set is saved and display the saved data set's number (figure 8).

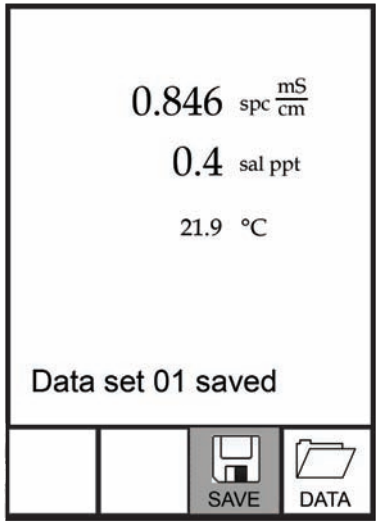


Figure 8, data set saved.

The instrument will display 'Memory Full' if all 50 data sets have been saved and you attempt to save another data set.

VIEWING AND ERASING SAVED DATA - DATA MODE

Data mode allows you to view and erase saved data. From the Run screen, use the up or down arrow keys to highlight Data and press enter to access Data mode. Note that the function boxes at the bottom of the display are different in Data mode (figure 9).

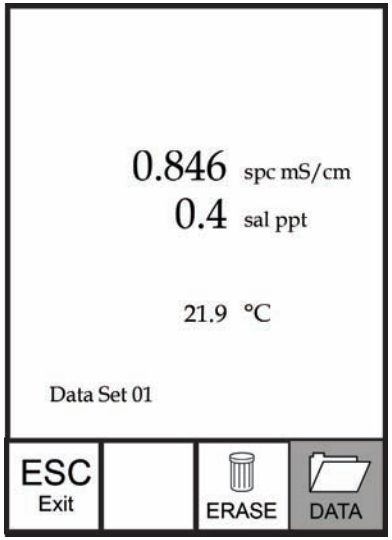


Figure 9, Data mode.

VIEWING DATA

Once in Data mode, use the up and down arrow keys to view saved data sets in sequential order or press enter to access the bottom functions. After accessing the bottom functions, highlight the Data box and press enter to regain access to viewing data. The data set displayed is indicated by the data set number, 01 through 50.

ERASING DATA

While viewing saved data, press the enter key to access the function boxes at the bottom of the display. Next, use the up or down arrow keys to highlight Erase, then press enter. The instrument will give you the option to erase one data set or all data sets (figure 10).

Figure 10, Erase data mode.

Use the up or down arrow key to select Erase Data Set, Erase All Sets or the ESC-Exit function box, then press enter to confirm.

Select ESC-Exit and press enter to exit Erase mode without erasing any data.

Select Erase Data Set and press enter to erase the data set that was displayed before entering Erase mode. For example, if data set 12 was displayed before entering erase mode, and Erase Data Set is selected, Data Set 12 will be erased from memory and the data sets AFTER that number will move up to keep them sequential. For example, if there are15 records and number 12 is erased then 13 becomes 12, 14 becomes 13, and 15 becomes 14. The instrument will return to Data mode after erasing one data set.

Select Erase All Data Sets and press enter to clear the Pro30 memory and return to Data mode.

EXITING DATA MODE

While in Data mode, press enter to access the bottom functions. Next, highlight the ESC-Exit box and press enter to return to the Run screen.

CARE, MAINTENANCE AND STORAGE

This section describes the proper procedures for care, maintenance and storage of the instrument. The goal is to maximize their lifetime and minimize down-time associated with improper instrument usage.

GENERAL MAINTENANCE

GENERAL MAINTENANCE - GASKET

The instrument utilizes a gasket as a seal to prevent water from entering the battery compartment. Following the recommended procedures will help keep the instrument functioning properly.

If the gasket and sealing surfaces are not maintained properly, it is possible that water can enter the battery compartment. If water enters this area, it can severely damage the battery terminals causing loss of battery power and corrosion to the battery terminals. Therefore, when the battery compartment lid is removed, the gasket that provides the seal should be carefully inspected for contamination (i.e. debris, grit, etc.) and cleaned with water and mild detergent if necessary.

SENSOR MAINTENANCE

SENSOR MAINTENANCE - TEMPERATURE

You must keep the temperature sensor free of build up. Other than that, no additional maintenance is required. A toothbrush can be used to scrub the temperature sensor if needed.

SENSOR MAINTENANCE - CONDUCTIVITY

The openings that allow sample access to the conductivity electrodes should be cleaned regularly. The small cleaning brush included in the Maintenance Kit is intended for this purpose. Dip the brush in clean water and insert it into each hole 10 to 12 times. In the event that deposits have formed on the electrodes, it may be necessary to use a mild detergent (laboratory grade soap or bathroom foaming tile cleaner) with the brush. Rinse thoroughly with clean water, then check the response and accuracy of the conductivity cell with a calibration solution.

SENSOR STORAGE

SHORT AND LONG TERM STORAGE

For both short and long term storage, the conductivity sensor should be stored clean and dry.

Remove the batteries from the instrument when storing it for long periods of time (>30 days).

Long Term Storage Temperature: -5 to 70°C (23 to 158°F)

TROUBLESHOOTING

Symptom	*Possible Solution*
Instrument will not turn on, a battery symbol appears, or "Critical Shutdown" displays on the screen.	1. Low battery voltage, replace batteries. 2. Batteries installed incorrectly, check battery polarity. 3. Return system for service.
Temperature values display Over or Undr on Run screen.	1. Sample temperature is less than -5° C or more than +55°C. Increase or decrease the sample temperature to bring within the allowable range. 2. Contact YSI Tech Support.
Instrument will not calibrate the Conductivity sensor; instrument displays "Calibration Over", "Calibration Under", or "Unstable Reading" during calibration.	1. Ensure the conductivity sensor is clean. Follow the cleaning procedures in the Care, Maintenance and Storage section of this manual. 2. Verify the calibration solution is above the two holes near the cable, see figure 8. 3. Verify the calibration solution is not expired or contaminated. Try a new bottle of solution. 4. Ensure you are entering in the correct value for the solution according to the measurement units. 1 mS = 1,000 uS. 5. Allow sufficient stabilization time for conductivity and temperature AND wait at least 3 seconds before confirming a calibration. 6. Contact YSI Tech Support.

Symptom	*Possible Solution*
Conductivity readings are inaccurate.	1. Ensure the conductivity sensor is clean. Follow the cleaning procedures in the Care, Maintenance and Storage section of this manual. 2. Verify the sample is above the two holes near the cable, see figure 8. 3. Verify calibration. 4. Verify temperature readings are accurate. 5. Verify the correct units are setup in the System Setup menu, i.e. uS vs mS and Conductivity vs. Specific Conductance. 6. Contact YSI Tech Support.
Conductivity values display Over or Undr on Run screen.	1. Ensure the conductivity sensor is clean. Follow the cleaning procedures in the Care, Maintenance and Storage section of this manual. 2. Verify the sample is above the two holes near the cable, see figure 8 3. Verify calibration. 4. Verify temperature readings are accurate. 5. Sample conductivity is outside the measurement range of the instrument, i.e. 0-200 mS. 6. Contact YSI Tech Support.

SPECIFICATIONS

These specifications represent typical performance and are subject to change without notice. For the latest product specification information, please visit YSI's website at www.ysi.com or contact YSI Tech Support.

Parameter	*Range*	*Resolution*	*Accuracy*
Temperature	-5 to 55°C	0.1°C	± 0.2°C
Conductivity	0-500 uS/cm 0-5 mS/cm 0-50 mS/cm 0-200 mS/cm (auto ranging)	0.0001 to 0.1 mS/cm; 0.1 to 0 uS/cm (range dependent)	Instrument only: ± 0.5% of the reading or 1 uS/cm, whichever is greater. Instrument with 1 or 4 meter cables: ± 1.0% of the reading or 1 uS/cm, whichever is greater. Instrument with 10, 20, or 30 meter cables: ± 2.0% of the reading or 1 uS/cm, whichever is greater.
Salinity	0 to 70 ppt	0.1 ppt	± 1.0% of the reading or ± 0.1 ppt, whichever is greater.
Total Dissolved Solids (TDS)	0 to 100 g/L. TDS Constant range: 0.3 to 1.00 (0.65 default)	0.0001 to 0.1 g/L (range dependent)	Dependent on accuracy of temperature, conductivity and TDS Constant.

ACCESSORIES / PART NUMBERS

Part Number	*Description*
6050030	Pro30 Instrument
60530-1, -4, -10, -20, or -30	1, 4, 10, 20, 30-meter cable assembly*
603077	Flow cell
603056	Flow cell mounting spike
603075	Carrying case, soft-sided
603074	Carrying case, hard-sided
603069	Belt clip
063517	Ultra clamp for instrument
063507	Tripod for instrument
603062	Cable management kit, included with all cables longer then 1 meter.
605978	Cable weight, 4.9 oz, stackable
603070	Shoulder strap
060907	Conductivity Calibration Solution, 1,000 µS/cm. 1 box of 8 pints.
060911	Conductivity Calibration Solution, 10,000 µS/cm. 1 box of 8 pints.
060660	Conductivity Calibration Solution, 50,000 µS/cm. 1 box of 8 pints.
065274	Conductivity Calibration Solution, 100,000 µS/cm. 1 box of 8 pints.

*All cables include a temperature and conductivity sensor.

DECLARATION OF CONFORMITY

The undersigned hereby declares on behalf of the named manufacturer under our sole responsibility that the listed product conforms to the requirements for the listed European Council Directive(s) and carries the CE mark accordingly.

Manufacturer:	YSI Incorporated 1725 Brannum Lane Yellow Springs, OH 45387 USA
Product Name:	Pro30 Water Quality Instrument
Model Numbers	
Instrument/Accessory:	Pro30 (6050030)
Probe/Cable Assemblies:	60530-1, -4, -10, -20, and -30
Conforms to the following:	
Directives:	IEC 61326-1:2005 RoHS 2002/95/EC WEEE 2002/96/EC IP-67 Protection per ANSI/IEC 60529-2004
Harmonized Standards:	• EN61326-1:2006 (IEC 61326-1:2005) Basic Immunity
Supplementary Information:	All performance met the operation criteria as follows: 1. ESD, IEC 61000-4-2:2001, Performance Criterion B 2. Radiated Immunity, IEC 61000-4-3, Performance Criterion A 3. Electrical Fast Transient (EFT), IEC 61000-4-4:2004, +Corr. 1:2006 + Corr. 2:2007, Performance Criterion B 4. Radio Frequency, Continuous Conducted Immunity, IEC61000-4-6, Performance Criterion A 5. Radiated Emissions, EN 61326-1:2006 (IEC61326-1:2005) Class B
Authorized EU Representative	YSI Hydrodata Ltd Unit 2 Focal Point, Lacerta Court, Works Road Letchworth, Hertfordshire, SG6 1FJ UK

Signed: Lisa M. Abel Date: 27 June 2011
Title: Director of Quality

RECYCLING

YSI is committed to reducing the environmental footprint in the course of doing business. Even though materials reduction is the ultimate goal, we know there must be a concerted effort to responsibly deal with materials after they've served a long, productive life-cycle. YSI's recycling program ensures that old equipment is processed in an environmentally friendly way, reducing the amount of materials going to landfills.

- Printed Circuit Boards are sent to facilities that process and reclaim as much material for recycling as possible.
- Plastics enter a material recycling process and are not incinerated or sent to landfills.
- Batteries are removed and sent to battery recyclers for dedicated metals.

When the time comes for you to recycle, follow the easy steps outlined at www.ysi.com.

BATTERY DISPOSAL

The Pro30 is powered by alkaline batteries which the user must remove and dispose of when the batteries no longer power the instrument. Disposal requirements vary by country and region, and users are expected to understand and follow the battery disposal requirements for their specific locale.

CONTACT INFORMATION

ORDERING AND TECHNICAL SUPPORT

Telephone: 800 897 4151 (USA)
+1 937 767 7241 (Globally)
Monday through Friday, 8:00 AM to 5:00 ET

Fax: +1 937 767 9353 (orders)
+1 937 767 1058 (technical support)

Email: environmental@ysi.com
Mail: YSI Incorporated
1725 Brannum Lane
Yellow Springs, OH 45387 USA

Internet: www.ysi.com

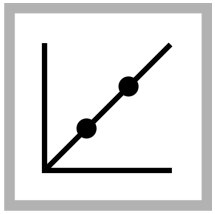
When placing an order please have the following available:
1.) YSI account number (if available)
2.) Name and phone number
3.) Purchase Order or Credit Card number
4.) Model Number or brief description
5.) Billing and shipping addresses
6.) Quantity

SERVICE INFORMATION

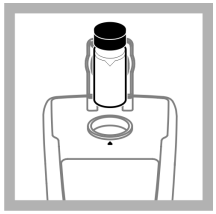
YSI has authorized service centers throughout the United States and Internationally. For the nearest service center information, please visit www.ysi.com and click 'Support' or contact YSI Technical Support directly at 800-897-4151 (+1 937-767-7241).

When returning a product for service, include the Product Return form with cleaning certification. The form must be completely filled out for a YSI Service Center to accept the instrument for service. The form may be downloaded from www.ysi.com by clicking on the 'Support".

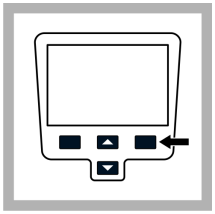
Item # 606082
Rev A
Drawing # A606082
July 2011



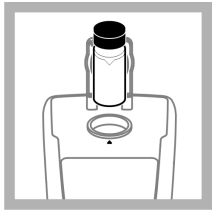
1. Push the **CALIBRATION** key to enter the Calibration mode. Follow the instructions on the display.
Note: *Gently invert each standard before inserting the standard.*



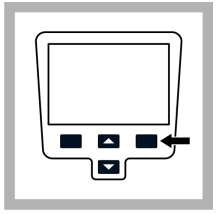
2. Insert the 20 NTU StablCal Standard and close the lid.
Note: *The standard to be inserted is bordered.*



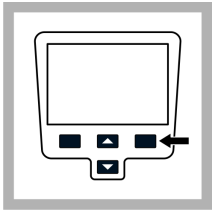
3. Push **Read**. The display shows Stabilizing and then shows the result.



4. Repeat Step 2 and 3 with the 100 NTU and 800 NTU StablCal Standard.
Note: *Push **Done** to complete a 2 point calibration.*



5. Push **Done** to review the calibration details.



6. Push **Store** to save the results.
After a calibration is complete, the meter automatically goes into the Verify Cal mode. Refer to Calibration verification (Verify Cal) on page 16.

Turbidity measurement

⚠ WARNING

Potential explosion and fire hazard. This turbidimeter is designed for water based samples. Do not measure solvent or combustible based samples.

Readings can be taken with the Normal reading mode, Signal Average mode or in the Rapidly Settling Turbidity mode. Refer to Reading modes on page 16 for more information. For accurate turbidity readings use clean sample cells and remove air bubbles (degassing).

Measurement notes

Proper measurement techniques are important in minimizing the effects of instrument variation, stray light and air bubbles. Use the following measurement notes for proper measurements.

Instrument

- Make sure that the meter is placed on a level, stationary surface during the measurement.
  Note: *Do not hold the meter in the hand during measurement.*
- Always close the sample compartment lid during measurement, calibration and storage.
- Remove sample cell and batteries from the instrument if the instrument is stored for an extended time period (more than a month).
- Keep the sample compartment lid closed to prevent the entry of dust and dirt.

Sample cells

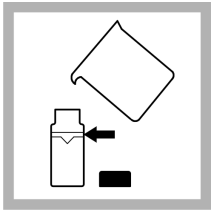
- Always cap the sample cell to prevent spillage of the sample into the instrument.
- Always use clean sample cells in good condition. Dirty, scratched or damaged cells can cause inaccurate readings.
- Make sure that cold samples do not “fog” the sample cell.
- Store sample cells filled with distilled or deionized water and cap tightly.

Measurement

- Measure samples immediately to prevent temperature changes and settling. Before a measurement is taken, always make sure that the sample is homogeneous throughout.
- Avoid sample dilution when possible.
- Avoid operation in direct sunlight.

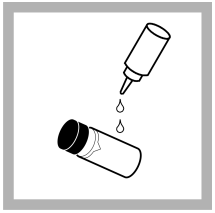
Turbidity measurement procedure

Note: *Before a measurement is taken, always make sure that the sample is homogeneous throughout.*



1. Collect a representative sample in a clean container. Fill a sample cell to the line (about 15 mL). Take care to handle the sample cell by the top. Cap the cell.

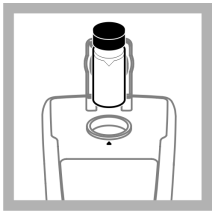
2. Wipe the cell with a soft, lint-free cloth to remove water spots and fingerprints.



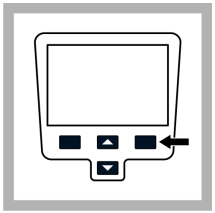
3. Apply a thin film of silicone oil. Wipe with a soft cloth to obtain an even film over the entire surface (Apply silicone oil to a sample cell on page 17).

4. Push the **Power** key to turn the meter on. Place the instrument on a flat, sturdy surface.

Note: *Do not hold the instrument while making measurements.*



5. Gently invert and then insert the sample cell in the instrument cell compartment so the diamond or orientation mark aligns with the raised orientation mark in front of the cell compartment. Close the lid.



6. Push **Read**. The display shows Stabilizing then the turbidity in NTU (FNU). The result is shown and stored automatically (Refer to Data management on page 11)

Data management

About stored data

The following types of data are stored in the data log:

- Reading Log: stores automatically each time a sample reading is taken (500 records).
- Calibration Log: stores only when **Store** is selected at the end of a calibration (25 records).
- Verify Cal Log: stores only after **Done** is selected at the end of a verification calibration (250 records).

When the data log becomes full, the oldest data point is deleted when more data is added to the log.

View data log

The data log contains Reading Log, Calibration Log and Verify Cal log. All logs can be sorted by date.

APPENDIX G

Field Investigation Standard Operating Procedures (SOPs)

SOP 1: Dry Weather Outfall Inspection

Introduction

Outfalls can be in the form of pipes or ditches and is the final point of discharge into a body of water for an engineered storm drain system. Current and pending regulations require that all outfalls, that are part of the storm drain system, be inspected, and that the water quality at these outfalls be analyzed under both dry and wet weather conditions. "SOP 2: Wet Weather Outfall Inspection," covers the objectives for wet weather outfall inspections. This SOP discusses the objectives of dry weather outfall inspections.[1]

During a dry weather period, it is expected that minimal flow will be observed, if at all, at any stormwater outfall. As such, the objective of dry weather outfall inspections is to analyze the presence of any flow at each stormwater outfall and identify any potential source(s) of an illicit discharge further described in "SOP 3: Locating Illicit Discharges."

As per the Consent Decree, by May 31st, 2023, the City of Holyoke (the City) shall submit to the EPA for review an Illicit Discharge Detection and Elimination (IDDE) Plan which includes screening and monitoring all known MS4 outfalls and interconnections under dry weather conditions. As defined in the Consent Decree, the City shall conduct dry-weather inspections only when no more than 0.1 inches of rainfall or significant snowmelt has occurred in the preceding 24 hours, but 48 hours when possible.[2] Unlike wet weather sampling, dry weather inspections are not intended to capture a "first flush" event, but rather identify any discharge that may be present at a stormwater outfall during a period without recorded rain or snowmelt in order to facilitate the detection of an illicit discharge.

Catchment Investigations

In order to determine the approximate location of suspected illicit discharges, the first step is to complete an investigation of the storm drain system under dry weather conditions. This includes systematically and progressively observing, sampling, and evaluating key junction manholes and sump manholes within the City. The City's DPW is responsible for completing catchment investigations, incorporating updates to the City's infrastructure into their storm system maps, and refining catchment delineations based on field investigations.

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1 *Standard Operating Procedures. Central Massachusetts Regional Stormwater Coalition. (n.d.). Retrieved January 16, 2023, from https://www.centralmastormwater.org/toolbox/pages/standard-operating-procedures*

2 *Civil Action No. 19-CV-10332-MGM: Final Consent Decree." United States District Court for the District of Massachusetts, United States and Massachusetts v. City of Holyoke, September 27, 2022.*

As per the 2016 Massachusetts Small MS4 General Permit, the following definitions of important terms related to the dry weather manhole inspection program are as follows[3]:

- **Junction Manhole** is a manhole or structure with two or more inlets accepting flow from two or more alignments. Manholes with inlets solely from private storm drains, individual catch basins, or both are not considered junction manholes for these purposes.
- **Key Junction Manholes** are those junction manholes that can represent one or more junction manholes without compromising adequate implementation of the illicit discharge program. A permittee may exclude a junction manhole located upstream from another located in the immediate vicinity or that is serving a drainage alignment with no potential for illicit connections. A pictorial example of junction manholes and how they relate to key junction manholes can be found in Figure 1 below.

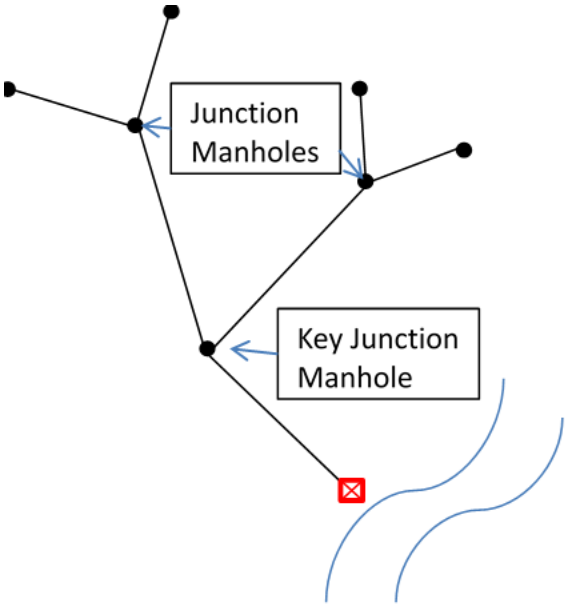

Figure 1 – Junction vs. Key Junction Manholes

- **Common Manholes** have connections to both the sewer and drain system and therefore provide a potential for cross-contamination.

In addition to the manhole types identified above, sump manholes may also be located in the City's system. These structures have a significant difference in elevation between the bottom of the structure and bottom of the outlet pipe. This difference in elevation, also known as a sump, could potentially allow illicit discharges to collect and, as a result, not flow downstream. In preparation for field inspections, the City's DPW should identify all key junction manholes, mainline sump manholes, as well as any potential connections to other catchments such as weirs or overflows. These structures will then systematically be inspected for evidence of illicit discharges, and if found, eventual isolation and elimination.

Prior to field investigations, the City shall notify property owners of upcoming investigations via flyers and/or door hangers. Ideally, storm drains and sump manholes should be cleaned prior to investigations, but it is not required. Specifically, any known problem areas or areas with known blockages should be prioritized for cleaning.

[3] *United States Environmental Protection Agency (EPA). (n.d.). General Permits for stormwater discharges from small municipal … –US EPA. Massachusetts Small MS4 General Permit. Retrieved January 16, 2023, from https://www3.epa.gov/region1/npdes/stormwater/ma/2016fpd/final-2016-ma-sms4-gp-mod.pdf*

Once property owners have been notified and cleaning of the storm drain system has occurred, catchment investigations can begin. This can occur in one of two ways, or via a combination of both:

(1) By working progressively down from the upper parts of the catchment toward the outfall ("Top Down") or
(2) By working progressively up from the outfall and inspecting key junction manholes along the way ("Bottom-Up").

Both methods have their advantages. Starting upstream can be more efficient, whereas starting downstream works well for small catchments that aren't influenced by receiving water bodies. As such, inspection direction can depend on the nature of the drainage system (e.g. size, receiving water influence) and also the completeness and accuracy of the City's GIS mapping. This can also depend on whether or not most outfalls are partially or totally submerged. In the event that manholes are partially or completely submerged, samples should not be collected. Rather these structures should be investigated furthered via building inspections, dye testing, or even bypass pumping so as to remove flow from the structure so it can be further visually inspected.

Once an inspection direction has been chosen, the investigation can then begin with key junction manholes and mainline sump manholes. From here, the inspection can continue towards junction manholes and other manholes, as needed, with the purpose to isolate any illicit discharges. The specific steps shall be as follows:

1. Manholes will be opened and inspected for visual and olfactory evidence of illicit connections during dry weather. A sample manhole inspection report is provided in Attachment 1. Visual evidence may include toilet paper, sanitary products, sewage, soap, food, or other indications of anything other than stormwater. Olfactory evidence may include sewage, soap, laundry, bleach, or other odors not typical of stormwater.
2. Where possible, condition information and measured elevation of the manhole rim as well as the invert depth should be recorded.
3. If flow is observed, a sample shall be collected and analyzed in accordance with the procedures outlined in the following sections.
4. If no flow is observed, the inlet or outlets to the manholes may be partially blocked using sandbags or similar barriers. More details associated with this method can be found in "SOP 3: Locating Illicit Discharges."
5. Where sampling results or visual or olfactory evidence indicate potential illicit discharges, the area draining to the manhole should be flagged for further upstream manhole investigation and/or isolation and confirmation of sources.
6. Subsequent manhole inspections shall proceed until the location of the suspected illicit discharges can be isolated to a pipe segment between two manholes.
7. If no evidence of an illicit discharge is found, catchment investigations will be considered complete upon completed of key junction manhole sampling.

Condition Assessment

If any flow is observed during dry weather conditions at a stormwater outfall, a sample shall be taken after a visual observation of the discharge is complete. If any pollution or signs of potential illicit connections are observed, they should be noted and investigated further. As per the Central Massachusetts Regional Stormwater Coalition, the following visual indicators shown in Table 1 may be the result of the following sources listed in Table 1.[4]

[4] *Standard Operating Procedures. Central Massachusetts Regional Stormwater Coalition. (n.d.). Retrieved January 16, 2023, from https://www.centralmastormwater.org/toolbox/pages/standard-operating-procedures*

Table 1 – Visual Condition Assessment

Indicator	Possible Source
Foam	upstream vehicle washing activities or illicit discharge
Oil Sheen	leak or spill
Cloudiness	suspended solids (i.e. dust, ash, powdered chemicals, ground up materials, etc.)
Color or Odor	raw materials, chemicals, or sewage
Excessive Sediment	disturbed earth of unpaved areas lacking adequate erosion control measures
Sanitary Waste/ Optical Enhancers*	illicit discharge
Orange Staining	high mineral concentrations

* Fluorescent dyes added to laundry detergent and some toilet paper

While many of the indicators listed in Table 1 would indicate an illicit discharge, some indicators may occur naturally. For example, orange staining could be the result of naturally occurring iron. However, it may be difficult to determine the difference between natural foam and foam caused by pollution. Natural foam can typically be found in water with high organic content such as bog lakes, streams that originate from bog lakes, productive lakes, wetlands, or woody areas. As per the Central Massachusetts Regional Stormwater Coalition, it's important to consider the following factors listed in Table 2 when determining if the source of foam present at a stormwater outfall is natural or not.[5]

Table 2 – Conditional and Qualitative Considerations of Foam

Factors	Explanation
Wind Direction or Turbulence	Natural foam occurrences of the beach coincide with onshore winds. Often, foam can be found along a shoreline and/or on open waters during windy days. Natural occurrences in rivers can be found downstream of a turbulent site.
Proximity to Potential Pollution Source	Some entities including the textile industry, paper production facilities, oil industries, and fire fighting activities work with materials that cause foaming in water. If these materials are released to a water body in large quantities, they can cause foaming. The presence of silt in water, such as from a construction site can cause foam.
Physical Feeling	Natural foam is typically persistent, light, not slimy to the touch.
Visual Observation	Prescence of decomposing plants or organic material in the water.

In addition to foam, both bacteria and petroleum can create a sheen on the water surface. Differentiating the two can be as simple as disturbing the "sheen" with a pole, stick, or similar object. A sheen caused by oil will remain intact and move in a swirl pattern while a sheen caused by bacteria will separate into a number of smaller patches and appear "blocky." In addition, bacteria or naturally occurring sheens are usually silver or dull in color. While bacterial sheen is not a pollutant, it should be noted when describing the discharge.[6]

[5] *Standard Operating Procedures. Central Massachusetts Regional Stormwater Coalition. (n.d.). Retrieved January 16, 2023, from https://www.centralmastormwater.org/toolbox/pages/standard-operating-procedures*

[6] *Standard Operating Procedures. Central Massachusetts Regional Stormwater Coalition. (n.d.). Retrieved January 16, 2023, from https://www.centralmastormwater.org/toolbox/pages/standard-operating-procedures*

Optical enhancers on the other hand can be visible to the naked eye when found in high enough concentrations and will appear as a bluish-purple haze. If a visual observation is unable to confirm the presence of this pollutant, a quantitative test can be used. In order to perform this test, a clean, white, cotton pad should be placed, either directly in, or within a sample of, the discharge for several days. After soaking, the cotton pad should be dried and then viewed under a fluorometer. If the cotton pad fluoresces, optical enhancers are assumed to be the pollutant and present. The magnitude of the fluorescence, as measured in fluorescent units, can be used to determine the concentration of optical enhancers within the sample. Often a visual observation is enough as it is not typical that this analysis is required.

Sample Collection

Table 3 lists the field equipment commonly used for dry weather outfall screening and sampling.

Table 3 – Field Equipment for Dry Weather Outfall Screening and Sampling

Equipment	Use/Notes
Clipboard	For organization of field sheets and writing surface
Field Forms or Tablet for Electronic Forms	Field sheets for both dry weather inspection and dry weather sampling should be available, with extra sheets included
Chain of Custody Forms	To ensure proper handling of all samples
Pens/Pencils/Permanent Markers	For proper labeling
Nitrile Gloves	To protect the sampler as well as the sample from contamination
Flashlight/Headlamp w/ Batteries	For looking in outfalls or manholes, helpful in early mornings as well
Cooler with Ice	For transporting samples to the laboratory
Digital Camera	For documenting field conditions at time of inspection
Personal Protective Equipment (PPE)	Reflective vest, safety glasses, hard hats, and boots at a minimum. Work gloves, long pants, and sleeves for protection from environmental conditions such as brush, insects, and poisonous plants.
Insect/Plant Repellant and Sunscreen	For protection from environmental conditions.
GPS Receiver	For taking spatial location data
Distilled water	For use with test kits and water quality meters
Water Quality Meters	Hand-held meters for testing various water quality parameters.
Field Test Kits	Have extra kits on hand to sample more outfalls than are anticipated to be screened in a single day
Rinse Water/Calibration standards	Cleaning equipment and calibration
Label Tape	For labeling sample containers
Sample Containers	Make sure all sample containers are clean.
	Keep extra sample containers on hand at all times.
	Make sure there are proper sample containers for what is being sampled for (i.e., bacteria and total phosphorus analysis require sterile containers and preservatives).
	Telescopic Sampling Pole/Dipper for hard to reach locations.
Cooler with Ice	Laboratory sample submittals

Equipment	Use/Notes
Pry Bar, Pick, and/or Shovel	For opening catch basins and manholes when necessary
Sandbags	For damming low flows in order to take samples
Small Mallet or Hammer	Helping to free stuck manhole and catch basin covers
Utility Knife	Multiple uses
Measuring Tape	Measuring distances and depth of flow
Traffic Cones	Safety
Hand Sanitizer	Disinfectant/decontaminant
Machete/Clippers	Accessing overgrown infrastructure
Flashlight with batteries	For looking in outfalls, manholes, and catch basins
Zip Ties/Duct Tape	For making field repairs
Rubber Boots/Waders	For accessing shallow streams/areas
Sampling Pole/Dipper/Sampling Cage	For accessing hard-to-reach outfalls and manholes
5-gallon Bucket w/ Cover	Disposal of chemical waste
Confined Space Entry Equipment (if needed)	DBI Sali Tripod and retrieval wench; MSA Tripod, rescue wench and material/personal wench; full body harness; 10' ladder; waders; hard hat; air monitoring equipment (Ventis 4 gas meter)

As per the 2016 Massachusetts Small MS4 General Permit, where dry weather flow is found at an outfall/interconnection, at least one (1) sample shall be collected.[7] A discrete manual or grab sample shall be collected for dry weather outfall inspections due to the time-sensitive nature of the process. Grab samples classify water at a distinct point in time and are used primarily when the water quality of the discharge is expected to be homogenous, or unchanging, in nature. A flow-weighted composite sample classifies water quality over a measured period of time and are used when the water quality of discharge is expected to be heterogenous, or fluctuating, in nature.[8]

Protocols for collecting a grab sample as per the Central Massachusetts Regional Stormwater Coalition are as follows:

1. Fill out sample information on sample bottles and field sheets (see Attachment 4 for example field sheets).
2. Do not eat, drink, or smoke during sample collection and processing.
3. Do not collect or process samples near a running vehicle.
4. Do not park vehicles in the immediate sample collection area, including both running and non-running vehicles.
5. Always wear clean, powder-free nitrile gloves when handling sample containers and lids.
6. Never touch the inside surface of a sample container or lid, even with gloved hands.
7. Never allow the inner surface of a sample container or lid to be contacted by any material other than the sample water.

[7] *United States Environmental Protection Agency (EPA). (n.d.). General Permits for stormwater discharges from small municipal ... – US EPA. Massachusetts Small MS4 General Permit. Retrieved January 16, 2023, from https://www3.epa.gov/region1/npdes/stormwater/ma/2016fpd/final-2016-ma-sms4-gp-mod.pdf*

[8] *Standard Operating Procedures. Central Massachusetts Regional Stormwater Coalition. (n.d.). Retrieved January 16, 2023, from https://www.centralmastormwater.org/toolbox/pages/standard-operating-procedures*

8. Collect sample with dipper or directly into sample containers. If possible, collect water while facing upstream of the flow into the sample bottles so as to not to disturb water or sediments in the outfall pipe or ditch.
9. Do not overfill sample containers, and do not dump out any liquid in them. Liquids are often added to sample containers intentionally by the analytical laboratory as a preservative or for pH adjustment.
10. Slowly lower the bottle into the water to avoid bottom disturbance and stirring up sediment.
11. Do not allow any object or material to fall into or contact the collected water sample.
12. Do not allow rainwater to drip from rain gear or other surfaces into sample containers.
13. Replace and tighten sample container lids immediately after sample collection.
14. Place laboratory samples on ice for analysis of bacteria and pollutants of concern.
15. Accurately label the sample with the time and location.
16. Document on the Dry Weather Outfall Inspection Survey that analytical samples were collected, specify parameters, and note the sample time on an Inspection Survey (see Attachment 2 and 3 for examples). This creates a reference point for samples.
17. Fill out chain-of-custody form for laboratory samples.
18. If using a dipper or other device, triple rinse the device with distilled water and then in water to be sampled, except for bacteria sampling.
19. Store used test strips and test kit waste/ampules properly in a 5-gallon bucket with a cover. Storage and disposal shall be coordinated with the City.
20. Decontaminate all testing personnel and equipment.

Samples that are unable to be analyzed for parameters using field instrumentation require laboratory analysis. Coordination with the laboratory, including the pick-up and/or dropping off, of samples, is the responsibility of the City. The laboratory requires that a chain-of-custody form be filled out and accompany any samples that require analysis. The laboratory will also provide additional details regarding how samples should be collected based on the sample containers and/or specific analytes.

Parameter Analysis

As per the Consent Decree, the City shall utilize the following IDDE screening thresholds shown in Table 4 as guidelines for its analysis of the data generated for each outfall and interconnection discharge sample.[9] In addition, each outfall and interconnection discharge sample shall be concurrently analyzed for all the parameters shown using laboratory analysis or field instrumentation defined in Table 4 as per EPA's Region 1's "EPA New England Bacteria Source Tracking Protocol," January 2012 Draft.[10]

Table 4 – Freshwater Water Quality Criteria, Threshold Limits, and Example Instrumentation[1]

Analyte/Indicator	Threshold Limits/ Single Sample[3]	Instrumentation
E. coli [2]	≥ 410 cfu/100ml	Laboratory via approved method
Enterococci [2]	≥ 130 cfu/100ml	Laboratory via approved method
Surfactants (as MBAS)	≥ 0.25 mg/l	MBAS Field Test Kit (e.g. CHEMetrics K-9400)
	≥ 0.1 mg/l	Laboratory via approved method
Ammonia (NH_3)	≥ 0.5 mg/l	Ammonia Field Test Strips (e.g. Hach Brand)
	≥ 0.1 mg/l	Laboratory via approved method
Chlorine	≥ 0.02 mg/l	Field Meter (e.g. Hach Pocket Colorimeter II)
Temperature	N/A	Field Meter (e.g. YSI Model 30)
Conductivity	N/A	Field Meter (e.g. YSI Model 30)
Salinity	N/A	Field Meter (e.g. YSI Model 30)

[A] The mention of trade names or commercial products does not constitute endorsement or recommendation for use by the U.S. EPA

[B] Class A or B Waters

[C] Levels that may be indicative of potential wastewater or washwater contamination

As per the 2016 Massachusetts Small MS4 General Permit and Consent Decree, all analyses, with the exception of indicator bacteria and pollutants of concern, can be performed with field tests or field instrumentation and are not subject to 40 CFR part 136 requirements. Sampling for bacteria and pollutants of concern shall be conducted using the analytical methods found in 40 CFR § 136, or alternative methods approved by EPA in accordance with the procedures in 40 CFR § 136.[11]

The City is responsible for selecting a laboratory or field kits intended for measuring each analyte. When selecting field kits, review the detection range for each field kit and ensure it corresponds to the threshold limits for each analyte of interest, as listed in Table 4. These limits should be communicated to the laboratory so that the laboratory's instrumentation can be properly calibrated to account for the threshold concentrations. In addition, each analyte has a corresponding analytical method as per Appendix G of the 2016 Massachusetts Small MS4

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[9] *Civil Action No. 19-CV-10332-MGM: Final Consent Decree." United States District Court for the District of Massachusetts, United States and Massachusetts v. City of Holyoke, September 27, 2022.*

[9] *United States Environmental Protection Agency (EPA). (n.d.). EPA New England Bacterial Source Tracking Protocol Purpose. EPA New England Bacterial Source Tracking Protocol. Retrieved January 16, 2023, from https://www3.epa.gov/region1/npdes/stormwater/ma/2014AppendixI.pdf*

[10] *United States Environmental Protection Agency (EPA). (n.d.). General Permits for stormwater discharges from small municipal ...–US EPA. Massachusetts Small MS4 General Permit. Retrieved January 16, 2023, from https://www3.epa.gov/region1/npdes/stormwater/ma/2016fpd/final-2016-ma-sms4-gp-mod.pdf*

General Permit[12], that each field kit and laboratory analysis shall utilize to ensure compliance. Lastly, as per 40 CFR § 136[13], maximum holding times and preservation requirements should be communicated to the laboratory. This is not applicable for field kits since samples are analyzed instantaneously after sample collection. Table 5 summarizes this information and it should be shared with the selected laboratory to ensure compliance with the Consent Decree.

Table 5 – Analytical Methods, Hold Times, and Preservatives for Laboratory Analysis

Analyte or Parameter	EPA or Approved Method No.[1]	Max. Hold Time[2]	Preservation[2]
E. coli	**EPA**: 1103.1; 1603	8 hours	Cool ≤10°C, 0.0008% $Na_2S_2O_3$
	Other: Colilert ®, Colilert-18®, mColiBlue-24®		
Enterococcus	**EPA**: 1106.1; 1600	8 hours	Cool ≤10°C, 0.0008% Na2S2O3
	Other: Enterolert ® 12 22.		
Surfactants[3]	**SM**: 5540-C	48 hours	Cool ≤6°C
Ammonia[3]	**EPA**: 350.1	28 days	Cool ≤6°C, H_2SO_4 to pH <2

SM = Standard Methods

[1]EPA or Approved Method No. obtained from Appendix G of the MA Small MS4 Permit, except for Surfactants obtained from 40 CFR Part 136

[2]Max Holding Time and Preservation obtained from 40 CFR Part 136

[3]Ammonia and Surfactants can be analyzed in the field. Samples are sent to the lab to confirm field results if desired (not required to meet 40 CFR Part 136).

Evaluation of sample data can show positive results due to sources other than human wastewater and false negative results due to chemical reactions or interferences. For example, elevated ammonia readings are common in the New England region due to sampling near historically filled tidal wetlands where the breakdown of biological organic material can skew sample results. The same elevated ammonia readings can also be triggered by discharge from a nearby landfill. In addition, elevated surfactant readings caused by salinity levels greater than one (1) part per thousand can be triggered by the presence of oil. Inconclusive surfactant readings, where the indicator ampule turns green instead of a shade of blue, can often be caused by fine suspended particulate matter being present in the sample being tested. Finally, very low bacteria concentrations can often be the result of elevated chlorine from

[12] *United States Environmental Protection Agency (EPA). (n.d.). Appendix G Massachusetts Small MS4 Permit Monitoring Requirements For Discharges into Impaired Waters – Parameters and Methods. Retrieved January 30, 2023, from https://www3.epa.gov/region1/npdes/stormwater/ma/2016fpd/appendix-g-2016-ma-sms4-gp.pdf*

[13] *The Federal Register. Federal Register. (n.d.). Retrieved January 30, 2023, from https://www.ecfr.gov/current/title-40/chapter-I/subchapter-D/part-136?toc=1*

leaking drinking water infrastructure inhibiting bacterial growth. As such, any detection of chlorine above the instrument Reporting Limit should be noted.[14]

Inspection Reporting

The City shall maintain detailed and accurate records of outfall and interconnection discharge samples that includes the following information:

- Date and time that sampling was conducted
- Weather conditions both during, and in the 48 hours prior to, each sampling event
- Unique identifier
- Receiving water
- Date of most recent inspection
- Dimensions
- Shape
- Material (concrete, PVC, etc.)
- Spatial location (latitude and longitude with a minimum accuracy of +/-30 feet
- Physical condition
- Indicators of potential non-stormwater discharges (including presence or evidence of suspect flow and sensory observations such as odor, color, turbidity, floatable, or oil sheen)

The Dry Weather Outfall Inspection Survey (Attachment 2) developed by the Central Massachusetts Regional Stormwater Coalition and Outfall Inventory Field Sheet (Attachment 4) are templates that can be used for documenting the listed observations related to both quantitative and qualitative characteristics of any/all flows conveyed by the structure.[15]

As per the 2016 Massachusetts Small MS4 General Permit, if an outfall/interconnection is inaccessible or submerged, the permittee shall proceed to the first accessible upstream manhole or structure for the observation and sampling and report the location with the screening results. In addition, if no flow is observed, but evidence of illicit flow exists (see SOP 3 Locating Illicit Discharges), the City shall revisit the outfall during dry weather within one week of the initial observation, if practicable, to perform a second dry weather screening and sample any observed flow.[16]

Attachments

1. Manhole Inspection Report
2. Dry Weather Outfall Inspection Survey developed by the Central Massachusetts Regional Stormwater Coalition
3. Field Data Collection Sheet
4. Outfall Inventory Field Sheet

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[14] *Standard Operating Procedures. Central Massachusetts Regional Stormwater Coalition. (n.d.). Retrieved January 16, 2023, from https://www.centralmastormwater.org/toolbox/pages/standard-operating-procedures*

[15] *Standard Operating Procedures. Central Massachusetts Regional Stormwater Coalition. (n.d.). Retrieved January 16, 2023, from https://www.centralmastormwater.org/toolbox/pages/standard-operating-procedures*

[13] *United States Environmental Protection Agency (EPA). (n.d.). General Permits for stormwater discharges from small municipal ...–US EPA. Massachusetts Small MS4 General Permit. Retrieved January 16, 2023, from https://www3.epa.gov/region1/npdes/stormwater/ma/2016fpd/final-2016-ma-sms4-gp-mod.pdf*

Related Standard Operating Procedures

1. SOP 2: Wet Weather Outfall Inspection
2. SOP 3: Locating Illicit Discharges

SOP 2: Wet Weather Outfall Inspection

Introduction

Outfalls can be in the form of pipes or ditches and is the final point of discharge into a body of water for an engineered storm drain system. Current and pending regulations require that all outfalls, that are part of the storm drain system, be inspected, and that the water quality at these outfalls be analyzed under both dry and wet weather conditions. "SOP 1: Dry Weather Outfall Inspection," covers the objectives for dry weather outfall inspections. This SOP discusses the objectives of wet weather outfall inspections.

The objective of wet weather inspections is to determine whether wet weather-induced high flows in sanitary sewers, or high groundwater in areas served by septic systems, results in discharges of sanitary flow to the MS4. As per the Consent Decree, by May 31st, 2023, the City of Holyoke (the City) shall submit to the EPA for review an Illicit Discharge Detection and Elimination (IDDE) Plan which includes screening and monitoring all known MS4 outfalls and interconnections in wet weather conditions. As defined in the Consent Decree, the City shall conduct wet-weather inspections once every three years when at least 0.25-inches of rain has occurred over a 24-hour period prior to sampling. However, precipitation events that produce enough flow from outfalls or interconnections to be sampled, will also be acceptable.[1]

Condition Assessment

Typical practice is to prepare for a wet weather inspection event when weather forecasts show a 40% chance of rain or greater. Early preparation is key to sampling first flush which is within the first 30 minutes of discharge to and reflects the maximum pollutant load. In some watersheds, increased discharge from an outfall may not occur with the required 0.25-inches of rain due to the amount of impervious surface present. Therefore, as more inspections occur, and the City understands how their outfalls respond to rain events, this precipitation amount can be modified. [2]

Dry weather sampling is required at any outfall or interconnection where *any* flow is observed under dry weather conditions, but sampling during wet weather conditions is required at *all* outfalls. Particularly, any outfalls that did not have any observed flow during dry weather conditions or those with dry weather flow that passed screening thresholds. Unlike dry weather conditions, wet weather conditions can help to identify a number of situations that would otherwise go unnoticed during dry weather. For example, wet weather can help identify locations where elevated groundwater exists and is causing an exchange of wastewater between cracked or broken sanitary sewers, failed septic systems, underdrains, or storm drains. Wet weather can also help to identify instances when there's an increase in sewer volume and sewage may be entering the storm drain system at common manholes or directly-piped connections to storm drains. Finally, wet weather can also help to identify locations subject to capacity-related SSO discharges or illicit connections that are not carried through the storm drain system during dry weather conditions.[3]

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[1] *Civil Action No. 19-CV-10332-MGM: Final Consent Decree." United States District Court for the District of Massachusetts, United States and Massachusetts v. City of Holyoke, September 27, 2022.*

[2] *Standard Operating Procedures. Central Massachusetts Regional Stormwater Coalition. (n.d.). Retrieved January 16, 2023, from https://www.centralmastormwater.org/toolbox/pages/standard-operating-procedures*

[3] *United States Environmental Protection Agency (EPA). (n.d.). EPA New England Bacterial Source Tracking Protocol Purpose. EPA New England Bacterial Source Tracking Protocol. Retrieved January 16, 2023, from https://www3.epa.gov/region1/npdes/stormwater/ma/2014AppendixI.pdf*

Prior to samples being taken, a visual observation of the discharge should occur. During this observation, the presence of any pollution should be noted and further investigated. As per the Central Massachusetts Regional Stormwater Coalition, the following visual indicators shown in Table 1 may be the result of the following.[4]

Table 1 – Visual Condition Assessment

Indicator	Possible Source
Foam	upstream vehicle washing activities or illicit discharge
Oil Sheen	leak or spill
Cloudiness	suspended solids (i.e. dust, ash, powdered chemicals, ground up materials, etc.)
Color or Odor	raw materials, chemicals, or sewage
Excessive Sediment	disturbed earth of unpaved areas lacking adequate erosion control measures
Sanitary Waste/ Optical Enhancers*	illicit discharge
Orange Staining	high mineral concentrations

* Fluorescent dyes added to laundry detergent and some toilet paper

While many of the indicators listed in Table 1 would indicate an illicit discharge, some indicators may occur naturally. For example, orange staining could be the result of naturally occurring iron. However, it may be more difficult to determine the difference between natural foam and foam caused by pollution. Natural foam can typically be found in water with high organic content such as bog lakes, streams that originate from bog lakes, productive lakes, wetlands, or woody areas. As per the Central Massachusetts Regional Stormwater Coalition, it's important to consider the following factors listed in Table 2 when determining if the source of foam present at a stormwater outfall is natural or not.[5]

Table 2 – Conditional and Qualitative Considerations of Foam

Factors	Explanation
Wind Direction or Turbulence	Natural foam occurrences of the beach coincide with onshore winds. Often, foam can be found along a shoreline and/or on open waters during windy days. Natural occurrences in rivers can be found downstream of a turbulent site.
Proximity to Potential Pollution Source	Some entities including the textile industry, paper production facilities, oil industries, and fire fighting activities work with materials that cause foaming in water. If these materials are released to a water body in large quantities, they can cause foaming. The presence of silt in water, such as from a construction site can cause foam.
Physical Feeling	Natural foam is typically persistent, light, not slimy to the touch.
Visual Observation	Prescence of decomposing plants or organic material in the water.

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In addition to foam, both bacteria and petroleum can create a sheen on the water surface. Differentiating the two can be as simple as disturbing the "sheen" with a pole, stick, or similar object. A sheen caused by oil will remain intact and move in a swirl pattern while a sheen caused by bacteria will separate into a number of smaller patches and appear "blocky." In addition, bacteria or naturally occurring sheens are usually silver or dull in color. While bacterial sheen is not a pollutant, it should be noted when describing the discharge.[6]

Optical enhancers on the other hand can be visible to the naked eye when found in high enough concentrations and will appear as a bluish-purple haze. If a visual observation is unable to confirm the presence of this pollutant, a quantitative test can be used. In order to perform this test, a clean, white, cotton pad should be placed, either directly in, or within a sample of, the discharge for several days. After soaking, the cotton pad should be dried and then viewed under a fluorometer. If the cotton pad fluoresces, optical enhancers are assumed to be the pollutant and present. The magnitude of the fluorescence, as measured in fluorescent units, can be used to determine the concentration of optical enhancers within the sample. Often a visual observation is enough. It's not typical that this analysis is required.

Sample Collection

Table 3 lists the field equipment commonly used for wet weather outfall screening and sampling.

Table 3 – Field Equipment for Wet Weather Outfall Screening and Sampling

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Clipboard	For organization of field sheets and writing surface
Field Forms or Tablet for Electronic Forms	Field sheets for both dry weather inspection and dry weather sampling should be available, with extra sheets included
Chain of Custody Forms	To ensure proper handling of all samples
Pens/Pencils/Permanent Markers	For proper labeling
Nitrile Gloves	To protect the sampler as well as the sample from contamination
Flashlight/Headlamp w/ Batteries	For looking in outfalls or manholes, helpful in early mornings as well
Cooler with Ice	For transporting samples to the laboratory
Digital Camera	For documenting field conditions at time of inspection
Personal Protective Equipment (PPE)	Reflective vest, safety glasses, hard hats, and boots at a minimum. Work gloves, long pants, and sleeves for protection from environmental conditions such as brush, insects, and poisonous plants.
Insect/Plant Repellant and Sunscreen	For protection from environmental conditions.
GPS Receiver	For taking spatial location data
Distilled water	For use with test kits and water quality meters
Water Quality Meters	Hand-held meters for testing various water quality parameters.
Field Test Kits	Have extra kits on hand to sample more outfalls than are anticipated to be screened in a single day

[6] *Standard Operating Procedures. Central Massachusetts Regional Stormwater Coalition. (n.d.). Retrieved January 16, 2023, from https://www.centralmastormwater.org/toolbox/pages/standard-operating-procedures*

Equipment	Use/Notes
Rinse Water/Calibration standards	Cleaning equipment and calibration
Label Tape	For labeling sample containers
Sample Containers	Make sure all sample containers are clean.
	Keep extra sample containers on hand at all times.
	Make sure there are proper sample containers for what is being sampled for (i.e., bacteria and total phosphorus analysis require sterile containers and preservatives).
	Telescopic Sampling Pole/Dipper for hard to reach locations.
Cooler with Ice	Laboratory sample submittals
Pry Bar, Pick, and/or Shovel	For opening catch basins and manholes when necessary
Small Mallet or Hammer	Helping to free stuck manhole and catch basin covers
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Hand Sanitizer	Disinfectant/decontaminant
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Rubber Boots/Waders	For accessing shallow streams/areas
Sampling Pole/Dipper/Sampling Cage	For accessing hard-to-reach outfalls and manholes
5-gallon Bucket w/ Cover	Disposal of chemical waste
Confined Space Entry Equipment (if needed)	DBI Sali Tripod and retrieval wench; MSA Tripod, rescue wench and material/personal wench; full body harness; 10' ladder; waders; hard hat; air monitoring equipment (Ventis 4 gas meter)

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4. Do not park vehicles in the immediate sample collection area, including both running and non-running vehicles.
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6. Never touch the inside surface of a sample container or lid, even with gloved hands.

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7. Never allow the inner surface of a sample container or lid to be contacted by any material other than the sample water.
8. Collect sample with dipper or directly into sample containers. If possible, collect water while facing upstream of the flow into the sample bottles so as to not to disturb water or sediments in the outfall pipe or ditch.
9. Do not overfill sample containers, and do not dump out any liquid in them. Liquids are often added to sample containers intentionally by the analytical laboratory as a preservative or for pH adjustment.
10. Slowly lower the bottle into the water to avoid bottom disturbance and stirring up sediment.
11. Do not allow any object or material to fall into or contact the collected water sample.
12. Do not allow rainwater to drip from rain gear or other surfaces into sample containers.
13. Replace and tighten sample container lids immediately after sample collection.
14. Place laboratory samples on ice for analysis of bacteria and pollutants of concern.
15. Accurately label the sample with the time and location.
16. Document on the Dry Weather Outfall Inspection Survey that analytical samples were collected, specify parameters, and note the sample time on an Inspection Survey (see Attachment 1 and 2 for examples). This creates a reference point for samples.
17. Fill out chain-of-custody form for laboratory samples.
18. If using a dipper or other device, triple rinse the device with distilled water and then in water to be sampled, except for bacteria sampling.
19. Store used test strips and test kit waste/ampules properly in a 5-gallon bucket with a cover. Storage and disposal shall be coordinated with the City.
20. Decontaminate all testing personnel and equipment.

Samples that are unable to be analyzed for parameters using field instrumentation require laboratory analysis. Coordination with the laboratory, including the pick-up and/or dropping off, of samples, is the responsibility of the City. The laboratory requires that a chain-of-custody form be filled out and accompany any samples that require analysis. The laboratory will also provide additional details regarding how samples should be collected based on the sample containers and/or specific analytes.

Parameter Analysis

As per the Consent Decree, the City shall utilize the following IDDE screening thresholds shown in Table 4 as guidelines for its analysis of the data generated for each outfall and interconnection discharge sample.[8] In addition, each outfall and interconnection discharge sample shall be concurrently analyzed for all the parameters shown using laboratory analysis or field instrumentation defined in Table 4 as per EPA's Region 1's "EPA New England Bacteria Source Tracking Protocol," January 2012 Draft.[9]

Table 4 – Freshwater Water Quality Criteria, Threshold Limits, and Example Instrumentation[1]

Analyte/Indicator	Threshold Limits/ Single Sample[3]	Instrumentation
E. coli [2]	≥ 410 cfu/100ml	Laboratory via approved method
Enterococci [2]	≥ 130 cfu/100ml	Laboratory via approved method

[8] *Civil Action No. 19-CV-10332-MGM: Final Consent Decree." United States District Court for the District of Massachusetts, United States and Massachusetts v. City of Holyoke, September 27, 2022.*

[9] *United States Environmental Protection Agency (EPA). (n.d.). EPA New England Bacterial Source Tracking Protocol Purpose. EPA New England Bacterial Source Tracking Protocol. Retrieved January 16, 2023, from https://www3.epa.gov/region1/npdes/stormwater/ma/2014AppendixI.pdf*

Analyte/Indicator	Threshold Limits/ Single Sample[3]	Instrumentation
Surfactants (as MBAS)	≥ 0.25 mg/l	MBAS Field Test Kit (e.g. CHEMetrics K-9400)
	≥ 0.1 mg/l	Laboratory via approved method
Ammonia (NH_3)	≥ 0.5 mg/l	Ammonida Field Test Strips (e.g. Hach Brand)
	≥ 0.1 mg/l	Laboratory via approved method
Chlorine	≥ 0.02 mg/l	Field Meter (e.g. Hach Pocket Colorimeter II)
Temperature	N/A	Field Meter (e.g. YSI Model 30)
Conductivity	N/A	Field Meter (e.g. YSI Model 30)
Salinity	N/A	Field Meter (e.g. YSI Model 30)

[A] The mention of trade names or commercial products does not constitute endorsement or recommendation for use by the U.S. EPA

[B] Class A or B Waters

[C] Levels that may be indicative of potential wastewater or washwater contamination

As per the 2016 Massachusetts Small MS4 General Permit and Consent Decree, all analyses, with the exception of indicator bacteria and pollutants of concern, can be performed with field tests or field instrumentation and are not subject to 40 CFR part 136 requirements. Sampling for bacteria and pollutants of concern shall be conducted using the analytical methods found in 40 CFR § 136, or alternative methods approved by EPA in accordance with the procedures in 40 CFR § 136.[10]

The City is responsible for selecting a laboratory, or field kits for measuring each analyte. When selecting field kits, review the detection range for each field kit and ensure that it corresponds to the threshold limits for each analyte of interest, as listed in Table 4. These limits should be communicated to the laboratory so that the laboratory's instrumentation can be properly calibrated to account for the threshold concentrations. In addition, each analyte has a corresponding analytical method as per Appendix G of the 2016 Massachusetts Small MS4 General Permit[11], that each field kit and laboratory analysis shall utilize to ensure compliance. Lastly, as per 40 CFR § 136[12], maximum holding times and preservation requirements should be communicated to the laboratory. This is not applicable for field kits since samples are analyzed instantaneously after sample collection. Table 5 summarizes this information and it should be shared with the selected laboratory to ensure compliance with the Consent Decree.

[10] *United States Environmental Protection Agency (EPA). (n.d.). General Permits for stormwater discharges from small municipal ...–US EPA. Massachusetts Small MS4 General Permit. Retrieved January 16, 2023, from https://www3.epa.gov/region1/npdes/stormwater/ma/2016fpd/final-2016-ma-sms4-gp-mod.pdf*

[11] *United States Environmental Protection Agency (EPA). (n.d.). Appendix G Massachusetts Small MS4 Permit Monitoring Requirements For Discharges into Impaired Waters – Parameters and Methods. Retrieved January 30, 2023, from https://www3.epa.gov/region1/npdes/stormwater/ma/2016fpd/appendix-g-2016-ma-sms4-gp.pdf*

[12] *The Federal Register. Federal Register. (n.d.). Retrieved January 30, 2023, from https://www.ecfr.gov/current/title-40/chapter-I/subchapter-D/part-136?toc=1*

Table 5 – Analytical Methods, Hold Times, and Preservatives for Laboratory Analysis

Analyte or Parameter	EPA or Approved Method No.[1]	Max. Hold Time[2]	Preservation[2]
E. coli	**EPA**: 1103.1; 1603	8 hours	Cool ≤10°C, 0.0008% $Na_2S_2O_3$
	Other: Colilert ®, Colilert-18®, mColiBlue-24®		
Enterococcus	**EPA**: 1106.1; 1600	8 hours	Cool ≤10°C, 0.0008% Na2S2O3
	Other: Enterolert ® 12 22.		
Surfactants[3]	**SM**: 5540-C	48 hours	Cool ≤6°C
Ammonia[3]	**EPA**: 350.1	28 days	Cool ≤6°C, H_2SO_4 to pH <2

SM = Standard Methods

[1]EPA or Approved Method No. obtained from Appendix G of the MA Small MS4 Permit, except for Surfactants obtained from 40 CFR Part 136

[2]Max Holding Time and Preservation obtained from 40 CFR Part 136

[3]Ammonia and Surfactants can be analyzed in the field. Samples are sent to the lab to confirm field results if desired (not required to meet 40 CFR Part 136).

Evaluation of sample data can show positive results due to sources other than human wastewater and false negative results due to chemical reactions or interferences. For example, elevated ammonia readings are common in the New England region due to sampling near historically filled tidal wetlands where the breakdown of biological organic material can skew sample results. The same elevated ammonia readings can also be triggered by discharge from a nearby landfill. In addition, elevated surfactant readings caused by salinity levels greater than one (1) part per thousand can be triggered by the presence of oil. Inconclusive surfactant readings, where the indicator ampule turns green instead of a shade of blue, can often be caused by fine suspended particulate matter being present in the sample being tested. Finally, very low bacteria concentrations can often be the result of elevated chlorine from leaking drinking water infrastructure inhibiting bacterial growth. As such, any detection of chlorine above the instrument Reporting Limit should be noted.[13]

[13] *Standard Operating Procedures. Central Massachusetts Regional Stormwater Coalition. (n.d.). Retrieved January 16, 2023, from https://www.centralmastormwater.org/toolbox/pages/standard-operating-procedures*

Inspection Reporting

The City shall maintain detailed and accurate records of outfall and interconnection discharge samples that includes the following information:

- Date and time that sampling was conducted
- Weather conditions both during, and in the 24 hours prior to, each sampling event
- Unique identifier
- Receiving water
- Date of most recent inspection
- Dimensions
- Shape
- Material (concrete, PVC, etc.)
- Spatial location (latitude and longitude with a minimum accuracy of +/-30 feet
- Physical condition
- Indicators of potential non-stormwater discharges (including presence or evidence of suspect flow and sensory observations such as odor, color, turbidity, floatable, or oil sheen)

The Wet Weather Outfall Inspection Survey (Attachment 1) developed by the Central Massachusetts Regional Stormwater Coalition and the Outfall Inventory Field Sheet (Attachment 3) are templates that can be used for documenting the listed observations related to both quantitative and qualitative characteristics of any flows conveyed by the structure..[14]

Attachments

1. Wet Weather Outfall Inspection Survey developed by the Central Massachusetts Regional Stormwater Coalition
2. Field Data Collection Sheet
3. Outfall Inventory Field Sheet

Related Standard Operating Procedures

1. SOP 2: Wet Weather Outfall Inspection
2. SOP 3: Locating Illicit Discharges

[14] *Standard Operating Procedures. Central Massachusetts Regional Stormwater Coalition. (n.d.). Retrieved January 16, 2023, from https://www.centralmastormwater.org/toolbox/pages/standard-operating-procedures*

SOP 3: Locating Illicit Discharges

Introduction

An "illicit discharge" is any discharge to an engineered storm drain system that is not composed entirely of stormwater. Exceptions for allowable non-stormwater discharge are detailed in the Massachusetts MS4 Permit and are as follows[1]:

a. Water line flushing
b. Landscape irrigation
c. Diverted stream flows
d. Rising ground water
e. Uncontaminated ground water infiltration (as defined at 40 CFR § 35.2005(20))
f. Uncontaminated pumped ground water
g. Discharge from potable water sources
h. Foundation drains
i. Air conditioning condensation
j. Irrigation water, springs
k. Water from crawl space pumps
l. Footing drains
m. Lawn watering
n. Individual resident car washing
o. Flows from riparian habitats and wetlands
p. De-chlorinated swimming pool discharges
q. Street wash waters
r. Residential building wash waters without detergents

Illicit discharges can enter an engineered storm drain system via direct and indirect connections. These connections can include: cross-connections of sewer services to storm drain systems; leaking septic systems; intentional discharge of pollutants to catch basins; combined sewer overflows; connected floor drains; and sump pumps connected to storm drain systems. As such, the discharges from these illicit connections can contribute high levels of pollutants, including heavy metals, toxics, oil, grease, solvents, nutrients, and pathogens to the receiving body of water.[2]

The City of Holyoke's (City) Stormwater Ordinance, adopted by the City Council on May 17th, 2017, grants the City the authority to prohibit illicit discharges, investigate suspected illicit discharges, eliminate illicit discharges (including discharges from properties not owned by or controlled by the MS4 that discharge into the MS4), and implement appropriate enforcement procedures and actions.

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[1] *United States Environmental Protection Agency (EPA). (n.d.). General Permits for stormwater discharges from small municipal ...–US EPA. Massachusetts Small MS4 General Permit. Retrieved January 16, 2023, from https://www3.epa.gov/region1/npdes/stormwater/ma/2016fpd/final-2016-ma-sms4-gp-mod.pdf*

[2] *Standard Operating Procedures. Central Massachusetts Regional Stormwater Coalition. (n.d.). Retrieved January 16, 2023, from https://www.centralmastormwater.org/toolbox/pages/standard-operating-procedures*

Identifying Illicit Discharges

Illicit discharges can be located be several methods, including routine dry weather outfall inspections (as described in detail in "SOP 1: Dry Weather Outfall Inspection") and citizen reports. As per the Central Massachusetts Regional Stormwater Coalition, the following indicators shown in Table 1 may be the result of an illicit discharge.[3]

Table 1 – Visual Condition Assessment

Indicator	Possible Source
Foam	upstream vehicle washing activities or illicit discharge
Oil Sheen	leak or spill
Cloudiness	suspended solids (i.e. dust, ash, powdered chemicals, ground up materials, etc.)
Color or Odor	raw materials, chemicals, or sewage
Excessive Sediment	disturbed earth of unpaved areas lacking adequate erosion control measures
Sanitary Waste/ Optical Enhancers*	illicit discharge
Orange Staining	high mineral concentrations

* Fluorescent dyes added to laundry detergent and some toilet paper

While many of the indicators listed in Table 1 would indicate an illicit discharge, some indicators may occur naturally. For example, orange staining could be the result of naturally occurring iron. However, it may be difficult to determine the difference between natural foam and foam caused by pollution. Natural foam can typically be found in water with high organic content such as bog lakes, streams that originate from bog lakes, productive lakes, wetlands, or woody areas. As per the Central Massachusetts Regional Stormwater Coalition, it's important to consider the following factors listed in Table 2 when determining if the source of foam present at a stormwater outfall is natural or not.[4]

Table 2 – Conditional and Qualitative Considerations of Foam

Factors	Explanation
Wind Direction or Turbulence	Natural foam occurrences of the beach coincide with onshore winds. Often, foam can be found along a shoreline and/or on open waters during windy days. Natural occurrences in rivers can be found downstream of a turbulent site.
Proximity to Potential Pollution Source	Some entities including the textile industry, paper production facilities, oil industries, and fire fighting activities work with materials that cause foaming in water. If these materials are released to a water body in large quantities, they can cause foaming. The presence of silt in water, such as from a construction site can cause foam.
Physical Feeling	Natural foam is typically persistent, light, not slimy to the touch.
Visual Observation	Prescence of decomposing plants or organic material in the water.

[3] *Standard Operating Procedures. Central Massachusetts Regional Stormwater Coalition. (n.d.). Retrieved January 16, 2023, from https://www.centralmastormwater.org/toolbox/pages/standard-operating-procedures*

[4] *Standard Operating Procedures. Central Massachusetts Regional Stormwater Coalition. (n.d.). Retrieved January 16, 2023, from https://www.centralmastormwater.org/toolbox/pages/standard-operating-procedures*

In addition to foam, both bacteria and petroleum can create a sheen on the water surface. Differentiating the two can be as simple as disturbing the "sheen" with a pole, stick, or similar object. A sheen caused by oil will remain intact and move in a swirl pattern while a sheen caused by bacteria will separate into a number of smaller patches and appear "blocky." In addition, bacteria or naturally occurring sheens are usually silver or dull in color. While bacterial sheen is not a pollutant, it should be noted when describing the discharge.[5]

Optical enhancers on the other hand can be visible to the naked eye when found in high enough concentrations and will appear as a bluish-purple haze. If a visual observation is unable to confirm the presence of this pollutant, a quantitative test can be used. In order to perform this test, a clean, white, cotton pad should be placed, either directly in, or within a sample of, the discharge for several days. After soaking, the cotton pad should be dried and then viewed under a fluorometer. If the cotton pad fluoresces, optical enhancers are assumed to be the pollutant and present. The magnitude of the fluorescence, as measured in fluorescent units, can be used to determine the concentration of optical enhancers within the sample. Often a visual observation is enough. It's not typical that this analysis is required.

Citizen Reports

Reports by residents and other users can be effective tools in helping the City to identify illicit discharges. The City's Department of Public Works (DPW) set up a phone hotline for this purpose, the phone number is (413) 534-2222. In addition, DPW should also provide guidance to the local City police department(s) and dispatch centers on how to manage data reported if residents should decide to report an illicit discharge with the police. An example Incident Tracking Sheet, provided by the Central Massachusetts Regional Stormwater Coalition, is included as Attachment 1 and can be used as an example that guides the responder to ensure that all pertinent details about the reported discharge are accurately documented. Reported illicit discharges should be communicated with the DPW.

Tracing Illicit Discharges

Once identified, suspected illicit connections must then be confirmed by the City. If confirmed, but the source is unidentified, the following additional procedures, as per the Central Massachusetts Regional Stormwater Coalition, should be completed[6]:

1. Review and consider information collected when an illicit discharge was initially identified, including, but not limited to, the time of day and the weather conditions for the previous 72 hours. Also review past reports or investigations of similar illicit discharges in the area.
2. Obtain storm drain mapping for the area of the reported illicit discharge. If possible, use a tracking system that can be linked to the City's GIS.
3. Document current conditions at the location of the observed illicit discharge point, including odors, water appearance, estimated flow, presence of floatables, and other pertinent information. Photograph relevant evidence.
4. If there continues to be evidence of the illicit discharge, collect water quality data using the methods described in "SOP 1: Dry Weather Outfall Inspection" and "SOP 2: Wet Weather Outfall Inspection". This may include using field test kits or instrumentation or collecting analytical samples for full laboratory analysis.

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[5] *Standard Operating Procedures. Central Massachusetts Regional Stormwater Coalition. (n.d.). Retrieved January 16, 2023, from https://www.centralmastormwater.org/toolbox/pages/standard-operating-procedures*

[6] *Standard Operating Procedures. Central Massachusetts Regional Stormwater Coalition. (n.d.). Retrieved January 16, 2023, from https://www.centralmastormwater.org/toolbox/pages/standard-operating-procedures*

5. Move upstream from the point of observation to identify the source of the discharge, using the system mapping to determine infrastructure, tributary pipes, and drainage areas that contribute. At each point, survey the general area and surrounding properties to identify potential sources of the illicit discharge. Document observations at each point on an Incident Tracking Sheet (Attachment 1) as well as with photographs.
6. Continue this process until the illicit discharge is no longer observed, which will define the boundaries of the likely source. For example, if the illicit discharge is present in catch basin 137 but not the next upstream catch basin, 138, the source of the illicit discharge is between these two structures.

If the source of an illicit discharge cannot be determined via the procedures listed above, additional methods, such as sandbagging, dye testing, smoke testing, and/or closed-circuit television inspection (CCTV) may need to be utilized. Descriptions for these four (4) methods are listed below[7].

Sandbagging

Sandbagging can be particularly useful when attempting to isolate intermittent or illicit discharges with very little perceptible flow. This technique involves placing sandbags, caulking, weirs/plates, or other temporary barriers within the outlets of a manhole to form a temporary dam. Sandbags and other barriers should only be installed when dry weather is forecasted and are typically left in place for 48 hours. If flow is present after 48 hours behind the sandbags/barriers, this would allow the inspector to properly observe and sample the flow, however, if no flow collects behind the sandbags/barriers, the upstream pipe network can be ruled out as a source of the intermittent discharge. Unlike the other three (3) methods described subsequently, this method can be quite time-consuming.

Dye Testing

Dye testing consists of discharging or flushing non-toxic dye into a suspended plumbing fixture and observing a nearby storm drain structure and/or sanitary sewer manhole for the presence of the same dye downstream. Fixtures, such as sinks, toilets, and sump pumps can all be tested with dye, but should be tested separately. This test should ideally be conducted with a team of two or more people, with one person adding the dye to the fixture of interest, while the other person watches for the presence or absence of dye near the source. Unlike the other methods mentioned, dye testing is relatively quick, effective, and inexpensive. This method is best used when the source of the illicit discharge has been relatively narrowed down. Dye testing can be done by the City or a third-party contractor and requires the City to receive permission prior to accessing any sites that may contain the suspected fixtures. Residents, business owners, police, fire, and local public health staff shall be notified prior to testing in preparation for responding to citizen phone calls concerning the dye and their presence in local surface waters.

Smoke Testing

Unlike dye testing, smoke testing is a useful method to utilize if the source of an illicit discharge is not as obvious. Smoke testing often works best when trying to locate an illicit discharge along short sections of pipe and, more specifically, along small diameters pipes. This method involves injecting a non-toxic smoke with the use of a smoke bomb or smoke generator. When added to the storm drain system, smoke will emerge in connected locations, allowing for an inspector to locate a less obvious source of an illicit discharge. Similar to dye testing, this testing activity can be performed by a third-party contractor. Proper notifications to residents, business owners, local police, and fire departments that may be in the area of interest is critical. Smoke may cause minor irritation for residents with respiratory conditions. These individuals should be monitored or evacuated from the area of testing.

[7] *Standard Operating Procedures. Central Massachusetts Regional Stormwater Coalition. (n.d.). Retrieved January 16, 2023, from https://www.centralmastormwater.org/toolbox/pages/standard-operating-procedures*

Closed Circuit Television Inspection (CCTV)

In CCTV inspections, cameras are used to record the interior of storm drain pipes. These cameras can be manually pushed with a stiff cable or guided remotely on treads or wheels. Video can be watched live, or reviewed as a recording, to locate illicit connections and infiltration from sanitary sewers into the storm drain. Again, this testing activity can be performed by a third-party contractor.

If the source of an illicit discharge still cannot be located, further investigation in a future program is necessary. Figure 1 below, from the Central Massachusetts Regional Stormwater Coalition shows a pictorial summary of this section.

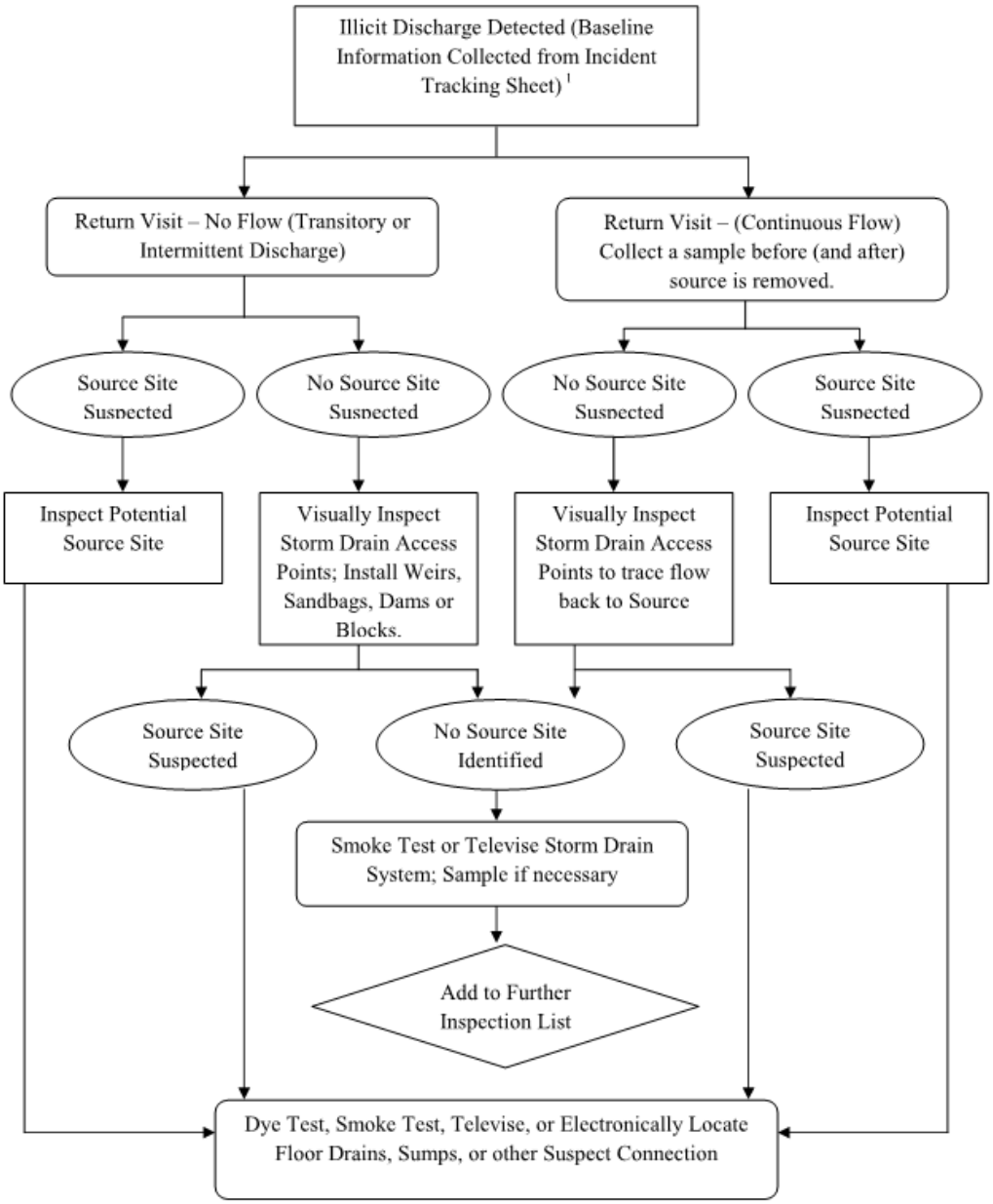

Figure 1 – Steps for Tracing Illicit Discharges

Removal and Abatement of Illicit Discharges

As per the Consent Decree, the "date of verification" of an illicit discharge shall be the date on which the City has identified a point of entry of an illicit discharge from a specific location, or address, that contributes wastewater flow to the MS4. Figure 2 summarizes the steps the City shall take upon identification of an illicit source.[8]

[8] *Civil Action No. 19-CV-10332-MGM: Final Consent Decree." United States District Court for the District of Massachusetts, United States and Massachusetts v. City of Holyoke, September 27, 2022.*

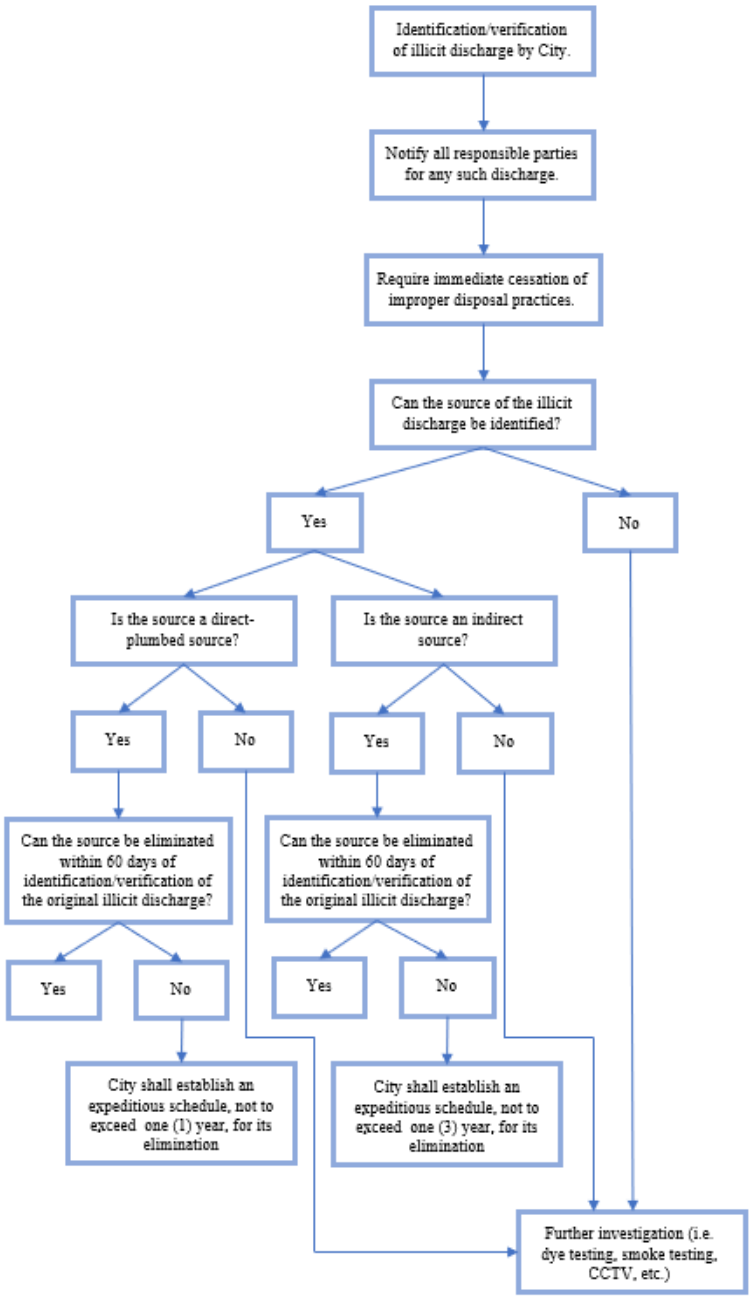

Figure 2 – Steps to Eliminate Illicit Discharge as per Consent Decree

If the source of an illicit discharge is located, proper removal ensures that it does not recur. This includes documenting any repairs, installation of new sanitary sewer connections, or any other corrective actions on an Incident Tracking Sheet (Attachment 1). This should include, but is not limited to, the following information:

- The location of the discharge and its source(s)
- A description of the discharge
- The method of discovery
- Date of discovery
- Date of elimination, mitigation or enforcement action OR planned corrective measures and a schedule for completing the illicit discharge removal
- Estimate of the volume of flow removed

A final inspection is required to confirm the illicit connection has been removed. As per the Consent Decree, within one year following the removal of a verified illicit discharge, the City shall conduct additional dry and wet weather (see SOP's 1 and 2) monitoring to confirm that the illicit discharge has been eliminated. If confirmatory screening indicates evidence of a continued potential illicit discharge, additional investigation of the catchment shall be scheduled and removal of the illicit discharge is required.

Table 3 - Illicit Discharge Enforcement Summary

Source Identified	Enforcement Authority	Procedure to Follow
One-time illicit discharge (e.g. spill, dumping, etc.)	Ordinance enforcement authority (e.g. Code Enforcement Officer)	• Contact Owner • Issue Notice of Violation • Issue fine
Intermittent or continuous illicit discharge from legal connection	Ordinance enforcement authority (e.g. Code Enforcement Officer)	• Contact Owner • Issue Notice of Violation • Determine schedule for removal • Confirm removal
Intermittent or continuous illicit discharge from illegal connection or indirect (e.g. infiltration or failed septic)	Plumbing Inspector or ordinance enforcement authority	• Notify Plumbing Inspector or ordinance enforcement authority
Intermittent or continuous illicit discharge from illegal connection or indirect (e.g. failed sewer line)	Ordinance enforcement authority (e.g. Code Enforcement Officer)	• Issue work order • Schedule removal • Remove connection • Confirm removal
Any	USEPA	• Notify exempt third party and USEPA of illicit discharge

Attachments

1. Incident Tracking Sheet

Related Standard Operating Procedures

1. SOP 1: Dry Weather Outfall Inspection
2. SOP 2: Wet Weather Outfall Inspection

APPENDIX H

Field Investigation Records

Dry Weather Outfall Screening Records

Illicit Discharge Detection Elimination (IDDE) Program

City of Holyoke, MA

June 2024

Owner	EPA Priority Category	Outfall ID	Address	MassDEP Stream Segment (AU ID)	Waterbody Name	Date Screened	Flow?	Sampled?	Ammonia (mg/L)	Chlorine (mg/L)	Surfactants (mg/L)	Salinity	Conductivity	E. coli (MPN/100mL)	Potential Illicit Discharge?
Holyoke	Problem	CA086	Jackson Street Flood Station	MA34-05	CONNECTICUT RIVER	5/20/2024	Yes	Yes	3	0	0.25	0.3	501	4343	Yes
Holyoke	Problem	CA158-A	6 Appleton St	MA34-05	CONNECTICUT RIVER	5/23/2024	Yes	Yes	0	0	0	0.4	636	411	Yes
Holyoke	Problem	CA046	14 Bobala Rd	MA34-05	CONNECTICUT RIVER	5/11/2024	Yes	Yes	0	0	0	0.1	192	11	No
Holyoke	Problem	CA047-A	361 Whitney Ave	MA34-05	CONNECTICUT RIVER	4/24/2024	Yes	Yes	0	0	0	0	150	5	No
Holyoke	Problem	CA047-B	361 Whitney	MA34-05	CONNECTICUT RIVER	4/24/2024	Yes	Yes	0	0	0	0	150	5	No
Holyoke	Problem	CA049	59 Bobala	MA34-05	CONNECTICUT RIVER	5/11/2024	No	No	0	0	0	0	0	0	No
Holyoke	Problem	CA073	938 Main St	MA34-05	CONNECTICUT RIVER	5/22/2024	Yes	Yes	0	0	0	0.3	495	411	Yes
Holyoke	Problem	CA068	Jones Ferry PS	MA34-05	CONNECTICUT RIVER	5/13/2024	Yes	Yes	0	0	0	0.3	471	411	Yes
Holyoke	Problem	CA045	150 lower Westfield rd		TANNERY BROOK	5/11/2024	Yes	Yes	0	0	0	0	267	69	No
Holyoke	Problem	CA052	100 Bobala	MA34-43	SCHOOLHOUSE BROOK	5/3/2024	Yes	Yes	0	0	0	0.2	359	9	No
Holyoke	Problem	CA053	100 Bobala	MA34-43	SCHOOLHOUSE BROOK	5/11/2024	Yes	Yes	0	0	0	0	359	9	No
Holyoke	Problem	CA064	86 Lower Westfield Rd		TANNERY BROOK	5/15/2024	No	No	0	0	0	0	0	0	No
Holyoke	Problem	CA065	200 Whiting Farms Rd	MA34-05	CONNECTICUT RIVER	5/15/2024	No	No	0	0	0	0	0	0	No
Holyoke	Problem	CA066	6 jeane Dr	MA34-05	CONNECTICUT RIVER	4/24/2024	No	No	0	0	0	0	0	0	No
Holyoke	Problem	CA071	1030 Main St	MA34-05	CONNECTICUT RIVER	5/22/2024	Yes	Yes	0.25	0	0	0.4	575	411	Yes
Holyoke	Problem	CA132	200 Whiting Farms Rd	MA34-05	CONNECTICUT RIVER	5/15/2024	Yes	Yes	0	0	0.25	0.1	188	5	No
Holyoke	Problem	CA142	50 Bray Park Dt	MA34-05	CONNECTICUT RIVER	5/21/2024	Yes	Yes	0	0	0	0.4	634	1007	Yes
Holyoke	Problem	CA143	14 Nicholls Drive	MA34-05	CONNECTICUT RIVER	4/24/2024	Yes	Yes	0	0	0	0	310	443	Yes
Holyoke	Problem	CA039	Highland Park PS	MA34-04	CONNECTICUT RIVER	5/13/2024	Yes	Yes	0	0	0	0.6	898	483	Yes
Holyoke	High	CA158-B	138 Appleton St	MA34-05	CONNECTICUT RIVER	5/28/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA012	Sullivan school	MA34-05	CONNECTICUT RIVER	5/11/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA016	Sullivan school	MA34-05	CONNECTICUT RIVER	5/11/2024	Yes	Yes	0	0	0	0.1	219.1	3	No
Holyoke	High	CA037	1 Berkshire St	MA34-05	CONNECTICUT RIVER	5/20/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA042	1 Bigelow St	MA34-05	CONNECTICUT RIVER	5/23/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA048	36 Bobala	MA34-05	CONNECTICUT RIVER	5/11/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA050	36 Bobala	MA34-05	CONNECTICUT RIVER	5/11/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA051	36 Bobala	MA34-05	CONNECTICUT RIVER	5/11/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA054	400 Whitney	MA34-05	CONNECTICUT RIVER	5/11/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA055	400 Whitney	MA34-05	CONNECTICUT RIVER	5/11/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA057-B	Holyoke mall	MA34-05	CONNECTICUT RIVER	5/3/2024	Yes	Yes	0	0	0	0	460	0	No
Holyoke	High	CA067	1 Sullivan Rd	MA34-05	CONNECTICUT RIVER	5/15/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA072	990 Main St Paper city car wash	MA34-05	CONNECTICUT RIVER	5/22/2024	Yes	Yes	0	0	0	0.5	859	163	No
Holyoke	High	CA084	1 Main St	MA34-05	CONNECTICUT RIVER	5/23/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA085	Mosher St Pump Station	MA34-05	CONNECTICUT RIVER	5/24/2024	Yes	Yes	0	0	0	0.1	230.6	257	No
Holyoke	High	CA087	636 Main St	MA34-05	CONNECTICUT RIVER	5/24/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA003	T1 university park	MA34-04	CONNECTICUT RIVER	5/11/2024	Yes	Yes	0	0	0	0.2	161	161	No
Holyoke	High	CA004	6 Hawthorne Ln	MA34-04	CONNECTICUT RIVER	5/24/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA005-A	29 Longfellow Rd	MA34-04	CONNECTICUT RIVER	5/20/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA005-B	29 Longfellow Rd	MA34-04	CONNECTICUT RIVER	5/20/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA005-C	29 Longfellow Rd	MA34-04	CONNECTICUT RIVER	5/20/2024	Yes	Yes	0	0	0	0.4	629	54	No
Holyoke	High	CA005-E	36 Longfellow Rd	MA34-04	CONNECTICUT RIVER	5/20/2024	Yes	Yes	0	0	0	0.4	602	41	No
Holyoke	High	CA006-A	10 Lindor Heights	MA34-05	CONNECTICUT RIVER	5/11/2024	Yes	Yes	0	0	0	0.1	82.8	13	No
Holyoke	High	CA006-B	10 Lindor Heights	MA34-05	CONNECTICUT RIVER	5/11/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA006-C	10 Lindor Heights	MA34-05	CONNECTICUT RIVER	5/11/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA006-D	10 Beaudoin Ter	MA34-05	CONNECTICUT RIVER	5/11/2024	Yes	Yes	0	0	0.25	0.1	223.5	195	No
Holyoke	High	CA007	14 Scott hollow rd	MA34-05	CONNECTICUT RIVER	5/11/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA009	330 Jarvis ave	MA34-05	CONNECTICUT RIVER	5/11/2024	Yes	Yes	0	0	0	0.1	233.9	13	No
Holyoke	High	CA010	27 Scotthollow	MA34-05	CONNECTICUT RIVER	2/8/2024	no	No	0	0	0	0	0	0	No
Holyoke	High	CA011	20 Wayne Court	MA34-05	CONNECTICUT RIVER	5/11/2024	Yes	Yes	0	0	0	0.3	487	59	No
Holyoke	High	CA013	26 Jarvis way	MA34-05	CONNECTICUT RIVER	5/11/2024	Yes	Yes	0	0	0	0.2	33.5	20	No
Holyoke	High	CA014	30 Jarvis Heights	MA34-05	CONNECTICUT RIVER	5/21/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA015	338 Jarvis ave	MA34-05	CONNECTICUT RIVER	2/8/2024	no	No	0	0	0	0	0	0	No
Holyoke	High	CA017	Sullivan school	MA34-05	CONNECTICUT RIVER	5/11/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA018	393 cherry st	MA34-05	CONNECTICUT RIVER	5/11/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA023-B	105 Cherry Street	MA34-04	CONNECTICUT RIVER	5/11/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA023-C	105 Cherry St	MA34-05	CONNECTICUT RIVER	5/11/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA027	14 Philip dr	MA34-05	CONNECTICUT RIVER	5/11/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA035-A	85 Woodland St	MA34-05	CONNECTICUT RIVER	5/21/2024	Yes	Yes	1	0	0.5	0.3	515	155	No
Holyoke	High	CA070	1030 Main St	MA34-05	CONNECTICUT RIVER	5/22/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA078-A	124 Ridgewood Ave	MA34-05	CONNECTICUT RIVER	5/11/2024	Yes	Yes	0	0	0	0.5	722	37	No
Holyoke	High	CA078-B	124 Ridgewood Ave	MA34-05	CONNECTICUT RIVER	5/11/2024	Yes	Yes	0	0	0	0.5	748	72	No
Holyoke	High	CA079	73 Madison Ave	MA34-04	CONNECTICUT RIVER	5/13/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA133-A	115 Bemis Rd	MA34-04	CONNECTICUT RIVER	5/13/2024	Yes	Yes	0	0	0	0.5	791	9	No
Holyoke	High	CA133-B	115 Bemis Rd	MA34-04	CONNECTICUT RIVER	5/13/2024	Yes	Yes	0	0	0	0.5	787	369	No
Holyoke	High	CA134	29 Claren Dr	MA34-04	CONNECTICUT RIVER	5/13/2024	Yes	Yes	0	0	0	0.5	678	67	No

Dry Weather Outfall Screening Records

Illicit Discharge Detection Elimination (IDDE) Program

City of Holyoke, MA

June 2024

Owner	EPA Priority Category	Outfall ID	Address	MassDEP Stream Segment (AU ID)	Waterbody Name	Date Screened	Flow?	Sampled?	Ammonia (mg/L)	Chlorine (mg/L)	Surfactants (mg/L)	Salinity	Conductivity	E. coli (MPN/100mL)	Potential Illicit Discharge?
Holyoke	High	CA135	30 Claren Dr	MA34-04	CONNECTICUT RIVER	5/13/2024	Yes	Yes	0	0	0	0.4	623	55	No
Holyoke	High	CA144	College way	MA34-05	CONNECTICUT RIVER	5/11/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA147	105 Cherry street	MA34-05	CONNECTICUT RIVER	5/11/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA056	91 South, mile 12 before exit 11	MA34-04	CONNECTICUT RIVER	5/21/2024	Yes	Yes	0	0	0	0.2	414.3	117	No
Holyoke	High	CA060	1152 Main St	MA34-05	CONNECTICUT RIVER	5/15/2024	No	No	0	0	0	0	0	0	No
Holyoke	High	CA082	River Terrace CSO	MA34-04	CONNECTICUT RIVER	5/13/2024	Yes	Yes	0	0	0	0.4	670	119	No
Holyoke	Low	CA026	518 Wesrfield Rd		TANNERY BROOK	5/11/2024	Yes	Yes	0	0	0	0.1	235.8	68	No
Holyoke	Low	CA058	Holyoke mall		TANNERY BROOK	5/15/2024	No	No	0	0	0	0	0	0	No
Holyoke	Low	CA062	Mount Marie Rd		TANNERY BROOK	5/15/2024	Yes	Yes	0	0	0.25	0.4	682	95	No
Holyoke	Low	CA138	150 lower Westfield rd		TANNERY BROOK	5/11/2024	Yes	Yes	0	0	0	0	267	65	No
Holyoke	Low	CA145	518 Homestead Ave		TANNERY BROOK	4/24/2024	Yes	Yes	0	0	0	0	296	5	No
Holyoke	Low	CA088	24 Holly Meadow	MA32055	PEQUOT POND	5/14/2024	No	No	0	0	0	0	0	0	No
Holyoke	Low	CA089	16 Holly Meadow Rd	MA32055	PEQUOT POND	5/14/2024	No	No	0	0	0	0	0	0	No
Holyoke	Low	CA091-A	700 Westfield Rd	MA32055	PEQUOT POND	5/14/2024	Yes	Yes	0	0	0	0	51	7	No
Holyoke	Low	CA091-B	700 Westfield Rd	MA32055	PEQUOT POND	5/14/2024	Yes	Yes	0	0	0	0	69	9	No
Holyoke	Low	CA019	2 hickory st		TANNERY BROOK	5/11/2024	No	No	0	0	0	0	0	0	No
Holyoke	Low	CA034	957 Homestead Ave		TANNERY BROOK	5/11/2024	yes	Yes	0	0	0	0	139	16	No
Holyoke	Low	CA059	1256 Main St		TANNERY BROOK	5/24/2024	Yes	Yes	0	0	0	0.5	815	99	No
Holyoke	Low	CA096-A	6 hollygrape dr	MA34-18	BROAD BROOK	11/2/2023	no	No	0	0	0	0	0	0	No
Holyoke	Low	CA096-B	6 Holly Grape Cir	MA34-18	BROAD BROOK	3/19/2024	No	No	0	0	0	0	0	0	No
Holyoke	Low	CA098	9 winterberry cir	MA34-18	BROAD BROOK	3/19/2024	No	No	0	0	0	0	0	0	No
Holyoke	Low	CA099	113 County Rd Southampton	MA34-18	BROAD BROOK	5/14/2024	Yes	Yes	0	0	0	0.1	208	380	No
Holyoke	Low	CA100	3 hemlock Dr	MA34-18	BROAD BROOK	3/19/2024	No	No	0	0	0	0	0	0	No
Holyoke	Low	CA101-A	9 deer run	MA34-18	BROAD BROOK	3/19/2024	No	No	0	0	0	0	0	0	No
Holyoke	Low	CA101-B	9 deer run	MA34-18	BROAD BROOK	3/19/2024	No	No	0	0	0	0	0	0	No
Holyoke	Low	CA102	10 deer run	MA34-18	BROAD BROOK	3/19/2024	No	No	0	0	0	0	0	0	No
Holyoke	Low	CA103	2 deer run	MA34-18	BROAD BROOK	3/18/2024	No	No	0	0	0	0	0	0	No
Holyoke	Low	CA105	15 Lemay Dr	MA34-18	BROAD BROOK	5/14/2024	No	No	0	0	0	0	0	0	No
Holyoke	Low	CA122	45 Keyes Rd	MA34-18	BROAD BROOK	5/22/2024	Yes	Yes	0	0	0	0	80.8	0	No
Holyoke	Low	CA128	95 Knollwood Circle		TANNERY BROOK	5/11/2024	No	No	0	0	0	0	0	0	No
Holyoke	Low	CA137	71 richard eger dr	MA32002	ASHLEY POND	5/11/2024	No	No	0	0	0	0	0	0	No
Holyoke	Low	CA139	18 bray berry Dr	MA34-18	BROAD BROOK	3/19/2024	No	No	0	0	0	0	0	0	No
Holyoke	Low	CA140	26 Ross rd	MA34-18	BROAD BROOK	5/14/2024	No	No	0	0	0	0	0	0	No
Holyoke	Low	CA141	95 Knollwood Dr		TANNERY BROOK	5/11/2024	No	No	0	0	0	0	0	0	No
Holyoke	Low	CA146	967 Homestead Ave		TANNERY BROOK	5/11/2024	Yes	Yes	0	0	0	0.1	140	29	No
Holyoke	Low	CA008	100 Jarvis ave	MA34101	WHITING STREET RESERVOIR	5/11/2024	No	No	0	0	0	0	0	0	No
Holyoke	Low	CA094	Pilsudski Park 200 County Rd	MA34-18	BROAD BROOK	5/14/2024	No	No	0	0	0	0	0	0	No
Holyoke	Low	CA002	2 Burns Way	MA34-04	CONNECTICUT RIVER	5/11/2024	No	No	0	0	0	0	0	0	No

Wet Weather Outfall Screening Records

Illicit Discharge Detection Elimination (IDDE) Program

City of Holyoke, MA

June 2024

Owner	EPA Priority Category	Outfall ID	Address	MassDEP Stream Segment (AU ID)	Waterbody Name	Date Screened	Flow?	Sampled?	Ammonia (mg/L)	Chlorine (mg/L)	Surfactants (mg/L)	Salinity	Conductivity	E. coli (MPN/100mL)	Potential Illicit Discharge?
Holyoke	Problem	CA053	100 Bobala	MA34-43	SCHOOLHOUSE BROOK	5/16/2024	Yes	Yes	0	0	0.75	0.2	274.1	967	Yes
Holyoke	Problem	CA047-A	361 Whitney Ave	MA34-05	CONNECTICUT RIVER	5/16/2024	Yes	Yes	0	0	0	0.1	158.2	411	Yes
Holyoke	Problem	CA046	14 Bobala Rd	MA34-05	CONNECTICUT RIVER	5/16/2024	Yes	Yes	0	0	0.25	0.1	91	411	Yes
Holyoke	Problem	CA047-B	361 Whitney	MA34-05	CONNECTICUT RIVER	5/16/2024	Yes	Yes	0	0	0.25	0	44.2	411	Yes
Holyoke	Problem	CA064	86 Lower Westfield Rd		TANNERY BROOK	5/16/2024	Yes	Yes	0	0	0.25	0	35.2	411	Yes
Holyoke	Problem	CA052	100 Bobala	MA34-43	SCHOOLHOUSE BROOK	5/16/2024	Yes	Yes	0	0	0.25	0.2	280	700	Yes
Holyoke	Problem	CA045	150 lower Westfield rd		TANNERY BROOK	5/16/2024	Yes	Yes	0	0	0	0	31.7	411	Yes
Holyoke	Problem	CA065	200 Whiting Farms Rd	MA34-05	CONNECTICUT RIVER	5/16/2024	Yes	Yes	0	0	0	0	14.6	411	Yes
Holyoke	Problem	CA132	200 Whiting Farms Rd	MA34-05	CONNECTICUT RIVER	5/16/2024	Yes	Yes	0	0	0	0	48.4	411	Yes
Holyoke	Problem	CA049	59 Bobala	MA34-05	CONNECTICUT RIVER	5/16/2024	Yes	Yes	0	0	0.25	0.1	86	411	Yes
Holyoke	Problem	CA068	Jones Ferry PS	MA34-05	CONNECTICUT RIVER	5/16/2024	Yes	Yes	0	0	0.25	0.1	216.1	411	Yes
Holyoke	Problem	CA066	6 jeane Dr	MA34-05	CONNECTICUT RIVER	5/16/2024	Yes	Yes	0	0	0.25	0	9.3	411	Yes
Holyoke	Problem	CA143	14 Nicholls Drive	MA34-05	CONNECTICUT RIVER	5/8/2024	Yes	Yes	1	0	0.25	0	48	443	Yes
Holyoke	High	CA003	T1 university park	MA34-04	CONNECTICUT RIVER	5/30/2024	Yes	Yes	0	0	0.25	0	20.8	0	No
Holyoke	High	CA006-A	10 Lindor Heights	MA34-05	CONNECTICUT RIVER	5/30/2024	Yes	Yes	0	0	0.25	0	21.5	0	No
Holyoke	High	CA006-B	10 Lindor Heights	MA34-05	CONNECTICUT RIVER	5/30/2024	Yes	Yes	0	0	0.25	0	61.3	0	No
Holyoke	High	CA006-C	10 Lindor Heights	MA34-05	CONNECTICUT RIVER	5/30/2024	Yes	Yes	0	0	0.25	0	39.3	0	No
Holyoke	High	CA005-E	36 Longfellow Rd	MA34-04	CONNECTICUT RIVER	5/30/2024	Yes	Yes	0	0	0	0.2	285.7	0	No
Holyoke	High	CA004	6 Hawthorne Ln	MA34-04	CONNECTICUT RIVER	5/30/2024	Yes	Yes	0	0	0.25	0	55.9	0	No
Holyoke	High	CA006-D	10 Beaudoin Ter	MA34-05	CONNECTICUT RIVER	5/30/2024	Yes	Yes	0	0	0	0	11.8	0	No
Holyoke	High	CA002	2 Burns Way	MA34-04	CONNECTICUT RIVER	5/30/2024	Yes	Yes	0	0	0.25	0	43.5	0	No
Holyoke	Low	CA138	150 lower Westfield rd		TANNERY BROOK	5/16/2024	Yes	Yes	0	0	0	0	31.7	411	Yes
Holyoke	Low	CA145	518 Homestead Ave		TANNERY BROOK	5/8/2024	Yes	Yes	0.5	0	0	0.5	198.6	5	No

APPENDIX I

IDDE Employee Training Record

TRAINING ATTENDANCE SHEET

DO NOT ALTER THIS FORM - DO NOT SUBMIT AS PDF

COURSE TITLE: IDDE Training

COURSE CODE: N/A

INSTRUCTOR: Ajay Sharma

(Kleinfelder)

TRAINING COORDINATOR FOR VENDOR INSTRUCTORS:

PROJECT LOCATION: Holyoke, MA

BU/OU: 00401

TAILGATE TRAINING: YES or NO

START TIME: 8:00 am **FINISH TIME: 3:00 pm**

DATE: 11/2/2023 **DURATION (HOURS): 7**

TRAINING MATERIALS UTILIZED: Agenda/ Hands on/ Open Discussion

PRINTED NAME	VEOLIA EMAIL ADDRESS *Must be typed in	SIGNATURE	SCORE
Jesse Danek	Jesse.danek@veolia.com		
Henry Duval	Henry.duval@veolia.com		
Roel Figueroa	Roel.figueroa@veolia.com		
Rolanda Joseph	Rolanda.joseph.com		
Michael Williams	michael.williams4@veolia.com		
Scott Hebert	Scott.hebert@veolia.com		
Kevin Lukasiewicz	Kevin.lukasiewicz@veolia.com		
Tony Orefice	Tony.orefice@veolia.com		
Joseph Pease	Joseph.pease@veolia.com		
Oswaldo Pedrosa	Oswaldo.pedrosa@veolia.com		

VEOLIA

PRINTED NAME	VEOLIA EMAIL ADDRESS *Must be typed in	SIGNATURE	SCORE
Tyler Schofield	Tyler.schofield@veolia.com		
Bernard Smyth	Bernard.smyth@veolia.com		
Jason Swain	Jason.swain@veolia.com		
Scott Urban	Scott.urban@veolia.com		
Chris Pedrosa	Christopher.pedrosa@veolia.com		
Heri Cabrera	Heri.cabrera@veolia.com		
Mira Gates	gatesm@holyoke.org		
Christina Woehrle	Christina.Woehrle@veolia.com		

APPENDIX E

THREATENED AND ENDANGERED SPECIES LIST AND THE PERMIT LETTER FROM USFWS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MA 02109-3912

VIA EMAIL

March 5, 2019

Alex B. Morse
Mayor

And;

Robert Pierent
City Engineer
63 Canal Street
Holyoke, MA. 01040
peirentr@holyoke.org

Re: National Pollutant Discharge Elimination System Permit ID #: MAR041011, City of Holyoke

Dear Robert Pierent:

The 2016 NPDES General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts (MS4 General Permit) is a jointly issued EPA-MassDEP permit. Your Notice of Intent (NOI) for coverage under this MS4 General Permit has been reviewed by EPA and appears to be complete. You are hereby granted authorization by EPA and MassDEP to discharge stormwater from your MS4 in accordance with the applicable terms and conditions of the MS4 General Permit, including all relevant and applicable Appendices. This authorization to discharge expires at midnight on **June 30, 2022.**

For those permittees that certified Endangered Species Act eligibility under Criterion C in their NOI, this authorization letter also serves as EPA's concurrence with your determination that your discharges will have no effect on the listed species present in your action area, based on the information provided in your NOI.

As a reminder, your first annual report is due by **September 30, 2019** for the reporting period from May 1, 2018 through June 30, 2019.

Information about the permit and available resources can be found on our website: https://www.epa.gov/npdes-permits/massachusetts-small-ms4-general-permit. Should you have any questions regarding this permit please contact Newton Tedder at tedder.newton@epa.gov or (617) 918-1038.

Sincerely,

Thelma Murphy, Chief
Stormwater and Construction Permits Section
Office of Ecosystem Protection
United States Environmental Protection Agency, Region 1

and;

Lealdon Langley, Director
Wetlands and Wastewater Program
Bureau of Water Resources
Massachusetts Department of Environmental Protection

APPENDIX D

THREATENED AND ENDANGERED SPECIES LIST LETTER FROM NEW ENGLAND ECOLOGICAL SERVICES FIELD OFFICE

SME
SEVEE & MAHER
ENGINEERS

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To:
Consultation Code: 05E1NE00-2018-SLI-2837
Event Code: 05E1NE00-2018-E-06647
Project Name: holyoke town boundary map

August 21, 2018

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2018-SLI-2837

Event Code: 05E1NE00-2018-E-06647

Project Name: holyoke town boundary map

Project Type: ** OTHER **

Project Description: MS 4 Notice of Intent for Holyoke, MA

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/42.22441267461942N72.63930318362088W

Counties: Hampden, MA | Hampshire, MA

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Flowering Plants

NAME	STATUS
Small Whorled Pogonia *Isotria medeoloides* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1890	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

APPENDIX F

GOOD HOUSEKEEPING MANUAL

GOOD HOUSEKEEPING MANUAL: FULL VERSION
A GUIDE TO GOOD HOUSEKEEPING BEST PRACTICES TO PREVENT STORMWATER POLLUTION
CITY OF HOLYOKE, MASSACHUSETTS
KLEINFELDER PROJECT NO. 20233959.001A

MAY 2023

KLEINFELDER
Bright People. Right Solutions.

A Report Prepared for:

CITY OF HOLYOKE, MASSACHUSETTS
536 Dwight Street
Holyoke, Massachusetts 01040

GOOD HOUSEKEEPING MANUAL (GHK MANUAL)

Prepared by:
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Reviewed by:
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1 INTRODUCTION

1.1 CURRENT STORMWATER REGULATIONS

The 2023 Municipal Separate Storm Sewer System (MS4) permit, as well as the Final Consent Decree requires that the City of Holyoke address six (6) Minimum Control Measures (MCMs). These measures include the following:

1. Public Education and Outreach
2. Public Involvement and Participation
3. Illicit Discharge Detection and Elimination (IDDE) Program
4. Construction Site Stormwater Runoff Control
5. Stormwater Management in New Development and Redevelopment (Post Construction Stormwater Management)
6. Good Housekeeping and Pollution Prevention for Permittee Owned Operations

As required by Term 19.b.iii "Good Housekeeping and Pollution Prevention for City Owned Operations" in the 2023 MS4 Consent Decree, the City developed this Good Housekeeping Manual which includes an inventory of all City-owned parks and open spaces, buildings and facilities that may contribute to stormwater pollution, and vehicle and equipment usage and staging areas, as well as written operations and maintenance procedures for the municipal operations at the aforementioned properties. Beyond maintaining these properties, the City is also responsible for keeping all MS4 infrastructure in good working order. The City has developed a written program detailing operation and maintenance for that MS4 infrastructure which is included in this Good Housekeeping Manual.

The 2023 MS4 Consent Decree requires that the City focus specifically on landscaping and street sweeping in this manual. This includes requirements for the use of slow-release fertilizers on all City-owned property that currently uses fertilizer; City-wide procedures to properly manage grass cuttings and leaf litter, including prohibiting organic waste on impervious surfaces; and increased street sweeping frequency of all City-owned, paved streets and parking lots to a minimum of two times per year, once following winter activities, such as sanding, and once following leaf fall.

1.2 HOW TO USE THIS MANUAL

The pollution prevention and good housekeeping controls outlined in this document and referred to as best management practices (BMPs), are standard operating procedures (SOPs) for City personnel and for use at all applicable City-owned facilities and drainage infrastructure within the MS4. These BMPs are intended to serve as guidance on good housekeeping practices as they relate to reducing pollutants in runoff from municipal operations.

Each of the BMP fact sheets provides a description of the practice, the pollution prevention approach, suggested practices, inspection procedures, and maintenance procedures. For those tasks that have a regulatory reporting component (e.g. volume of material removed from a catch basin), appropriate tracking log examples or inspection forms are included. These logs/forms will facilitate compilation of data required for National Pollutant Discharge Elimination System (NPDES) annual reporting.

The BMP fact sheets provide **Targeted facilities and operations**, which include public school properties, police and fire departments, parks and recreation spaces, City-owned buildings, and parking lots and garages, as well as municipal activities that take place throughout the City. Examples of these types of City-wide activities include roadway and drainage system maintenance. The potential pollutants associated with these targeted facilities and operations are identified below this list as **Targeted constituents** on each BMP fact sheet.

Manual Updates

This Manual is intended to be a 'living document' that is updated as necessary to meet the City's needs while striving to reduce pollution "to the maximum extent practicable" under the NPDES MS4 Permit. Under each BMP, a space for Notes / Specific Procedures has been included so that unique conditions, problem areas, protocol specifics, or changes can be documented by the City.

1.3 ANNUAL REPORTING

This document, as updated, should be included in the Annual Reports provided to the Massachusetts Department of Environmental Protection (MassDEP) and the United States Environmental Protection Agency (US EPA). Note that specific BMPs (such as the catch basin cleaning and street sweeping BMPs) are required elements of the Permit and specific data pertinent to execution of these tasks must be reported in the Annual Report.

1.4 DOCUMENT LIMITATIONS AND OTHER REGULATORY REQUIREMENTS

It should be noted that this document outlines best practices and procedures but does not include all best management practices required for Fire Station #6, the DPW Barn, and the Upland Road Maintenance Garage which all require a written Stormwater Pollution Prevention Plan (SWPPP) under this Permit or under the Multi-Sector General Permit (MSGP), which has additional requirements not included in this document. Lastly, facilities adjacent to wetlands may have Wetlands Protection Act Orders of Conditions for certain maintenance activities in proximity to wetland resources.

1.5 MANUAL DISTRIBUTION & TRAINING LOG*

Facility Name	Date of Manual Receipt	Name of Staff Person Receiving Manual and Training	Notes

* Training records should be included in Annual Report.

2 BEST MANAGEMENT PRACTICES (BMP) SHEETS

BMP 1 – LAWN AND GROUNDS MAINTENANCE

DESCRIPTION

Nutrient loads generated by suburban lawns as well as municipal properties can be significant, and recent research has shown that lawns produce more surface runoff than previously thought. Pesticide and fertilizer runoff can contribute pollutants that contaminate drinking water supplies and are toxic to both humans and aquatic organisms.

POLLUTION PREVENTION APPROACH

It is important to reduce pesticides, herbicides, fertilizers, and lawn debris from entering surface and ground water supplies by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater drainage system.

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

SUGGESTED BEST MANAGEMENT PRACTICES

Landscaping Activities

- Chemicals (insecticide, herbicide, or fertilizer) should only be applied by properly trained, licensed, or certified individuals.
- Use mulch or other erosion control measures on exposed soils.
- Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the stormwater drainage system.
- Avoid rinsing impervious surfaces with a hose after chemical application, especially if the area is near a drainage channel or surface waters.
- Plant drought-resistant vegetation when possible to reduce water usage.
- Use manual or mechanical weeding, biological controls, and Integrated Pest Management (IPM) strategies as outlined by Massachusetts Department of Agricultural Resources.
- Utilize natural compost or organic fertilizers when possible because they benefit soil health.

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Facilities with lawns and grounds
- Street and Public Rights-of-Way

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Organics
- Low Dissolved Oxygen

REFERENCE

- Integrated Pest Management (IPM) Six Step Approach | Mass.gov
- City of Holyoke Yard Waste Disposal Program

NOTES / SPECIFIC PROCEDURES:

(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

BMP 1 – LAWN AND GROUNDS MAINTENANCE	
• Employ mowing techniques to maintain a healthy lawn and minimize chemical use—no more than 1" of lawn should be removed from each mowing (grasses kept at 2.5" to 3.0" high are more heat resistant than close-cropped grass). • Keep mower blades sharp and leave clippings in place after mowing. • Plant disease-resistant, native plants and/or minimally mowed vegetation between application areas and drainage areas or surface waters to act as a buffer or filter. • Spot treat infected areas with a recommended amount of pesticides rather than treating the entire area. • Water plants in the early morning to maximize soil infiltration and minimize evaporation. *Fertilizer and Pesticide Management and Storage* • Utilize slow-release fertilizers when possible. • Time fertilizer application periods for maximum plant uptake, usually in the fall and the spring. • Do not over-apply fertilizer in late fall to "use it up" before winter. The effectiveness of fertilizer will not reduce when stored. • Avoid combined products such as "weed and feed," which do not target specific problems at the appropriate time. • Follow manufacturers' recommendations and label directions regarding amount and method of chemical application. • Do not apply insecticides within 100 feet of drainage channels or surface waters such as lakes, ponds, wetlands, and streams. • Use the minimum amount of toxic chemicals needed to complete the job. Avoid use of copper-based pesticides if possible. • Do not apply chemicals when the ground is frozen, when the soil is dry, when irrigation is expected to turn on, or when it is currently raining or expected to rain to reduce chances of chemical runoff. • Do not mix or prepare pesticides/fertilizers for application near storm drains or where accidental spills will contaminate surface water, groundwater, or soil. • Perform a soil analysis prior to applying fertilizers to determine the appropriate nutrients required for soil conditions. • Calibrate fertilizer/pesticide distributors to avoid excessive application. • Ensure that pesticide application equipment is capable of immediate shutoff in case of emergency. • Apply pesticides/fertilizers only when wind speeds are low.	

BMP 1 – LAWN AND GROUNDS MAINTENANCE	

• Till fertilizers into the soil rather than dumping or broadcasting them onto the surface.
• Irrigate slowly to prevent runoff and then only as much as is needed.
• Dispose of empty pesticide/fertilizer containers according to the instructions on the container label.
• Use up the pesticides. Rinse containers and use rinse water as product. Dispose of unused pesticide as hazardous waste.
• Implement storage requirements for pesticide products with guidance from the local Fire Department and the Massachusetts Department of Agricultural Resources.
• Provide secondary containment for pesticides and label them clearly.
• Store chemicals in an area which has been constructed in accordance with local fire codes for storing flammable or combustible materials.
  – Flammable products shall be stored separately from non-flammable products, preferably in a fire-proof cabinet.
  – Small quantities (less than 500 lbs or 220 gallons) of pesticides can be stored in cabinets constructed of double-walled 18-gauge sheet metal.
  – Large quantities (greater than 500 lbs or 220 gallons) of pesticides can be stored in a prefabricated Hazardous Material Storage Building or in a purpose-built storage facility. It is not anticipated that many municipal facilities will store quantities in excess of 500 lbs or 220 gallons of pesticides.
  – Building walls should have a two-hour fire rating and be impervious to the stored materials.
  – Floors should be watertight, impervious, and provide spill containment.
• Store materials in an enclosed area or in covered, impervious containment, such as a locked cabinet. The cabinet shall be located in a first story room or one which has direct access to the outdoors.
• For pesticides, storage cabinets should be kept locked and the door to the storage area should contain a weatherproof sign warning of the existence and danger of pesticides inside. The door should be kept locked. The sign should be posted in both English and the language or languages understood by workers if this is not English.	

BMP 1 – LAWN AND GROUNDS MAINTENANCE

The sign should be visible at a distance of twenty-five feet and should read as follows:

DANGER
PESTICIDE STORAGE
AREA
ALL UNAUTHORIZED
PERSONS KEEP OUT
KEEP DOORS LOCKED
WHEN NOT IN USE

- Pesticides shall not be stored in the same place as ammonium nitrate fertilizer.
- Separate pesticides and fertilizers from other chemical storage and other flammable materials.
- Label all containers with date of purchase, and use the older materials first.
- Clearly label all secondary containers.
- Never leave unlabeled or unstable pesticides and fertilizers in uncontrolled locations.
- Maintain a current written inventory of all pesticides and fertilizers at the storage site.
- Order for delivery as close to time of use as possible to reduce the amount of chemical stored at the facility.
- Order only the amount of materials needed in order to minimize excess or obsolete materials, which require storage and disposal.
- Regularly inspect storage area for leaks and spills.
- Storage area should be equipped with easily accessible spill cleanup materials and portable firefighting equipment.
- Emergency eyewash stations and emergency drench showers should be located near the storage area.
- Ensure that contaminated waste materials are kept in designated containers and stored in a labeled, designated, covered, and contained area.
- Dispose of excess or obsolete pesticides/fertilizers and associated waste materials in accordance with the manufacturer's specifications and all applicable regulations.

BMP 1 – LAWN AND GROUNDS MAINTENANCE	
Debris Removal • Use yard waste as mulch and topsoil. • Compost or mulch yard waste or leaf litter. • Sweep up yard debris instead of hosing down. • Yard waste can be disposed of at Holyoke's Yard Waste Facility during the Spring season with the use of a permit. The facility exclusively accepts Paper Leaf Bags containing yard waste. It is located at the City's Water Pollution Control Facility at 1 Berkshire Street, Holyoke, MA 01040, which is across from Casella Waste Systems • Clean pavement and sidewalk if fertilizer/pesticide is spilled on these surfaces before applying irrigation water by sweeping or vacuuming. Do not rinse off fertilizer/pesticide with water. • Do not leave yard waste in the street, and do not sweep it into storm drains or streams. • Do not blow organic waste onto adjacent impervious surfaces. **INSPECTION PROCEDURES** • Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. • Minimize excess watering, and repair leaks in the irrigation system as soon as they are observed. • Inspect and remove accumulated debris from grounds. • Routinely monitor lawns to identify problems during their early stages. • Inspect for problems by testing soils. **MAINTENANCE PROCEDURES** • Sweep paved areas regularly to collect loose particles, like leaf litter. Increase frequency of sweeps during fall months. • Wipe up spills with rags and other absorbent material immediately. • Do not hose down the area to a storm drain. • Maintain sharp mower blades.	

BMP 2 - STREET AND PARKING LOT SWEEPING

DESCRIPTION

Street and parking lot sweeping includes self-propelled equipment to remove sediment from paved surfaces that can enter storm drains or receiving waters. Sweeping is most effective for removing coarse particles, leaves, and trash. Regularly sweeping reduces catch basin cleaning, drainage blocks, and surface water pollution. The City currently aims to sweep all City-owned streets and parking lots at least twice annually.

POLLUTION PREVENTION APPROACH

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

SUGGESTED BEST MANAGEMENT PRACTICES

- Adhere to a street and parking lot cleaning schedule – all City-owned streets and parking lots should be cleaned twice annually, once following road sanding and salting and once following leaf falls, and main streets should be cleaned approximately twice monthly.
- City parking lots should be checked regularly by Facility personnel and swept when needed.
- Any visible sediment should be swept up (including sand/salt mixtures and granular material) and disposed of properly.
- Control the number of points where vehicles leave the Facilities to allow sweeping to be focused on certain areas in parking lots.
- Sweep up the smallest particles feasible.
- Sweep in pattern to keep spilled material from being pushed into catch basins.
- Before sweeping, manually rake sand from any turf areas on surfaces to be swept.
- Use hand-held tools to assist with mechanical equipment.
- If possible, recycle Fall leaf sweepings by composting.
- The Highway Department should maintain a log or schedule of sweeping activities they conduct. Information should include mileage, number of sweepings removed, and heavily sedimented areas for street rights-of-way.
- Facilities should maintain a log or schedule for their facility parking lots. Information should include number of sweepings removed, heavily sedimented catch basins, and date of sweeping activities. By recording heavily sedimented areas, prioritizations can be made to sweep these areas or clean catch basins more frequently.

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Facility Parking Lots
- Street Rights-of-Way
- Highway Division Operations

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Salt
- Trash
- Metals
- Oil & Grease
- Organics

REFERENCE

- Reuse and Disposal of Street Sweepings, MassDEP Policy # BAW-18-001
- Holyoke 2021 Street Sweeping Map

NOTES / SPECIFIC PROCEDURES:

(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

BMP 2 - STREET AND PARKING LOT SWEEPING	
INSPECTION PROCEDURES • Regularly inspect streets and City-owned parking lots within the MS4 for debris. **MAINTENANCE PROCEDURES** • Adjust broom frequently to maximize efficiency of sweeping operations. • After sweeping is finished, properly dispose of sweeper wastes, composting organic material when possible. • Do not use kick brooms or sweeper attachments that tend to spread dirt. • When unloading sweeper, make sure there is no dust or sediment release. • Inspect sweepers to check that they are properly maintained and repaired.	

Street Sweeping & Parking Lot Maintenance Activity Log

Date	Street Name (Segment) or Facility Name	Distance/Length (miles)	Equipment Used	Est. Volume of Material Removed

MAINTENANCE LOG BMP 2 - Street & Parking Lot Sweeping

Maintenance Records (copy information below for each control measure) **Example**

Equipment: FRHT M2 Sweeper

Regular Maintenance Activities: Check sweeper brooms for wear/issues.

Regular Maintenance Schedule: Regularly after use.

Date of Action: May 2023

Reason for Action: ☒ **Regular Maintenance** ☐ **Discovery of Problem**

If Problem,

- **Description of Action Required: No problems noted.**
- **Date Fixed:**
- **Justification if Maintenance Schedule is Extended:**

Notes:

Control Measure Maintenance Records (copy information below for each control measure)

Equipment:

Regular Maintenance Activities:

Regular Maintenance Schedule:

Date of Action:

Reason for Action: ☐ **Regular Maintenance** ☐ **Discovery of Problem**

If Problem,

- **Description of Action Required:**
- **Date Fixed:**
- **Justification if Maintenance Schedule Extended:**

Notes:

BMP 3 – ROAD SAND/SALT APPLICATION AND STORAGE

DESCRIPTION

Holyoke's current policy is to use salt or sand (or a combination of these materials) on streets and City-owned parking lots. Currently, road salt is stored at the salt shed under I-391 on South Water Street. Winter sand is available for use by Holyoke residents at Jed Days Landing. Proper storage is necessary to prevent contamination to surface and ground water supplies. Salts are very soluble—once in contact with water there is no way to remove salt. The major reasons for keeping salt covered and controlling use are that salt:

- Kills vegetation
- Corrodes infrastructure
- Blocks storm drains and swales
- Increases sedimentation to streams and rivers
- Small quantities (5% road salt) contain phosphorus, nitrogen, copper, and cyanide

POLLUTION PREVENTION APPROACH

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater system to the maximum extent practicable.

SUGGESTED BEST MANAGEMENT PRACTICES

Proper Storage

Currently, the City has enclosed piles of road salt in the aforementioned salt shed. Storage Facilities for salt and sand/salt mixtures should have the following key elements:

- Covered structures on impervious surfaces.
- Drainage should be diverted away from storage facility.
- Sand/salt handling should be done within storage facility.
- Should not be located in a water supply watershed or within 100-year floodplain.

Proper Disposal

Disposal of sand/salt mixtures should not be done in the following areas:

- Wetlands
- Any surface waters
- Well locations and public drinking supplies

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Facilities with walkways or vehicle parking including, but not limited to: Schools, Parking lots, etc.
- Facilities that store salt or sand
- Street Rights-of-Way

TARGETED CONSTITUENTS

- Salt
- Nutrients
- Metals
- Low Dissolved Oxygen
- TSS/TDS/Sediment
- Oil & Grease

REFERENCE

- City of Holyoke Sidewalk Snow Removal Ordinance
- Holyoke DPW Snow Information PageMassDEP Guidelines on Road Salt Storage (Updated January 1996)

NOTES / SPECIFIC PROCEDURES:
(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

BMP 3 – ROAD SAND/SALT APPLICATION AND STORAGE

Proper Removal

- Street cleaning of all City roadways at least twice annually.
- Catch basin cleaning completed as necessary to ensure that no catch basin within the MS4 is ever greater than 50% full.

Proper Use

- Establish a low salt area near any water bodies or residential areas.
- Regulate the amount of road salt applied to prevent over-salting of motorways and increasing runoff concentrations.
- Vary the amount of salt applied to reflect site-specific characteristics, such as road width and design, traffic concentration, and proximity to surface waters.
- Provide calibration devices for spreaders in trucks to aid maintenance workers in the proper application of road salts.
- Establish air temperature and snow depth conditions favorable for successful use of salt.
- Use alternative materials, such as sand or gravel, in especially sensitive areas.
- Use environmentally friendly products alternative to traditional deicing salt.

INSPECTION PROCEDURES

- Inspect salt storage shed for leaks on a regular basis including Fall and Spring.
- Inspect salt application equipment including calibration equipment and spreaders.
- Inspect salt regularly for lumping or water contamination.
- Inspect surface areas for evidence of runoff – salt stains in ground near and around the salt storage shed, loading area, or downslope.
- Inspect for excessive amounts of salt on roads.

MAINTENANCE PROCEDURES

- Service trucks and calibrated spreaders/sanders regularly to ensure accurate, efficient distribution of salt and sand.
- Educate and train operators on hazards of over-salting roads and environment at the beginning of the snow season as part of meetings with supervisors and drivers.
- Repair salt storage shed leaks.

MAINTENANCE LOG BMP 3 - Road Sand/Salt Application & Storage

Maintenance Records (copy information below for each control measure) **Example**

Equipment: FRHT Sander

Regular Maintenance Activities: Check sand distribution, check fluids in vehicle.

Regular Maintenance Schedule: Regularly during winter season.

Date of Action: November 2023.

Reason for Action: ☒ **Regular Maintenance** ☐ **Discovery of Problem**

If Problem,

- **Description of Action Required: No issues noted.**
- **Date Fixed:**
- **Justification if Maintenance Schedule Extended:**

Notes:

Maintenance Records (copy information below for each control measure)

Equipment:

Regular Maintenance Activities:

Regular Maintenance Schedule:

Date of Action:

Reason for Action: ☐ **Regular Maintenance** ☐ **Discovery of Problem**

If Problem,

- **Description of Action Required:**
- **Date Fixed:**
- **Justification if Maintenance Schedule is Extended:**

Notes:

BMP 4 – SNOW STOCKPILING AND REMOVAL

DESCRIPTION

Proper snow management in terms of stockpiling and removal can prevent or minimize runoff and pollutant loading impacts. Snow piles can contain trash, nutrients, sediments, salt, sand, and vehicle pollutants (petroleum, antifreeze, and oil) that can directly be carried into surface waters during snowmelt.

POLLUTION PREVENTION APPROACH

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

SUGGESTED BEST MANAGEMENT PRACTICES

The City does not regularly stockpile snow. During extreme conditions when stockpiling is necessary, the following practices should be applied:

- Do not stockpile snow near or within direct drainage to surface waters.
- Do not stockpile snow in wooded areas, around trees, or in vegetated buffer zones due to sediment and salt damage to vegetation.
- Stockpile snow in pervious areas where it can slowly infiltrate.
- During plowing activities on pervious surfaces, blading (plow lowers blade below ground surface level and plows the upper layers of soil in addition to overlying snow) should be avoided to prevent erosion.
- Do not dispose of snow into waters of the United States. Snow disposal sites, including selection of appropriate snow disposal sites, will adhere to the Massachusetts Department of Environmental Protection Snow Disposal Guidance (Effective Date: December 11, 2020).

INSPECTION PROCEDURES

- Check snow piles for debris that could be windblown.

MAINTENANCE PROCEDURES

- Contain sediments as snow melts and removed every Spring from snow storage areas. This includes sweeping roadways and parking lots or other impervious areas.
- During plowing activities, avoid blocking drainage structures including catch basins, swales, and channels.

TARGETED FACILITIES AND OPERATIONS

- Street Rights-of-Way
- All City-Owned Facilities with walkways or vehicle parking including, but not limited to: Schools, Parking lots, etc.
- Highway Department Services

TARGETED CONSTITUENTS

- Sediment
- Salt
- Nutrients
- Trash
- Oil & Grease

REFERENCE

- Snow Disposal Guidance | Mass.gov

NOTES / SPECIFIC PROCEDURES:

(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

BMP 5 - MATERIALS MANAGEMENT

DESCRIPTION

Materials management entails the selection of the individual product and quantity, the correct use and storage of the product, and the proper disposal of associated waste(s). It is important to be responsible with common chemicals and solvents including paints, cleaners, and automotive products to reduce contamination to stormwater runoff.

POLLUTION PREVENTION APPROACH

Proper management reduces the likelihood of accidental spills or releases of hazardous materials into storm drains or during storm events. In addition, health and safety conditions at the facility will improve.

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

SUGGESTED BEST MANAGEMENT PRACTICES

Material Inventory

- Identify all hazardous and non-hazardous substances by reviewing purchase orders and conducting a walk-through of each City facility.
- Compile Material Safety Data Sheets (MSDS) for all chemicals. These should be readily accessible to all facility employees and submitted to the Holyoke Fire Department when applicable.
- Label all containers of significant materials that include cleaners, fuels, and other hazards.
- Take note of materials that require secondary containers, and clearly label secondary containers.
- Identify handling, storage, and disposal requirements of all chemicals.
- Use environmentally friendly or non-hazardous substitutes when appropriate that include but not limited to $H_2Orange_2$, Orange Thunder, and Simple Green®.
- Keep hazardous materials and waste off the ground.
- All drums and containers should be in good condition and properly labeled.
- Loose materials including any gravel, salt, or sand piles should be covered or placed in shelter when possible.

Solid and Liquid Waste

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Facilities
- All City-Owned Parks and Open Spaces
- All Fleet Vehicle and Equipment Operations

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics
- Low Dissolved Oxygen

NOTES / SPECIFIC PROCEDURES:

(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

BMP 5 - MATERIALS MANAGEMENT	
• Trash storage bins, dumpsters, and disposal areas should be clean and free of debris, especially those located near catch basins. • Dumpsters should be maintained in good condition, inspected regularly, and securely closed at all times. • All equipment and materials should be stored properly, and work areas should be kept clean. • Waste shall be disposed of according to local, state, and federal laws. – Temporary trash storage should be inspected weekly before it is taken to the transfer station. • Piled debris, including sweepings, construction, and wood debris should be inspected weekly before it is taken off-site. • Do not dump or discharge any pollutant into MS4 storm drain systems or surface waters. Pollutants include any waste materials resulting from sewage, agricultural, industrial, or commercial processes. Exemptions include flows from firefighting activities, municipal waterline flushing, irrigation discharge, water from individual residential car washing, natural groundwater, stream, or wetland flows, and fluid from dye tests provided the Holyoke DPW was notified of such tests. **INSPECTION PROCEDURES** • Physical on-site verification of sealed floor drains (or redirected to sanitary sewer). • Regular inspection of material storage areas (inside and outside) to verify items are not exposed to precipitation and are covered or in enclosed areas. • Regular inspection and cleaning of oil/water separators by qualified contractor or facility personnel. • Inspect stormwater discharge locations and on-site stormwater drainage infrastructure (e.g., catch basins) regularly (for contaminants, soil staining, plugged discharge lines and other maintenance needs). **MAINTENANCE PROCEDURES** • Repair or replace any leaking/defective containers and replace labels as necessary. • Maintain caps and/or covers on containers. • Maintain aisle space for inspection of products/wastes. • Routinely clean workspaces. • Properly collect/dispose of waste. • Routinely maintain and inspect vehicles and equipment.	

BMP 5 - MATERIALS MANAGEMENT	
• Train employees routinely when new products enter the facility on proper use, storage, disposal, and safety concerns. MSDS sheets should be reviewed and readily accessible in a central facility location. • Review any Spill Prevention, Control, and Countermeasure (SPCC) Plan if applicable for the facility. SPCC Plans are in place for specific facilities with petroleum products. • Adhere to SWPPP maintenance requirements if facility is required to have a SWPPP.	

MAINTENANCE LOG BMP 5 - Materials Management

Maintenance Records (copy information below for each control measure) **Example**

Control Measure or Equipment: Waste materials collecting in workspace.

Regular Maintenance Activities: Maintain clean work area and dispose of waste properly.

Regular Maintenance Schedule: As needed.

Date of Action: June 2, 2021

Reason for Action: ☐ **Regular Maintenance** ☒ **Discovery of Problem**

If Problem,

- **Description of Action Required: Remove collected waste.**
- **Date Fixed: Immediately; June 2, 2021**
- **Justification if Maintenance Schedule Extended:**

Notes:

Maintenance Records (copy information below for each control measure)

Control Measure or Equipment:

Regular Maintenance Activities:

Regular Maintenance Schedule:

Date of Action:

Reason for Action: ☐ **Regular Maintenance** ☐ **Discovery of Problem**

If Problem,

- **Description of Action Required:**
- **Date Control Measure Returned to Full Function:**
- **Justification for Extended Schedule, if applicable:**

Notes:

BMP 6 - HAZARDOUS MATERIAL STORAGE

DESCRIPTION

It is important to properly store hazardous materials to prevent them from contaminating stormwater runoff. Common hazardous materials that may be present in City-owned facilities within the MS4 include:

- Cleaning agents: solvents, drain cleaners, and bleach
- Vehicle maintenance fluids: motor oil, gasoline, antifreeze, degreasers, and radiator flush
- Water treatment chemicals
- Paints

POLLUTION PREVENTION APPROACH

Proper management reduces the likelihood of accidental spills or releases of hazardous materials during storm events. In addition, health and safety conditions at the facility will improve.

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

SUGGESTED BEST MANAGEMENT PRACTICES

Loading/Unloading

- All facilities should have proper procedures in place for loading and/or unloading hazardous materials, especially in areas located near catch basins.
- Do not conduct loading and unloading of exposed hazards during wet weather, whenever possible.
- Load and unload only at designated loading areas.
- If feasible, load and unload all materials and equipment in covered areas such as building overhangs at loading docks.
- Use drip pans underneath hose and pipe connections and other leak-prone spots during liquid transfer operations, and when making and breaking connections.

Storage

- When possible, store hazardous materials and wastes indoors.
- Storage of reactive, ignitable, or flammable liquids must comply with the Massachusetts Fire Prevention Regulations for the Storage of Flammable and Combustible Materials (527 CMR 14.03).
- Place containers in a designated area that is paved, free of cracks and gaps, and impervious, in order to contain leaks and spills. The area should also be covered.

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Facilities
- All Fleet Vehicle and Equipment Operations

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics
- Low Dissolved Oxygen

REFERENCE

- City of Holyoke Department of Public Works

NOTES / SPECIFIC PROCEDURES:

- These BMPs may not be enough to meet all regulatory compliance obligations for specific materials, container types (e.g. UST/AST), or volumes of material, kept at municipal facilities. If there are specific regulatory compliance guidelines for a material, those guidelines should supersede this guidance.

BMP 6 - HAZARDOUS MATERIAL STORAGE

- Provide secondary containment for hazardous materials and waste placed outdoors.
- Keep containers away from high traffic areas.
- Cover all containers and drums or place under shelter, if stored outdoors.
- MSDSs should be supplied for all stored materials at a specific facility, and in readily accessible location for all facility employees.
- Maintain a log inventory of materials stored at the facility.
- Chemicals should be kept in original labeled containers.
- Containers should not be overfilled.
- Store containers on pallets.
- Properly stack containers and drums.
- Storage areas should be enclosed.
- Minimize storage on-site.
- Keep storage areas clean and organized.
- Certain hazardous materials are accepted by the Holyoke DPW by appointment on scheduled collection days. The Collection Facility is located at 63 Canal Street, Holyoke, MA 01040
- Certain medical waste materials are accepted by Tapestry Health at 15A Main Street, Holyoke, MA 01040.
- Contractors should be responsible for delivery, storage, and waste disposal practices.
- Containers should not be glass.
- Segregate reactive/incompatible materials (such as chlorine and ammonia).
- Place drip pans under container spouts.
- Install overfill protection on storage tanks/drums.
- Lock storage areas and provide warning signs.

INSPECTION PROCEDURES

- Check loading and unloading equipment regularly for leaks, including valves, pumps, flanges and connections.
- Look for dust or fumes during loading or unloading operations.
- Inspect storage areas regularly for leaks or spills.
- Conduct routine inspections and check for external corrosion of material containers.
- Check for structural failure, spills and overfills due to operator error, failure of piping system.
- Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.
- Visually inspect new tank or container installations for loose fittings, poor welding, and improper or poorly fitted gaskets.

BMP 6 - HAZARDOUS MATERIAL STORAGE	
• Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system. • Replace containers that are leaking, corroded, or otherwise deteriorating with ones in good condition. If the liquid chemicals are corrosive, containers made of compatible materials must be used instead of metal drums. • Label new or secondary containers with the product name and hazards. **MAINTENANCE PROCEDURES** • Conduct regular inspections and make repairs as necessary. The frequency of repairs will depend on the age of the facility. • Check loading and unloading equipment regularly for leaks. • Sweep area regularly with dry broom. • Conduct major clean-out of loading and unloading area and any sumps annually in the Fall. • Repair or replace any leaking/defective containers and replace labels as necessary. • Maintain caps and/or covers on containers. • Maintain aisle space for inspection of products/wastes. • Train employees on proper procedures and when new hazardous materials are used.	

MAINTENANCE LOG BMP 6 - Hazardous Material Storage

Maintenance Records (copy information below for each control measure) **Example**

Control Measure or Equipment: Cap on hazardous material container is cracked.

Regular Maintenance Activities: Noted during regular work operations. Check hazardous materials containers.

Regular Maintenance Schedule: As needed.

Date of Action: May 29, 2023

Reason for Action: ☐ **Regular Maintenance** ☒ **Discovery of Problem**

If Problem,

- **Description of Action Required: Replace cracked cap.**
- **Date Fixed: Immediately, May 29, 2021**
- **Justification if Maintenance Schedule Extended:**

Notes:

Maintenance Records (copy information below for each control measure)

Control Measure or Equipment:

Regular Maintenance Activities:

Regular Maintenance Schedule:

Date of Action:

Reason for Action: ☐ **Regular Maintenance** ☐ **Discovery of Problem**

If Problem,

- **Description of Action Required:**
- **Date Fixed:**
- **Justification if Maintenance Schedule Extended:**

Notes:

BMP 7 - VEHICLE FUELING, MAINTENANCE, AND STORAGE

DESCRIPTION

Vehicle repair and service (e.g. parts cleaning and fueling), replacement of fluids (e.g. oil change), and outdoor equipment storage and parking (dripping engines) can impact water quality if stormwater runoff from areas with these activities occurring on them becomes polluted by a variety of contaminants. Spills and leaks that occur during vehicle and equipment fueling can contribute hydrocarbons, oil and grease, as well as heavy metals to stormwater runoff. It only takes 1 gallon of oil to contaminate 1 million gallons of drinking water. Some fueling/transportation facilities may be subject to specific regulations (e.g. SWPPP) requirements.

POLLUTION PREVENTION APPROACH

It is important to properly store and discard vehicle fluids including oil, transmission fluid, antifreeze, and lubricants to prevent surface and groundwater contamination from spills or improper disposal. Currently, vehicle washing is done at the Upland Road Maintenance Garage and completely indoors at the DPW Barn.

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system.

SUGGESTED BEST MANAGEMENT PRACTICES

General Practices

- Store fluids in labeled, plastic or metal container with a lid away from drains and catch basins.
- Place flammables in a fire safe cabinet.
- Place drip pans under leaking vehicles, valves, spigots, and pumps.
- Routinely check for leaking vehicles.
- Do not do any vehicle maintenance near storm drains.
- Vehicle maintenance should be done in a covered facility.
- Install inlet catch basin equipped with a small sedimentation basin or grit chamber to remove large particles from stormwater in highly impervious areas.

Fueling

- Ensure that all fueling activities are not conducted near storm drains and dry wells or that procedures are in place to control any spills.
- Fuel storage tanks should be placed on impervious surfaces with no cracks or gaps; secondary containment is recommended.

TARGETED FACILITIES AND OPERATIONS

- All City-owned facilities storing vehicles and equipment

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease (Hydrocarbons)

NOTES / SPECIFIC PROCEDURES:

(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

BMP 7 - VEHICLE FUELING, MAINTENANCE, AND STORAGE

- Provide barriers such as posts, guard rails, or bollards where tanks are exposed, to prevent collision damage with vehicles.
- Post signs at the fuel dispenser or fuel island warning vehicle owners/operators against "topping off" of vehicle fuel tanks.
- Label drains within the facility boundary, by paint/stencil (or equivalent), to indicate whether they flow to an oil/water separator, directly to the sewer, to a storm drain or into a drywall.

Vehicle Maintenance

- Provide a designated area for vehicle maintenance on an impervious surface.
- Keep equipment clean; don't allow excessive build-up of oil and grease.
- If possible, perform all vehicle fluid removal or changing inside or under cover:
  - Keep a drip pan or absorbent pad under the vehicle while you unclip hoses, unscrew filters, or remove other parts.
  - Promptly transfer used fluids to the proper waste or recycling drums. Don't leave drip pans, absorbent pads, or other open containers lying around.
  - Keep drip pans or containers under vehicles or equipment that might drip during repairs.
  - Do not change motor oil or perform equipment maintenance in non-appropriate areas.
- If temporary work is being conducted outside: Use a tarp, ground cloth, drip pans, or absorbent pads beneath the vehicle or equipment to capture all spills and drips.
- If equipment (e.g., radiators, axles) is to be stored outdoors, oil and other fluids should be drained first. This is also applicable to vehicles being stored and not used on a regular basis.

Disposal

- Recycle or properly dispose of fluids.
- Dump full pans into 55-gallon drums.
- Dispose of debris including oil filters, oil cans, rags, and clean-up supplies.
- Do not dump vehicle fluids down storm drains.
- Interior floor drains should discharge to holding tanks or be sealed.

Used Oil

- Recycle used oil.
- Do not mix wastes with used oil.

INSPECTION PROCEDURES

BMP 7 - VEHICLE FUELING, MAINTENANCE, AND STORAGE	
• Identify locations of floor drains and catch basins and know where they discharge to. Floor drains should be connected to the sanitary sewer system and catch basins should be connected to the drainage system. • Regularly inspect vehicles and equipment for leaks and repair immediately. • Inspect fuel storage tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system. • Inspect fueling areas, catch basin inserts, containment areas, and drip pans on a regular schedule. **MAINTENANCE PROCEDURES** • Sweep the maintenance area on a regular basis, if it is paved, to collect loose particles. Wipe up spills with rags and other absorbent material immediately. Do not hose down the area to a storm drain. • Clean oil/water separators, sumps and on-site treatment/recycling units at appropriate intervals. • Keep ample supplies of spill cleanup materials onsite. Cleanup spills immediately. • Properly train employees on fueling and handling oil and waste oil.	

BMP 8 - VEHICLE WASHING

DESCRIPTION

Wash water from vehicle and equipment cleaning activities performed outdoors or in areas where wash water flows onto the ground can contribute toxic hydrocarbons and other organic compounds, oils and greases, nutrients, phosphates, heavy metals, and suspended solids to stormwater runoff.

Consistent with the USEPA NPDES Phase II Small Municipal Separate Storm Sewer System (MS4) Permit, municipal vehicle washing activities should not discharge pollutants to the MS4 system.

POLLUTION PREVENTION APPROACH

If possible, take vehicles to the City's Upland Road Maintenance Garage, the DPW Barn, or a commercial car wash facility to avoid discharging wash fluids outdoors. Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system.

SUGGESTED BEST MANAGEMENT PRACTICES

General

- Use biodegradable, phosphate-free detergents for washing vehicles as appropriate. Products include Simple Green® biodegradable car wash cleaner.
- Mark the area clearly as a wash area.
- Post signs stating that only washing is allowed in wash area and that discharges to the storm drain are prohibited. Facility employees should know where catch basins are.
- Provide a trash container in wash area.
- Those that use facility to wash vehicles (e.g., students) should be informed of proper washing protocols via signage or training.

Vehicle and Equipment Cleaning

- Install sumps or drain lines to collect wash water or construction of a berm around the designated area and grading of the area to collect wash water as well as prevent stormwater run-on.
- Consider washing vehicles and equipment inside the building if washing/cleaning must occur on-site.
- Use dry clean-up methods as much as possible instead of washing with water, like sweeping, vacuuming, or wiping equipment down.
- If washing must occur on-site and outdoors:
  - Use designated paved wash areas. Designated wash areas must be well marked with signs indicating where and how

TARGETED FACILITIES AND OPERATIONS

- All City-owned facilities storing vehicles and equipment

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics

NOTES / SPECIFIC PROCEDURES:
(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

BMP 8 - VEHICLE WASHING

washing must be done. This area must be covered or bermed to collect the wash water and graded to direct the wash water to a treatment or disposal facility. – Cover the wash area when not in use to prevent contact with rainwater. – Grassy and pervious (porous) surfaces may be used to promote direct infiltration of wash water, providing treatment before recharging groundwater and minimizing runoff to an adjacent stormwater system. – Consider using a pollutant filter that removes petroleum and nutrients, like Filtrexx™, if washing vehicles on impervious surfaces discharging to storm drains. • Use hoses with nozzles that automatically turn off when left unattended. Use high-pressure, low-volume sprays. • Perform pressure cleaning and steam cleaning off-site to avoid generating runoff with high pollutant concentrations. If done on-site, no pressure cleaning and steam cleaning should be done in areas designated as protection areas for public water supply. • Do not power wash, steam clean, or perform engine cleaning or undercarriage cleaning if wash water cannot be properly contained and disposed of. *Disposal* • Filter and recycle wash water if possible. • If discharging to an oil/water separator, do not use detergents that disperse oil in wash water and make oil/water separators ineffective with oil passing to the sanitary sewer system. It is best to use high pressure water with no cleaning agent. If using a cleaner, it must be a non-emulsifying product such as QOR-110 ("Quick Oil Release"). **INSPECTION PROCEDURES** • Inspect floor drain systems regularly – use only those that discharge to a sanitary sewer. • Identify the cleaning needs of catch basins and oil/water separators. **MAINTENANCE PROCEDURES** • Maintain a figure of on-site storm drain locations to avoid discharges to the storm drainage system. • Take precautions against excess use of and spillage of detergents. • Clean vehicles only where wash-water can be captured for proper disposal.	

BMP 9 – SPILL PREVENTION AND RESPONSE

DESCRIPTION

It is important to have a plan in place in the event a spill should occur, so contaminants do not mix with stormwater runoff. A spill prevention and response plan can be effective at reducing the risk of contamination to surface and groundwater contamination—but only with proper personnel training, the availability of cleanup supplies, and when management ensures procedures are followed.

POLLUTION PREVENTION APPROACH

- Create a well thought out and implemented spill prevention and response plan.
- Post a response checklist in any hazardous waste storage area with contact information (including emergency phone numbers), and spill containment procedures.
- Train personnel.
- Regularly update plan, checklists, and contact information.
- Regularly inspect spill potential areas.
- Facilities with aboveground storage tanks (ASTs) and underground storage tanks (USTs) greater than 1,320 gallons and 42,000 gallons must have a Spill Prevention, Control and Countermeasures (SPCC) Plans in place.

SPILL PREVENTION AND RESPONSE PLAN

An effective Spill Prevention and Response Plan may include one or more of the following:

- Description of the facilities, the address, activities and materials involved.
- Identification of key spill response personnel and hospital contacts.
- Identification of the potential spill areas or operations prone to spills/leaks.
- Identification of which areas should be or are bermed to contain spills/leaks.
- Facility map identifying the key locations of areas, activities, materials, structural BMPs, etc.
- Material handling procedures and safety measures for each kind of waste.
- Spill response procedures including:
  - Assessment of the site and potential impacts
  - Containment of the material
  - Notification of the proper personnel and evacuation procedures

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Buildings
- Street and Public Rights-of-Way

TARGETED CONSTITUENTS

- Nutrients
- Metals
- Oil & Grease
- Hydrocarbons
- Organics

NOTES / SPECIFIC PROCEDURES:

(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

BMP 9 – SPILL PREVENTION AND RESPONSE

- Clean up of the site
- Disposal of the waste material
- Proper record keeping procedures

- Plan to protect all storm drains in the event of a spill.
- Descriptions of spill response equipment, including safety and cleanup equipment.

SUGGESTED BEST MANAGEMENT PRACTICES

Spill/Leak Prevention

- If possible, move material handling indoors, under cover, or away from storm drains or sensitive water bodies.
- Properly label all containers so that the contents are easily identifiable.
- Berm storage areas so that if a spill or leak occurs, the material is contained.
- Cover outside storage areas either with a permanent structure or with a seasonal one such as a tarp so that rain will not come into contact with the materials.
- Check containers (and any containment sumps) often for leaks and spills. Replace containers that are leaking, corroded, or otherwise deteriorating with containers in good condition. Collect all spilled liquids and properly dispose of them.
- Store, contain, and transfer liquid materials in such a manner that if the container is ruptured or the contents spilled, they will not discharge, flow or be washed into the storm drainage system, surface waters, or groundwater.
- Place drip pans or absorbent materials beneath all mounted taps and at all potential drip and spill locations during the filling and unloading of containers. Any collected liquids or soiled absorbent materials should be reused/recycled or properly disposed of.
- For City programs that involve material transport, only transport the minimum amount of material needed for the daily activities and transfer materials between containers at a municipal yard where leaks and spills are easier to control.
- If paved, sweep and clean storage areas monthly, do not use water to hose down the area unless all the water will be collected and disposed of properly (e.g., in an oil/water separator).
- Install a spill control device (such as a tee section) in any catch basins that collect runoff from any storage areas if the materials stored are oil, gas, or other materials that separate from and float on water. This will allow for easier cleanup if a spill occurs.
- If necessary, protect catch basins while conducting field activities so that if a spill occurs, the material will be contained.

BMP 9 – SPILL PREVENTION AND RESPONSE	
• Keep ample supplies of spill cleanup materials such as Speedi Dry and absorbent boom pads onsite. *Spill Clean Up* • Small non-hazardous spills: – Use a rag, damp cloth or absorbent materials for general cleanup of liquids. – Use brooms or shovels for the general cleanup of dry materials. – If water is used, it must be collected and properly disposed of. The wash water cannot be allowed to enter the storm drain. – Dispose of any waste materials properly. – Clean or dispose of any equipment used to clean up the spill properly. • Large non-hazardous spills – Use absorbent materials for general cleanup of liquids. – Use brooms, shovels, or street sweepers for the general clean-up of dry materials. – If water is used, it must be collected and properly disposed of. The wash water cannot be allowed to enter the storm drain. – Dispose of any waste materials properly. – Clean or dispose of any equipment used to clean up the spill properly. • For hazardous or very large spills, the Fire Department and/or a private cleanup contractor may need to be contacted to assess the situation and conduct the cleanup and disposal of the materials. • Chemical cleanups of material can be achieved with the use of absorbents, gels, and foams. • Remove the adsorbent materials promptly and dispose of according to regulations. • If the spilled material is hazardous, then the used cleanup materials, including rags, are also hazardous and must be sent to a certified laundry facility or disposed of as hazardous waste. *Reporting* • Report any spills immediately to the identified key municipal spill response personnel. • Report spills in accordance with applicable reporting laws. Spills that pose an immediate threat to human health or the environment must be reported immediately to the Fire Department at 911, the City's Board of Health at 413-322-5595, and the Department of Public Works at 413-322-5645.	

BMP 9 – SPILL PREVENTION AND RESPONSE	
• Large spills including those over 10 gallons should be reported to the Fire Department at 911 and the Department of Public Works at 413-322-5645. • Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour). An oil spill over 10 gallons that reaches a surface water, sewer, storm drain, ditch, or culvert leading thereto requires MassDEP notification at 1-888-304-1133. • After the spill has been contained and cleaned up, a detailed report about the incident should be generated and kept on file. The incident may also be used in briefing staff about proper procedures. **INSPECTION PROCEDURES** • Inspect secondary containment systems and oil/water separators periodically to identify any operational problems. • Inspect containers for leaks, areas near storm receiver inlets and outlets, and floor drains for indications of spills. **MAINTENANCE PROCEDURES** • Pump out oil/water separators as needed. • Protect drains with oil absorbent materials. • Clean out receivers on regular schedule. • Remove spilled salt from salt loading areas and salting procedures.	

BMP 10 - CATCH BASIN CLEANING

DESCRIPTION

It is important to remove sediments from catch basins that can have a high concentration of pollutants including metals and hydrocarbons. These sediments can clog downstream drainage systems and transport pollutants to nearby water bodies.

POLLUTION PREVENTION APPROACH

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

SUGGESTED BEST MANAGEMENT PRACTICES

- Prioritize inspection and maintenance for catch basins located near construction activities.
- Ensure that no catch basin at any time will be more than 50 percent full.
- Document catch basins with sumps more than 50 percent full during two consecutive inspections/cleanings.
- US EPA recommends cleaning basins when solids reach one-third the depth from the basin bottom to the invert of the lowest pipe into or out of the basin.
- Target cleaning for early Spring or late Fall.
- Clean manually or with equipment (i.e., bucket loaders).
- Properly dispose of catch basin material or store until contractor picks up cleanings (MassDEP and US EPA requires chemical analysis to determine if substance is hazardous waste).
- Repair damaged catch basins including outlet traps.
- Install hoods if catch basins do not have them.
- Inform employees that catch basins are part of the stormwater drainage system and not the sanitary sewer system.
- The DPW should maintain a log of cleaning activities. Information should include the amount of waste removed (volume or weight) and areas with heavily filled basins.
- Facilities should maintain a log of cleaning activities on their parking lots. Information should include amount of waste removed (volume or weight), heavily filled catch basins, and dates cleaned by the Highway Division.

INSPECTION PROCEDURES

- Inspect catch basins, grates, and ditches at least once per year (best times are before the start and before the end of the rainy season).

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Facilities
- Street Rights-of-Way
- Disposal of Removed Solids

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics

REFERENCE

- MassDEP Management of Catch Basin Cleanings

NOTES / SPECIFIC PROCEDURES:

(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

BMP 10 - CATCH BASIN CLEANING	
• Inspections should be incorporated during routine cleaning, as part of reconstruction contracts, and through requests made by residents or other City departments. • If illicit discharges are observed or suspected, notify the DPW at phone 413-322-5645. **MAINTENANCE PROCEDURES** • Clean catch basins based on the cleaning schedule or as needed. Catch basins should be checked for sediment levels in sump. Those in areas that accumulate a significant amount of sediment should be cleaned more frequently. • During catch basin repairs, any hoods missing should be replaced.	

Catch Basin Maintenance Log

Date	Catch Basin Asset ID	Nearest Street Address	Percent Full Sump at Initiation (Estimated)	Volume of Material Removed (Estimated)	Disposal Method	Follow-up Required

CATCH BASIN INSPECTION FIELD SHEETS

Background Data

City:	Street:	Catch Basin ID: CB-
Owner: ☐ City ☐ State ☐ Private ☐ Other: _____	Nearest House/Utility Pole #:	
Today's date:	Time (Military):	
Investigators:	Form completed by:	
A: Depth Rim to Lowest Outlet Invert (in):	B: Depth Rim to Top of Sediment (Before Cleaning) (in.):	
C: Depth Rim to Bottom of Sump after Cleaning (in.):	D: Depth of Sump = A – C (in):	Catch Basin Sump % Full = (C-B) / D:

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

☐ Industrial	☐ Ongoing Construction Site
☐ Urban Residential	☐ Open Space/Wooded
☐ Suburban Residential	☐ Institutional
☐ Commercial	Other: _____
	Known Industries: _____

Notes:

Visual/Sensory Observations of Potential Illicit Discharge?

Are Any Visual/Sensory Observations Present? ☐ Yes ☐ No *(If No, Skip Entire Section)*

INDICATOR	CHECK if Present	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)		
Flow	☐	Flow Source:	☐ 1 – Trickle	☐ 2 – Moderate	☐ 3 – Substantial
Odor	☐	☐ Sewage ☐ Rancid/sour ☐ Petroleum/gas ☐ Sulfide ☐ Other:	☐ 1 – Faint	☐ 2 – Easily detected	☐ 3 – Noticeable from a distance
Color	☐	☐ Clear ☐ Brown ☐ Gray ☐ Yellow ☐ Green ☐ Orange ☐ Red ☐ Other:	☐ 1 – Faint color	☐ 2 – Moderately visible	☐ 3 – Clearly visible
Turbidity	☐	See severity	☐ 1 – Slight cloudiness	☐ 2 – Cloudy	☐ 3 – Opaque
Floatables (Does Not Include Trash!)	☐	☐ Sewage (Toilet Paper, etc.) ☐ Suds ☐ Petroleum (oil sheen) ☐ Other:	☐ 1 – Few/slight; origin not obvious	☐ 2 – Some; indications of origin (e.g., possible suds or oil sheen)	☐ 3 - Some; origin clear (e.g., obvious oil sheen, suds, or floating sanitary materials)

Section 7: Any Non-Illicit Discharge Concerns (e.g., trash or needed infrastructure repairs)?

BMP 11 - PET WASTE, WATERFOWL, AND LITTER MANAGEMENT

DESCRIPTION

Pet droppings are important contributors of pollution in surface waterbodies where there are high populations of dogs. Studies have shown that a typical dog dropping can have as many as 3 billion fecal coliform and can carry many diseases that could make water unsafe for contact.

Waterfowl waste not only raises bacteria concentrations to levels unsafe for water contact recreation, but it is also a source of nutrients that allow excessive growth of algae and rooted aquatic plants in receiving waters. Feeding of waterfowl by streams and ponds encourages waterfowl congregation in those areas.

POLLUTION PREVENTION APPROACH

Provide pet waste and waterfowl management awareness and education programs with the following elements:

- Encouraging residents to clean up after their pets and to properly dispose of such wastes that may be deposited in their yards, streets, and parks.
- Posting signs in local parks describing the problem and urging cleanup and proper disposal of pet wastes.
- Discourage feeding of waterfowl at local parks, particularly where adjacent to waterways. Produce educational material and/or post signage as appropriate.
- Provide pet waste information to dog owners during annual pet license renewal.

SUGGESTED BEST MANAGEMENT PRACTICES

- Put pet waste in the trash.
- Provide pet waste bag dispensers at City-owned parks.
- Restrict dog access to areas of parks where swales, steep slopes and streams are.
- Provide vegetated buffers of prescribed widths between dog parks and waterways, swales, storm drain inlets, gullies, and steep slopes.
- Incorporate public outreach elements like signage and informational brochures into and around parks.

INSPECTION PROCEDURES

- Routinely inspect common dog walking areas for pet waste.
- Evaluate pet waste/waterfowl waste management and document targeted effort to address “problem” areas.

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Parks, Playgrounds, and Reservations
- Sidewalk and Street Rights-of-Way
- Areas surrounding waterbodies with bacteria/pathogen impairments: Housatonic River, East, Southwest, and West Branch

TARGETED CONSTITUENTS

- Bacteria
- Nutrients
- Organics
- Low Dissolved Oxygen

Reference

- Housatonic Valley Association – Be River Smart

NOTES / SPECIFIC PROCEDURES:

(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

BMP 11 - PET WASTE, WATERFOWL, AND LITTER MANAGEMENT	
MAINTENANCE PROCEDURES • Remove and properly dispose of pet waste.	

BMP 12 – WASTE MANAGEMENT

DESCRIPTION

Improper storage and handling of solid wastes can allow toxic compounds, oils and greases, heavy metals, nutrients, suspended solids, and other pollutants to enter stormwater runoff.

POLLUTION PREVENTION APPROACH

The discharge of pollutants to stormwater from waste handling and disposal can be prevented and reduced by tracking waste generation, storage, and disposal; reducing waste generation and disposal through source reduction, re-use, and recycling; and preventing run-on and runoff.

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

SUGGESTED BEST MANAGEMENT PRACTICES

General

- Cover storage containers with leak proof lids or some other means. If waste is not in containers, cover all waste piles (plastic tarps are acceptable coverage) and prevent stormwater run-on and runoff with a berm. The waste containers or piles must be covered except when in use.
- Use drip pans or absorbent materials whenever grease containers are emptied by vacuum trucks or other means. Grease cannot be left on the ground. Collected grease must be properly disposed of as garbage.
- Sweep and clean the storage area regularly. If it is paved, do not hose down the area to a storm drain.
- Dispose of rinse and wash water from cleaning waste containers into a sanitary sewer if allowed by the local sewer authority. Do not discharge wash water to the street or storm drain.
- Transfer waste from damaged containers into safe containers.
- Take special care when loading or unloading wastes to minimize losses.

Controlling Litter

- Post “No Littering” signs and enforce anti-litter laws.
- Provide a sufficient number of litter receptacles for the facility.
- Clean out and cover litter receptacles frequently to prevent spillage.

Waste Collection

- Keep waste collection areas clean before contractor picks up.
- Inspect solid waste containers for structural damage or leaks regularly. Repair or replace damaged containers as necessary.
- Secure solid waste containers; containers must be closed tightly when not in use.
- Place waste containers under cover if possible.

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Facilities

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics
- Low Dissolved Oxygen

NOTES / SPECIFIC PROCEDURES:
(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

BMP 12 – WASTE MANAGEMENT	
• Do not fill waste containers with washout water or any other liquid. • Ensure that only appropriate solid wastes are added to the solid waste container via inspections and signage. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc. may not be disposed of in solid waste containers (see chemical/ hazardous waste collection section below). • Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal. *Good Housekeeping* • Use the entire product before disposing of the container. • Keep the waste management area clean at all times by sweeping and cleaning up spills immediately. • Use dry methods when possible (e.g. sweeping, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer. • Stencil storm drains on the facility's property with prohibitive message regarding waste disposal. *Chemical/Hazardous Wastes* • Select designated hazardous waste collection areas on-site and label or mark them clearly. • Store hazardous materials and wastes in covered containers protected from vandalism, and in compliance with fire and hazardous waste codes. • Place hazardous waste containers in secondary containment. • Make sure that hazardous waste is collected, removed, and disposed of only at authorized disposal areas. *Run-on/Runoff Prevention* • Prevent stormwater run-on from entering the waste management area by enclosing the area or building a berm around the area. • Prevent the waste materials from directly contacting rain. • Cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropylene, or Hypalon. • Cover the area with a permanent roof if feasible. • Cover dumpsters to prevent rain from washing waste out of holes or cracks in the bottom of the dumpster. • Move the activity indoor after ensuring all safety concerns such as fire hazard and ventilation are addressed. **INSPECTION PROCEDURES** • Inspect and replace faulty pumps or hoses regularly to minimize the potential of releases and spills. • Check waste management areas for leaking containers or spills.	

BMP 12 – WASTE MANAGEMENT	
• Repair leaking equipment including valves, lines, seals, or pumps promptly. **MAINTENANCE PROCEDURES** • Maintain equipment for material tracking program.	

BMP 13 – BUILDING OPERATIONS

DESCRIPTION

Typical building operations include cleaning operations such as outside pressure washing of buildup and repairs.

POLLUTION PREVENTION APPROACH

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

SUGGESTED BEST MANAGEMENT PRACTICES

Pressure Washing of Buildings, Rooftops, and Other Large Objects

- In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a waste/water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.
- If soaps or detergents are not used, and the surrounding area is paved, wash water runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in the catch basin to trap the particles in wash water runoff.
- If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement. Ensure that this practice does not kill grass.

Building Repair, Remodeling, and Construction

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.
- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.
- Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.
- Clean paint brushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal. Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Facilities

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics
- Low Dissolved Oxygen

NOTES / SPECIFIC PROCEDURES:
(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

BMP 13 – BUILDING OPERATIONS	
and enter a catch basin. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and solids must be collected and disposed of before removing the containment device(s) at the end of the work day. • If you need to de-water an excavation site, you may need to filter the water before discharging to a catch basin or off-site. In which case you should direct the water through hay bales and filter fabric or use other sediment filters or traps. • Store toxic material under cover with secondary containment during precipitation events and when not in use. A cover would include tarps or other temporary cover material. **INSPECTION PROCEDURES** • Sweep paved areas regularly to collect loose particles and wipe up spills with rags and other absorbent material immediately; do not hose down the area to a storm drain.	

BMP 14 – OIL/WATER SEPARATORS

DESCRIPTION

Oil/Water separators (OWS)/interceptors are important structural devices to prevent gasoline, oil, or sand from getting into the drainage systems. An OWS removes substances other than water before entering the sanitary sewer system. In the following places they are always required:

- Repair garages where motor vehicles are serviced and repaired, and where floor drainage is provided
- Commercial motor vehicle washing facilities
- Gasoline Stations with grease racks, grease pits, or wash racks
- Facilities which have oily and/or flammable waste because of manufacturing, storage, repair, or testing
- Public storage garages with floor drainage
- Any place where solid, oil, gasoline or other volatile liquids can enter the drainage system

POLLUTION PREVENTION APPROACH

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

SUGGESTED BEST MANAGEMENT PRACTICES

- Frequent sweeping of areas discharging to the separator, depending on use.
- Target cleaning for early Spring or late Fall.
- Use oil absorbent materials on any liquid spills, such as oil or hydraulic fluid leaks because most OWS systems are not meant to manage high concentration loads of fluids other than water
- The facility manager should maintain a log of cleaning activities. Information should include frequency of cleanings.
- It is important to remove sediments from garage floors that can have a high concentration of pollutants including metals and hydrocarbons. These sediments can clog downstream drainage systems and transport pollutants to nearby water bodies.

INSPECTION PROCEDURES

- Oil/Water Separators/interceptors should be inspected twice per year by a properly trained employee or third-party firm (best times are before the start and before the end of the rainy season).
- Weekly inspections of an OWS system should include the following:
  - Visually examine the area served by the OWS for evidence of spills or leaks.

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Facilities
- Street Rights-of-Way
- Disposal of Removed Solids

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics
- Low Dissolved Oxygen

NOTES / SPECIFIC PROCEDURES:

(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

BMP 14 – OIL/WATER SEPARATORS

- Inspect the point of discharge (i.e., sewer manhole) for evidence of petroleum bypassing the OWS.
- Inspect drains for any signs of unauthorized substances entering the OWS.
- Examine the OWS for signs of leaks or any malfunction.

- Quarterly inspections of an OWS should include the following:

  - Complete tasks noted as appropriate for daily and weekly inspection.
  - Complete the Quarterly OWS Inspection Checklist, attached, during the inspection.
  - Take the following measurements to benchmark function of the OWS:
    - Distance from rim of access cover to bottom of structure
    - Distance from rim of access cover to top of sludge layer
    - Depth of sludge layer (C = A – B)
    - Distance from rim of access cover to the oil/water interface
    - Distance from rim of access cover to the top of the liquid surface
    - Depth of oil layer (F = D – E)

MAINTENANCE PROCEDURES

Cleaning of the OWS is required when there has been a spill to the OWS that exceeds ten gallons of oil, one gallon of detergent or solvent, or any material prohibited by the owner of the sanitary sewer. Cleaning is also required when the levels of accumulated sludge and/or oil meet the manufacturer's recommended levels for cleaning. This will vary based on the manufacturer of the OWS. If the manufacturer's recommendations are unknown, the following guidelines are appropriate for determining when to clean:

- When sludge accumulates to 25% of the wetted height of the separator compartment; or
- When oil accumulates to 5% of the wetted height of the separator compartment; or
- When 75% of the retention capacity of the OWS is filled.

Cleaning should be performed a minimum of once per year. When cleaning is required, it shall be performed by licensed OWS maintenance companies. Materials removed from the OWS must be disposed of in accordance with Massachusetts Hazardous Waste Regulations, 310 CMR 30.00.

BMP 14 – OIL/WATER SEPARATORS	
• Drains and grates should be free of debris or sediments. • Dripping pans should be used under vehicles or spigots. • Spill absorbent material should be ready for use. • Floors should be kept clean and spill materials should be cleaned up in a timely manner.	

Oil/Water Separator (OWS)
Quarterly Inspection Checklist

Facility: _____

OWS Location: _____

Inspected By: _____

Date: _____

Visual Inspections	Are there any signs of spills or leaks in the general area?	Yes ☐ No ☐
	Is there any evidence of petroleum bypassing the OWS?	Yes ☐ No ☐
	Are there any unauthorized substances entering the OWS?	Yes ☐ No ☐
	Does the OWS exhibit any signs of leaks or malfunctions?	Yes ☐ No ☐

Comments: _____

_____

If you answered "yes" to any of the above questions, further inspection, repair, and/or cleaning may be necessary.

Measurements	A	Distance from rim of access cover to bottom of structure	
	B	Distance from rim of access cover to top of sludge layer	
	C = A - B	Depth of sludge layer	
	D	Distance from rim of access cover to the oil/water interface	
	E	Distance from rim of access cover to the top of the liquid surface	
	F = D - E	Depth of oil layer	

If the values for “C” and/or “F” are greater than those in the manufacturer’s recommendations, the OWS must be cleaned by a licensed OWS maintenance company.

BMP 15 - BIORETENTION

DESCRIPTION

Bio-retention areas allow for runoff to be filtered through a soil medium that removes different pollutants before the runoff enters the stormwater drainage system. The Bio-retention facility needs to be maintained frequently for the first year and then annually after that.

POLLUTION PREVENTION APPROACH

The suggested Best Management Practices should be used to reduce the influx of pollutants into the storm water drainage system and increase the longevity of the bio-retention basin.

SUGGESTED BEST MANAGEMENT PRACTICES

- It is recommended that the area be cleaned once in early Spring and once in late Fall.
- The area should be cleaned with hand tools, rakes, shovels, and light construction equipment. Vehicles should not be driven on the bio-retention area.
- All damage should be repaired and mulch areas that are exposed should be fixed.
- Facilities and personal in-charge of the bio-retention area should keep inspectional logs and cleaning activity logs.

INSPECTION PROCEDURES

- Bio-retention areas should be inspected after every rainfall over a half inch of rainfall for the first year.
- Inspection of the bio-retention area should be daily for the first month to ensure the area is taking properly.
- The bio-retention area should be inspected once a month during the growing season and once in the beginning of Spring and at the end of Fall.

MAINTENANCE PROCEDURES

Bio-retention areas should be kept free of debris and weeds to ensure a properly working infiltration and stormwater management area. Routine maintenance should be done year-round and does not require much effort if area is well kept.

After planting:

TARGETED FACILITIES AND OPERATIONS

- All City-Owned property
- City-owned parking lots with
- Street Rights-of-Way

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics
- Low Dissolved Oxygen

REFERENCE

- University of Minnesota- Rain gardens and Maintenance
- "Vermont Rain Garden Manual"
- Housatonic Valley Association – Be River Smart

NOTES / SPECIFIC PROCEDURES:

(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

BMP 15 - BIORETENTION

- The area should be watered daily for two weeks unless significant rainfall has occurred.
- Inspect the bio-retention area for any signs of erosion.
- Re-mulch any area where bare soil has become exposed or mulch layer has been significantly reduced.
- If necessary, use stones to stabilize drainage paths within the bio-retention area. If it is possible use a wetland grass mixture if the area will hold the seeds.

After first rainfall:

- The bio-retention area should be free of standing water within 72-hours of rainfall. No standing water should be visible within the bio-retention area. If the area has not drained, continue to monitor; soil remediation or an improved under drain system may be needed.
- Ensure that mulch has not moved and settled in clumps.
- If applicable, inspect all inlets and outlet structure to ensure that runoff has drained properly with the basin.

One month of planting:

- Inspect all plants to ensure that they are free of pest and diseases; do not use any toxic pesticide or other toxic methods to remove pest and diseases. The toxic substance will enter the ground and the storm sewer system.
- Make repairs to all areas in and around the bio-retention area that appear to be worn down.
- Add mulch to areas that are bare or for which insufficient mulch coverage is observed.
- Remove any weeds from the area, ensure that all root systems from the weeds have been destroyed. Do not us any toxic substances to remove weeds.

The following seasons:

- Every 6 months or in spring and fall, whichever comes first, add 1” of mulch.
- Once every 2 to 3 years, in the spring, apply a new 3” layer of mulch in the entire bio-retention garden.
- If plants are showing signs of pest, disease or are growing poorly, remove the plant(s) and replace. Inspect the plants surrounding the area to ensure that there is not a greater problem.
- During times of extended drought look for features of stress (wilting, spotted brown leaves, loss of leaves, poor plant health, etc.)

BMP 15 - BIORETENTION	
• Area should be watered, when needed, in the early morning when maximum absorption takes place. • Prune excess growth annually or more often. Trimmed material may be recycled in with the mulch. • Weed the area regularly; however the area should not be mowed.	

BMP 16 – STORMWATER, SANITARY MAINTENANCE & WATER LINE REPAIR

DESCRIPTION

Some operation and maintenance activities of public utilities and accidents can result in the discharge of pollutants that can pose a threat to both human health and the quality of receiving waters if they enter the storm drainage system. Sewage incident response and investigation may involve a coordinated effort between staff from a number of different departments/agencies. Storm drainage systems need to be cleaned regularly. Routine cleaning reduces the amount of pollutants, trash, and debris both in the storm drainage system and in receiving waters.

POLLUTION PREVENTION APPROACH

Inspect potential non-stormwater discharge flow paths and clear/cleanup any debris or pollutants found (i.e. remove trash, leaves, sediment, and wipe up liquids, including oil spills).

SUGGESTED BEST MANAGEMENT PRACTICES

Stormwater Drainage Maintenance

- Cleaning the storm drain by flushing is more successful for pipes smaller than 36 inches in diameter.
- A water source is necessary for cleaning. The wastewater generated from storm line cleaning must be collected and treated once flushed through the system.
- Depending on the condition of the generated wastewater, it may or may not be disposed to sanitary sewer systems.
  The efficiency of storm system flushing decreases when the length of sewer line being cleaned exceeds 700 feet.

Sanitary Sewer Maintenance

- Clean sewer lines on a regular basis to remove grease, grit, and other debris that may lead to sewer backups.
- Establish routine maintenance program. Cleaning should be conducted at an established minimum frequency and more frequently for problem areas such as restaurants that are identified.
- Cleaning activities may require removal of tree roots and other identified obstructions.

TARGETED FACILITIES AND OPERATIONS

- All City-Owned Facilities
- Street Rights-of-Way

TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics
- Low Dissolved Oxygen

BMP 16 – STORMWATER, SANITARY MAINTENANCE & WATER LINE REPAIR	

• During routine maintenance and inspection note the condition of sanitary sewer structures and identify areas that need repair or maintenance. Items to note may include the following:
  – Cracked/deteriorating pipes
  – Leaking joints/seals at manhole
  – Frequent line plugs
  – Line generally flows at or near capacity
  – Suspected infiltration or exfiltration
• Prioritize repairs based on the nature and severity of the problem. Immediate clearing of blockage or repair is required where an overflow is currently occurring or for urgent problems that may cause an imminent overflow (e.g. pump station failures, sewer line ruptures, sewer line blockages). These repairs may be temporary until scheduled or capital improvements can be completed.
• Review previous sewer maintenance records to help identify "hot spots" or areas with frequent maintenance problems and locations of potential system failure.
 	
Spills and Overflows
 	
• Establish lead department/agency responsible for spill response and containment. Provide coordination within departments.
• Record required information at the spill site & contact Mass DEP.
• Perform field tests as necessary to determine the source of the spill.
• Develop notification procedures regarding spill reporting.
• When a spill, leak, and/or overflow occurs and when disinfecting a sewage contaminated area, take every effort to ensure that the sewage, disinfectant and/or sewage treated with the disinfectant is not discharged to the storm drainage system or receiving waters. Methods may include:
  - Blocking storm drain inlets and catch basins
  - Containing and diverting sewage and disinfectant away from open channels and other storm drain fixtures (using sandbags, inflatable dams, etc.)
  - Removing material with vacuum equipment
 	
Septic Systems
 	
• Document City's septic systems on a map.	

BMP 16 – STORMWATER, SANITARY MAINTENANCE & WATER LINE REPAIR

Planned Water Line Maintenance

- Discharge generated wastewater to a sanitary system with approval.
- Discharge to the storm drainage rain system using applicable pollution control measures. (Only available to clean water discharges such as water main/ water storage tank/water hydrant flushing).
- Discharge to the storm drainage rain system using applicable pollution control measures. (Only available to clean water discharges such as water main/ water storage tank/water hydrant flushing).
- If water is discharged to a storm drain, control measures must be put in place to control potential pollutants (i.e. sediment, chlorine, etc.) such as silt fences, gravel and wire mesh filter, or wooden weir and fabric.
- General Design considerations for inlet protection devices include the following:
    - The device should be constructed such that cleaning and disposal of trapped sediment is made easy, while minimizing interference with discharge activities.
    - Devices should be constructed so that any standing water resulting from the discharge will not cause excessive inconvenience or flooding/damage to adjacent land or structures.
- The effectiveness of control devices must be monitored during the discharge period and any necessary repairs or modifications made.

Unplanned Water Line Maintenance

- Stop the discharge as quickly as possible.
- Inspect flow path of the discharged water:
    - Identify erodible areas which may need to be repaired or protected during subsequent repairs or corrective actions.
    - Identify the potential for pollutants to be washed into the waterway.
- If repairs or corrective action will cause additional discharges of water, select the appropriate procedures for erosion control,

BMP 16 – STORMWATER, SANITARY MAINTENANCE & WATER LINE REPAIR	
chlorine residual, turbidity, and chemical additives. Prevent potential pollutants from entering the flow path. **Inspection Procedures** • Inspect for root infiltration. Tree roots are a major cause of backups. • Inspect for water inflow/infiltration. Rainwater entering the sewer pipe can contribute to sanitary sewer overflows. • Inspect for solids. Typical solids that buildup in the pipe and cause backups are grease, dirt, bones, tampons, paper towels, diapers, broken dishware, garbage, concrete, and debris. • Inspect for structural defects in pipes and manholes - Sags in the line, cracks, holes, protruding laterals, misaligned pipe, and offset joints are all possible causes of backups. **Maintenance Procedures** • Repair structural defects in pipes and manholes. • Refurbish portions of the utility lines periodically. • All maintenance should be documented in City systems.	

APPENDIX A

FACILITIES INVENTORY

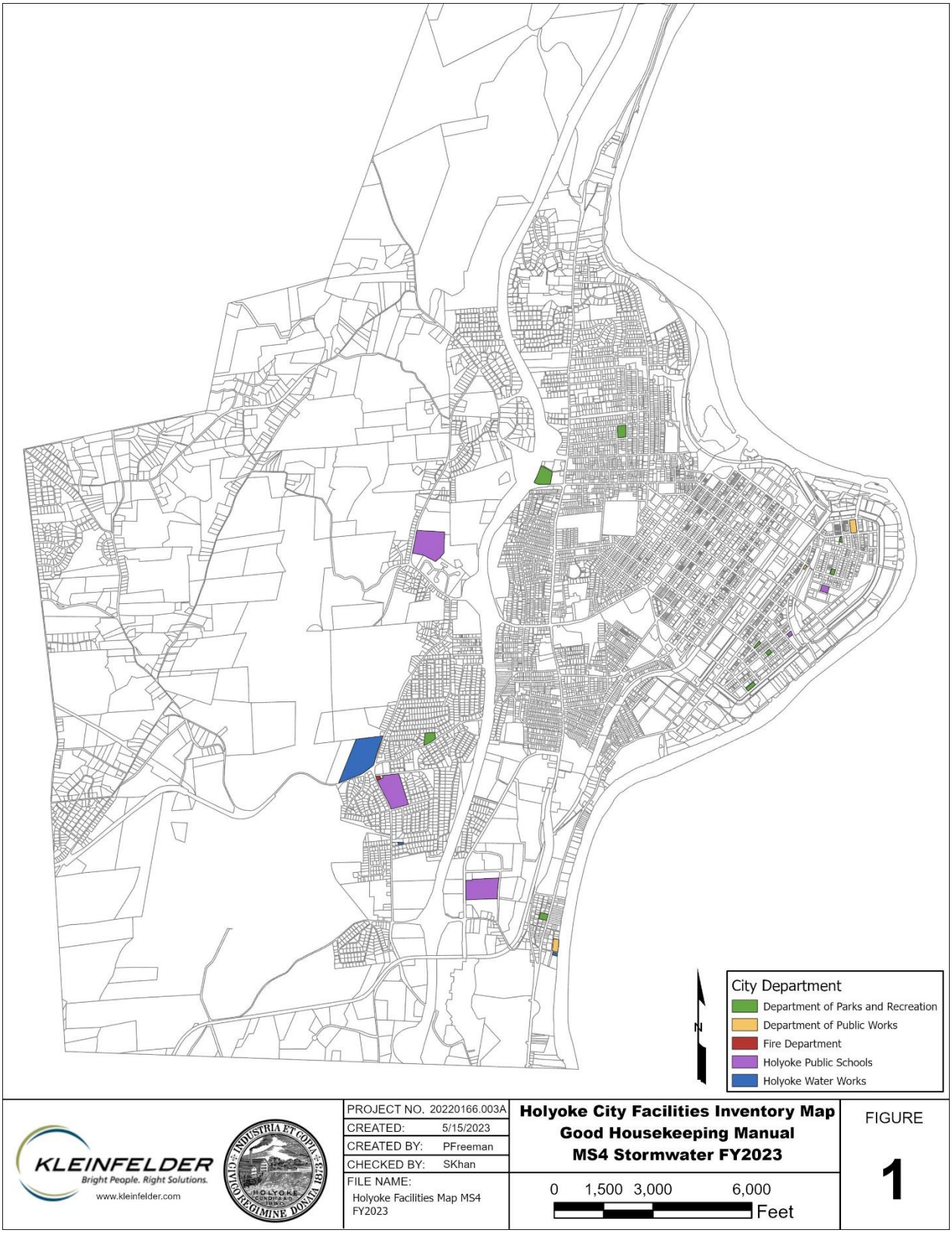
APPENDIX A: FACILITIES INVENTORY

Facility Name	Address	Department	Applicable BMPs
Fire Station #6	640 Homestead Avenue	Fire Department	BMP 3, BMP 4, BMP 5, BMP 7, BMP 8, BMP 9, BMP 10, BMP 12, BMP 13, BMP 14
Jones Ferry Pump Station	2 Jones Ferry Road	Department of Public Works	BMP 3, BMP 4, BMP 5, BMP 6, BMP 9, BMP 10, BMP 12, BMP 13
Boathouse	8 Oscar Street	Department of Public Works	BMP 3, BMP 4, BMP 5, BMP 7, BMP 8, BMP 10, BMP 11, BMP 12, BMP 13
DPW Barn/Garage	63 N. Canal Street	Department of Public Works	BMP 3, BMP 4, BMP 5, BMP 6, BMP 7, BMP 8, BMP 9, BMP 10, BMP 12, BMP 13, BMP 14
Water Tanks		Holyoke Water Works	BMP 3, BMP 4, BMP 5, BMP 9, BMP 10, BMP 13
West Heights Pump Station	555 Homestead Avenue	Holyoke Water Works	BMP 3, BMP 4, BMP 5, BMP 6, BMP 9, BMP 10, BMP 12, BMP 13
Pump Station and Upland Road Maintenance Garage	45 Upland Road	Holyoke Water Works	BMP3, BMP 4, BMP 5, BMP 6, BMP 7, BMP 8, BMP 9, BMP 10, BMP 12, BMP 13, BMP 14
Maurice A. Donahue School	210 Whiting Farms Road	Holyoke Public Schools	BMP 1, BMP 2, BMP 3, BMP 4, BMP 5, BMP 9, BMP 10, BMP 11, BMP 12, BMP 13, BMP 15
McMahon School	75 Kane Road	Holyoke Public Schools	BMP 1, BMP 2, BMP 3, BMP 4, BMP 5, BMP 9, BMP 10, BMP 11, BMP 12, BMP 13, BMP 15
Morgan School	496 S Bridge Street	Holyoke Public Schools	BMP 1, BMP 2, BMP 3, BMP 4, BMP 5, BMP 9, BMP 10, BMP 11, BMP 12, BMP 13, BMP 15
Marcella R. Kelly School	216 West Street	Holyoke Public Schools	BMP 1, BMP 2, BMP 3, BMP 4, BMP 5, BMP 9, BMP 10, BMP 11, BMP 12, BMP 13, BMP 15
Sullivan School and Park	400 Jarvis Avenue	Holyoke Public Schools	BMP 1, BMP 2, BMP 3, BMP 4, BMP 5, BMP 9, BMP 10, BMP 11, BMP 12, BMP 13, BMP 15

Facility Name	Address	Department	Applicable BMPs
Ingleside Park	Between 43 and 63 Arthur Street	Parks and Recreation	BMP 1, BMP 2, BMP 3, BMP 4, BMP 10, BMP 11, BMP 12, BMP 13, BMP 15
Mayer Field	Westfield Road and Memorial Drive	Parks and Recreation	BMP 1, BMP 2, BMP 3, BMP 4, BMP 10, BMP 11, BMP 12, BMP 13, BMP 15
Anniversary Park	1575 Northampton Street	Parks and Recreation	BMP 1, BMP 2, BMP 3, BMP 4, BMP 10, BMP 11, BMP 12, BMP 13, BMP 15
Kennedy Park	Lincoln Street and Waldo Street intersection	Parks and Recreation	BMP 1, BMP 2, BMP 3, BMP 4, BMP 10, BMP 11, BMP 12, BMP 13, BMP 15
Ely Court	Center Street and Lyman Street	Parks and Recreation	BMP 1, BMP 2, BMP 3, BMP 4, BMP 10, BMP 11, BMP 12, BMP 13, BMP 15
Pina Park	Center Street and E Dwight Street	Parks and Recreation	BMP 1, BMP 2, BMP 3, BMP 4, BMP 10, BMP 11, BMP 12, BMP 13, BMP 15
Jackson Courts	Jackson Street and Canal Street	Parks and Recreation	BMP 1, BMP 2, BMP 3, BMP 4, BMP 10, BMP 11, BMP 12, BMP 13, BMP 15
Carlos Vega Park	Hamilton Street and S East Street	Parks and Recreation	BMP 1, BMP 2, BMP 3, BMP 4, BMP 10, BMP 11, BMP 12, BMP 13, BMP 15
Valley Arena Park	S Bridge Street and Hamilton Street	Parks and Recreation	BMP 1, BMP 2, BMP 3, BMP 4, BMP 10, BMP 11, BMP 12, BMP 13, BMP 15
Train Station	74 Main Street	Department of Public Works	BMP 2, BMP 3, BMP 4, BMP 10, BMP 11, BMP 12, BMP 15

APPENDIX B
FACILITIES MAP FIGURE

APPENDIX B: FACILITIES MAP FIGURE



APPENDIX C

VEHICLE AND EQUIPMENT INVENTORY

APPENDIX C: VEHICLE AND EQUIPMENT INVENTORY

Manufacturer	Model	Description	Department	Storage Location	Number of Items

APPENDIX D

FACILITY INSPECTION LOG

APPENDIX D: FACILITY INSPECTION LOG

General Information			
Facility Name			
Date of Inspection		**Start/End Time**	
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			
Weather Information			
Weather at time of this inspection? ❑ Clear ❑Cloudy ❑ Rain ❑ Sleet ❑ Fog ❑ Snow ❑ High Winds ❑ Other: Temperature:			
Have any previously unidentified discharges of pollutants occurred since the last inspection? ❑Yes ❑No **If yes, describe:**			
Are there any discharges occurring at the time of inspection? ❑Yes ❑No **If yes, describe:**			

Control Measures: *Number the structural storm water control measures on your site map and list them below (add as many control measures as are implemented on-site). Carry a copy of the numbered site map with you during your inspections. This list will ensure that you are inspecting all required control measures at your facility. Describe corrective actions initiated, date completed, and note the person that completed the work in the Corrective Action Log.*

	Structural Control Measure	**Control Measure is Operating Effectively?**	**If No, In Need of Maintenance, Repair, or Replacement?**	**Corrective Action Needed and Notes** (identify needed maintenance and repairs, or any failed control measures that need replacement)
1		❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	
2		❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	
3		❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	
4		❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	
5		❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	
6		❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	
7		❑Yes ❑No	❑ Maintenance	

	Structural Control Measure	Control Measure is Operating Effectively?	If No, In Need of Maintenance, Repair, or Replacement?	Corrective Action Needed and Notes (identify needed maintenance and repairs, or any failed control measures that need replacement)
			❑ Repair ❑ Replacement	
8		❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	
9		❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	
10		❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	

Areas of Materials or Activities exposed to Stormwater

	Area/Activity	Inspected?	Controls Adequate (appropriate, effective, and operating)?	Corrective Action Needed and Notes
1	**Material loading/unloading and storage areas**	❑Yes ❑No ❑ N/A	❑Yes ❑No	
2	**Equipment operations and maintenance areas**	❑Yes ❑No ❑ N/A	❑Yes ❑No	
3	**Fueling areas**	❑Yes ❑No ❑ N/A	❑Yes ❑No	
4	**Outdoor vehicle and equipment washing areas**	❑Yes ❑No ❑ N/A	❑Yes ❑No	
5	**Waste handling and disposal areas**	❑Yes ❑No ❑ N/A	❑Yes ❑No	
6	**Erodible areas/construction**	❑Yes ❑No ❑ N/A	❑Yes ❑No	
7	**Non-storm water/ illicit connections**	❑Yes ❑No ❑ N/A	❑Yes ❑No	

	Area/Activity	Inspected?	Controls Adequate (appropriate, effective, and operating)?	Corrective Action Needed and Notes
8	**Salt storage piles or pile containing salt**	❑Yes ❑No ❑ N/A	❑Yes ❑No	
9	**Dust generation and vehicle tracking**	❑Yes ❑No ❑ N/A	❑Yes ❑No	
10	**(Other)**	❑Yes ❑No ❑ N/A	❑Yes ❑No	

Non-Compliance: Describe any incidents of non-compliance observed and not described above:
Additional Control Measures: Describe any additional control measures needed to comply with the permit requirements:
Notes: Use this space for any additional notes or observations from the inspection:

APPENDIX G

CITY ORDINANCE, REGULATION, DESIGN GUIDELINE REVIEW

M E M O R A N D U M

TO:	Kris Baker, P.E. City of Holyoke
FROM:	Jeffrey Ling, Kleinfelder
DATE:	May 10, 2023
SUBJECT:	City Ordinance, Regulation, Design Guideline Review
CC:	Peter Varga, Pam Westgate, Kleinfelder

The City of Holyoke is required by Consent Decree term 19.b.ii. to adopt or amend ordinances to require that New Development and Redevelopment stormwater management BMPs be optimized for Nitrogen removal. In addition to the remedial terms set by the Consent Decree, the City of Holyoke is required to continue to administer its Stormwater Management Program in conformance with requirements of the Massachusetts General Permit for stormwater discharges from Small Municipal Separate Storm Sewer Systems (MS4) as per Consent Decree term 67. As an element of that program, the City is required to evaluate current street design and parking lot guidelines (and other local requirements) that affect the creation of impervious surface cover. Per the language of the permit (Section 2.3.6 (b)):

> "This assessment shall be used to provide information to allow the permittee to determine if changes to design standards for streets and parking lots can be made to support low impact design options. If the assessment indicates that changes can be made, the assessment shall include recommendations and proposed schedules to incorporate policies and standards into relevant documents and procedures to minimize impervious cover attributable to parking areas and street designs."

Upon completion of the evaluation, the City must implement the recommendations in accordance with a City-set schedule.

Similarly, under Section 2.3.6(c), the City is required to assess existing regulations to determine the feasibility of implementing allowable Green Infrastructure when appropriate site conditions exist. These practices, which also address the requirements to include Nitrogen-removing BMPs, specifically include:

- Green roofs;
- Infiltration practices such as rain gardens, porous and pervious pavements, and other designs to manage stormwater using landscaping and structured or augmented soils; and
- Water harvesting devices such as rain barrels and cisterns, and the use of stormwater for non-potable uses.

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Summary of PVPC Work

In 2021 under the 2021 MVP Action Grant, Pioneer Valley Planning Commission (PVPC) completed a review of the City's ordinances and regulations in relation to climate resiliency and all topics relevant to MS4 permit requirements. Their review specifically covered the following topics:

- Illicit Discharge Detection & Elimination (IDDE),
- Construction Erosion & Sediment Controls (ESC),
- Post-Development SW Management Standards,
- Low Impact Development (LID) & Green Infrastructure,
- And Road/Parking Lot Design Guidelines.

PVPC held several workshops with the Regulatory Review Advisory Working Group (created specifically by the City to collaborate with PVPC) and individual meetings with various City departments to draft regulatory edits and supplementary documents that would improve stormwater management in the context of climate resiliency. Their analysis and recommendations fully satisfy the permit year 4 requirements (Section 2.3.6(b)) & (Section 2.3.6(c)). However, their recommendations have yet to be implemented except for recommendations to the stormwater regulations (PVPC Attachment 3). Suggested edits are summarized below:

- Holyoke Ordinances Ch. 38 Art. IV (PVPC Memo Attachment 1)
    - Modifying and conforming definitions for ESC, LID, and new/re-development.
    - Conforming site requirements for applicability for ESC.
    - Including regulation language regarding construction wastes, site plan review, construction site inspection, and enforcement.
    - Conforming applicability/exemption conditions with existing regulations for new and re-development.
- Regulations for Stormwater Management and Erosion and Sediment Control (PVPC Memo Attachment 3) – the following recommendations have been implemented:
    - Include LID site design to infiltrate, manage, and treat runoff.
    - Retain open space and mature trees, reduce impervious surfaces from streets, parking lots, and sidewalks.
    - Increase requirements for pre-development plan submissions for ESC and post-development performance.
    - Creating standards around soil compaction on construction sites.
    - Larger emphasis on LID techniques and site design, and
    - Final construction inspection of stormwater elements before and after installation.
- Subdivision Rules and Regulations (PVPC Memo Attachment 7)
    - Integrate LID at project initiation through plan review checklist.
    - Adoption of LID standards in Right of Way (ROW) and Street Design, integrate green and complete street philosophies.
    - Explicitly permit LID approaches and make sure draining related regulations reference the SW Management Ordinance and Regulations.
- Zoning Ordinance (PVPC Memo Attachment 9)

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- Require landscaping standards that promote infiltration in parking lots and vegetation requirements that limit compaction of native soils and removal of native vegetation.
- Reduce impervious area of parking lots through reduction of required parking spots, reducing stall size, encouraging porous materials.
- Increase requirements for site plan review process to promote thinking about soils, landscaping buffers, and the design standards stated in subsection 10.1.7.2 Landscape and Open Space Design Standards.

In addition to recommended edits, PVPC also supplied the City with draft IDDE Ordinance language, floodplain ordinance edits, Construction site inspection forms, and pre-development site review checklists for both Subdivision Regulations and the Zoning Ordinance.

Priority List

KLF completed an independent review of ordinances and regulations for compliance with the terms set by the Consent Decree. KLF also completed a streets/parking lots and LID/GI review and prioritization list by design criteria or topic (Appendix A). KLF's analysis was used to prioritize PVPC's suggested revisions and other documents that were previously provided to the City.

Please note that priority level was assigned based off the overall compliance in relation to the CD, and the 2016 MS4 over the improvements towards street/parking lots design guidelines and GI implementation. PVPC attachments listed as "High" priority level are ordinances/regulations that should be completed immediately as they contain updates that pertain to activities required by the CD or past permit deadlines. PVPC attachments listed as "Medium Priority" are ordinances/regulations that were identified to be lacking or inhibiting LID practices in relation to Streets/Parking lots/GI. PVPC Attachment 12 was excluded from this prioritization as it is a high-level analysis of streets/parking lots design guidelines. The prioritized items are shown in the table below:

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Priority	Document	PVPC Attachment	Comments
High	Draft IDDE Ordinance/ Regulation	2	Would recommend that this be done as soon as possible to give enforcement powers to the City for illicit connections and IDDE related activities listed in the CD. Can maybe ratify this as a regulation or edit to the current regulation for quickest implementation. If passed as a regulation, would also recommend codifying it with an edit/addition to the Chapter 38 Ordinance.
Medium	Holyoke Ordinances Ch. 38	1	There is a gap in ESC regulatory language within the ordinance as it lacks definitions of erosion terms, it is suggested to conform the definitions within the ordinance to match the updated Regulations for Stormwater Management and Erosion and Sediment Control. The suggested changes match language around new development and redevelopment applicability and exceptions criteria which is a yr. 3 Permit requirement within MCM 5. Additionally, new language is provided for LID definitions to explicitly promote things like porous pavement, green roofs ,etc.
Medium	Draft Erosion and Sediment Control Inspection Form	4	If there is not already a form of documentation for site inspection in use, the City should begin to track inspections and enforcement actions with a form like this for reporting purposes for the annual report and enforcement of Regulations for Stormwater Management and Erosion and Sediment Control.
Medium	LID Checklist for Pre-application Meeting	5	Checklist for pre-construction plans for developers, the City (planning, conservation commission, and city engineer). Covers general site natural resources assessment, soil types, and impervious area drainage. Enforces the post construction requirements on development in the planning phase.
Medium	Zoning Ordinance	8 & 9	Changes in this document effectively decrease parking (impervious) area requirements and increase requirements for landscaping requirements that promote infiltration. Additionally increases requirements for site plan reviews to consider soil types, open space design, and LID techniques. Would effectively bolster the update made in the Regulations for Stormwater Management and Erosion and Sediment Control.
Medium	Subdivision Rules and Regulations	6 & 7	Further integration of LID into pre-construction checklists and discussions. It's most closely related to the street design guidelines and LID features such as allowing bio-swales and curb cuts.
Low	Draft Guidance on Awarding Wetlands Protection Ordinance	11	Guidance document on pre-construction meetings for developers about the following LID and GI features: Bioretention systems, green roofs, porous paving, urban tree canopy. Provides talking points and application considerations.
Low	Floodplain Ordinance	10	Updates, mostly deletions to previous references, to accommodate new Flood Insurance Rate Maps (FIRMs) are updated (expected to be in 2023).

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APPENDIX A – SEPARATE KLF ORDINANCE ANALYSIS

The purpose of the following analysis is to determine if City ordinances meet the remedial terms of the Consent Decree and if the street/parking Low Impact Design (LID) practices and Green Infrastructure (GI) practices are allowed. This analysis identifies what hinders implementation of the practice if any exist. Thereafter, the City is responsible to determine what updates are feasible to ordinances or regulations and establish an implementation schedule. It is critical that all recommendations for ordinances, regulations, and design guidelines agree with the broader context of the City's development vision and master planning goals.

The City will be responsible for reporting on the status of these assessments including any planned or completed changes to local regulations and ordinances in annual reports which are a required submittal to EPA and the Massachusetts Department of Environmental Protection. This Technical Memorandum documents the approach, results, and recommendations of the required evaluations.

Methodology

To complete the analyses, the following City ordinance and regulation documents were reviewed:

- *Rules and Regulations Governing the Subdivision of Land in the City of Holyoke (referred to as Subdivision Rules and Regulation or 'SRR')*
- *The City of Holyoke Zoning Ordinance (referred to as 'Zoning Ordinance')*
- *Holyoke Stormwater Authority Stormwater Regulations (referred to as 'Stormwater Regulations')*
- *The City of Holyoke Code of Ordinances (referred to as 'Code of Ordinances')*
- *City Driveway Standards for Apron/Sidewalk Construction in the City ROW (referred to as 'Driveway Standards')*

To gain a broader context of City initiatives related to development, complete or green streets, and impervious pavement reduction, the following documents were reviewed:

- *The Holyoke Master Plan (referred to as 'Master Plan')*
- *The City of Holyoke Open Space and Recreation Plan (referred to as 'OSRP')*
- *Municipal Vulnerability Preparedness (MVP) Community Resilience Building Workshop Summary (referred to as 'MVP Summary')*
- *The City of Holyoke Impervious Surface Mapping for Resilience and Implementation (referred to as 'Impervious Area Story Map')*
- *Holyoke Green Streets (2017) – Prepared for the Pioneer Valley Planning Commission (PVPC) & Holyoke by The Conway School (referred to as 'Green Streets Guidebook')*

The matrix attached to this Technical Memorandum (Attachment 1) is adapted from the Massachusetts Audubon-created Analysis Tool for Local Land Use Regulations found on the EPA's website (Stormwater Tools in New England | US EPA). The adapted matrix provides grading criteria by design factor for

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ordinances, design guidelines, and regulations with regards to improved stormwater management (related to water quality or water quantity). The matrix provides examples of 'conventional', 'better', and 'best' regulation/ordinances/design guidelines.

The analysis was completed by reviewing relevant sections of the cited reference documents to determine where, or if, pertinent criteria currently exist in the City's regulations as a basis for comparison to recommended best practices. Existing practices that were determined to be less than optimum based on the matrix criteria were flagged for further consideration. If the City had no current regulation addressing the design factor, this was noted. Note that the lack of language specifically allowing a particular best practice was deemed to not hinder such practices. In addition to the analysis done to satisfy the Consent Decree and MS4 Permit Year 4 requirements (streets, parking lots, and green infrastructure), a high-level analysis was done identifying ordinances with regards to 2016 MS4 Permit MCM 4 construction erosion and sedimentation control ordinance requirements.

Analysis and Recommendations

The analysis summary is categorized into the following tables:

- Consent Decree, MCM 4 Construction Erosion & Sedimentation Control
- Street Design and Parking Lot Guidelines
- Green Infrastructure

Relevant regulations and guidelines are cited as necessary. Consent Decree terms and MCM 4 ordinances were reviewed for compliance with the Consent Decree and the 2016 MS4 Permit. Street Design, Parking Lot, and Green Infrastructure regulations and guidelines are rated from conventional, better, and best practices based on the criteria from the matrix in Attachment 1. Current regulations, hinderances, and recommendations are discussed for each design factor.

Consent Decree-Specific, MCM 4 Ordinances: Summary of Findings

Section 5.01 a) v. of the Stormwater Regulations satisfy the remedial terms of the Consent Decree. Current City regulations clearly state that structural BMPs in new development and redevelopment (disturbing an acre or more) must be optimized for Nitrogen removal to satisfy the Long Island Nitrogen TMDL. Additionally, the Stormwater Regulations satisfy the other permit year 3 requirements: requiring LID site planning when feasible, setting design standards as stringent as the 2008 MA Handbook for new development and redevelopment (MCM5). This analysis also contains a high-level review of ordinances related to Phosphorus removal standards for structural BMPs, construction erosion and sediment control. Regulations pertaining to both subjects were found to be consistent with the permit requirements.

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Factor	Regulation Source	Compliant (Y/N)	Discussion
Nitrogen	*Stormwater Regulations 5.01 a) v.*	Y	*Current design standards:* - Stormwater BMPs must be optimized for nitrogen removal for sites that will result in 5000 sq. ft. of impervious area or any land disturbance that disturbs one or more acres - Optimization guidance is provided by 2016 MS4 permit appendix H or appropriate EPA Region 1 or federally approved state tool for Nitrogen removal. - Matches intent of the Consent Decree Term - Current language allows for flexibility in looking for a guidance document *Hinderances:* - The optimization guidance referenced does not exist, Nitrogen removal estimates for structural BMPs are located within Attachment 3 to Appendix F of the 2016 MS4 Permit *Recommendation:* - Would recommend updating the language to reference Appendix F Attachment 3 which has methods of calculating Nitrogen and Phosphorous removal anyway
Phosphorus	*Stormwater Regulations 5.01 a) iv.*	Y	*Current standards:* - New development must remove 90% of TSS and 60% of TP for sites that will result in 5000 sq. ft. of impervious area or any land disturbance that impacts one or more acre - Redevelopment must remove 80% of TSS and 50% of TP for sites that will result in 5000 sq. ft. of impervious area or any land disturbance that impacts one or more acre *Hinderances:* - (N/A) *Recommendation:* - Consistent with permit requirements for new development and redevelopment, no recommendations
Construction Erosion and Sedimentation Plan	*Zoning Ordinance 10.1.5.7; Stormwater Regulations 4.02 a. xvii.3.; 5.01 a) i.; 5.01 a) x. 5.01 a) xi.; 5.03 a) iv.; Code of Ordinances Sec. 38-33 to 38-42*	Y	*Current Ordinance/Regulations:* - The site SWMP must contain erosion and sedimentation control narrative covering construction wastes streams as well for construction activities in developments that will result in 5000 sq. ft. of impervious area or any land disturbances that impacts one or more acre - Performance standards require developments that will result in 5000 sq. ft. of impervious area or any land disturbances that impacts one or more acre to control construction related impacts *Hinderances:* - (N/A) *Recommendations:*

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Factor	Regulation Source	Compliant (Y/N)	Discussion
			- Consistent with permit requirements for construction sites, no recommendations

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Street Design and Parking Lot Guidelines: Summary of Findings

Street design and parking lot standards and guidelines are detailed mostly in the SRR and the Zoning Ordinance documents. References to relevant by-laws and regulations are made for each design element or practice. Regulations that hinder best practices are called out. Refer to Attachment 1 for evaluation criteria and detailed matrices. The following summary of findings will discuss relevant street and parking lot design guidelines that are related to decreasing impervious area or incorporating low impact designs (LID).

Current regulations are graded "worse than conventional," "conventional," "better," and "best" to describe the level of which they promote and allow LID features for streets and parking lots. "Worse than conventional" regulations explicitly or inexplicitly impede or prevent implementation of LID practices. "Conventional" regulations follow general historic practices that do not address stormwater LID practices. They typically do not impede the use of LID practices but can hinder LID. "Better" guidelines offer flexibility and allow implementation of stormwater LID practices. "Best" guidelines explicitly encourage and promote LID features and go beyond NPDES minimum requirements. This can include incentivizing with Stormwater Utility credits or development opportunities. Criteria for design factors were taken from an EPA guidance/sample document on the matter. Full criteria definitions are detailed in Attachment 1.

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Factor	Regulation Source	Rating	Discussion
Street Location	Code of Ordinances Sec. 78-58; SRR 6.2.1 (1)	Best	*Current design standards:* - Subdivision rules state that streets shall be designed for safe vehicular travel - Complete Streets design standards and guidelines are provided by: Massachusetts Project Development & Design Guide (2006); National Association of City Transportation Officials Urban Bikeway Design Guide; ITE Designing Walkable Urban Thoroughfares: A Context Sensitive Approach; ITE Recommended Practice report guidelines; American Association of State Highway and Transportation Officials Green Book *Hinderances:* - Does not explicitly reference any standards or design features in the Code of Ordinances *Recommendations:* - Explicitly define Complete Streets design standards and guidelines as related to street location, grading, and road length - Can refer more directly to Green Streets Guidebook posted by the PVPC
Road Width	Code of Ordinances Sec. 78-85(a)(1), Sec 78-86; SRR 6.2.2	Conventional	*Current design standards:* - No definition of major and minor categories - SRR does not prescribe road width in a subdivisions or developments, just ROW widths - Code of Ordinances sets minimum street width to be minimum 50’ in width *Hinderances:* - Current standards promote high amounts of impervious area - Conventional criteria typically set street width to 24’-30’ - Road widths may be varied with Planning Board approval *Recommendations:* - Create wide, medium, narrow, and alley categories where widths are limited to 24’ for busy two travel lane roads with 2’ shoulders, and 18’-20’ for low traffic residential neighborhoods - Allow/encourage permeable paving materials for shoulders, low-traffic, narrow, or secondary streets - Incorporate or reference concepts the Green Streets Guidelines

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Factor	Regulation Source	Rating	Discussion
ROW Width	Code of Ordinances Sec. 78-58; SRR 6.2.2	Conventional	*Current design standards:* - Complete Streets design standards and guidelines are provided by: Massachusetts Project Development & Design Guide (2006); National Association of City Transportation Officials Urban Bikeway Design Guide; ITE Designing Walkable Urban Thoroughfares: A Context Sensitive Approach; ITE Recommended Practice report guidelines; American Association of State Highway and Transportation Officials green book - SRR defines minimum 22' and 32' in width for developments - SRR defines minimum ROW as 50' in a subdivison *Hinderances:* - Does not explicitly reference any standards or design features in the Code of Ordinances *Recommendations:* - Explicitly define Complete Streets design standards and guidelines as related to ROW width
Access Option	Zoning Ordinance 6.1.9 (a)	Better	*Current design standards:* - Common drives are allowed with Special Permit - Must be surfaced with material that reduces water flow onto streets or properties *Hinderances:* - Does not explicitly allow one way loop streets - Minimum width for residential common driveways shall be 16' from the roadway to the point of intersection of individual driveways - Requires a Special Permit *Recommendations:* - Explicitly allow one way loop streets - Explicitly allow common drives for multi-family homes without requiring a Special Permit
Dead Ends/Cul-de-sacs	SRR 6.2.4(1), 6.2.4(2)	Conventional	*Current design standards:* - Permanent dead-ended streets are required to have a minimum diameter of 90' - Dead-end streets are a maximum of 500' in length *Hinderances:* - Does not allow a hammerhead turnaround for permanently dead-end streets *Recommendations:* - Explicitly allow and/or require hammerhead turnaround - Explicitly allow and/or require center landscaped bioretention island

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Factor	Regulation Source	Rating	Discussion
Curbing	Stormwater Regulations 5.02 (g) iv.	Best	*Current design standards:* - Suggests omission of curbs to reduce impervious surfaces *Hinderances:* - (N/A) *Recommendations:* - Preference for no curbs and open drainage with roadside swales
Roadside Swales	Stormwater Regulations 5.02 (g) xi.	Best	*Current design standards:* - Grass swales along roads are cited as an optional technique to create a hydrologically functional site - LID explicitly encouraged *Hinderances:* - (N/A) *Recommendations:* - Adopt technical specifications and design templates for green infrastructure, can utilize the Green Streets Guidebook endorsed by the PVPC
Utilities	Zoning Ordinance 7.7.4.8; 10.1.7.4	Best	*Current design standards:* - Required to be located underground where physically and environmentally feasible *Hinderances:* - (N/A) *Recommendations:* - Consider explicitly allowing flexibility in siting utilities underground in ROW for roadside swales or other LID along roads
Sidewalks	Code of Ordinances Sec. 78-85 a) (6); Sec. 78-161; Sect 78-85 a) (9)	Conventional	*Current design standards:* - Board approval required for flexibility in sidewalk material and design - Does not explicitly mention sidewalk-specific construction rules - Sidewalks are installed per requirements from Public Works and City Engineer *Hinderances:* - Does not explicitly prefer permeable pavement material - Does not explicitly prefer siting with consideration to land contours for best pedestrian utility and impact minimalization *Recommendations:* - Encourage permeable pavement - Prefer siting that considers land contours and best pedestrian utility (not necessarily immediately parallel to road) and allow only on one side of the road in low density neighborhoods

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Factor	Regulation Source	Rating	Discussion
Sidewalk Drainage	Zoning Ordinance 7.5.7.7	Best	*Current design standards:* - Non-structural techniques and drainage systems that reduce impervious surfaces are encouraged for flexible development zones *Hinderances:* - (N/A) *Recommendations:* - Preference for sidewalks to drain to green space, and provide references to the Green Streets Guidebook for examples of potential drainage features
Parking	Zoning Ordinance 6.1.2; 6.1.7; 8.9.9.1	Conventional	*Current design standards:* - Off-street parking spaces must be at least 9'x18' - Special permit is required for reduction of parking spaces - Minimum number of off-street parking spaces for residential uses is one parking space per residential unit *Hinderances:* - Does not establish maximum parking spaces - Does not encourage minimum number of parking spaces - Does not allow for tenants to enter into separate, optional lease agreements for parking *Recommendations:* - Set limits on maximum number of parking spaces - Encourage minimum number of spots needed - Allow for reductions in parking based on available transit options nearby (e.g. large parking garages, bus stops, bike routes, etc.) - Allow tenants to enter into separate optional lease agreements for shared residential parking
Commercial Parking	Zoning By law 7.1.5; 8.3.2.3; 8.9.9.3	Conventional	*Current design standards:* - General regulations establish parking minimums and necessitate a request to reduce amount of parking through Plan Approval process *Hinderances:* - Does not explicitly state smaller spot option for compact cars - Does not offer flexibility to reduce minimum spaces based on nearby parking facilities or other transit options *Recommendations:* - Allow for reduction of parking requirements near transit - Create stall category for compact car up to 30% smaller than typical parking stall size

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Factor	Regulation Source	Rating	Discussion
			- Parking minimums should be calculated from required spots and not developed space.
LID in Parking Areas	Zoning Ordinance 6.1.7.6	Better	*Current design standards:* - Landscaping/other buffering materials are required between parking lots and adjacent parcels *Hinderances* - Landscaping is not explicitly referring to LID or bioretention - No requirement that the buffer is vegetation or non-structural *Recommendations:* - Require landscaping within parking areas have LID or bioretention - Require minimum of 10% of the interior parking area is landscaped and a minimum of 25 square feet for island planting areas, allow exception for curb cuts around islands to allow flow to infiltrate through retention area
Easy Siting of LID Features (bioretention, swales, etc.)	Zoning Ordinance 10.1.8.1; 10.1.8.2 Stormwater Regulations 5.02 (g) xi.	Best	*Current design standards:* - Explicitly states that incentives are available for LID best practices - Explicitly states that grass swales along roads are an option to integrate into site design to create a hydrologically functional site - PVPC has endorsed several Green Streets Guidebooks for Holyoke to adopt *Hinderances:* - (N/A) *Recommendations:* - Refer to Green Streets Guidebook

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Factor	Regulation Source	Rating	Discussion
Permeable Paving	Stormwater Regulations 5.02 (g) xi.; 5.03 (a) iii.	Best	*Current design standards:* - Permeable pavement is allowed in site design for small and large developments - Several initiatives including the MVP summary which promote road dieting and reduction of impervious areas *Hinderances:* - Permeable pavement and pavers are not explicitly preferred for residential drives, parking stalls, spillover parking spaces, and emergency access ways - Does not explicitly allow two track design for driveways and secondary emergency access *Recommendations:* - Explicitly state preference for permeable pavement for all parking lots and driveways, can reference Green Streets Guidebook
Stormwater Management O&M Plan	Zoning Ordinance 6.1.7.7; Stormwater Regulation 4.02 (a) viii. 5.01 (a) iii. 6.02 (b) 5.02 (g)	Best	*Current design standards:* - O&M plan required and must meet Massachusetts Stormwater Handbook provisions - O&M plan must maintain post development peak discharges for a 24-hour-2 year frequency storm event - Requirements for stormwater management plans for large developments (1 acre or larger) require developers to consider LID techniques (i.e. swales, rain gardens, etc.) to meet recharge requirements *Hinderances:* - (N/A) *Improvements:* - Encourage surficial bioretention and swales

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Green Infrastructure Analysis: Summary of Findings

This analysis focuses on whether current design standards and guidelines within Stormwater Regulations and Code of Ordinances allow the following types of Green Infrastructure:

- Green roofs,
- Infiltration Practices (rain gardens, curb extensions, planter gardens, porous and pervious pavement, etc.),
- And Water Harvesting Devices (rain barrels, cisterns, use of stormwater for non-potable uses)

Generally, Holyoke regulations and guidelines do not explicitly ban green roofs, infiltration practices, and water harvesting devices, but there are no explicit development incentives for creating green roofs or other infiltration practices.

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Green Infrastructure	Regulation Source	Currently Allowable? (Y/N)	Discussion
Green Roofs	Stormwater Regulations 5.02 xi.	Y	*What Allows Practice?* - Stormwater regulations allow 'roof gardens' in site design where practicable *What Hinders Practice?* - Nothing explicitly limits or hinders practice - No incentives for creating green roofs for businesses or residents
Infiltration (rain gardens, curb extensions, planter gardens, pours and pervious pavement, etc.) Water Harvesting (rain barrels, cisterns, use of stormwater for non-potable uses)	Stormwater Regulations 5.02 a); 5.03 a) iii. Code of Ordinances Sec. 38-76 b) (8)	Y	*What Allows Practice?* - Stormwater regulations and ordinances require LID features in site design for large and small developments - Regulations explicitly state preference for infiltration, flow, attenuation, and pollutant removal of runoff on site to existing areas with grass, trees, and similar vegetation and through the use of open vegetated swales and natural depressions; bioretention areas and rain gardens; permeable pavement; use rain barrels or other cisterns to provide onsite stormwater storage; planting of trees, etc. *What Hinders Practice?* - Ordinances only encourage use of LID practices to the maximum extent practicable - Does not offer incentives for infiltration practices

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Proposed Implementation Schedule

It is recommended that some design guidelines and standards in the Zoning By-Laws and LSSR be modified to limit impervious area, encourage surficial infiltration, and allow green infrastructure. Topics are sorted by high priority, medium priority, and low priority level for each document.

Regulation	Topic	Implementation Date
Code of Ordinances	*High Priority:* • *Road Width (78-85(a)1., 78-86)*: remove 50' road width requirement and create categories for different traffic levels. Make sure it is in line with complete streets and green streets (78-58). • *Sidewalks (78-85(a)6., 78-85(a)9., 78-161)*: Encourage permeable pavement and siting that considers land contours and best pedestrian utility.	
	Low Priority: • *Street Location* (78-58): Refer directly to complete streets design criteria or Green Streets Guidebook	
SRR	*High Priority:* • *Right of Way Width (6.2.2)*: Define Road widths as opposed to just defining ROW, decrease ROW for subdivided roads. • *Dead Ends 6.2.4*: Explicitly allow hammerhead turnarounds or require landscaped bioretention island	
Zoning Ordinance – App. A	*High Priority:* • *Parking (6.1.2, 6.1.7, 8.9.9.1)*: Set maximum parking limits, encourage only developing the minimum spots needed, and allow tenants to enter into optional lease agreements to share residential parking. • *Commercial Parking (7.1.5, 8.3.2.3, 8.9.9.3)*: Allow reduction of parking requirements near transit. Create smaller stall requirements for compact cars. Parking minimums should be calculated by usage and not sq. ft. of the developed space.	

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Regulation	Topic	Implementation Date
	Medium Priority: • *Access Options (6.1.9(a)):* Explicitly allow one way loop streets and common drives for multi-family homes • *LID in Parking (6.1.7.6):* Require 10% of the parking lot to have landscaped bioretention or infiltration area. Allow exceptions for curb cuts to allow flow into bioretention islands.	
	Low Priority: • *Utilities* (*7.7.4.8, 10.1.7.4*): Explicitly allow flexibility in locating utilities underground to allow installation of roadside LID such as swales or rain gardens • *Sidewalk Drainage (7.5.7.7):* State preference for sidewalks to drain into green space and can reference Green Streets Guidebook • *Easy Siting of LID (10.1.8.1, 10.1.8.2):* Recommend LI	
Storm Water Regulations	*Medium Priority:* • *Roadside Swales (5.02(g)xi.):* Adopt technical specifications from Green Streets Guidebook	
	Low Priority: • *Roadside Swales (5.02(g)xi.):* Adopt technical specifications from Green Streets Guidebook • *Permeable Paving (5.02(g)xi, 5.03(a)iii):* Explicitly state preference for permeable pavement for parking lots and driveways	

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Appendix H
Previous Annual Certifications

1 CERTIFICATION

STORMWATER MANAGEMENT PROGRAM, CITY OF HOLYOKE, MASSACHUSETTS

Authorized Representative: All applications, reports, or information submitted to the Director shall be signed and certified by either a principal executive officer or ranking elected official (See 40 CFR 122.22).

CERTIFICATION

"I certify under the penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information is submitted, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Printed Name:

Signature: _____ Date: 5/31/2023